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Poster Presentations

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P001 - Abdominal Cavity and Abdominal Wall

Prevention Of Stoma Site Hernia After Laparoscopic Reversal Of Hartmann's Procedure

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Background and Objectives: The rate of hernia at stoma site has been reported as 32 % following colostomy reversal. This prospective study focused on the patients who underwent laparoscopic colostomy closure after laparoscopic Hartmann's for severe diverticulitis, and was specifically aimed at investigating if mesh placement could be accepted as a safe and effective strategy of tissue reinforcement for prevent the stoma site from developing a hernia.

Methods: A prospective database involving three surgeons in our institute was mined to identify a consecutive series of patients from April 1991 to May 2011, who underwent laparoscopic colostomy closure after the laparoscopic Hartmann's procedure at the Texas Endosurgery Institute. All the perioperative information was processed by SSPS.

Results: Among 41 patients with laparoscopic Hartmann's, 33 had the procedure of laparoscopic colostomy reversal with the rate of 80.5 %. Of these 33 stomas, 29 were reinforced with Paritex Composite mesh. The operating time (OR) was 124.8 ± 66.6 min including laparoscopic colostomy takedown, intraoperative colonoscopy, as well as reestablishment of intestinal continuity. Blood loss during the operation was 86.3 ± 72.9 ml. Postoperatively none of the patients developed any major or minor complications, and length of hospital stay is 5.1 ± 3.3 days. Lastly in the 1-year follow-up, one patient was diagnosed as anastomotic stenosis while no one was found to develop either hernia or wound infection at the stoma site.

Conclusions: Laparoscopic colostomy reversal can be safely performed in the restoration of colonic continuity with low postoperative morbidity and short hospital stay. Moreover, application of mesh such as Paritex Composite to the stoma site has been effectively prevent from the developing the stoma hernia and did not cause gross wound infection at the stoma site.

P002 - Abdominal Cavity and Abdominal Wall

Complications of Laparoscopic Total Extraperitoneal (TEP) Inguinal Hernia Repair

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Aims: To evaluate intraoperative and postoperative complications in laparoscopic total extraperitoneal (TEP) repair of inguinal hernia regarding their early detection and management.

Methods: We studied a group of 35 patients who underwent TEP procedure for inguinal hernias.

Results and Discussions: There were 5 cases with complications: 2 small seromas, 2 gas diffusion complications and 1 early mesh migration with hernia recurrence. There was 1 patient with simple subcutaneous emphysema and another with an extended subcutaneous emphysema associated with pneumoperitoneum, pneumomediastinum and hypercarbia. All cases had a spontaneous resolution except the mesh migration, a very rare complication. In this patient we noticed an early hernia recurrence, 3 days after the operation, that needed an open reintervention with migrated mesh repositioning and fixation with two threads at the profound orifice and reinforcement of the abdominal wall with a second polypropylene prosthesis (Lichtenstein procedure). The 2 small seromas highlighted in our cases were spontaneously absorbed, but large seromas usually need puncture aspiration. It is mandatory to have a close intraoperative and postoperative patient observation for early detection of possible complications like those presented. Long term follow up for 3 years until now showed no recurrences or other complications.

Conclusions: TEP procedure, besides certain advantages like good postoperative aesthetics and fast recovery, has also possible complications. Some of these are spontaneously resolved, like small seromas and gas diffusion incidents, but others like early mesh migration with hernia recurrence raise significant problems. Our experience being not a large one, we expect that progression on the learning curve will diminish the complications rate.

Keywords: TEP, Gas complications, Early mesh migration

P003 - Abdominal Cavity and Abdominal Wall

Prevention of Parastomal Hernia by Using an Intraperitoneal Onlay 3D Mesh

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Background: The incidence of developing a parastomal hernia after creating a permanent stoma lies at least by 50 %, and about 75 % of these patients are indicating complaints. The different surgical procedures, we have available for reparation, are afflicted with high rates of complications and recurrence. The prevention of parastomal hernia by using prosthetic or biological meshes at the primary operation could reduce the rate of hernia formation.

Methods: From January until September 2012 we used the Dahlhausen IPST® 3D Mesh in intraperitoneal onlay technique for open (n = 4) and laparoscopic (n = 7) colorectal surgery to prevent hernia formation and prolaps by creating a permanent stoma.

Results: We report 11 Patients with a median age of 71.5 years.(5 female, 6 male) None of them developed a parastomal hernia or a proplaps(mean follow up 6 months) and there were no infections or mesh related complications. The mesh is easy to place and the procedure takes about 10 min.

In one case, the mesh was explanted at the primary operation, because of an ischaemic damage of the colon for what the close-fitting implant and not the insufficient perfusion was incriminated by the surgeon.

Conclusion: The prevention of parastomal hernia by using a synthetic 3D mesh in IPOM technique is feasible, safe and effective.

P004 - Abdominal Cavity and Abdominal Wall

Laparoscopic Incisional Hernia Repair; Clinical Outcomes and Our Technique

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Aims: Laparoscopic repair for incisional hernia has recently been reported to be beneficial, offering numerous advantages including low recurrence rates. We present herein an assessment of these benefits and an innovation we have established at our hospital, where we have been performing laparoscopic incisional hernia repairs since 2007.

Methods: We examined 22 patients who underwent laparoscopic incisional hernia repair during the 6-year period between January 1, 2007 and December 31, 2012. The size of the hernial defect is measured on computed tomography, and is measured again intraoperatively with a reduced pneumoperitoneum, allowing the hernial defect to be closer to its actual size. The mesh size is determined to allow approximately 3 cm overlap from the hernial defect in all directions. We secure the perimeter of the mesh with four sutures to facilitate surgical handling within the abdominal cavity. The entire perimeter of the mesh is then fixed with tacks. Moreover, to prevent organ invagination through the mesh gap, the tacks are placed in small intervals.

Results: A total of 22 patients (7 men, 15 women) with a mean age of 70.2 years, underwent laparoscopic incisional hernia repair. Mean diameter of the hernial defect measured intraoperatively was 6.0 cm. Mean operative time was 114.1 min, and mean blood loss was 8.7 g. Three patients developed seroma as a postoperative complication, and the mean length of postoperative hospitalization was 3.9 days. We have observed recurrence in only one patient (4.5 %) to date.

Discussion: We believe that laparoscopic repair may become the standard procedure for treating incisional hernia, since it offers good perioperative outcomes and enables the surgeon to thoroughly examine and securely cover the hernial defect.

P005 - Abdominal Cavity and Abdominal Wall

Significance of Margin Status for Laparoscopic Resection of Colorectal Liver Metastases

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Aim: Recent studies of margin recurrence questioned survival benefits of wide resection margin following resection of colorectal liver metastases. The aim of the current study was to determine whether resection margin aiming at 1 cm had survival benefit over minor and millimetric resection margin.

Methods: Between August 1998 and April, 2012 a total of 425 laparoscopic liver resections were performed in 317 patients during 351 procedures at the Intervention Centre and the Department of Hepatopancreatobiliary Surgery, Oslo University Hospital - Rikshospitalet. Primary laparoscopic liver resections for colorectal metastases were included in the study. After excluding two-stage resections and procedures accompanied by concomitant liver ablations, a total of 155 eligible patients were classified into four groups according to resection margins: <1 mm (Group 1, n = 33) including 17 patients with positive margin (Group 1a); 1 ≤ 3 mm³ (Group 2, n = 31); 3 ≤ 10 mm³ (Group 3, n = 55) and 10 mm³ (Group 4, n = 36). Perioperative and survival data were compared between the groups. Median follow-up was 31 months (range 2–136).

Results: Perioperative outcomes were similar in all groups. Intraoperative unfavourable incidents developed in 9.7 % (including 3.2 % of conversions). Postoperative complications developed in 11 %. Recurrence in the resection bed developed in 3 (1.9 %) patients, including 2 (6.1 %) in group1. Actuarial 5-year overall, disease-free and recurrence-free survivals were 49.41, and 33 %, respectively. Median length of survival was 65 months. Margin status had no significant impact on patient survival. Basingstoke Predictive Index (BPI) generally underestimated survival. It was especially marked in Group1 when post-operative BPI was applied.

Conclusions: Patients with margin <1 mm achieved survival comparable to patients with margin 10 mm³. Resection margin should not be considered as one of the most important factors influencing survival of patients with colorectal liver metastases when modern surgical equipment, which probably creates additional coagulation zone, is applied. Postoperative BPI, which includes margin status as one of the core factors predicting postoperative survival, seems to be less precise compared with preoperative BPI.

P006 - Abdominal Cavity and Abdominal Wall

Laparoscopic Radical Excision of Urachal Remnant in a Patient Presented with Abdominal Wall Abscesses

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Surgical excision is the curative treatment for urachal remnant complicated by recurrent infections. Such patient presents with umbilical discharge, periumbilical erythema and induration. The diagnosis is established by physical examination and imaging of abdominal CT showing a tubular structure below the anterior abdominal wall between the bladder and the umbilicus.

We report our laparoscopic excision of urachal remnant after abdominal wall abscesses.

A 12 mm trocar is placed in the right side lateral to the rectus muscle and above the level of the umbilicus for the scope and two working ports, two 5 mm, are placed supra-umbilical and in the right side of lower abdomen in the anterior and middle axillary lines.

The great omentum has adhered to the peritoneum of the anterior abdominal wall. After dissecting the adhesion, a peritoneal incision is performed between the medial and median umbilical folds in both side and liberated urachus from the posterior layer of the extra-peritoneal ligament and the transversalis fascia from the bladder to the umbilicus according to anatomical point of view derived from our experience in ventral or inguinal hernia surgery. The urachal remnant is then circumferentially isolated. At the dome of the bladder, the remnant is amputated by an absorbable suture. At this moment a peri-umbilical incision is made and umbilicus was removed with the remnant. Finally the peritoneal defect in the median is closed by an absorbable continuous intracorporeal suture, what is against post-operative adhesion.

Laparoscopic intervention for urachal remnant gives good access especially to the posterior aspect of the umbilicus as well as the urachus, therefore the possible existence of a deep prolongation of the urachus can be detected.

P007 - Abdominal Cavity and Abdominal Wall

Laparoscopic Treatment of Ventral Hernias - 7 Years Experience

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Objective: Aim of our presentation is to represent our experience in laparoscopic treatment of incisional and ventral hernias using laparoscopic technique, as an innovation in modern herniology. We operated 176 patients in Surgical Clinic Nis, Clinical Center Nis, since 04.12.2006. to 31.12.2012.

Methods: Prospectively we analyzed 176 patients (ASA I, II and in selected cases ASA III), 92 females and 84 males, who were operated laparoscopically used Parietex composite MESH, Proceed mesh and Relimesh. All patients had antibiotic prophylaxis (cephalosporin II g 2.0 g IV). Median age was 57 year (from 37 to 74). Size of defects was varying from 2 × 2 cm to 18 × 6 cm in the diameter. Postoperative hernias was 74 (38.7 %), epigastrical and umbilical hernias 15 (9.7 %), epigastrical 77(45.16 %), umbilical 10 (38.7). We analysed: size of defect, size of the mesh, duration of the operation, BMI, duration of hospitalisation, complications, mortality and the rate of relapse.

Results: All patients were operated under the general endotracheal anesthesia. BMI was varying from 19.5 to 31.6 kg/m². Size of MESH was 20 × 15 cm for 102 hernias, 15 × 10 for 42 hernias and circular MESH 12 × 12 for 22 hernias and 25 × 30 and 20 × 30 in 10 cases. Median operating time was 100 min. (from 75 to 195). Intraoperative complication was three. One was damage of stomach with Veress needle (provided with the suture) and two seroma. Duration of the hospitalization was 3 days average. We have no mortality. It was one recurrence in follow up period. All patients after 7–15 days successfully returned to normal life.

Conclusions: Reasons like: minimal invasive procedure with three little wounds on the abdomen, faster postoperative recovery, minimal pain, minimal rate of complications (with out infections, haematoma and neuralgias), low rate of economical costs, marks this procedure as reliable method in the treatment of ventral hernias.

P008 - Abdominal Cavity and Abdominal Wall

Introduction of Single Incision Laparoscopic Surgery for Inguinal Hernia: TEP

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Introduction: Single incision laparoscopic surgery for inguinal hernia is not so popular than cholecystectomy since TAPP procedures need suture or ligation that is technically difficult due to restriction of forceps handling. Since suture and ligation is not necessary for TEP, TEP may be suitable procedure for single incision hernia repair.

Purpose: We will evaluate and report our initial series of TEP with single incision.

Methods: Procedure was carried out through 2 cm long skin incision made at umbilicus. Trocar was inserted into retro muscular space through silicon rubber lid (EZ access Hakko corporation Japan) fitted to wound retractor. Dissection of pre-peritoneal space was done by Laparoscopic coagulating scissors. After reduction of hernia and isolation of vas deference, polyester mesh and absorbable tackler were used to cover inguinal wall.

Results: From March 2012 30 patients received TEP with single incision. 15 patients had bilateral hernia (bilateral direct 7, bilateral indirect 5, direct and indirect 2) and rest 15 patients had unilateral hernia (direct 3, indirect 12.). Duration of procedures ranges from 30 min to 150 min (average 78 min).

Every patient could discharge within 2 days after surgery without any adverse event except 5 cases of seroma. Duration of procedure was similar between direct hernia (Unilateral 64 min, Bilateral 88 min) and indirect hernia (Unilateral 59 min, Bilateral 96 min). Duration of surgery was longer than 100 min for initial 5 cases. However after initial 5 cases those were less than 100 min except large indirect hernia go down to the scrotum.

Discussion: Our initial result of TEP with single incision demonstrated acceptable result. For direct hernia reduction of hernia sac and isolation of spermatic cord was easier than that for indirect hernia. Limitation of coaxial handling more affected treatment for indirect hernia, especially during isolation of large hernia sac from spermatic cord. For large indirect hernia being insistent on single incision is not beneficial.

(Conclusion) Our result demonstrated that TEP hernia repair with single incision was feasible procedure. Due to restriction of forceps handling, TEP repair with single incision was good option for direct hernia and indirect hernia staying within inguinal canal.

P009 - Abdominal Cavity and Abdominal Wall

Outcomes of Transabdominal Preperitoneal Procedures (TAPP) on Inguinal Hernias - A Comparison with the Kugel Method and Anterior Approach Method

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Aim: TAPP was introduced as surgery for inguinal hernia in our institution in 1995; however, tension free methods such as the Kugel method became the primary method of inguinal hernia surgery. In recent years, however, proficiency in endoscopic surgical techniques and reaffirmation of the benefits of TAPP has led to TAPP becoming the first choice of surgery. This study compared the surgical results of TAPP following its reintroduction with those of other methods of surgery carried out over the same period.

Method: TAPP was reintroduced in 2010 and 171 TAPP procedures (T group) subsequently carried out as of December 2012. 80 Kugel method procedures (K group) and 104 anterior approach method procedures (A group) were carried out over the same period. Operative time, amount of bleeding, frequency of postoperative analgesic use, postoperative length of stay, frequency of recurrence and frequency of chronic pain were retrospectively compared between the groups.

Results: The operative time was 106.9 min, 58.8 min and 78.0 min, the amount of bleeding was 3.9 ml, 11.2 ml and 10.8 ml, the frequency of postoperative analgesic use was 1.46 times, 1.56 times and 2.14 times and the postoperative length of stay was 6.4, 6.7 and 7.0 days for the T, K and A groups respectively. The operative time was significantly longer with TAPP, but this method resulted in significantly less bleeding. In addition, 198 subjects were contacted at least 3 months after surgery and there were no reports of recurrence in any group. Although there was no significant difference observed between the groups with respect to the incidence of chronic pain (pain persisting even after 3 months or more post surgery), induration and discomfort, the incidence of chronic pain was lower in the TAPP group.

Conclusion: No cases have suffered recurrence following TAPP surgery and the incidence of chronic pain in TAPP group subjects is also quite low. As TAPP presents few intra-operative and postoperative complications it is also an appropriate surgery for the acquisition of endoscopic surgical technique. We consider TAPP to be extremely useful as a method of inguinal hernia surgery.

P010 - Abdominal Cavity and Abdominal Wall

A Prospective Non Randomized Comparative Study of Covered Meshes vs Polypropylene Meshes in Laparoscopic Repair of Incisional and Ventral Hernia

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Aims: Covered meshes are favored for laparoscopic repair of incisional hernia because of low incidence of long term bowel complications of adhesions, fistula formation etc. But high cost associated with these meshes hamper their use especially in developing countries where majority of meshes used are still uncovered polypropylene mesh. We analysed our prospective data to compare the long term results of use of covered and uncovered meshes in laparoscopic repair of incisional hernia.

Methods: Study was conducted in a single surgical unit from January 2004 to December 2012. Data was collected prospectively in a non randomized way. The demographic details, hernia characteristics, intraoperative and post operative details and follow up of patients were recorded on a prestructured proforma. Heavyweight polypropylene mesh or covered meshes were used based on the availability and patient affordability.

Results: 364 patients were included in this study. Polypropylene mesh was used in 149 patients and covered meshes (Composix, Proceed, Physio) were used in 215 patients. The demographic profile was comparable between the two groups with a mean age of 42.4 years (45.4 vs 40.6 years). Laparoscopic repair was successful in 346 patients; however, 18 (4.9 %) patients required conversion either due to dense adhesions or due to bowel, bladder or vascular injury. The average follow up period was 35.4 months (3–70 months). There was no difference in the incidence of complications in the post operative period between the two groups. There was no difference in pain scores and seroma formation between both the groups (p value 0.3 and 0.9 respectively). The most common post operative complication was port site infection. 12 patients developed subacute intestinal obstruction which was managed conservatively. Entero-cutaneous fistula was seen in two patients, one in each polypropylene and covered mesh group. Both these patients underwent exploratory laparotomy and removal of mesh along with resection anastomosis of the fistulous segment. The incidence of recurrence of hernia was 4.2 % in uncovered (polypropylene mesh) group, 4.4 % in covered mesh group and this was not statistically significant.

Conclusion: Polypropylene mesh was equally efficacious and safe in terms of post operative complications and recurrence when compared to covered meshes.

P011 - Abdominal Cavity and Abdominal Wall

Comparison of Different Trocar Systems in Respect of Fascial Defects

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Aims: Trocar-related access injuries in laparoscopy are currently being reduced by two technical advancements: using fewer trocars and reducing trocar size. However, the impact of the different trocar systems on the layers of fascia in the abdominal wall is yet unknown. **Methods:** On 12 recently deceased cadavers, we exposed the skin and the subcutis, and then introduced the following exactly measured trocar systems into the midline and the lateral abdominal wall: two single-port systems (SILS™ Port, OctoPort), three 10–12 mm trocars (cutting, bladeless and dilating), and one cutting and one bladeless trocar of 5 and 3 mm, respectively. All trocar systems were used equally often in the midline above, below and in the umbilical region, and on exactly predetermined sites in the lateral abdominal wall. After removing the trocar systems, the areas of the fascial defects were carefully measured and compared. Regional differences in abdominal wall defects after the trocar incisions were evaluated.

Results: The mean age of the 9 female and 3 male cadavers was 80.5 years. The external diameter of the trocar systems varied markedly from 30.6 mm for the SILS™ Port to 5.7 mm for the 3-mm trocar. In accordance with port diameter, the single-port systems were associated with fascial defects of 310 mm² for the Octo Port and 313 mm² for the SILS™ Port ($p = 0.22$). For the mutually competitive 10–12 mm trocars, we observed similar defect areas of 82.5 mm² with the cutting trocar, 81.4 mm² with the bladeless trocar, and 80.0 mm² with the dilating trocar. The 5-mm trocars caused, on average, fascial defects of 36 mm². This size was significantly ($p < 0.001$) undercut by the 3-mm trocars, which produced mean fascial defects of 19 mm².

Conclusions: Trocar-related access injuries in the fascial region can be significantly minimized by using 3-mm mini-trocars. Trocar site hernias can be almost completely avoided by using these ports. Single-port systems cause significant fascial defects, whose effects on postoperative pain and the emergence of trocar site hernias should be evaluated in prospective randomized clinical studies.

P012 - Abdominal Cavity and Abdominal Wall

Laparoscopy for Management of Nontraumatic Acute Abdomen

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Introductions: Progress in laparoscopic experience has increased the number of laparoscopic procedures performed, even in emergency cases. In this study, we aim to evaluate and summarize our experience with laparoscopic procedures, both diagnostic and interventional, for emergency nontraumatic abdominal conditions.

Methods: From January 2008 to December 2012, a total of 1895 patients were subjected to a variety of emergency procedures at the Emergency Hospital and 1548 of these patients were managed laparoscopically (81.7 %). We evaluated the initial clinical diagnosis, the laparoscopic findings and the subsequent outcome in this group of patients with a provisional diagnosis of acute abdomen, laparoscopically treated or who underwent explorative laparoscopy.

Results: After diagnostic laparoscopy, 1458 patients (94.2 %) were resolved by this method: acute cholecystitis-612, appendicitis-730, perforated peptic ulcer-21, intestinal occlusion for adhesions-17, ectopic pregnancy with hemoperitoneum-32, rupture of haematic ovarian cyst-17, pelviperitonitis-29. The conversion rate was 6 % due to necessity of managing their condition. In 81 cases we recorded postoperative complications and mean hospital stay was 3.4 days. No laparoscopy-related mortality was recorded.

Conclusion: Laparoscopic approach to abdominal emergency provides high diagnostic accuracy and therapeutic option. Laparoscopy has been shown to play a crucial role in the management of almost every abdominal emergency, offering, compared with the open approach, an initial diagnostic or explorative tool and a valid alternative in the treatment of the cause of acute abdomen with low morbidity and mortality rates.

P013 - Abdominal Cavity and Abdominal Wall

The Direct and Postponed Results of Patients with Afteroperational Ventral Hernias Laparoscopic Treatment Using PTFE Mesh with Nitinol

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Aims: To evaluate the direct and postponed efficacy of the after operational ventral hernias intraperitoneal laparoscopic plastic performed using polytetrafluoroethylene (PTFE) mesh with nitinol ring.

Methods: 56 patients were underwent after operational ventral hernias laparoscopic treatment using (PTFE) mesh with nitinol ring 'Rebound system' during the last 3 years. The following parameters of the laparoscopic intervention were comparatively evaluated: the clinical manifestation of the after operational seromas' formation in 4 (15.4 %) patients in the area of the removed hernia upper position that compelled us to do the repeated functions. 1 patient (3.8 %) complained on haematoma in the areas of the main laparoscopic port insertion. The patients started to stand up 6–8 h after the operation, 24 h after all the patients started to eat, they completely restore their motor activity. The after operational period average duration after self-expanding PTFE mesh with nitinol ring laparoscopic insertion was equal to 2.7 ± 1.2 days.

Results: The clinical manifestation of the direct after operational period in patients who underwent the laparoscopic treatment using (PTFE) mesh with nitinol ring was satisfactory. Patients were free from narcotic anesthetic drugs. There were any episodes of hernias recidivism. One could see after operational seromas' formation in 4 (15.4 %) patients in the area of the removed hernia upper position that compelled us to do the repeated functions. 1 patient (3.8 %) complained on haematoma in the areas of the main laparoscopic port insertion. The patients started to stand up 6–8 h after the operation, 24 h after all the patients started to eat, they completely restore their motor activity. The after operational period average duration after self-expanding PTFE mesh with nitinol ring laparoscopic insertion was equal to 2.7 ± 1.2 days.

Any patient 12–24 months after the laparoscopic operation didn't complained on pain syndrome. There were no hernias recidives also. Patients' both physical and psychic components of the health according to modified «SF-36 Health Survey» test were significantly higher comparing to the same data before the operation and close to those in case of the 'absolute health'.

Conclusions: The results of patients with after operational ventral hernias with PTFE mesh with nitinol ring laparoscopic treatment are optimistic according to medical indexes in direct and postponed periods.

P014 - Abdominal Cavity and Abdominal Wall

Role of Laparoscopic Adhesiolysis in the Abdominal Adhesive Disease Complex Treatment

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Aims: To analyze the efficiency of laparoscopic adhesiolysis in treatment of abdominal adhesive disease (AAD).

Methods: The study group included 31 patients with AAD, to whom laparoscopic adhesiolysis for the complex treatment of adhesive disease was performed. There were 11 male and 20 female patients aging from 21 till 62 years. 15 patients were operated after conservative treatment of adhesive intestinal obstruction. Patients with conversion were excluded from the study group. Diagnostic program before operation included complaints, anamnesis, clinical examinations, ultrasonography of the abdomen, barium contrast enterography.

We used the following indication for laparoscopic adhesiolysis: painful form of AAD, chronic adhesive intestinal obstruction, recurrent adhesive small intestinal obstruction, prophylaxis of recurrence of adhesive small intestinal obstruction. During laparoscopic for good visualization of abdominal cavity we used dissection of adhesion with the parietal peritoneum, and we used dissection for adhesions which led to deformation of intestine and influenced on the passage of intestinal contents. This method has demonstrated as a less traumatic and led to reducing time of operation. After the operation epidural anesthesia electrophoresis with Lydase and phonophoresis with Hydrocortisone to the anterior abdominal wall, medical stimulation of the intestine, non-steroid anti-inflammatory drugs, drugs with proteolytic activity (Longydase) were performed.

Results: Postoperative data in terms was 6 months to 5 years. Relapse of AAD with constant pain syndrome registered in 1 (3.2 %) patient, periodically arising pain—in 5 (16.1 %) patients, phenomena of adhesive intestinal obstruction was absent.

Conclusions: Laparoscopic adhesiolysis in a complex treatment of AAD is an effective treatment for adhesive disease and reduce the number of relapses of adhesions.

P015 - Abdominal Cavity and Abdominal Wall

Minilaparoscopic Approach for Transabdominal Preperitoneal (TAPP) Inguinal Hernia Repair

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Aims: Recently, reduced port laparoscopic surgery using minilaparoscopic instruments has been widely adopted as innovative features in minimally invasive surgery. We previously reported that the application of newly developed 3 mm minilaparoscopic instruments with supra-pubic approach in combining conventional 5 mm trocar at umbilicus to trans-umbilical single port access laparoscopic appendectomy could be feasible with excellent cosmetic result. Thus we attempted to apply modified technique for trans-abdominal preperitoneal (TAPP) inguinal hernia repair using minilaparoscopic instruments.

Methods: From July to December of 2012, 5 consecutive patients were assigned to undergo minilaparoscopic TAPP inguinal hernia repair at our hospital. We conducted to study our modified technique using reusable metallic trocar (ENDOTIP™, 3.3, 6 mm in diameter, KARL STORZ GmbH & Co. KG, Tuttlingen, Germany) as a working port, and VERSAPORT™, 5 mm in diameter, COVIDIEN, INC., Mansfield, MA, USA, XCEL™, 5 mm in diameter, ETHICON ENDO-SURGERY, INC., Pittsburgh, PA, USA) as a camera port. Straight-type grasping forceps and dissecting forceps (3.3 mm in diameter) were used through the left lower abdominal quadrant port with the triangular co-axial setup.

Results: Clinical records of 12 cases of TAPP inguinal hernia repair (from July to December of 2012) were analyzed retrospectively in background factors, operative time and length of hospital stay. Of them, we had 5 cases with modified TAPP (male 5, average age of 58.8, range 44–81) as was 71.7(m 5), 56–81 in the control group. The average operative time in the modified group was 123.2 min (105–150), significantly shorter than that of 168.4 (123–259) in the control group. The mean hospital stay in the modified group was 3 days, same as that in the control group. Postoperative complications were not observed in all cases.

Conclusions: We conclude that modified technique for TAPP inguinal hernia repair could be a promising option with safety and an attractive advantage of better cosmetic result in managing this condition.

P016 - Abdominal Cavity and Abdominal Wall

Ukrainian Experience in Laparoscopic Hernia Repair

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Ukraine is a second largest country on the European continent, after Russia. Annually around 340,000 operations on abdominal organs and more than 92,000 operations on hernia are performed in Ukraine. But the decreasing of incarcerated hernia frequency is not observed last years. On average, 12.7 thousands (13.8 %) of incarcerated hernia cases are operated in Ukraine every year. The quantity of late hospitalizations cases (>24 h.) averages 21 % with increasing of postoperative mortality to 3.64. First laparoscopic hiatal hernia repairs was executed by Prof. V.Grubnik in 1994. Today he has largest experience in Ukraine (>1800 operations). Then, in 1995 the Ukrainian Association Of Specialists From Miniinvasive, Endoscopic and Laser Technologies was found. In 1995 the group of surgeons led by Prof. Ya. Feleshtynskyi established first center of abdominal hernias surgery in Kyiv, in which the first time in Ukraine (1995) polypropylene mesh was widely used as a plastic material for hernias tension-free treatment. More than 3,000 patients with inguinal hernias were operated in this center only during 2004–2009 with minimal rate (4 %) of postoperative complications and hernia recurrence (1 %). 93 % alloplastic and 7 % autoplasic open and laparoscopic operations were performed. In department of laparoscopic surgery of Shalimov's Institute more than 30,000 laparoscopic operations were performed only for the last 10 years. But near 100 operations was done by reason of hernia. Regarding Khmelnytskyi Region, we have a department of miniinvasive surgery under the city hospital, in which near 1500 laparoscopic hernia repairs was done from 1998. In 2003, current president Ya.Feleshtynskyi founded association of surgeons-herniologists "Ukrainian Hernia Society". Until now we have 7 meetings for discussion the main problems of hernia surgery. In 2010 Ukrainian center of hernia surgical treatment in Kiev was created. In 2010 the Ukrainian specialists gain a first experience in using of single port laparoscopic interventions for hernia repair. In conclusion, today only limited number of surgeons in Ukraine use laparoscopic technologies for hernia repair. Operations are executed only in specialized laparoscopic centers and are in limited supply. The number of laparoscopic operations in Ukraine does not exceed 1 % from the total number of hernia operations.

P017 - Abdominal Cavity and Abdominal Wall

Laparoscopic Ventral Hernia Repair Identifies Multiple Defects & is Associated with Positive Long Term Follow Up Including Subsequent Pregnancies

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Aims: To assess: Initial operative experience, complication rates and ability to diagnose other discrete hernias. Long term follow up, recurrence rates and patient satisfaction following laparoscopic repair of ventral and incisional hernias (LRVIH). Patient experience during pregnancy following LRVIH.

Methods: A prospective study of 138 patients who underwent LRVIH over an 8 year period was carried out, an initial Performa was filled out at the time of operation and during initial hospital stay, patients were then followed up in clinic and a structured patient satisfaction questionnaire completed.

Of the 52 patients of child bearing age 13 patients had become pregnant during their follow up period and these patients completed a second questionnaire about pain, recurrence and problems during pregnancy and delivery and a physical examination was performed.

Results: 138 patients were included in this study, 70.3 % female and 29.7 % male, mean age was 47, mean BMI 38. 26 (19.6 %) patients had previously underwent an open hernia repair, 9 (34 %) of these had other discrete defects identified on laparoscopy. Multiple defects were identified in 28 (20.3 %) of all patients.

3 (2.1 %) patients had an inadvertent enterotomy, 2 of these were converted to open and 1 was managed laparoscopically. Other complications included seroma at 22.5 %, hematoma 1.4 %, and port site infection 2.2 %.

Mean follow up period of 31.4 months, 90.6 % of patients were satisfied with the procedure and would recommend it to other patients. Only 2.8 % of patients had recurrence.

13 patients had become pregnant during their follow up period, none of these patients experienced any pain, discomfort or recurrence of their hernia.

Conclusion: LRVIH identifies multiple defects that could otherwise be missed on conventional open repair and subsequently present as "recurrence". It is suitable for patients with high BMI and associated with low risk of complication including inadvertent enterotomy.

Long term follow up suggested positive overall patient experience, absence of pain and low recurrence rate. LRVIH in fertile women who intend to have further pregnancies is safe and is not associated with pain, discomfort or hernia recurrence.

P018 - Abdominal Cavity and Abdominal Wall

Mini-Totally Extraperitoneal Hernioplasty Using Progrid: The Vajira Crispy Roll Technique

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Introduction: Nowadays, endoscopic hernioplasty has been accepted to be the standard of care in groin hernia patients. Although, it can be safely performed in the expert's hand, there still needs the mesh fixing devices. If this device is not necessary, the cost of procedure can be reduced and the totally extraperitoneal (TEP) hernioplasty can be done by mini-laparoscopic instruments (3-mm trocar) which resulting in minimization of post-operative pain. We would like to share our Mini-TEP technique using Progrid™ which performed without any fixing devices.

Aim: To reduce the cost of the procedure.

Methods: We use three ports TEP technique, a 12-mm trocar is placed beneath umbilicus for the camera and balloon dissector, and two 3-mm trocars are placed in the midline of lower abdomen. Progrid mesh size 15 × 9 cm is used. To prepare the mesh before insertion, we mark a point at 6 cm in width from upper edge and loosely roll the upper and lower edge to meet this point by the grip side out as Crispy Roll. After completed dissection of myopeteneal orifice (MPO) and hernia sac, the mesh is inserted through 12-mm trocar, then placed the rolled mesh along iliopubic tract and unrolled to cover MPO.

Result: The operation has been done without any complication. No fixing devices needed.

Conclusions: Our technique helps us save the cost of the TEP hernioplasty and may reduce the post-operative pain. Nevertheless, further randomized controlled trial is needed to compare the outcomes between our technique and the standard TEP technique.

P019 - Abdominal Cavity and Abdominal Wall

Lightweight Polypropylene Mesh Fixation by Titanium or Absorbable Tacks in Laparoscopic Incisional Hernia Repair

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Introduction: Laparoscopic repair of ventral hernias has gained popularity, since many studies have reported encouraging results. The choice of the mesh and fixation methods are crucial issues in preventing complications and recurrence.

Materials and Methods: 40 laparoscopic ventral hernia repair performed consecutively in 38 patients (16 males, 22 females) for incisional hernias were retrospectively evaluated on the basis of a prospective maintained database. Patients were divided into two groups depending on which kind of tack was used; titanium tacks (*ProTack*TM, Covidien surgical, Mansfield MA, USA) vs absorbable tacks (*Securestrap*TM, Ethicon Endosurgery, Johnson & Johnson Inc.).

Results: All patients received totally laparoscopic incisional hernia repair by the use of lightweight polypropylene mesh with resorbable coverage. No major post-operative complications were reported. Post-operative pain, evaluated by Visual Numerical Scale (VNS), was higher in group A (titanium tacks, $p < 0.05$). No differences in follow-up as well as in recurrence incidence (1 case in both groups at 5 months after first surgical repair) were reported. Both patients received laparoscopic repair by the same kind of mesh.

Conclusions: *Securestrap*TM absorbable tacks are safe and effective and easy to use and did not increase the risk of mesh dislocation compared with non absorbable tack. The specific design well fits the lightweight polypropylene mesh *Physiomes*TM. Further evaluations in larger randomized studies are needed to confirm these preliminary data.

P020 - Abdominal Cavity and Abdominal Wall

Laparoscopic Inguinal Hernia Repair Experiences in an Urban Hospital in Turkey

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Aim: Inguinal hernia is commonly seen in daily surgical practice. Laparoscopy became widely preferred in all types of surgical diseases including inguinal hernias. For inguinal hernia repair there are two laparoscopic techniques; totally extraperitoneal (TEP) and transabdominal preperitoneal (TAPP). The aim of this study is to report our experiences in laparoscopic totally extraperitoneal inguinal hernia repair.

Method: From November 2011 to December 2012, laparoscopic hernia repair was done to 20 patients due to inguinal hernia. Totally extraperitoneal (TEP) hernia repair was done by the same surgeon to all patients. In 5 cases, the operation was started laparoscopically but were converted to open procedure because of the opening of peritoneal sac; 2 of them has had appendectomy, and these cases were excluded. Patients' demographic data, details of surgery, complications, postoperative pain, and recurrences were recorded and analyzed. Postoperative pain was assessed by using a scale from 0 to 10.

Results: All patients were male and mean age was 43 years (20–72). 10 patients had right, 8 left, 2 bilateral and 2 recurrent inguinal hernias. Mean hospitalization time was 2 days. Mean operation time was 70 min in one side and 95 min in bilateral hernias. Most of the hernias were indirect. In one patient, there was also cholelithiasis and laparoscopic cholecystectomy was done at the same time. In 2 cases postoperative complication occurred; one hemorrhagia, one seroma formation. Hemorrhagia stopped at postoperative 3rd day. Mean postoperative pain score was 4.4 (3–9). Chronic groin pain was continued up to 2 months in only one patient. These complications were occurred in first two patients. There is no recurrence and late complication at mean 4 months follow up.

Conclusion: Laparoscopic hernioplasty requires specific training and it is technically difficult. On the other hand, it is an effective and safe procedure in the hands of experienced surgeons. Especially in bilateral and recurrent hernias, there is less postoperative pain and morbidity.

P021 - Abdominal Cavity and Abdominal Wall

Trocar Site Hernia After Laparoscopic Cholecystectomy

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Aim: Laparoscopy has become the gold standard in an increasing number of procedures. Trocar site hernia (TSH) is an important complication of laparoscopic surgery, which carries a high risk of strangulation due to the small size of the defect involved. The aim of this study was to determine the incidence and risk factors for trocar site hernias after laparoscopic cholecystectomy.

Method: Between January 2009 and December 2011, laparoscopic cholecystectomy was performed to 344 patients in Nevsehir State Hospital, Turkey, via conventional method with 4 trocars. 10 mm trocar was used at the umbilical site to all patients. In 184 patients (Group A), the umbilical site trocar was placed by open primary entry technique via incision to external fascia and at the end of the operation, the fascia was closed by non-absorbable sutures. In 160 patients (Group B), firstly pneumoperitoneum was done by Veress needle, then the trocar was placed by closed technique. The fascia was not sutured at the end of the operation. All patients were analyzed retrospectively for trocar site hernia.

Results: There were no significant differences between the groups regarding age, gender, surgery type or the trocar sites. All trocar site hernias were seen at the umbilical site. Totally 6 TSH were diagnosed, the overall percentage of TSH was 1.7 % of all laparoscopic cholecystectomy patients. In Group A, TSH was diagnosed in 1 (0.5 %) patients. On the other hand, in Group B, TSH was diagnosed in 5 (3.1 %) patients. TSH was seen significantly higher in Group B ($P < 0.05$). Mean Body Mass Index (BMI) of Group A was 28 (20–38) and Group B was 26 (18–34). BMI was 28 and over in TSH patients in both groups.

Conclusion: The insertion of large trocars at the umbilical site is important in developing TSH. All fascial defects larger than or equal to 10 mm should be closed with non-absorbable sutures. Other conditions such as obesity can be additional risk factors since the umbilical defect must often be widened in these cases.

P022 - Abdominal Cavity and Abdominal Wall

Single Incision Laparoscopic Surgery for Revision of Defunctioning Ileostomy Following Early Post Operative Stoma Dehiscence and Retraction

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Complications after creation of an ileostomy are common. They range from benign to potentially life-threatening conditions. Common early complications include metabolic derangements, skin irritation, ischemia, mucocutaneous separation and stoma retraction. Most early complications can be treated conservatively, although serious complications may require surgical revision and re-siting.

This report describes a technique of managing an early mucocutaneous separation and retraction of ileostomy, utilizing the original ileostomy site as a single incision laparoscopic surgery (SILS) port for revising and re-siting the stoma.

A 65 year old man with known generalized exfoliative dermatitis on long term steroids underwent laparoscopic low anterior resection with defunctioning ileostomy. His recovery was complicated by mucocutaneous separation and retraction of the ileostomy, resulting in severe sepsis from extensive subcutaneous emphysema and abdominal wall abscess. A single incision laparoscopic surgery technique was used for revision and re-siting of the ileostomy at the incision site previously made for retrieval of the anterior resection specimen. The original ileostomy incision was closed at the fascial level but the subcutaneous tissue and skin were left to drain and heal by secondary intention. The revised ileostomy functioned well and the infected wound resolved with antibiotics. 3 months after the initial surgery, the patient had his ileostomy reversed.

Early recognition of complications of ileostomy and prompt appropriate management, including possible revision and re-siting of stoma, is vital in ensuring good outcome. This case illustrates the use of a novel technique for ileostomy revision and re-siting, thus avoiding a laparotomy and retaining the benefits of the index laparoscopic surgery.

P023 - Abdominal Cavity and Abdominal Wall

Transumbilical Single-Port Laparoscopic Transabdominal Preperitoneal Repair of Inguinal Hernia: Progress in Reducing Invasiveness

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Background: Conventional laparoscopic repair of inguinal hernia usually requires 3 ports. Recently, single-port laparoscopic surgery techniques have been developed to further minimize surgical trauma and invasiveness compared to conventional laparoscopic surgery. We want to present our experience in single-port transabdominal preperitoneal (TAPP) repair of inguinal hernia.

Methods: Since August 2011, data from single-port TAPP interventions have been prospectively collected. Until now, 193 single-port TAPP were performed—51 in patients with bilateral hernia and 142 in patients with unilateral hernia, 10 (5.2 %) of them were recurrent hernia. The overall mean BMI was 25 kg/m² and mean age was 48.7 years.

Results: Median hospitalization period was 2 days, no difference between patients with unilateral and bilateral hernia was observed. Median operation time was 63 min for unilateral and 102 min for bilateral hernia. Mean fascial incision length was 24.7 mm (± 9 mm), median skin incision length was 31 mm (± 8.5 mm). In 7.8 % one or in 2.1 % two additional 5 mm trocars were used due to intraabdominal adhesions, major hernias or technical problems. No additional trocars were placed in patients operated for recurrent hernia. No intraoperative complications were observed. No conversion to open surgery was necessary. Postoperative course was uneventful in most patients, there were two revisions for bleeding resp. Hematoma (one open) and one Single Port revision for small bowel obstruction. Up to now no recurrence was observed.

Conclusion: Single-port TAPP represents a safe and generally applicable surgery technique (even for the repair of recurrent hernia). The use of additional trocars is mainly due to improve patient safety. Moreover, it is nearly scarless and minimizes surgical trauma.

P024 - Abdominal Cavity and Abdominal Wall

Less is More - Advantages of Single Port IPOM Procedures

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Background: Laparoscopic repair for incisional or primary ventral hernia has become an increasingly used approach. Incisional hernias especially after open but also laparoscopic surgery are often complicated by adhesions. Applying pneumoperitoneum and insertion of trocars can be difficult and afflicted with the risk of bowel injury. Single port surgery was introduced for several laparoscopic procedures as for IPOM. The aim of this paper is to show the benefits of a single port approach.

Methods: In videos of several cases open approach, introduction and advantages of single port technique in IPOM procedures is shown.

Results: Single Port surgery offers an open approach with the advantage of primarily open adhesiolysis before introduction of the port system and then immediate camera and two to three instruments available. Adhesiolysis and introduction of even larger meshes can be obtained more easily. Close and hampering distance of trocars to the ribs and bone are avoided. The size of the first incision especially in patients with higher BMI is comparable. The only fascia defect can be covered by the mesh itself and closure is easier.

Conclusion: Single Port approach to incisional and primary ventral hernia repair has some advantages to conventional laparoscopy and is safe and feasible.

P025 - Abdominal Cavity and Abdominal Wall

Traumatic Supra-iliac Abdominal Wall Disruption. Laparoscopic Approach

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Introduction: Laparoscopic ventral hernia repair is an effective alternative to conventional surgery in primary and incisional hernias. Laparoscopic approach has decreased complications rate associated to a early discharge.

Traumatic abdominal wall hernias are frequently associated with internal injuries and usually requires surgical repair. We present a rare location of a traumatic abdominal Wall hernia managed successfully by laparoscopic approach.

Case Report: A 58 years old male affected by an abdominal direct impact secondary to an accidental motorcycle fall. The clinical examination showed a non penetrating injury, pain and a 20 cm haematoma in left flank. Tomography was practised showing a disruption in the underlying muscle fibers and fascia 6 cm wide above left iliac crest without content, or any other injury inside. Patient was discharged in 48 h. Definitive treatment with laparoscopic ventral hernia repair was performed successfully in 4 weeks.

Methods: Patient was positioned in decubitus supinus. Three ports (5 and 10 mm) were placed in the right flank and paraumbilicus. First step was to create a peritoneum aperture from the last rib to the iliac crest and the paravertebral muscle. A 15 × 16 cm light weight mesh (VENTRALIGHT™ ST Mesh. BARD™) was fixed using bioabsorbable tackers by Double Crown technique overlapping the hole 5 cm. Iliac Nerves must be identified and preserved.

Patient stud up in the first 24 h and was successfully discharged in 48 h.

There is not recurrence in 18 months follow up.

Conclusions: Laparoscopic approach in atypical locations in ventral hernias or traumatic disruption in abdominal wall is useful, feasible and reproducible with a lower rate of pain, early discharge and a lower rate of complications.

Light weight meshes and bioabsorbable tackers reduce cronic pain due to nerve entrapment without a recurrence increase.

P026 - Abdominal Cavity and Abdominal Wall

Delayed Right-Sided Diaphragmatic Rupture and Laparoscopic Repair with Mesh Fixation

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Introduction: Diaphragmatic ruptures (DRs) are found in 0.8–5.8 % of cases after high velocity blunt thoraco-abdominal trauma. Probably owing to the protective role of the liver on the right side, left-sided DR are more frequent, ranging 56–75 %.

They mostly occur immediately after the trauma but may also have a delayed onset in 14.6 % of cases. In these cases, the stretching of the diaphragm causes stress damage to the muscular fibres and vascular structures, inducing local ischemia finally leading to late DR.

Case Report: A 59-year-old woman presented with a 3-month-history of breathing discomfort, nausea, and abdominal pain. The patient underwent a 12-year-therapy for severe depression and multiple suicide attempts (by defenestration and phlebotomy). Physical examination revealed diffuse abdominal tenderness. Chest X-ray revealed a diffuse opacity of the right inferior pulmonary field. CT-scan showed a right-sided DR with right/transverse colon and liver herniation.

A laparoscopic repair with mesh fixation was performed. Although the liver was partially herniated in the thorax, the 30° laparoscope allowed pulling liver and colon out of the thorax, visualizing and closing the diaphragm (by discontinuous non-absorbable sutures) and fixing a 15 × 15 cm prosthesis by absorbable staples. Interestingly, no hernial sac was found, suggesting diaphragmatic necrosis as the pathogenetic mechanism of the DR. Two drains were left: one thoracic, one sub-diaphragmatic. The procedure lasted 190 min. Patient's outcome was uneventful. The patient was discharged on day 7 and is well 20 months after surgery.

Discussion: Diagnosis of delayed DR may be challenging, since thoraco-abdominal trauma occurring years before symptoms' onset can pass unnoticed. Moreover, symptoms are often non-specific, such as in the present case, where the patient complained of abdominal pain and respiratory discomfort for months. Therefore, a meticulous report of medical history and not delaying CT-scan are the keys to diagnosis.

At the present state of the art, a thoracic approach is highly recommended for right-sided DR, since the presence of the liver is supposed to interfere with the DR transabdominal repair. The present case shows that the laparoscopic repair is a viable option, even on the right-side and in presence of herniated colon and liver.

P027 - Abdominal Cavity and Abdominal Wall

Our Experience with Tapp Henioplasty Without Mesh Fixation

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Aim: The most accepted technique for inguinal hernia repair is TAPP procedure. Very important for postoperative result are precise anatomic preparation, type of the mesh and mesh fixation.

Method: We perform at our Department of minimally invasive surgery TAPP hernia repair more than 10 years. In the beginning we started with Prolen mesh and 3-point fixation. Now we use every time Ultrapro mesh 10 × 15 cm. Preparation is now more extensive than before—till midline and rectovesical connection. In patients with indirect or small direct inguinal hernia we use mesh without fixation. We fixed mesh in patients with big direct hernia near midline.

Result: In last 7 years—from 1.1.2006 till 31.12.2012, we performed 480 TAPP procedures.

414 (86.8 %) were primary hernias, 63 (13.2 %) were recurrent hernias but only 4 (0.8 %) after TAPP. In 221 (46.1 %) patients we used mesh with 3-point fixation using hernia stapler but in 259 (53.9 %) we used mesh without any fixation. Median operative time was in 2006—64.7 min and in 2012—51.6 min. Hospital stay is 2–3 days, and patients can be active from the first day after operation.

Conclusion: The most easy procedure for hernia repair is TAPP. It is very important create adequate space by precise preparation in inguinal region for 10 × 15 cm mesh. It is recommended use light weight mesh, partially absorbable. In our experiences mesh fixation is not necessary by indirect and small direct primary hernias where mesh overlap hernia aperture in all directions more than 2.5–3 cm. By big direct hernia aperture and by recurrent hernia is fixation recommended.

P028 - Abdominal Cavity and Abdominal Wall

Ambulant Intraoperative Onlay Mesh Repair of Inguinal Hernias Using Dual Mesh Plus Fixed by Helical Stapler: 14 Years Results

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Introduction: Laparoscopic repair of inguinal hernias is usually achieved by totally extraperitoneal (TEP) or transabdominal preperitoneal (TAPP) techniques. The intraperitoneal onlay mesh (IPOM) is an alternative much easier to perform, faster to execute, very repetitive technical steps with very few perioperative, middle and long term complications.

Materials and Methods: From October 1998 to January 2012 we performed 163 laparoscopic hernia procedures on 149 patients all males with a mean age of 58 (range 35–74) and mean BMI 33 with an IPOM technique combining the 10 × 15 cm Dual Mesh Plus (Gore™) and ProTack™ 5 mm tack for its fixation. We use three trocars: one 10 mm through the umbilicus and two 5 mm at umbilicus level approx 10 cm left and right for uni- and bi-lateral hernias.

Results: Mean operative time was 15 min for unilateral hernia and 25 min for bilateral. 35 hernias were direct, 57 were indirect, 49 scrotal and 22 bilateral (13 of 22 were recurrent). 15 patients had previous appendectomy, 4 left hemicolectomy and 2 appendectomy plus left hemicolectomy. In 5 cases an umbilical hernia repair was associated. Mean hospital stay was 8 h (range from 4 to 17) 24 % of patients needed analgesics the second postoperative day. Mean recovery time for working and general physical activities was four days. Patients were checked after 12 days, 1–3–6 months and 1–2 years. Average follow up time was 8 years (range 1–14). No short-term complications although some patients claim for pinches in inguinal area. One recurrence (0.6 %) 14 months after repair in a patient diagnosed for oesophagus cancer that lose 30 kg.

Conclusion: IPOM inguinal hernia repair because the absence of dissection and fast surgery could be done in ambulant care, come to rapid recovery and reincorporation to work activities, without local discomfort and very low recurrence rate. Specially indicated in recurrent and bilateral cases.

P029 - Abdominal Cavity and Abdominal Wall

'Double Leg Lowering' Test: Is It a Practical Measurement for Abdominal Wall Muscle Function in Patients with Abdominal Hernia?

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Aims: An ideal practical test for abdominal muscle in patients with hernia is still to be searched for. Double leg lowering 'DLL' test (for lower abdominal muscles) has been advocated as an objective measurement of abdominal wall function for patients with abdominal hernia. This study aims to assess the 'DLL' test—is it applicable in our daily practice?

Methods: 12 consecutive patients with abdominal hernias, incisional and parastomal, were studied. Data were collected prospectively for double leg lowering 'DLL' by one examiner.

Results: Even with examiner's help, 9 out of 12 (75 %) patients could not achieve the test's starting position of 'raising both legs straight at 90° with the trunk'. Only 3 (25 %) patients could be tested by 'DLL'. The table below demonstrates the reasons why DLL was not applicable in the 9 patients:

Conclusions: In this pilot study, 'DLL' test does not seem to be applicable in our daily practice as a measurement of abdominal wall muscles function for patients with abdominal hernia. Obesity, osteoarthritis, low back pain, lower limbs weakness and advanced age are limiting factors. Further studies are needed.

P030 - Abdominal Cavity and Abdominal Wall

Abdominal Wall Biomechanics: A Factor in Hernia Recurrence?

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Aim: Only the static size of abdominal hernia is usually measured by the operating surgeon either on relaxed abdomen (open repair) or inflated abdomen (laparoscopic repair). This study investigates the abdominal wall dynamics and aims to measure the tensile strain 'TS' (extended length) and compressive strain 'CS' (shortened length).

Methods: Three-dimensions videos were taken of five healthy volunteers during variety of movements. Digital image correlation technique was used to determine the extent of strains along 12 lines (longitudinal and transverse) marked on their abdomen. Original length of each line was defined when abdominal muscles were paused in relaxed position after exhalation and this length was considered as a reference for all related strains on that line. TS and CS were presented in positive and negative percentages, respectively.

Results: There was a high level of variability between different movements and repetitions of the same movement, both for an individual and between different volunteers. In transverse lines, the maximum mean for TS (12 %) and CS (−18 %) were found at the transverse lines on either side of umbilicus. In longitudinal lines, the maximum mean TS (28 %) was found at lower midline, while the maximum mean CS (−17 %) was found at the paramedian lines. The maximum value among all lines was [19 % ± 44.5 %] for TS and [(−23 %) ± (−26.5 %)] for CS. All maximum values were detected at either trunk rotation or lateral flexion. Interestingly, neither forced deep respiration (which mimics the inflated abdomen in laparoscopy) nor coughing was associated with any of the maximum values.

Conclusions: Understanding abdominal wall dynamic strains may help in preventing hernia recurrence. Although 5 cm is the standard teaching for mesh overlap, larger overlap should be considered in the lower abdomen.

P031 - Abdominal Cavity and Abdominal Wall

Abdominal Wall Biomechanics: A Factor in Mesh Materials?

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Aim: A better understanding of the mechanics of the abdominal wall may enable biomechanically compatible mesh materials to be developed and appropriately deployed in hernia repair. This study aims to explore the deformation (shear and principal strains) of the abdominal wall.

Methods: Digital image correlation technique was used to accurately study three-dimensional movement of the abdominal wall. Stereoscopic videos were taken of five healthy volunteers during a variety of movements. Analysis of speckle patterns on the volunteers enabled the deformation (strain) to be calculated at points of interest across the abdominal wall during each movement.

Results: At each point of interest on the abdominal wall tensile or compressive strains are reported in longitudinal and transverse directions (transverse strain maximum 26.6 %, minimum -10.1 %; longitudinal strain maximum 16.1 %, minimum -18.6 %). However, measurement of longitudinal and transverse strains may not capture the true maximum and minimum strain values which can occur diagonally. These *principal strains* and their directions are reported for each movement. For the first time *shear* (rotational) strain is reported (typical maximum $\pm 6.0^\circ$).

Conclusions: Consideration of shear strain and the magnitude and direction of the principal strains, at any location on the abdominal wall under a range of movements, may provide new insights into the design requirements for mesh materials and may enable existing meshes to be better utilised. High shear strains are likely to result in wrinkling and premature failure of the mesh.

P032 - Abdominal Cavity and Abdominal Wall

Routine Use of Open Access Technique to Create Pneumoperitoneum in Laparoscopic Surgery

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Background: The main challenge facing the laparoscopic surgery is the primary abdominal access, as it is a blind procedure associated with vascular and visceral injuries. It has been proved that 50 % of laparoscopic surgery major complications occur prior to the commencement of the surgery. If there is delay in diagnosis of visceral injuries the morbidity will increase and may lead to mortality.

Aim: To evaluate the "open access" technique in a retrospective study in 1,302 consecutive laparoscopic operations performed over a 20 year period.

Patients and Methods: During a 20-year period, from January 1993 till December 2012, 1,302 laparoscopic operations were performed. These included 1,094 cholecystectomies, 127 Nissen funduplications, 43 appendectomies, 25 exploratory laparoscopies, 11 Heller myotomies for achalasia, 12 radiofrequency ablations of liver tumors and 7 resections of non-parasitic cysts of the liver. In 197 patients a previous operation was performed (28 in the upper abdomen and 169 in the lower abdomen). Fifteen patients were morbidly obese. The open access technique for the creation of the pneumoperitoneum was used in all the cases. A midline incision from the linea alba up into the inverted umbilicus was performed in the cicatrix tube and the peritoneum was penetrated allowing air to flow into the abdominal cavity followed by a blunt trocar insertion.

Results: Successful establishment of pneumoperitoneum was performed in 1,293 patients. In 9 patients the operation was converted to open, in 8 patients because of dense adhesions and in 1 patient because of small bowel injury. In 7 patients there was bleeding from the port site. In 4 of them the bleeding was recognized at the end of the operation and stopped with haemostatic stitches while in 3 patients the bleeding was recognized postoperatively, treated with blood transfusions and stopped spontaneously.

Conclusion: In this series, the "open access" technique to create pneumoperitoneum is applicable in all patients. It is fast, easy to learn with very few associated problems.

P033 - Abdominal Cavity and Abdominal Wall

Evaluation of Laparoscopic Transabdominal Preperitoneal Repair (TAPP) for Recurrent Inguinal Hernia After Anterior Approach Hernia Repair

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Background: In Japan there are not recommended operations for recurrent inguinal hernia. According to European Hernia Society (EHS) guidelines, endoscopic or open posterior are recommended for recurrent inguinal hernia after anterior approach hernia repair. We investigated the recurrent inguinal hernia after anterior technique operated on by TAPP.

Methods: We experienced 60 patients (62 hernias) who underwent TAPP for recurrent inguinal hernia after anterior technique during January 2007–December 2012. We analyzed retrospectively patient characteristics, the last operations, hernia classifications, used prostheses.

Results: Average age was 63.1 years (15–89 years), male patients were 57 and female were 3. Average operation time was 82.0 min, average blood loss was 3.0 g, postoperative hospital stay was 1.1 days. The last operations were 35 conventional repairs, 18 children's hernioplasty, 8 Mesh-Plug repairs, 1 Lichtenstein repair. Recurrent hernia classifications were 36 lateral hernias, 22 medial hernias, 3 femoral hernias, 1 pantaloon hernia. 57 hernias were repaired by polypropylene (PP) mesh and 5 hernias were repaired by PP mesh with expanded polytetrafluoroethylene (ePTFE). At present we don't experienced recurrence after TAPP for recurrent inguinal hernia.

Conclusions: TAPP is considered as a useful procedure for recurrent inguinal hernia after anterior approach.

P034 - Abdominal Cavity and Abdominal Wall

Lap Transabdominal Extra-Peritoneal Mesh Repair of Ventral Hernia - A Safe and Cost-Effective Alternative

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Background: Laparoscopic repair of ventral hernia requires the mesh to be put intraperitoneally. This causes adhesion formation and hence warrants use meshes with adhesion barrier. Extraperitoneal placement of usual polypropylene mesh can reduce the cost of the procedure without increasing chances of adhesion formation.

Methods: Six patients of ventral hernia (primary and small incisional hernias) underwent laparoscopic trans-abdominal extra-peritoneal (TAEP) repair with polypropylene mesh. An 'L' shaped peritoneal flap was raised after precise intracorporeal measurement according to the size of mesh. The neck of sac was circumcised and defect closed with polyglactin suture. Polypropylene mesh was placed in the extra-peritoneal space and fixed using tacking devices. Flap was repositioned using the same tacking device or using polyglactin suture.

Results: All procedures were successfully completed. The average operative time was 126.5 min (88–176). Average number for peritoneal rents was 1.17 (including the circumcised sac). Post-operative pain was comparable and the cost of procedure was significantly less than intraperitoneal onlay mesh repairs. There were no recurrences in a follow-up of up to 18 months.

Conclusion: Laparoscopic trans-abdominal extra-peritoneal (TAEP) repair of ventral hernias is feasible, safe and a cost-effective option, although larger study with longer follow is required for long term results.

P035 - Abdominal Cavity and Abdominal Wall

Laparoscopic Incisional Hernia Repair

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Introduction: Laparoscopy has become a popular approach for incisional hernia repair. The purpose of this study is to present our experience and evaluate the efficacy and safety of laparoscopic incisional hernia repair.

Material and Methods: During the period January 2009–January 2013, 41 patients underwent laparoscopic incisional hernia repair at our department.

Results: The procedure was completed in 39 patients. The mean VAS score of postoperative pain at first 24 h was 4. The mean operative time was 53 min and postoperative hospitalization was 2 days. Seroma occurred in 5 patients and was managed conservatively in all cases. During a mean follow-up time of 14 months one recurrence was observed.

Conclusion: Laparoscopic repair is a safe, feasible and effective approach for the management of incisional hernias

P036 - Abdominal Cavity and Abdominal Wall

Laparoscopic Approach to ‘Complex’ Incisional Hernia

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Aims: Incisional hernia is a common complication of abdominal surgery, with reported occurrence rate of up to 20 % after laparotomy. Although laparoscopic incisional hernia repair is now somewhat standardized, with reported morbidity, mortality and recurrence rate similar to open procedures, the management of “complex” incisional hernias remains a challenge for laparoscopy. The aim of this study was to assess the feasibility, safety and efficacy of laparoscopic repair even for this category of hernias.

Methods: Since September 2002 through January 2012, 203 patients underwent laparoscopic repair for incisional hernia in our institution. We retrospectively reviewed the charts of 87 patients (42.8 %) with “complex” hernias: defects located next to abdominal borders (suprapubic, subxiphoidal, subcostal and lumbar region: 33 cases) and defects >10 cm in size (54 cases). Comparative analysis was done between complex (Group-A) and non-complex (Group-B) hernias, with respect to clinical features, post-operative course and morbidity rate; recurrence rate were assessed during a mean follow-up period of 41 months (range 12–75 months).

Results: Group A included 54 females and 33 males, with a mean age of 61.1 years and a mean BMI of 28.9; eighteen (20.6 %) of these showed recurrent hernias; the mean defect size was 137 cm² (range 16–500 cm²); in 94.2 % of repairs we used an expanded-polytetrafluoroethylene mesh. Demographic and clinical features were similar in both groups. Complex hernias required a significantly higher mean operative time (136 vs 104 min, $p < 0.0001$) and a longer hospital stay (5.6 vs 4.3, $p = 0.001$); moreover, the use of more than 3 trocars ($p = 0.01$) and the addition of transfascial sutures for mesh fixation ($p = 0.01$) were more frequent in this group. Conversely, no statistical differences were noted between the two groups regarding the conversion rate (4.5 vs 1.7 %), postoperative morbidity (16 vs 8.6 %), as well as recurrence rate, which was 4.5 % (4 cases) in group A and 3.4 % (4 cases) in group B.

Conclusions: Laparoscopic incisional hernia repair is safe and effective even in complex defects, with morbidity and recurrence rate similar to the non-complex group. Nevertheless, it requires a longer operative time and specific surgical skills, therefore an adequate learning curve is mandatory.

P037 - Abdominal Cavity and Abdominal Wall

Laparoscopic Reconstruction of the GIT After the Open Abdomen Operations - Our Technique

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Aims: Reconstruction of GIT after open abdomen operations resulting with enterostomy demands extensive laparotomy, which involves significantly higher risk of morbidity. The aim of our message is to present our practical experience with renewing continuity of the bowel in laparoscopic way step by step.

Methods: In several video sequences we would like to show the ordinary procedure, possible pitfalls and the way we deal with possible complication during the operation. For the video presentation we have chosen patient who underwent the reconstruction of the GIT for leftsided stomy and another one with the rightsided stomy. We review the results obtained on patients, who underwent reconstruction of the GIT in retrospective study. We considered the early postoperative outcome, duration of the operation, type of the operation, peroperative data and postoperative follow up.

Results: Presentation of the technique in the video sequences and analysis of possible pitfalls.

Presentation of the postoperative outcome and follow-up, possible peroperative and post-operative complications.

Conclusion: Laparoscopic reconstruction of the GIT is demanding performance due to the numerous adhesions because of the previous diseases and revisions. Our results show, that this operation can be done safely with relatively low morbidity. That is why the laparoscopic way is a very good option to open access.

P038 - Abdominal Cavity and Abdominal Wall

Laparoscopic Reconstruction of the GIT After the ‘Open Abdomen’ Therapy by V.A.C. System - Case Report

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Aims: Reconstruction of GIT after open abdomen operations resulting with enterostomy demands extensive laparotomy, which involves significantly higher risk of morbidity. The aim of our message is to present our experience with renewing continuity of the small intestine in laparoscopic way step by step after the open abdomen VAC therapy—case report.

Methods: For video presentation we have chosen patient with recurrent operations for ileus caused by severe abdominal adhesions after perforated appendicitis. Patient ended up with two stomas in the small intestine and the abdominal cavity was healed by V.A.C system. After healing of the abdominal cavity patient underwent the laparoscopic GIT reconstruction. In video presentation we would like to show the laparoscopic procedure, pitfalls and complications during the operation. Intestinal anastomosis was done intraabdominally. One ileostomy left for the safe healing of the anastomosis. The reconstruction was completed 6 weeks later with uneventful postoperative course.

Results: Presentation of the technique in the video sequences and analysis of possible pitfalls.

Conclusion: Laparoscopic reconstruction of the GIT is demanding performance due to the numerous adhesions because of the previous diseases and revisions. This video shows, that the operation can be done safely. That is why the laparoscopic way is a very good option to open access.

P039 - Abdominal Cavity and Abdominal Wall

A Systematic Review of Hernia Surgery in SIL (Single Incision Laparoscopy) Technique

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Background: Hernia repair in single incision laparoscopic surgery (SIL) technique has become increasingly common at specialized centers. Still, safety issues and potential benefits of SIL hernia repair have to be elucidated. This review summarizes available literature and provides an overview of current developments.

Materials and Methods: A literature search was performed in PubMed, the Cochrane Database and Google for peer reviewed publications on SIL hernia repair. Main outcome parameters were defined and it was attempted to define clinical recommendations.

Results: SIL technique can be applied for inguinal, ventral and hiatal hernia repair. The lack of randomized controlled trials (RCT) does not allow valid conclusions on safety or improved patient satisfaction over standard multiple port laparoscopy.

Conclusion: RCTs are necessary to elucidate urgent questions, e.g. the incidence of incisional hernias at the trocar site, safety in large cohorts and potential benefits beyond less scarring and cosmesis.

P040 - Abdominal Cavity and Abdominal Wall

The Shrinkage of Synthetic and Biologic Implants-Implications for the Use as Prophylactic Reinforcement in Hernia Repair

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Prophylactic mesh placement is discussed at many operative sites, e.g. laparotomy, hiatus, stoma. New degradable synthetic and biologic implants are especially promoted for these indications. We investigated shrinkage in experimental onlay, IPOM and hiatal repair as key parameter.

Methods: Synthetic and biologic implants were tested in onlay, IPOM and hiatal repair in rats and pigs. Integration, foreign body reaction and shrinkage were assessed at acute and chronic time points.

Results: Shrinkage was rarely observed with synthetic meshes and caused by abundant scar formation. Specific patterns of shrinkage were observed in porcine and bovine biologics. Collagen matrices shrink per se even under favorable local conditions.

Conclusion: The finding of specific patterns of shrinkage of biologics is new and potentially important for clinical application. New synthetic materials rarely shrink but degrade at fast rates. The impact for prophylactic placement is discussed with inclusion of experimental and clinical literature with special emphasis on the possible use in endoscopic surgery.

P041 - Abdominal Cavity and Abdominal Wall

Massive Lateral Relaxation of Abdominal Wall: Laparoscopic Approach

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Aim: Abdominal wall relaxation is considered a challenge to surgeons. Different surgical options have been proposed such as mesh implantation or the combination of plastic reconstruction with preperitoneal mesh implantation. Scientific evidence supporting any treatment option is weak, because few series are published, the inhomogeneity of the cases, and few prospective, randomized trial data are available. Lateral relaxations are even more difficult to be treated due to the proximity of the bone margins, which add more difficulties to the repair.

Method: We present a 55 years old male who underwent a right hemicolectomy through a right paramedical incision, developing a massive infection of the abdominal wall, being necessary an extensive dissection of the abdominal wall tissues with excision of the muscles of the area. Ct-scan showed a lateral weakness of the lateral abdominal wall with all the abdominal content displaced to the right abdominal cavity. A laparoscopic approach was performed dissecting all the structures of the abdominal wall, removing the fatty tissue of the preperitoneal space and exposing the bone margins. A large e-PTFE mesh (26 × 34 cm) was placed intraabdominally being fixed under very low pneumoperitoneum (7–8 mm Hg) with tackers to the bone margins and the psoas muscle and with tackers and transfascial sutures to the rectus muscle. Patient was discharge 3 days after surgery and pain and discomfort was present during the first 2 months. After 6 month the patients is pain-free, asymmetry has disappeared and the Ct-scan shows a correct mesh placement.

Conclusions: Laparoscopic repair of ventral hernias is increasing the indications since the benefits of this approach are evident, especially in lateral hernias closed to bone margins. Laparoscopic approach of abdominal wall relaxations opens a new frontier to this challenge to the surgeons, although long-term follow up a larger series are necessary.

P042 - Anaesthesiology

Types of the Anaesthesia Selection in the Acute Intestinal Obstruction Urgent Videolaparos? Opic Surgery

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Aims: To show the original results of prolonged epidural blockade (EB) efficiency at anaesthesiology maintenance of laparoscopic surgery in cases of acute intestinal obstruction (AIO).

Methods: It is spent prospective; randomized research at 100 patients with AIO with an average age equal to 60 years. Risk of anesthesia for all patients corresponded to the III class to the ASA scale, and was due to the basic pathology.

38 patients (I group) were operate in the conditions of the general balanced combined intravenous anesthesia with artificial ventilation of lungs and at 62 patients (II group) in conditions of prolonged EB at level Th₈₋₉ with artificial ventilation of lungs. It was using a 'step-by-step' induction EB of the 0.5 % solution of bupivacaine entered in small volumes of 2–3 ml with an interval 10–15 min under the constant control the arterial blood pressure and heart rate. An essential fluctuation of haemodynamics and the oxygen status at patients during anesthesia was not marked. Average duration of anaesthesia was 2 h and 25 min.

Results: The analysis of results has shown, that at patients of II group, restoration of function of intestines occurred on the average on 4–6 h earlier, provided optimum intra- and postoperative analgesia, did not demand appointment of opioids and also allowed to carry out painful manipulations (bandagings, change of drainages, catheters etc.).

Conclusions: Prolonged EB is an optimum component of anaesthesiology maintenance and postoperative intensive therapy after operation during and after AIO.

P043 - Basic and Technical Research

Establishment of a Novel Laparoscopic Cecum Resection Model for the Simulation of Laparoscopic Appendectomy in Rats

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Aims: Laparoscopic appendectomy (LA) has become one of the most common surgical procedures to date. In order to further improve and standardize this technique cost-effective and reliable animal models are inevitably needed. We developed a novel laparoscopic cecum resection model in rats facilitating to probe new technical modifications and medical products used during LA.

Methods: In a pilot study, thirty Wistar rats underwent laparoscopic cecum resection using different surgical instruments to optimize the surgical parameters. After establishment of the optimized conditions a subsequent test study was performed within another 30 rats comparing three different ways of cecum resection and bowel closure techniques. In Group 1 (n = 10) we used bipolar coagulation, in Group 2 (n = 10) a modified endoloop combined with bipolar coagulation and in Group 3 (n = 10) a 5 mm Ligasure™ (Covidien) device to close the basis of the cecal stump.

Results: Growing surgical experience operating on a series of 30 rats revealed that optimal surgical conditions are accomplished by positioning the animals in a dorsal position. A combination of 2 and 3 mm laparoscopic instruments and trocars as well as a 2.7 mm camera proof to fit best for the operation. In contrast to published successful cecum resections using bipolar coagulation, this method led to an insufficiency of the cecal stump closure in all operated rats (Group 1). Endoloop ligation followed by bipolar coagulation and resection (Group 2) or resection with a Ligasure™ device (Group 3) resulted in sufficient cecal stump closure. The median operating times differed among the three groups: In Group 2 the longest operation time was measured (median: 39.5 min; range: 35–48 min) while the shortest operations were performed in Group 3 in which we used the Ligasure™ (median: 21 min; range: 15–31 min).

Conclusions: We developed a novel LA model by comparing three different cecum resections in rats. While only bipolar coagulation seems to be insufficient, endoloop closure and bipolar coagulation as well as usage of Ligasure™ proved to be secure, time-saving and cost-effective methods for LA.

P044 - Basic and Technical Research

Biocompatibility and Adhesion Formation of Different Endoloop Ligature in Securing the Base of the Appendix During Laparoscopic Appendectomy

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Background: The standard technique used in securing the base of the appendix is endoloop ligature. Vycril (polyglactin 910) and PDS (polydioxanone) endoloop ligatures can be used. There are potential benefits of the use of PDS Plus endoloop ligature. However, use of different materials may vary in terms of inflammation, foreign body reaction, rate of infection in the surgical area or rate of adhesions formation.

An ideal suture would induce minimal inflammatory response and adhesion formation.

Materials and Methods: Ninety rats were randomized into 3 groups: group I in which appendectomy was performed using Vycril ligature, group II in which appendectomy was performed using PDS ligature, and group III in which appendectomy was performed using PDS* Plus ligature. The animals were sacrificed on the 7th, 28th and 60th days after surgery. The secured stump was used for histopathological, *immunohistochemistry analysis and evaluation of formation of adhesions*.

Results: Mild and moderate inflammation is more frequent in the PDS and PDS* Plus group than in the Vycril group on the 7th postoperative day. There were no significant differences in the degree of inflammation on the 28th and 60th postoperative day. The lowest degree of postoperative adhesions was observed in the PDS group.

Conclusion: The milder postoperative inflammatory changes and lower degree of postoperative adhesions were seen in the PDS ligature group, suggesting that this could be the standard endoloop used to secure the base of the appendix.

P045 - Basic and Technical Research

The First Experience of ‘Physiomesh’ Use at Laparoscopic Plasticity of Umbilical Ring

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Nowadays the IPOM technology is widely used for abdominal wall hernias treatment. The advantages of this technique are a technical simplicity of performance and a lack of traumatic dissection of layers of abdominal wall.

Aims: To estimate prospects of possible use of the ‘Physiomesh’ at laparoscopic IPOM plastic at patients with umbilical hernias.

Methods: So far at laparoscopic IPOM plastic of an umbilical ring we have used the composite ‘Proceed’ (Ethicon) mesh. Due to the appearance of a new generation of a separating mesh material, we have made three operations with the use of ‘Physiomesh’. In our domestic literature we have not found any data on application of this material. Among our patients there were two men and one woman. The age ranged from 27 to 75 years old. The width of the hernial ring was W1-W2 on classification of Shevrel, Rath (1999). The size of a mesh -10 × 15 cm. The fixation was made by gerniostepler of Protack and in one case by Securestrap (5 mm). The abdominal cavity wasn’t drained.

Results: Estimating the technical aspects of performance of operations we came to the conclusion that the use of the ‘Physiomesh’ simplifies the procedure of setting a mesh in an abdominal cavity and facilitates the mesh positioning on a peritoneum in comparison with other composite materials. This is due to the elasticity and transparency of a material, the surface tension between a mesh and a peritoneum, the existence of color marking. The general duration of each operation was reduced on the average for 9 min. In the comparative analysis of a postoperative course the essential difference from the postoperative period at patients with the use of ‘Proceed’ mesh was not noticed. There weren’t any complications. Patients were discharged on the 3–4th days.

Conclusions: Our first results of the use of the ‘Physiomesh’ at laparoscopic IPOM plastic of an umbilical ring testify that this method can be perspective, owing to the characteristics of a synthetic artificial limb at the expense of simplification of the equipment of implantation and the reduction of the surgery time.

P046 - Basic and Technical Research

Short and Middle Term Result of Laparoscopic Sigmoid Cancer Resection in a Single Center

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Purpose: Since April 2007 of hospital opening, we tried to perform laparoscopic resection for colon cancer. This study was to analyze short and middle term result after laparoscopic curative resection for sigmoid colon cancer in a single center.

Patients: Three-hundred thirty-one patients (203 males, 128 females, average 67.0 years old) underwent curative sigmoid colon cancer resection in our institution. Laparoscopic resection was performed for 272 cases (82.2 %). We analyzed retrospectively. Survival rate was calculated using Kaplan-Meier method.

Results: There in no mortality and all patients returned to normal daily life after surgery. Among 272 patients, male to female ratio was 166:106, and the mean age was 66.4 (range 38–89). The open conversion rate was 2/272 (0.74 %). Postoperative complication was observed in 42 cases. Reoperation was required in 2 cases of anastomosis leakage. There were significant differences in blood loss (16.3 g v.s. 405.2 g), postoperative complication (15.4 v.s. 35.5 %), postoperative hospital stay (7 day v.s. 9 day median) between open resection. The mean follow-up length were 743.1 days (range 20–1680 days). Recurrence were observed in 13 cases. According to stage, each overall 3-year disease free survival rate was: Stage I-94.5 % (open 100 %), IIA-92.7 % (76.9 %), IIB-85.7 % (–), IIC-100 % (80.0 %), IIIA-100 % (100 %), IIIB-85.5 % (72.9 %), IIIC-58.8 % (100 %).

Conclusion: Short and middle term results of laparoscopic resection for sigmoid colon cancer in a single center were similar to that of open. Laparoscopic resection for sigmoid colon cancer was usually already operations.

P047 - Basic and Technical Research

How Can Working Space in (Pediatric) Endoscopic Surgery be Optimized?

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Aims: Adequate working space is essential for safe and effective laparoscopic surgery. However, of the factors that influence working space only the effect of intra-abdominal pressure (IAP) has been researched scientifically. Working space can be very limited, especially in children. The following literature-review was undertaken to search for factors that can be influenced in order to increase working space in laparoscopy.

Methods: PubMed literature-review of factors that influence laparoscopic working space.

Results: Many factors affect working space of which some e.g. body size, cannot be influenced. Other factors like bowel content, positioning of the patient and muscle tone can be influenced in order to increase working space. The quantitative effects of almost all these factors has not been adequately studied. Strategies to avoid the negative consequences of CO₂ pneumoperitoneum have been developed e.g. IV volume loading, intermittent lower limb compression, vaso-active medication, and different ventilation strategies. Interestingly enough, not much attention has been paid to quantification of the effect of increasing IAP on laparoscopic working space.

The effect of muscle tone on working space is certainly important but has not been studied well either. Many factors are co-responsible for muscle tone e.g. depth of anesthesia, the use of neuromuscular blocking agents and loco-regional anesthesia. The use of anesthetic drugs may also either increase (e.g. opioids) or decrease (e.g. propofol) muscle tone. Unfortunately, there is a lack of methods for assessing muscle tone accurately.

A major problem in studying laparoscopic working space is the method of its evaluation. Most studies use surgeon's satisfaction or the duration of the intervention as primary outcomes. However, we feel that changes in working space ask for a more precise, quantitative method of evaluation.

Conclusions: Working space in laparoscopic surgery, although essential, has not been adequately researched. A simple but accurate method for measuring working space is needed in studying the effects of various interventions. The smaller the patient, the more important this becomes.

P048 - Basic and Technical Research

Endoscopic Percutaneous Transesophageal Gastrostomy (EPTEG), a Novel Approach for Gastric Decompression. Evaluate of Safety and Results in Thailand

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Introduction: Long term insertion of nasogastric tube can cause many complication. We proposed EPTEG, the new technique as another option for advanced stage cancer patients who need long term nasogastric tube placement for gastric decompression. Aim to evaluate the safety of procedure and patients quality of life.

Method: The procedures were performed from July 2007 to December 2012 in King Chulalongkorn Memorial University Hospital, using endoscopic and ultrasound guided technique without requiring any special instrument. The data were collected for success rate, complication and patient's family opinions about aftercare were collected by telephone interview.

Results: EPTEG were performed in 24 patients with 100 % success rate. No mortality related to procedure. There were 14 females and 10 male patients and mean age was 60 years. All patient had advanced stage cancer (Intra-abdominal cancer and one case of breast cancer) except for one patient who had recurrent GIST. Average time of procedure was 38 min. There were 2 cases (8.3 %) with complication, one case had tube displacement and one case had subcutaneous emphysema which can be treated successfully by conservatively. All patients had short post operative hospital stay (range 3–6 days) and started feeding within 24 h after procedure. Average life span after operation was 65 days (range 25–180 days). Patient's families interview show 25 % with highly satisfied, 46 % with satisfied, 12.5 % with neutral, However 4 of patient's families interviews could not be done due to loss of contact.

Conclusion: This EPTEG method using endoscopic and ultrasound guided technique is feasible and safe without requiring any specific commercial instruments which can reduces the cost of the procedure. It can help carers to improve their attendance to family member with advance disease.

P049 - Basic and Technical Research

Cleaning the Windshield: An Observational Study of Laparoscopic Distal Lens Cleaning

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Aims: Maintaining clear vision throughout a procedure is a key requirement for performing safe laparoscopy. The objective of this study was to investigate the real world practice of laparoscopic lens cleaning. We aimed to quantify the amount of time taken cleaning the lens and the proportion of work done with a spotless display screen. We also aimed to explore qualitatively the 'how', 'who' and 'why' relating to laparoscopic lens cleaning.

Methods: The study was conducted in a large teaching hospital across multiple specialities including liver, general, gynaecological, paediatrics and urological surgery. An observational tool for data collection was developed and lens contamination was categorised as 'mild' or 'significant' as defined by a focus group of experts; 'mild' if peripheral AND covering less than 25 % of the display and 'significant' if central OR covering more than 25 % of the display. All surgeons were blinded to the data being collected until the end of the procedure when a semi-structured interview was conducted with the primary operator. The interviews were transcribed and coded for analysis.

Results: 64 h of operative time were observed. Cleaning the distal lens made up 7 % of operative time and the time spent with a spotless display was only 56 %. For the 37 % where the visual field was suboptimal it was 'mild' for 23 % and 'significant' for 14 %. The lens was cleaned on average 13 times per procedure (range 0–41). Cleaning occurred at all points in the operation with 34 % happening in the first quarter, 26 % second quarter, 21 % third quarter and 19 % final quarter. The interviews identified key themes including disruption to 'fluidity of movement', 'wasted time' and a need for 'better technology' for cleaning.

Conclusion: A substantial proportion of operative time is spent with a suboptimal visual field. Cleaning the lens absorbs a significant amount of time and is associated with negative reactions from surgeons. There is a need for technological improvements to lens cleaning to enhance safety, optimise the operative time and ease surgeon's frustration to avoiding *pulling out to clean the windshield*.

P050 - Clinical Practice and Evaluation

Simultaneous Single and Multi Port Laparoscopic Surgery in Gynecology

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Materials and Methods: In our study we included 120 simultaneous laparoscopic operations, performed traditionally (four ports) and 50 simultaneous laparoscopic operations, performed through single port (SILS) (total n = 170. Among indications for surgical interventions were cholelithiasis, polyps of gall bladder, ventral hernia accomplished by different gynecological conditions (endometriosis, myoma, ovarian cysts etc.). The goal of the study was to analyze the operative time, time of hospital stay, blood loss, pain, number of complications and cosmetic effect in both groups. More of that we wanted to estimate the technical benefits and disadvantages of single and multiport approach for simultaneous interventions.

Results: Hospital stay, blood loss amount didn't differ in both groups. Complication rate was also the same and didn't overcome 2.5 %.

Operative time differed significantly within each group and depended on type of surgery. Taking into consideration that choice of approach was not applied randomly and depended on co-factors (e.g. presence of adhesions) we do not consider evaluation of operative time is good evaluation criteria.

Pain scale analyses showed statistically significant differences after the first 12 h postoperatively regarding abdominal pain, and after the first 6 h postoperatively regarding shoulder tip pain. Patients in the SILS group reported significantly lower pain scores than patients in the classic four-port laparoscopic group. Single-incision laparoscopic surgery showed better cosmetic results.

SILS technique gives a great opportunity to use the umbilicus incision to extract the removed organs or to perform some surgical steps (e.g. bowel resection) extracorporeal. The size of umbilicus wound allows mesh placement for hernia repair to be performed easily. Well known disadvantages of SILS, such as low mobility or big size of the operated organ, instruments movement limitations and a small angle between them, can become a serious problem for a young surgeons.

Traditional 4-port laparoscopy allows to overcome some technical limitations. But wound extension or colpotomy is needed for extraction.

Conclusion: Simultaneous operations are appreciated for surgical and gynecological conditions. The correct choice of SILS or traditional approach, according to clinical case, surgeon's experience, equipment facilities are crucial for achieving good results.

P051 - Clinical Practice and Evaluation

Clinical Management and Outcome After Laparoscopic Surgery in Haemophiliacs - A Matched Pairs Analysis

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Aims: Laparoscopic surgery (LS) is worldwide gaining popularity for several striking benefits such as a faster postoperative recovery, earlier hospital discharge and better cosmetic results. Though the management and outcome of LS in haemophiliacs are thus far poorly defined and therefore issue of our present study.

Methods: We performed a single centre retrospective analysis of haemophiliacs undergoing laparoscopic surgery and present detailed information about patients and their perioperative management. Besides, in a meta-analysis we compared the outcomes of haemophiliacs and non-haemophiliacs operated on laparoscopically in the same period of time.

Results: We identified 21 haemophiliacs who underwent laparoscopic surgery between 1990 and 2012 at our department. There were 11 male and 10 female patients with a median age of 43 years (range: 26–76 years). Eight patients suffered from FVIII deficiency (haemophilia A), 4 patients had von-Willebrand-Jürgens disease and 9 (female) patients were carriers for haemophilia A. Among the 8 patients with haemophilia A, 4 had a severe haemophilia, one patient had a moderate and 3 had a mild type. Perioperative factor substitution was necessary in 19 patients. Most patients (N = 15) underwent a laparoscopic cholecystectomy while 3 patients underwent a total extraperitoneal hernia repair and in 3 patients a laparoscopic appendectomy was performed. In no patient transfusion of erythrocyte concentrates was necessary for intra- or postoperative bleeding. By comparing haemophiliacs and healthy patients undergoing laparoscopic procedures within a matched-pairs analysis there were no significant differences regarding intra- and postoperative outcomes. However, length of hospital stay (LOS) was longer in haemophiliacs. Comparing haemophiliacs undergoing a laparoscopic procedure compared to haemophiliacs undergoing an open operation LOS was shorter for the laparoscopic group.

Conclusions: In general surgery LS appears as safe in haemophiliacs as in healthy patients. A longer LOS in haemophiliacs may be due to thorough postoperative monitoring for possible bleeding complications and to guarantee necessary factor substitution. For the laparoscopically operated haemophiliacs LOS was shorter as in the conventional group underlining the benefit of LS even in haemophiliacs. Still surgery in haemophiliacs should be performed in a strictly interdisciplinary setting involving experienced hemostaseologists and surgeons who are used to these patients.

P052 - Clinical Practice and Evaluation

Therapeutic Outcome in Patients with Hyperbilirubinemia After Laparoscopic Cholecystectomy for Acute Cholecystitis

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Laparoscopic cholecystectomy has been performed at our hospital since 2006 for all patients (n = 300) with a benign disorder. To date, no patient has had bile duct injury or a need for laparotomy. We have performed cholecystectomy as early as possible, even in cases of acute cholecystitis. This includes 40 patients with hyperbilirubinemia before surgery, of whom 10 had a bilirubin level >3 mg/dl. Therapeutic outcomes were examined in 9 of these 10 patients, after exclusion of 1 patient who first received EST for a complication of choledocholithiasis. The patients (4 males, 5 females) had an average age and BMI of 72 years old (51–92 years old) and 25.7, respectively. Five had predominantly conjugated hyperbilirubinemia. In preoperative DIC-CT, it was difficult to detect the cystic duct in all patients. The common-bile-duct was detectable in 5 patients. The average time from development of inflammation to surgery was 2.1 days (1–3 days). The average operation time was 80.4 min and the hemorrhage level was ≤30 ml in all patients. The gallbladder duct was identified after initial exfoliation of the cervical part in 8 patients. Postoperatively, the bilirubin level improved almost immediately and the course was favorable. A 92-year-old patient with gas-forming cholecystitis required artificial ventilation management for 1 week postoperatively. A decreased blood platelet count was found after surgery in a 78-year-old patient with gangrenous cholecystitis and required treatment for 3 days. Oral intake was commenced one day after surgery for 6 patients. The average postoperative hospital stay was 13 days (7–29 days). There were no long-term complications. Cholecystitis with jaundice is categorized as severe cholecystitis and surgery is indicated with careful observation of general conditions. At our hospital, improvement of hepatic function and symptoms occurred immediately after surgery in all patients, which suggests that surgery should be performed as soon as possible to decrease the burden on patients and ensure early postoperative recovery. However, postoperative respiratory management may be required, especially for elderly patients. In addition, conjugated hyperbilirubinemia may be dominant in patients with cholecystitis with no clear origin of stenosis, and this should be considered in selecting a therapeutic policy.

P053 - Clinical Practice and Evaluation

Adhesion Prophylaxis According to Intra-abdominal Stratum Examination Following Laparoscopic Colorectal Surgery

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We describe our method of adhesion prophylaxis (AP) following laparoscopic colorectal surgery, using anti-adhesion barriers with an easy insertion method, which we have termed the half-overlap method. This method consists of eight steps, preparation, moisture removal, half-combination overlap, roll into a cone shape, cone affixation, screw in, release, and application. To increase the efficacy of the AP we have also divided the intra-abdominal cavity into three parts according to depth, with AP technique varying accordingly, which we have termed strata-based AP. The first stratum is the deepest, situated at the ligation of the main feeder at the bottom of the pelvic cavity, the second stratum is situated in the space surrounding the mesentery in the pelvic cavity, and the third stratum is the area directly below the incision. Comparative analysis of cases where AP was not undertaken (non-prophylactic), cases where sole AP was undertaken (sole prophylactic) and cases where strata-based AP was performed (strata-based prophylaxis), revealed a postoperative incidence rate of small bowel obstruction of 9.7 % (6/62) for the non-prophylactic group, 5.0 % (1/19) for the sole prophylactic group, and 0 % (0/86) for the strata-based prophylaxis group, respectively. Using the Chi-square test, a significant difference was observed between the three groups. The results suggest that strata-based AP by the half-overlap method following laparoscopic abdominal surgery is effective.

P054 - Clinical Practice and Evaluation

Appropriate Use of Group and Save Testing Prior to General Surgical Procedures in a District General Hospital

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Aims: The maximum surgical blood order schedule (MSBOS) is a table of elective surgical procedures and their typical transfusion requirements i.e. whether or not pre-operative group and save (G&S) testing is indicated. This audit examined to what extent the MSBOS was adhered to in a district general hospital.

Methods: All general surgical procedures performed in our hospital over a one month period were included.

Results: Of 148 operations 52 did not require G&S. Within this group 48 % correctly had no G&S however 52 % of patients had unnecessary G&S testing performed. None of these patients required a blood transfusion post-operatively. Of the 96 procedures which did warrant G&S testing according to the MSBOS 79 % did have a G&S, 19 % did not and 2 % had a G&S which was rejected due to incorrect labelling. The latter two groups consisted entirely of unscheduled operations. 8 patients who had a G&S test required a post-operative blood transfusion.

Conclusion: These findings show that a significant number of unnecessary G&S tests are carried out costing the hospital in the region of three hundred pounds per month for general surgical procedures alone. It also highlighted that some patients undergoing emergency procedures did not have preoperative G&S test performed. The name of the exact procedure as surgeon intends to perform should be given on elective patients' pre-assessment information wherever possible. This improvement along with encouraging increased awareness of the MSBOS amongst junior doctors could improve patient safety as well as efficiency and cost effectiveness of G&S testing in the hospital.

P055 - Clinical Practice and Evaluation

Laparoscopic Donor Nephrectomy - Ten Years Experience

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During a 10-years period, a single surgeon performed 328 laparoscopic donor nephrectomy, a retrospective chart reviews was preformed to evaluate safety, complication during hospital stay.

Results: 98 /230 female/ male, 56Rt (18 %), 272Lt (82 %), 265 single artery 81 %, 19 >more than one artery, operative time 60–140 mi (mean 100 min), warm ischemic time 150–320 s (mean 230 s). Three conversion 0.9 %, two were a results of vascular complication, one due to stapler malfunction, the second due to renal vein injury with energy device, last due to monitor failure. One donor developed small intestinal obstruction (0.3 %) due internal hernia, requiring lapotomy, three donors (1 %) required blood transfusion, two intraoperative (conversion) one in the post operative period. Over all morbidity 3 %, no Mortality 0 %, average hospital stay 2.3 days and return to work 2–3 weeks.

Conclusions: Our results shown that LDN is a safe procedure associated with low morbidity and quick recovery, attention to details required to prevent complication

P056 - Clinical Practice and Evaluation

Impact of Rectus Sheath Block in Single-Incision Laparoscopic Cholecystectomy

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Background: The single-incision laparoscopic cholecystectomy (SILC) is now increasingly applied in an approach for cholecystectomy, proved to be safe and feasible with equivalent short-term operative outcome compared to four-port cholecystectomy (4PLC). Although many investigators in randomized studies suggested benefit of cosmetic result after SILC, benefit of decreased pain after SILC remains controversial. Therefore, this study aimed to assess the efficacy of the rectus sheath block in single-incision laparoscopic cholecystectomy (RSB-SILC).

Methods: From April 2010 to March 2012, the 50 patients with symptomatic gallstone or gallbladder polyps were randomly assigned into 3 groups as follows: (1) single-incision laparoscopic cholecystectomy (SILC, n = 7), (2) single-incision laparoscopic cholecystectomy under rectus sheath block (RSB-SILC, n = 24), (3) four-port laparoscopic cholecystectomy (4PLC, n = 16). A total of 3 patients were excluded from this study. We evaluated data which included operative details, length of hospital stay and analgesia usage. The postoperative pain was registered at 2,6,12 and 24 h after surgery using a visual analog score (VAS).

Results: There were no differences with regard to age, ASA, BMI, duration of operation, and length of hospital stay in each groups. The number of times for analgesic use was significantly fewer in the RSB-SILC group than in the SILC and 4PLC groups (RSB-SILC: 1.45 ± 1.41 ; $p < 0.05$ vs SILC and 4PLC groups). Significantly lower pain scores were also observed in the RSB-SILC group than in the 4PLC group at 2 and 6 h (2 h, 1.91 ± 1.41 vs 3.12 ± 1.02 , 6 h, 1.58 ± 1.17 vs 2.56 ± 0.89 ; $p < 0.01$). Pain scores and need for analgesia were similar between in the SILC group and in the 4PLC group.

Conclusion: Single-incision laparoscopic cholecystectomy using ultrasound guided rectus sheath block effectively reduced postoperative pain compared to SILC(alone) and 4PLC.

P057 - Clinical Practice and Evaluation

Technical Errors in Laparoscopic Surgery: Retrospective Analysis the Results of 8000 Operations

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Background: Some two decades after its introduction, the popularity of laparoscopic surgery has exploded as evidenced by the dramatic increase in the number of laparoscopically performed abdominal procedures. Without an excellent understanding of anatomy and extensive experience using remote controls to operate on confined parts of the body, surgeons may sever nerves and organs, causing serious damage to patients. Nonetheless complications due to the laparoscopic approach are not rare as documented by several studies.

Methods: We have an interpretation the results of 8000 laparoscopic procedures performed from October 1994 to December 2012 in the Caspian Hospital and Tusi memorial Clinic with identification of an errors and complications. We evaluated the effect of videotape debriefing on the performance of all laparoscopic procedure. Knowledge about these complications is essential for there prevention.

Results: In all these instances, errors analysis research has demonstrated that an understanding of the underlying causes of these complications requires a comprehensive approach addressing the entire system related to the procedure for identification and characterization of the errors ultimately responsible for the morbidity.

Conclusion: The present study demonstrates that excellent agreement of procedural errors can be achieved by carefully defining and training recognition of targeted events. Extension of this simple and reliable analysis tool the procedures should be feasible to define behaviors leading to adverse clinical outcomes.

P058 - Clinical Practice and Evaluation

The Impact of the Financial Crisis in Performing Laparoscopic Surgery in Greece

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Aim: We studied the availability of consumable instruments used in laparoscopic surgery and whether their use is safe.

Material and Methods: We recorded the consumables used in the last 96 laparoscopic procedures we performed in 2012. The consumables we used (trocars, dissector, scissors, graspers and irrigation-suction tubes) over the last years were single use products. Due to budgetary constrains in the last two years, it was inevitable to re-use these products. These consumables were re-used after disinfection until they were not functional any longer. The used disinfectant liquid was sent for culture several times during this study. We observed the postoperative septic complications of our patients. Following the disinfection, the mechanical damages of the consumables that could be potentially dangerous for the patients and the total cost of the instruments were also recorded.

Results: Low-grade fever was seen in 58 (60.4 %) patients during the first 24 h postoperatively. One patient with high fever had developed lung atelectasis. A second patient, with urine catheter in use, developed high-grade fever due to urinary tract infection. There were no other septic complications observed. Pathologic microorganisms were not grown in the cultures of the disinfectant liquid. There were no damages of the disinfected consumables that could put patients at risk. The cost of consumable instruments was reduced by 42 % in comparison with using new products for every procedure.

Conclusions: There has been a significant cost reduction in comparison with previous years. There were no septic or other complications that could implicate the application of re-used disinfected consumables.

Such conclusions, of course, could encourage politicians to decrease the funds in health service even further. However we still remain concerned because: (a) our study group is small, (b) there are more factors that should be studied, such as cultures of disinfected consumables and especially from more challenging for cleaning parts and (c) there are infections such as these of viral origin that cannot be diagnosed at early postoperative stages.

P059 - Clinical Practice and Evaluation

Comparison of the Predictive Value of Cardio Pulmonary Exercise Testing to O-POSSUM Scoring System

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Aims: Does CPX aid in predicting mortality, morbidity and inform levels of post-operative care when compared to O-POSSUM scoring systems

Methods: CPX was performed for 52 consecutive patients who were considered for oesophagectomies and O-POSSUM scores were collected for these patients. The outcomes were measured in terms whether the patient under went surgery, mortality, morbidity, ITU/HDU stay and whether patients needed any extra prophylactic postoperative interventions.

Results: 46/52 under went oesophagectomies. 6 patients did not have oesophagectomies. Medically unfit. CPX ranged from V AT max (6–22) with a median of 13. 12 patients had V AT max below 11. At VAT max of 11 the specificity and sensitivity was 22 and 66 % respectively. Predicted O-POSSUM morbidity ranged from (33 to 93 %) with a median of 55 %. Predicted mortality of (1.6 to 21.9 %) with a median of 2.7 %. O-POSSUM scoring selection based on 5 % mortality of specificity and sensitivity was 18 and 66 % respectively. The outcomes of surgery showed there were no 30 day deaths and two (4.6 %) in-hospital deaths. 27 patients (59 %) developed complications. These ranged and included intra-operative complications such as bleeding, splenic injury and postoperative complications such as leaks, chest infection.

Conclusions: CPX is no better at predicting fitness for surgery nor at predicting outcome when compared to O-POSSUM scoring system.

P060 - Clinical Practice and Evaluation

Bibliometric Analysis of Scientific Contributions in Minimally Invasive Surgery

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Aims: Publication of scientific studies in peer reviewed medical journals is considered a measure of research productivity. Aim of the present study was to quantify the research contributions of different countries in minimally invasive surgery.

Methods: The electronical archives of four major surgical journals (Annals of Surgery, British Journal of Surgery, Journal of the American College of Surgeons and Surgical Endoscopy) were searched for the time period 2009–2012. Publications on minimally invasive surgery were assessed according to the country.

Results: A total of 6595 records were identified; 2160 articles were related to minimally invasive surgery. The USA (31 %), the UK (7.6 %), Japan (6.7 %), Korea (6.7 %) and The Netherlands (5.9 %) were the most productive countries. When adjusted for country population, The Netherlands (7.7/10⁶), Denmark (4.4/10⁶), Switzerland (4.1/10⁶), Israel (3.4/10⁶) and Belgium (2.9/10⁶) occupied the highest ranks; when adjusted for the number of physicians, Switzerland (2.4/10⁴), The Netherlands (2.2/10⁴), Sweden (2.2/10⁴), Austria (1.3/10⁴) and Greece (1.2/10⁴) topped the ranking. The USA (21 %), the UK (19 %), The Netherlands (7 %), China (5 %), Italy (5 %) and Korea (5 %) produced about half of the published randomized trials.

Conclusions: Although the USA is the most productive country in terms of research contributions in minimally invasive surgery, several European countries where more prolific, when population size was taken into account. Bibliometric analysis is a useful tool for quantification of research contributions and opens further perspectives for research fund allocation and dissemination of minimally invasive surgery.

P061 - Clinical Practice and Evaluation

Laparoscopic Right Colectomy with Natural Orifice Specimen Extraction in Male

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Introduction: Laparoscopic colorectal surgery with natural orifice specimen extraction (NOSE) was regarded as a more advanced minimal invasive surgery because of abridging abdominal extending wound. However, this method had some limitation, including male patients undergoing right hemicolectomy. In this preliminary study, we used endoscopy assisted method to complete NOSE in male patient after right hemicolectomy.

Patients and Materials: From April 2012 to June 2012, we selected male patient to perform hybrid laparoscopic right side colectomy with transluminal colonoscopic specimen extraction under the criteria of right site colon benign lesion and less than 2 cm at China medical university hospital. Exclusion criteria were malignancy tumor, visceral obesity and anal stenosis. Specimen was retracted by endoscopic snare and pass through left side colon with colonoscopy until out of anus. After specimen retrieval, intracorporeal stapler side to side anastomosis was performed.

Results: In this period, there were total four patients receiving operation under diagnosis of unresectable sessile polyp. Average age was 64.6-y/o (60–69-y/o) and body mass index (BMI) was 24.9 kg/m². Two patients had benign tumor in transverse colon, one in ascending colon and one in cecum. Laparoscopic right hemicolectomy was done in two patients and laparoscopic segmental colectomy was done in the other two patients. One patient was converted to conventional laparoscopic surgery due to difficult specimen extraction related to long specimen length (22 cm). The length of other three specimens was only 8, 10 and 12 cm. Mean operative time was 372.6 min (328–420 min) and estimated blood loss was 30 ml. None use pethidine after operation and three patients (75 %) had flatus passage on postoperative day 1. There were no complications or intra-abdominal infection occurring after this procedure. Median postoperative hospital stay was 3.5 days (3–4 days).

Conclusion: Laparoscopic right side colectomy with NOSE can also be used in male patients safely. However, if the specimen was too long, it may be difficult to extraction with endoscopy. The postoperative course was smooth and wound pain was less. In conclusion, hybrid laparoscopic colectomy with endoscopic specimen extraction can be a alternate method for benign colon lesion.

P062 - Clinical Practice and Evaluation

Laparoscopic Right Colectomy in Patients with Previous Gastric Surgery

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Aims: As the use of laparoscopy has spread worldwide, laparoscopic colorectal surgery has been performed in patients with previous abdominal surgery in increasing institutes. The purpose of this study is to evaluate the feasibility of laparoscopic right colectomy in patients with prior gastric surgery.

Methods: Among 646 consecutive colorectal cancer patients who underwent elective laparoscopic right colectomy from 2004 July to 2012 August, 17 patients had previously undergone gastrectomy. The indication of laparoscopic surgery to right colon cancer was all cases except when severe adhesion was expected. We retrospectively investigated the short term outcomes of the surgery in relation to the duration of surgery, blood loss, conversion rate, time to return of bowel function, resumption of diet, complications, and the hospital stay.

Results: The study included 6 men and 11 women. The operations consisted of 3 transverse colectomy, 7 right hemi-colectomy, and 7 ileocecal resection. The median age of the patients was 76 years (range, 60–93 years). The staging according to TNM classification is stage I/II/III/IV = 10/5/2/0. The median operating time is 213 min (range, 104–324 min). The median blood loss was 10 ml (range, 5–200 ml). One case required conversion to open surgery because of adhesion. There were no accidental events during the operations. The median time to return of bowel function and resumption of diet is 1 day and 2 days after the surgeries, respectively. The median postoperative hospital stay is 11 days (range 8–56). There were two complications (12 %): one intraperitoneal abscess, and one cholecystitis. The case of intraperitoneal abscess was due to panniculitis around the anastomosis, requiring reoperation with resection of the anastomosis on the 35 postoperative day. There were no complications directly attributable to adhesiolysis, although consolidation around the middle colic artery and adhesion of mesocolon associated with prior gastric surgery might derive longer operating time.

Conclusion: Laparoscopic right colectomy is feasible in patients with prior gastric surgery.

P063 - Clinical Practice and Evaluation

Classical Surgery in the Age of Laparoscopy

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Laparoscopic surgery has been performed at the Surgical Clinic no. 1 U.M.F. Victor Babes Timisoara since 1994. The advantages of laparoscopic surgery come from minimizing the trauma of access to internal organs. By avoiding a long incision through the muscles, many post-operative problems are eliminated and pain and hospital stay is markedly reduced. In practice, laparoscopic approach of the surgical pathology is limited to the contraindications of the general anesthesia, as the state of the art logistics (equipment, instruments, the specialized team) allows any surgical technique. The surgical oncological procedures can be performed through the laparoscopic approach: the removal of the tumor or the secondary disseminations, with the physiological recovery of the body. Laparoscopic extirpation of tiny and small non-invasive tumors is easy, but extremely complicated in the case of the bulky ones, which may be invasive. During the laparoscopic surgical operation, the surgeon is deprived of some of his senses—olfactory, tactile. These drawbacks may be compensated by his experience. However, the situation may be completely different in the case of some diseases, such as solid, bulky abdominal tumors (over 2 or 3 kg). We exemplify such cases recently operated in our clinic. They can be difficultly triturated and much more difficult, or even impossible to remove through the orifice of a trocar. In such situations, even if the laparoscopic surgery is made use of, the intervention is completed through an appropriate laparotomy. The question is—in the above mentioned cases, a classical intervention would not have been a better option from the beginning? From our experience, solid, bulky abdominal tumors, bigger than 2 or 3 kg (teratomas, pelvic fibromatous tumors, intraabdominally developed) are difficult to be removed laparoscopically only. However, when laparoscopic intervention is tempted, the correct approach of the case until solved will be a classical one.

Our conclusion is that, regardless the sophistication of the surgical equipment, classical surgery cannot be dropped, or ignored yet. Moreover, cases which cannot be easily solved laparoscopically are neglected abdominal diseases, such as the abdominal tumors, over 2 or 3 kg.

P064 - Clinical Practice and Evaluation

Trends in the Management of Perforated Ulcer

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Background: Despite the powerful medical treatments of peptic ulcer disease, the complication of perforation is still a common indication for emergency gastro-duodenal surgery with high morbidity and mortality rates. Graham's patch closure with lavage and drainage and post-operative triple therapy should be standard treatment and definitive procedures are performed only when they are absolutely indicated. Laparoscopic approach proved both successful and efficient with known advantages of minimal access surgery being usually enjoyed. Conservative therapy for those with contained perforations and hemodynamic stability proved successful but close observation and monitoring are essential. We reviewed the different management lines of perforated peptic ulcer cases which were followed in our military hospital so we present our results.

Methods: Medical records review of cases of perforated peptic ulcers during the period between 2001 and 2012 was conducted.

Results: We found 42 cases, 8 of them were non-operatively managed, 9 cases were laparoscopically approached and laparotomy was performed for the remaining 25 cases.

Conclusion: Non-operative (conservative) treatment was found safe and can be offered to those with a contained perforation and with a clinical stability. Laparoscopic approach proved both diagnostic and therapeutic. Open surgery largely remained the preferred modality by a number of surgeons and morbidity rates were found comparable between three groups of patients.

P065 - Clinical Practice and Evaluation

Laparoscopic Assisted Cryosurgery for Intra Abdominal Malignancy

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Cryotherapy for cancer was first reported by James Arnott in England in 1850. But the widespread of the clinical applications started more than one century later along with the development of better instrumentations for cryosurgery, especially also due to the significant improvement of imaging techniques. Beside the open surgical procedure, recently the application of cryosurgery to the organ inside the body can also be done percutaneously or with laparoscopic technique as minimally invasive approach.

Compare to the open surgical approach, the laparoscopic technique shows some advantages, namely: less pain, faster recovery, lower surgical site infections, better cosmetic result and also an excellent diagnostic tool. This technique has gained increasingly more acceptance to replace the open approach in many surgical procedures including the cryosurgery, known as laparoscopic assisted cryosurgery. It has been applied for malignancy in liver, kidney and other intra-abdominal solid organs with advantages of the minimally invasive technique and also improving the diagnostic, better monitoring of the process for the effectiveness and safety of the during the cryosurgery procedure.

P066 - Clinical Practice and Evaluation

Is Laparoscopic Hernia Repair Feasible in a Low-Budget Health System?

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Aim of the Study: Laparoscopic hernia repair has been reported to have equivalent or superior outcomes to open repair, but implies higher cost for disposable equipment or special meshes and longer OR time. In our low-budget health system (mean 300–340 EUR/treated patient) minimally-invasive surgery is still under-developed and only a few centers perform routinely other procedures than laparoscopic cholecystectomy claiming much higher costs.

Material and Method: We performed a retrospective analysis of 90 inguinal hernia repairs (30 open and 60 laparoscopic) performed in our center between 2010 and 2012. We included in our study only patients admitted electively where a single procedure was performed (unilateral hernia repair), in order to minimize the variation of hospital cost. The cost of anaesthesia, OR-time, medication and disposable equipment or materials was calculated manually for each patient. For the cost of hospital stay we used the daily hospital standard for our surgical clinic. In order to estimate the cost of the recovery period we used the mean annual salary for our country.

Results: Our National Insurance House reimburses for a hernia repair (open or laparoscopic, uni- or bilateral) about 190-210 EUR (corresponding to a DRG value of 0.5797), while the costs for a Lichtenstein hernia repair were between 174 and 578 EUR (mean 224.7 EUR); mean costs for laparoscopic hernia repair (TEP) were 199–355 EUR (mean 256.8) while for TAPP hernia repair they were 254–785 EUR (mean 345.7 EUR). There was a significant difference between recovery period after Lichtenstein hernie repair (27.9 days) versus laparoscopic hernia repair (10.7).

Conclusions: From the point of view of the hospital laparoscopic hernia repair is not feasible, it generates higher costs than reimbursed by the National Insurance House. But if we take into consideration the the recovery period we obtain similar costs.

P067 - Clinical Practice and Evaluation

The First Experiment of Sigmocolpopoiesis with the Use of the Laparoscopic Technology

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Aims: Vaginal aplasia is encountered in 1 case per 5–10 thousand births of girls. The aim of this study is to estimate the possibility of applying laparoscopic sigmocolpopoiesis in the treatment of the congenital vaginal aplasia.

Methods: From 1999 to 2010 there were performed 26 operations of colpopoiesis in our hospital—peritoneal colpopoiesis was performed in 17 patients of them, 4 had sigmocolpopoiesis by the open (laparotomy) method and 5—laparoscopic sigmocolpopoiesis. This work presents the results of treating 5 patients with the congenital vaginal aplasia within the period from 2007 to 2010. All patients were performed vaginoplasty with the use of the sigmoid colon and the cause for the vaginal aplasia was Muller-Rokitansky-Kuster-Hauzer syndrome, i.e., symptomatology did not exceed the limits of the reproductive system.

For performing laparoscopic sigmocolpopoiesis there were utilized 4 laparoports. During the operation we mobilized the section of the sigmoid colon of 20 cm in length on the feeding vascular leg. The endoscopic sewing apparatus ETS-Flex 45 (Ethicon) was used for intersection of the sigmoid. The mobilized section is turned round 180° clockwise and is delivered through the separate opening as anus praeter naturalis in the vestibule of the vagina. The continuity of the large intestine was restored with the aid of the circular sewing apparatus Curved Intraluminal Stapler (Ethicon) of 29 mm in diameter, whose head was introduced into the sigmoid colon through the extended puncture in the right iliac region and fixed laparoscopically with a purse-string suture. On the 3rd day the transplant was opened on the vaginal side and additionally fixed with the interrupted sutures.

Results: The postoperative period was uneventful in all patients.

On the control examination in 6 months the state of the transplant was satisfactory, the patients live regular sexual life. All patients consider the results of the operation satisfactory.

Conclusions: Noninvasive operation allows to get medical and social rehabilitation. It is expedient to use laparoscopic sigmocolpopoiesis in more significant anomalies.

P068 - Clinical Practice and Evaluation

Laparoscopic Removal of Retained Surgical Items

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Retained objects inside the abdomen after surgery will be always a safety problem. In many cases it's the cause of persistence or non-recovery of patient's symptoms after operations. Retained surgical object is a rare but known problem in patients who have medical history of surgery. Suspicion and evaluation of this rare condition is sometimes very difficult for the clinician because it can be totally asymptomatic. For this reason clinician should exercise high rate of suspicion.

In most reported series, retained sponges are the most common surgical item left in patients. Here we report our experience in dealing with retained surgical items where we used laparoscopy as a therapeutic tool.

Keywords: Gossypiboma, Textiloma, Missed gauze, Foreign body, Laparoscopy

P069 - Clinical Practice and Evaluation

Single-Incision Laparoscopic Appendectomy Versus Open Appendectomy in our Hospital

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Aim: Single-incision laparoscopic appendectomy (SILA) has been performed in our hospital since October 2010. The purpose of this study is to compare SILA with open appendectomy (OA) in our hospital retrospectively.

Methods: Among 180 patients treated with appendectomy at Fukui Prefectural Hospital between October 2010 and May 2012, 91 patients (50.5 %) were treated with single-incision laparoscopic procedure. The results of treatment in the SILA group were compared retrospectively with those in 79 patients treated with OA.

Results: Mean operative time was 75 min for SILA and 63 min for OA ($p < 0.05$). The hospital stay of 5.0 days in the SILA group and 7.2 days in the OA group was significantly different ($p < 0.05$). Four postoperative complications were observed: 1 wound infection in the SILA group; 1 wound infection and 2 intraabdominal abscess in the OA group. Of the patients diagnosed as gangrenous or perforative appendicitis, the hospital stay of those patients treated with SILA was significantly shorter than those of the OA group (8.3 days vs 11.9 days, $p < 0.05$), but operative time was significantly longer (116 vs 83 min, $p < 0.05$). Of the patients diagnosed as catarrhal or phlegmonous appendicitis, there were no significant differences in the hospital stay and operative time between the SILA group and the OA group (4.1 days vs 4.3 days, $p = 0.2$ and 63 min vs 51 min, $p = 0.08$).

Conclusions: Our initial experiences suggested that SILA is feasible for gangrenous or perforative appendicitis patients. However, further studies need to be undertaken to prove that it has non-cosmetic advantages over open appendectomy or conventional laparoscopic appendectomy.

P070 - Clinical Practice and Evaluation

Gastroscopy and Flexible Sigmoidoscopy Results in a Country Hospital for 12 Months

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Aim: Nevşehir is a small city in Turkey which has a 200,000 population. In this population general surgeons and gastroenterologists made over 1500 endoscopic investigation. The aim of this study was to determine the prevalence of gastrointestinal disorders like gastroesophageal reflux, gastritis, Helicobacter Pylori related disorders, carcinoma, hemorrhoids and anal fissures in a country population.

Methods: Between January 2012 and December 2012, 1600 patients was referred to endoscopy unit. All gastroscopies and flexible sigmoidoscopies (FSS) were done by general surgeons and gastroenterologists. Sedo-analgesia was admitted by anesthesiologist and biopsies have been done, if necessary. The patients complaints were dyspepsia 26.37 % (n:422), gastrointestinal hemorrhage 18.6 % (n:298), reflux 75 % (n:220), anemia 13.4 % (n:215), stomachache 13.1 % (n:210), vomiting 6.87 % (n:110), constipation 5 % (n:80) and melena 2.8 % (n:45).

Results: 56 % of the patients were female (n:900) and 44 % were male (n:500). Gastroscopies were done to 1300 and FSS to 300 patients. 75 % of gastroscopy patients had gastritis (n:980). The localization of gastritis and ulcerations were 60 % antrum, 30 % prepyloric and 10 % other localization. 40 % (n:520) positive Helicobacter Pylori infection, 1.07 % (n:14) gastric cancer which has been confirmed by biopsies, 2 % (n:26) gastric polyps that have benign nature, 3.6 % (n:48) esophagitis due to reflux, 3 % (n:38) hiatal hernia and 15 % (n:194) normal gastroscopic findings were detected. The patients to whom FSS was done showed a distribution like: 29.3 % (n:88) hemorrhoids, 18.6 % (n:56) anal fissure, 1.6 % (n:5) rectum carcinoma, 1.3 % (n:4) colon carcinoma, 11.33 % (n:34) polyps, 1 % (n:3) solitary rectal ulcer, 0.6 % (n:2) totally rectal prolapse, 2.6 % (n:8) inflammatory bowel disease (crohn / ulcerative colitis), 33.3 % (n:100) normal FSS findings.

Conclusions: In a small country hospital 1600 endoscopy management is a very good result. By this investigation we found that the gastrointestinal system disorders have a similar incidence in Nevşehir compared with the Medline results. It is important to make endoscopic research, patients who have anemia, rectal bleeding and weight loss to determine gastric and colon and rectum malign disorders.

P071 - Clinical Practice and Evaluation

Short-Term Outcomes Following Hemicolectomy for Treatment of Benign Colonic Polyps: A Case-Matched Study

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Background: The number of patients diagnosed with complex colonic polyps (broad based, crossing two haustral folds, or being located at the ileocaecal valve or colonic flexures) has increased significantly since introduction of the bowel cancer screening programs. The efficacy of advanced endoscopic techniques for treatment of such lesions is limited. Outcomes after hemicolectomy for benign colonic polyps (BCP), when compared to patients undergoing surgery for colonic cancer, are poorly documented. We present a case-matched comparison from two institutions.

Methods: Consecutive patients undergoing surgery for BCP were identified in two hospitals from prospectively maintained databases (data collection period 2005–2006 and 2010–2012 respectively). Hospital coding database was also searched using operation codes to identify missing patients. Each patient was matched for age, sex, ASA grade, site and type of resection (laparoscopic, open, and converted) to two controls undergoing surgery for treatment of colonic cancer (CC) identified in each centre. The length of stay (LOS) and 30-day outcomes were analysed with further adjustments for BMI, blood loss and operation time. Multilevel linear and logistic regression analyses were performed.

Results: 46 BCP patients were matched with 81 CC patients. Median size of BCP was 4 cm (IQR 2.5, 5.4). BCP group had a marginally longer LOS [median 5.5 days (IQR 4, 8) and 5 days (IQR 3, 7) respectively ($p = 0.04$)]. 21/46 (46 %) patients with BCP had a post-operative complication compared to 25/81 (31 %) CC patients ($p = 0.12$, OR = 2.11; CI 0.82–5.41). 4/46 (9 %) BCP patients underwent reoperation and further 3/46 (7 %) were readmitted versus 1/81 (1 %) and 2/81 (2 %) in CC group ($p = 0.07$ and 0.28 respectively). No deaths were observed in either group.

Conclusion: Complications following segmental colectomy for BCP are not significantly different to those after cancer surgery. The results of this study provide further impetus for the development of a local full thickness colonic excision technique as an alternative, less invasive treatment option in order to improve patient outcomes.

P072 - Clinical Practice and Evaluation

Pressurized Intraperitoneal Aerosol Chemotherapy (PIPAC): Occupational Health and Safety Aspects

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Background: Pressurized intraperitoneal aerosol chemotherapy (PIPAC) is a novel approach for treating peritoneal carcinomatosis. First encouraging results have been obtained in human patients. However, delivering chemotherapy as an aerosol might imply an increased risk of exposure to healthcare workers, as compared with other administration routes.

Methods: Air contamination levels were measured under real clinical conditions during PIPAC application (doxorubicin and cisplatin), according to the German guideline TGRS 402 and to the IFA Databases on hazardous substances: GESTIS international limit values 201. Air was collected on a cellulose nitrate filter with a flow of 4 m³/h. Toxicological research of cisplatin was performed according to NIOSH 7300 protocol. Sampling and analysis were performed by an independent company (Dräger Safety AG, Lübeck).

Results: The following safety measures were implemented: tight abdomen, laminar air flow (air exchange 36x/h), closed aerosol waste over a particle filter and protection curtain. The procedure was remote-controlled (nobody remaining in the OR). No cisplatin was detected in the air (detection limit <0.0002 mg/m³) at the putative positions of the surgeon and the anaesthesiologist, under real PIPAC conditions.

Conclusion: For the drugs tested, PIPAC is in compliance with European Community working safety law and regulations. Work place contamination remains below the tolerance margin. The safety measures and conditions as defined above are sufficient. NIPAC can be used safely in the clinical setting if the conditions specified above are met.

P073 - Clinical Practice and Evaluation

Right Atrium Monitoring with Transesophageal Echocardiography Could Prevent from Crucial Carbon Dioxide Gas Embolism in Laparoscopic Hepatectomy

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Backgrounds: For this decade, innovative energy devices, including ultrasonic coagulation, bipolar coagulation, and monopolar soft coagulation, have made it possible to perform laparoscopic hepatectomy (LH) safely all over the world. Pure LH, having an advantage in cosmetics, has been expansively applied. Although high pressure of the pneumoperitoneum is maintained to control hemostasis during hepatic parenchymal transection in pure LH, risks in carbon dioxide gas embolism are not well discussed. This study is aimed to explore that the right atrium monitoring with transesophageal echocardiography (TEE) could prevent from life-threatening carbon dioxide gas embolism.

Methods: From January to December 2012, total of 16 cases underwent LH. Among them, right atrium monitoring with TEE was performed in 9 cases without esophago-gastric varices. During hepatic parenchymal transection, ultrasonic coagulation, bipolar coagulation, cavitron ultrasonic surgical aspirator, and VIO system containing a bipolar clamp (BiClamp) were used without portal triad clamping. The pneumoperitoneum was kept at 8–12 mmHg during transection. Microbubbles in the right atrium observed with TEE were divided into three groups.

Results: TEE showed three steps of microbubbles (Grade 0: 5 or less in the still frame, Grade 1: more than 5 in the still frame) Although only one case had Grade 2 (full of microbubbles in the right atrium), the anesthesiologist let the author know that and perform rapid press-hemostasis, leading to stable vital signs. Just SpO₂ decreased temporally down to 87 % and gradually improved.

Conclusion: Right atrium monitoring with TEE could be useful for preventing from crucial carbon dioxide gas embolism in LH.

P074 - Clinical Practice and Evaluation

Pilot Study on Laparoscopic Surgery in Port-Harcourt, Nigeria

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Background: Video-laparoscopic surgery has long been practiced in Western countries, however documented practice of this minimal invasive surgical technique are recently emanating from Nigeria. Our study is the first from the Niger Delta region.

Aim: To evaluate laparoscopy as a useful tool for management of common surgical abdominal conditions in a developing country.

Materials and Method: This was a prospective outcome study of all consecutive surgical patients who had laparoscopic procedures in General and Paediatric surgery units of our institution from August 2011 to November 2012. Data obtained on patients' age, gender, indication for surgery, duration of hospital stay and outcome of surgery were collated and analysed.

Results: Fifteen laparoscopic procedures were performed on patients during the study period with patient age range of 2–65 years; mean age 31.5 years. There were 11 male and 4 female. 6 laparoscopic appendicectomies, 6 diagnostic laparoscopy ± biopsy, 1 laparoscopic transabdominal preperitoneal herniorrhaphy for bilateral indirect inguinal hernia and 2 laparoscopic adhesiolysis for adhesive small bowel obstruction. All were successfully completed except one conversion (6.7 %) for uncontrollable bleeding in an intraabdominal tumour.

Conclusion: The practice of laparoscopic surgery in our environment is feasible and safe despite the numerous but surmountable challenges. There is the need for adequate training of the support staff and a dedicated theatre suite.

Keywords: Laparoscopy, Feasibility, Developing country

P075 - Clinical Practice and Evaluation

Endoscopic Evaluation of Gastrointestinal Polyps with Flexible Spectral Imaging Color Enhancement: Comparison with Histopathologic Results

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Aim: Polyps are common lesions of gastrointestinal tract and easy to determine. We aimed to present our experience of flexible spectral imaging color enhancement (FICE) with gastrointestinal polyps and their histopathologic findings at the beginning of our learning period.

Materials and Methods: The patients with a polyp, which was revealed by conventional endoscopy and FICE, were classified according to Kudo's Pit Pattern Classification (KPPC). The KPPC results were compared with pathologic findings.

Results: Twenty five patients were included to the study (12 male and 13 female). The median age was 58 (33–82). According to FICE, 8 patients were classified as Kudo2, 11 patients as Kudo3 and 6 patients as Kudo5. In 23 cases, there was a complete correlation between FICE and pathology results (92%). Two patients (8%) were misinterpreted as Kudo 5. One of two patients had been previously operated due to a larynx cancer. During our examination, this patient was diagnosed with a proximal esophagus cancer. However, the pathology results showed a hematoma. For the other Kudo 5 case, histo-pathologic examination showed a hyperplastic polyp.

Conclusion: Vascular and mucosal patterns of GIS polyps can be more effectively screened by FICE. This technique allows predicting the pathology results and prevents unnecessary endoscopic polypectomies. However, the endoscopists should have enough experience with the procedure to perform it.

P076 - Clinical Practice and Evaluation

The Complications After Laparoscopic Appendectomy - The Role of the Technique in Securing the Base of the Appendix

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Background: The laparoscopic appendectomy is a minimally invasive surgical technique. The standard technique in securing the base of the appendix is by endoloop ligatures, a stapler and a double clip. There are several complications of the laparoscopic appendectomy like infection of the surgical incision or abdominal cavity (peritonitis), abscess, bleeding or bowel obstruction. The objective of this report is to compare the incidence of postoperative complications for each procedure.

Methods: Data of the patients who underwent laparoscopic appendectomy at general surgery department in JBC were collected during the years 2011–2012. The cohort of the patients is divided into three groups: In the first group, the base of the appendix is secured using an endoloop ligature, in the second group using a stapler and in the third group using double clip and Z stitch. The primary outcome measures are operative time, length of hospital stay, histology, grade of the operating surgeon and complications—wound infection, intraabdominal abscess and bowel obstruction.

Results: Will be introduced in the poster.

Conclusion: We would like to find out if the technique in securing the base of the appendix can influence the rate of postoperative complications.

P077 - Clinical Practice and Evaluation

Reduced Postoperative Low Back Pain: Another Social Impact of Laparoscopy

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Background and Aim: Low back pain affect 80 % of world population. There are no available data on the real incidence of low back pain (LBP) after surgery, both open (LPT) and laparoscopic (LPS). LPT break the “Core Stability” of the abdominal-lumbar-pelvic belt and is expected to increase this problem. A retrospective study was undertaken in order to verify this hypothesis and to compare the effect of a specific rehabilitative program (not reported in this paper).

Materials and Methods: The records of 287 patients (pts) undergone to primary (not converted from LPS) major laparotomy in the last two years at our Institution were examined. Surgical incisions less than 2/3 of the xifo-pubic line were excluded. All pts received a phone call for an interview on LBP. Two hundred eight pts were not reachable or dead or had comorbidity influencing LBP and were excluded. Seventy nine pts (27.5 %) answered to the interview. The 4-questions interview concerned the presence of LBP before operation, recurrent or new postoperative LBP, timing. The same questionnaire was administered to a 79 pts control group, undergone major LPS operations, selected out of 150 records. Pts with comorbidities or complication potentially influencing LBP were excluded from the analysis. The groups were comparable for age, sex, weight of surgery, prevalence of preoperative LBP.

Results: Preoperative LBP was reported at least once by 110/158 pts (69.7 %), without significant difference between the two groups. The incidence of postoperative LBP was 39.2 % (31/79) in LPT pts and 10.1 % (8/79) in LPS group— $p < 0.01$.

Recurrent LBP was 67.7 % in LPT and 87.5 % in LPS. New LBP was 32.3 % in LPT and 12.5 % in LPS. Peaks of LBP occurred after 3 mo. (54.8 % in LPT, 87.5 % in LPS) and within 1 mo. (38.8 % in LPT, 12.5 % in LPS).

Conclusion: In our knowledge, this is the first study demonstrating that laparoscopy significantly reduces LBP after major abdominal surgery, in comparison with open surgery. This finding enhances the social and economical impact of laparoscopy. A prospective study was undertaken.

P078 - Clinical Practice and Evaluation

Feedback Helps to Improve Prophylaxis Against Deep Vein Thrombosis in the Patients Undergoing Laparoscopic Surgery: Review of Sign Guidelines

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Aims: Deep vein thrombosis (DVT) in surgical patients is associated with recognised morbidity and mortality. The Scottish Intercollegiate Guidelines Network (SIGN) has developed guidelines and protocols to prevent the incidence of DVT in the surgical patients. Our aim was to review the DVT prophylaxis administered at a single institute and the re-auditing performed following feedback to assess the improvement in the managing DVT prophylaxis in patients undergoing laparoscopic surgery.

Methods: In the first phase 100 patients undergoing laparoscopic surgery (elective and emergency) were reviewed for DVT prophylaxis on the surgical floor using the SIGN guidelines (anti-embolism stockings (AES) and low molecular weight heparin (LMWH)). The results reviewed and feedback provided to all junior doctors involved in the management of surgical patients. A re-auditing was performed and the compliance to the SIGN guidelines was recorded.

Results: In the initial phase 100 patients (47 elective, 53 emergency) were reviewed. 19 patients who should have received AES were not prescribed AES. No explanation was provided in the notes and drug charts for not prescribing the AES. 23 patients were not prescribed LMWH. 31 patients were prescribed the wrong dose of LMWH. In 14 patients both AES and LMWH were missed all together with no documentation. The feedback was provided at the departmental level and re-auditing was performed in 100 patients (59 elective, 41 emergency). 98 % compliance was observed at this stage.

Conclusions: The feedback helps to improve compliance. SIGN guidelines for DVT prophylaxis can be easily adopted. The involvement and training of all the medical staff can improve outcome in the management of the surgical patients undergoing laparoscopic surgery.

P079 - Clinical Practice and Evaluation

Laparoscopic Cholecystectomy in a Low-Budget Hospital vs. a Standard Western European Hospital

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Aim: Unfortunately across the European Union there are still significant differences regarding financing of the healthcare system. For example, in 2010 the total health expenditure per capita in Germany was about 1800 EUR, while in Romania it was about 275 EUR. Despite this huge differences, quality of healthcare and treatment standards should be similar, at least for the common pathology.

We tried to analyze the impact of this low financing on the quality and costs of laparoscopic cholecystectomy in 2 similar clinics, one in Germany and one in Romania, similar regarding the number of beds and types of pathology. We also analyzed data regarding cost-efficiency and the impact of financing on quality standards.

Methods: We compared and analyzed data obtained from the Surgical Clinic—Emergency City Hospital Lugoj, Romania with data from the Quality report 2010 of the CKS Saarbrücken, Germany. We also compared funding and functioning costs of the two surgical clinics and public data regarding financing of the healthcare system in the two countries.

Results: Although the Romanian and German healthcare systems are similar, with DRG-based funding, there are significant differences in reimbursement from the health insurance companies: the German hospital obtained in 2010 5525.76 (1.801 × 3068) EUR for a complicated laparoscopic cholecystectomy and 2742.79 (0.894 × 3068) EUR for a simple laparoscopic cholecystectomy, while the Romanian hospital was reimbursed 563.76 (1.7075 × 330.17) EUR for simple cholecystectomies respectively 278.76 (0.8443 × 330.17) EUR for simple cholecystectomies.

Although both clinics are similar as number of beds, in the Low-budget clinic there were performed only 114 laparoscopic cholecystectomies while in the German hospital 215 cholecystectomies.

Another significant difference in costs was regarding the number and reimbursement of personnel, while the German clinic employs 9 surgeons and 23 nurses, the Romanian clinic employs 3 surgeons and 13 nurses. Also remuneration of a German doctor is approximately 6 times one of a Romanian doctor. The costs regarding equipment and medication were similar.

Conclusions: While the reimbursement for the German clinic is approximately 10 times the reimbursement for the Romanian surgical clinic, this difference cannot be objective in the functioning costs.

P080 - Clinical Practice and Evaluation

Multimodal Rehabilitation with Pre and Early Postoperative Feeding and Early Mobilization Improves Recovery After Laparoscopic Colorectal Surgery

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Introduction: Laparoscopic surgery may allow earlier recovery compared with open surgery. There is still little data derived from randomized controlled studies that have investigated differences fast track and conventional approaches. In this study, we demonstrate the impact of multimodal therapy on recovery of patients after laparoscopic colorectal surgery.

Methods: Patients underwent laparoscopic approach were randomized into a fast track (FT) and conventional care (CC) group. We also compared data obtained during the study (randomized patients) with the beginnings of laparoscopic colorectal surgery in our hospital, when all patients were in the conventional postoperative treatment.

The Fast track group received preoperative oral feeding, early postoperative oral feeding, early mobilization and early ambulation. We compared mobilization time, tolerable diet for 24 h, mobilization, postoperative hospital stay, complications, and quality of life, pain and other subjective data (nausea, hunger, thirst well being) by visual analog scale.

Results: Time to full mobilization and time to full diet was shorter in the Fast track group than in the conventional care group. The FT group patients had better subjective criteria (pain, less nausea and vomiting). There was no difference in perioperative complications and duration of postoperative hospitalization.

Conclusion: A rehabilitation program with preoperative and early oral feeding and early mobilization after laparoscopic colon surgery results in reduced recovery time without increased complications. These results suggest that a multimodal rehabilitation program may increase the short-term benefits after laparoscopic colon surgery.

P081 - Day Surgery

Ambulatory Laparoscopic Hernia Repair in the Romanian Low-Budget Health System - Possible or Not?

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Aim of the Study: In the U.S. and Western European countries most hernia operations are performed on an outpatient basis, while in most Eastern European Countries hernia operations are performed on inpatient basis. The aim of this study was to analyse the causes why ambulatory laparoscopic hernia repair is still uncommon in Romania.

Material and Method: We calculated the costs of laparoscopic ambulatory hernia repair in our state hospital, by using the data obtained for the hospital case-costing system; and also the cost of operating room time and medication. We also calculated the median cost of ambulatory hernia repair in a private hospital by analyzing 100 laparoscopic hernia repairs performed 2010–2012.

Results: While costs for the hospital are fairly similar, there is a more than significant difference in reimbursement. While the state hospital is reimbursed 110 EUR, the private hospital is reimbursed 450–1000 EUR depending on cost of reusable materials.

Conclusions: Development of ambulatory laparoscopic surgery in Romania in state hospitals hindered by the reduced reimbursement by the National Insurance House. While in private hospitals the reimbursement exceeds the costs, so development of laparoscopic hernia repair seems feasible.

P082 - Day Surgery

Single-Incision Versus Standard Laparoscopic Cholecystectomy: Comparison of Surgical Outcomes from a Single Institution

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Aims: We here described our 24-month experience with SILS cholecystectomy. The objective of this study was to assess the feasibility of SILS cholecystectomy using a novel method of establishing single access using existing instrumentation with the addition of the SILS Procedure Kit Plus Components (Covidien, Norwalk, CT), as compared with standard multiport cholecystectomy.

Methods: Between February 2009 and 2011, patients referred for cholecystectomy to the General and Endocrine Unit of our institution who agreed to undergo SILS were included in a prospective study. All operations were performed by the same surgical team specially trained in this type of surgery. The umbilicus was the sole point of entry for all patients. The same operative technique was used in all patients. Data of patients undergoing SILS cholecystectomy were compared with those from an uncontrolled group of patients undergoing standard laparoscopic cholecystectomy during the same study period.

Results: The SILS and standard cholecystectomy groups included 120 patients each. SILS was performed in all patients and none of them required conversion to an open procedure. The median operating time of 45 min in the SILS group was not significantly different from that in the standard laparoscopic cholecystectomy group. We suture fascial edge with simple stitches under direct vision, thus reducing the risk of incisional hernia in SILS group (P = 0.046).

Conclusion: SILS cholecystectomy was technically feasible and safe and represents a reproducible alternative to standard laparoscopic cholecystectomy in selected patients. The definitive clinical, esthetic, and functional advantages of this technique require further analysis.

P083 - Day Surgery

Are We Prepared for Single Incision Laparoscopic Cholecystectomy as a Day Surgery Procedure?

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This report describes a single-center experience of single-incision laparoscopic (SILS) cholecystectomy in overnight-stay patients. Between 2009 and 2011, 150 patients (58 % women, mean age 51 years) referred for cholecystectomy to the day surgery unit who agreed to undergo SILS were included in a prospective study. All operations were performed by the same team and the same surgical technique was used in all cases. Postoperative pain and nausea were assessed using visual analogue scores (scale 0–10) on a self-completion questionnaire on the night of operation and the morning of discharge. SILS was successfully performed in all patients and none of them required conversion to an open procedure. There were no significant differences in the median VAS for postoperative pain and nausea between the night of surgery and the next morning. The mean length of hospital stay was 22 h, and 98 % of patients were satisfied with results of surgery and would be willing to undergo the same procedure again. SILS cholecystectomy is a valid alternative to standard laparoscopic cholecystectomy as an outpatient surgery or overnight stay procedure. According to these promising results, SILS cholecystectomy could be included in a major ambulatory surgery program.

P084 - Day Surgery

Single Visit Laparoscopic Cholecystectomy Clinic - A Feasible Option

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Aims: Laparoscopic cholecystectomy is the treatment of choice for gall bladder disease and is performed in many centres as a day case procedure. The aim of this study was to evaluate the outcomes of patients who underwent laparoscopic cholecystectomy using a 'single visit' clinic pathway.

Methods: A retrospective analysis was conducted on 50 patients who underwent laparoscopic cholecystectomy for uncomplicated gall bladder disease from June 2007 to December 2012 using a single visit clinic pathway. A single visit clinic is one where patients are first seen by a surgeon on the day of their procedure and discharged usually within 24 h with no follow appointment. This pathway excludes patients with known complicated gall bladder disease and high anaesthetic risk.

Results: The male female ratio was 1:5, and mean age 46.6 years. 28 patients (56 %) were discharged on the same day and 44 patients (88 %) discharged within 24 h. There was one intraoperative haemorrhage (2 %), and one conversion to open cholecystectomy (2 %); 2 readmissions following discharge (4 %) and 2 unexpected post operative outpatient visits (4 %). Furthermore the number of preoperative outpatient visits reduced from 2 to 0, reducing waiting times and saving £310 (373 Euros) per patient.

Conclusions: Single visit laparoscopic cholecystectomy clinic is a safe and cost-effective option in the management of the uncomplicated gall bladder disease.

P085 - Day Surgery

Laparoscopic Tepp Inguinal Hernia Repair - Two Port Technique

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There are several reports about two port techniques for repair of ventral and incision hernia, published and searched on Medline. The application of two port technique for laparoscopic TEPP inguinal hernia repair is not investigated up to now and there are only two reports about that on Medline. The aim of the study is to reveal 5 years experience with that technique, outcome, benefits and limits. Overall 138 patients were operated on by one surgeon in two hospitals / one in UK and one in Bulgaria. They were 105 male and 33 female, age range from 18 to 65 years. Balloon dissection was used only in 14 cases. Standard technique was with one 12 mm port and one 5 mm port. The mesh was fixed with tacks or sutures in 79 cases, a biogluue was used in 4 cases and not fixed in the rest of them. The operating time varied from 25 to 65 min, average 40 min. 58 patients were operated on as day case and the rest were discharged on next morning after surgery. Intraoperative complications were noted in 2 cases and tear of peritoneum in 7 cases. Postoperative complications as pain, lasting more than 48 h or seroma were documented in 5 cases. Recurrence of hernia was noted in 2 cases. The application of two port technique in laparoscopic TEPP procedure seemed to be feasible and safe. It was suitable for patients with type I or II inguinal hernias by Nyhus or Bendavid classification. The technique is a good alternative to single port technique for TEPP laparoscopic repair. It is not applicable for bilateral hernias and should be used by experienced laparoscopic surgeons.

P086 - Day Surgery

Laparoscopic Transabdominal Preperitoneal (TAPP) Approach for Inguinal Hernia Repair: A Two-Years Experience at a Day-Surgery Settings

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Aim: Since 2011 January laparoscopic transabdominal preperitoneal (TAPP) hernia repair has been performed for selected patients as day-case surgery in Republican Hospital of Kaunas Day Surgery Department. Laparoscopic hernia repair has emerged as an effective alternative method for treating inguinal hernias. Today TAPP is usual, safe, cost-effective day surgery procedure. In this report we summarize our laparoscopic hernia repair results and recommendations.

Materials and Methods: The transabdominal preperitoneal procedures for groin hernias performed between 2011 and 2013 at a single center were analyzed retrospectively. The selection criteria of patients required groin hernias, ASA grade of 1 or 2 (in rarely case 3), excluding serious associated pathology, good contact with doctor, residence less than 2 h way of the hospital. The operation was performed using a standard three-trocar technique, it was using self fixating mesh and stapler fixated mesh. Complications, admissions and readmissions aspects were assessed. The difference was considered to be reliable when the estimated $p < 0.05$.

Results: A total of 62 TAPP procedures were reviewed retrospectively. There were 57(91.9 %) males and 5 (8.1 %) females. The average age was 52.2 years (range 24–77). The mean length of hospital stay was 22.7 h (range 8–48). The mean duration of surgery was 90 min. (range 55–142). 40 hernias were in right side, 19 hernias were in left side, 3 were bilateral. 4 hernias were recurrence. 3 patients complained of pain, 1 patient complained of nausea, 1 patient has early recurrences.

Discussion: Laparoscopic TAPP hernia repair has proven to be an efficient method for the treatment of groin hernias at our institution. There was not any major complication, and results confirm that TAPP is safe, effective, feasible, applicable procedure in day surgery. Such low morbidity makes TAPP an attractive method for the routine treatment of groin hernias.

P087 - Different Endoscopic Approaches

Early Experience of Single Port Laparoscopic Colectomy

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Introduction: Single incision laparoscopic technique is an emerging modality which has recently gained widespread acceptance. The purpose of our study was to compare the intraoperative and short term postoperative outcome of the Single incision laparoscopic colectomy (SILC) versus multi-incision laparoscopic colectomy (MILC).

Patients and Methods: We retrospectively reviewed the charts of all patients who underwent laparoscopic colectomy between October 2010 and October 2012. The cohort was divided into two groups—SILC vs. MILC. The two groups were compared in two aspects: Intra-operative and early post-operative outcomes. The intra-operative parameters were: total operative time, surgical margin involvement and lymph node extraction. The post-operative parameters were: length of hospital stay (LOS), 30-day readmission, unplanned re-operation, maximum pain score, morbidity and mortality.

Results: Sixty six patients had laparoscopic colectomy (SILC-18/MILC-48). There was no statistical difference in patients' characteristics between the two groups (age, gender, ASA score, pathology and type of procedure). The first aspect of intra-operative outcomes demonstrated no difference between the two groups. In regards to the postoperative outcomes- the SILC LOS was three days longer than MILC ($p = 0.07$). The remaining parameters showed no statistical difference. There were no deaths in both groups.

Conclusions: SILC is feasible and safe. According to our data- there is a trend of longer LOS after SILC. Nevertheless, the number of observed cases is relatively small and needs to be substantiated by larger prospective randomized controlled cases.

P088 - Different Endoscopic Approaches

A Study of 133 Cases of Single-Incision Laparoscopic Cholecystectomy Using Multi-Channel Port (E•Z Access Port)

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Aims: Recently, single-incision laparoscopic surgeries (SILS) have been rapidly spreading in Japan. Facilities adopting SILS for cholecystectomy are also increasing. In our hospital, we have been conducting stylized single-incision laparoscopic cholecystectomy (SILC) using a multi-channel port, the E•Z Access Port (Hakko, Japan), since April 2010. We studied the effectiveness of this technique in 133 cases, taking the operation time and appearance of complications into consideration.

Methods: We made a 15–20-mm vertical incision in the umbilicus. We used the E•Z Access Port with 3 trocars of 5 mm in diameter. We used straight-type forceps, traditionally employed in laparoscopic surgeries. Also, needle forceps of 2.1 mm in diameter (BJ needle forceps: Niton, Japan) were used in the right abdomen to retract the gallbladder.

Operability: Although the technique is limited to cholecystopathy diagnosed as benign by preoperative imaging, we also apply this technique in cases with a history of laparotomy and marked inflammation. The reason is that it is straightforward to switch to traditional laparoscopic cholecystectomy using trocars puncturing the E•Z Access Port, when single incision is considered difficult during the surgery.

Results: The mean operation time was 72 min, amount of bleeding was 9 g, and no complications occurred. The success rate with a single incision was 94.0 %, and 1 trocar was added in 5 cases. In 3 cases, it was difficult even after the addition of a trocar, and laparoscopic surgery was switched to laparotomy. In cases without inflammation, the operation time was within 1 h, and the procedure was not inferior to the traditional 4-trocar laparoscopic cholecystectomy. In comparison with using other access ports, SILC could be performed economically and safely.

Conclusion: The E•Z Access Port facilitates safe and smooth single-incision laparoscopic cholecystectomy.

P089 - Different Endoscopic Approaches

Transvaginal Specimen Extraction After Liver Resection for Metastatic Colorectal Cancer

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Aims: Even if pure laparoscopic liver resection is done, an abdominal incision is still necessary to remove the resected specimen. Because abdominal incisions continue to be a major source of morbidity after laparoscopic-assisted surgery, an abdominal incision negates the benefit of low invasive surgery. Here, we report transvaginal specimen retraction after liver resection.

Methods: A 73-year-old woman with a past history of T3N2M0 colon cancer underwent laparoscopic-assisted transverse colectomy followed by adjuvant chemotherapy. Two years and six months later, she was found to have a positron emission tomography-positive lesion of 3 cm on the left lateral liver segment. We performed pure laparoscopic liver resection by using two 5-mm trocars and two 12-mm trocars. After pure laparoscopic liver resection, we created the transvaginal route to extract the specimen. First, we elevated the uterus and inserted a Cusco speculum into the posterior vagina. Secondly, we identified the posterior vagina both from inside and outside the body, and then cut off the posterior vagina from within the abdominal cavity. Finally, the specimen was placed in an endobag, which was inserted and extracted transvaginally. The posterior vagina was closed from within the abdominal cavity. The specimen was 13.5[GREEKX]7.5-[GREEKX]5.0 cm and the lesion was 4.3[GREEKX]3.4[GREEKX]2.9 cm. The patient had no complications and was discharged on postoperative day 9.

Results: Operating time was 237 min and blood loss was minimal. The patient was discharged on postoperative day 9. Post-operative pain was particularly mild, which made earlier ambulation possible. No postoperative complications were evident after 90 days.

Conclusions: Transvaginal specimen extraction in laparoscopic liver resection is a feasible and safe technique. This technique is an attractive method, which results in quicker recovery, less operative pain, and fewer wound-related complications. We believe it is one potential method of minimally invasive surgery in laparoscopic liver resection.

P090 - Different Endoscopic Approaches

A Novel Laparo-Endoscopic Combination Procedure for Local Full Thickness Colonic Resection

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Introduction: Introduction of bowel cancer screening programs has resulted in an increasing number of patients diagnosed with complex (endoscopically irresectable) colonic polyps. Such patients are generally treated by hemicolectomy which is associated with a significant risk of morbidity and mortality. To address this, we have modified a previously reported full thickness laparo-endoscopic excision (FLEX) technique as a potential alternative treatment.

Methods: Surgery was performed in five 70-kg pigs. A simulated colonic polyp was created by endoscopic injection of Spot® and the clearance margin was delineated by circumferential placement of mucosal argon plasma coagulator (APC) marks. Full thickness eversion of the colonic wall was achieved by endoscopic placement of prototype BraceBars (BBs). The everted colon was excised using a linear laparoscopic stapler placed below the BBs. The first pig was terminated immediately and others 8 days after surgery.

Results: The median duration of the procedure (defined from placement of mucosal APC marks to specimen excision) was 26 min (range 20–31 min). All excised specimens contained three pairs of BBs delineating a circumferential clearance margin with a median specimen diameter of 5.1 cm (range 4.5–6.3 cm). Postoperative recovery in survival animals was uneventful and post-mortem evaluation demonstrated well-healed resection sites with no evidence of intra-abdominal infection or inadvertent organ damage. Endoscopic evaluation of anastomoses at post-mortem demonstrated widely patent lumen without evidence of stenosis at excision sites. Histological examination of the anastomoses showed primary closure by mucosal abutment and regeneration, with repair and restoration of submucosal continuity.

Conclusion: This proof-of-concept porcine survival study has demonstrated the feasibility and safety of full thickness colonic excision, with specimens excised of up to 6 cm in diameter. Accurate placement of endoscopic BBs ensures completeness of excision, reducing the risk of recurrence or residual disease, while laparoscopic overview during the procedure avoids collateral damage. This localized excision technique is suitable for translational study in the human as an alternative to hemicolectomy. The ability to preserve mesenteric vasculature and colonic length is likely to result in less morbidity and mortality, while the technique should reduce treatment costs.

P091 - Different Endoscopic Approaches

Single Port Transumbilical Operations in Abdominal Cavity, Pelvis and Retroperitoneal Space

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The Aim of the Study: To analyze the technique of the single access operations, the results of early postoperative period.

Methods: The study comprised a clinical series of 56 single port operations. 10 men and 29 women underwent single-port laparoscopic cholecystectomies, 6 men and 5 women - laparoscopic resection of renal cyst and 6 women—ovariectomy. The patients' ages ranged from 38 to 75 years. For access to the abdominal cavity we used SilsPort (Covidien) and TriPort (Olympus), which were placed through transumbilical approach. We used a 10-mm laparoscope, 5 mm bipolar coagulator-dissector Enseal of Ethicon Endo-Surgery, curved reusable instruments in addition to standard laparoscopic equipment. All interventions were performed surgical team with extensive experience in laparoscopic surgery procedures.

Results: The single-access operations were completed successful in all patients. There were 3 conversions to multiport laparoscopic surgery and no conversions to open surgery. Mean laparoscopic operative times of chronic calculous cholecystitis was 45 + 7 min, kidney cyst—45 + 10 min, ovariectomy—35 + 5 min. Patients became active on the first day after surgery. We used non-steroid anti-inflammatory drugs as pain medication. Use of narcotic analgesics was required. Insurance drain was removed at 1–2 days after surgery. Mean hospital postoperative stay was 3–5 days for chronic calculous cholecystitis and kidney cyst, and 2–4 days for ovariectomy. At the early postoperative period no complications were registered.

Conclusion: The results of the study demonstrated that there were some of the technical features associated with the use of a single-incision approach. This was because the laparoscope and tools are located in the same plane parallel to the optical axis, and close to each other, which creates difficulties for optimal visualization and manipulation. However single port operations can be performed safely using curved reusable instruments, which helps avoid the conflict between the surgeon's hands or between the instruments' tips. This single-access method can achieve a good cosmetic effect and refuse additional mini-laparotomy to remove the preparation. So this approach is safe, aesthetic and successful.

P092 - Different Endoscopic Approaches

Laparo-Endoscopic Assisted Caecal Wedge Resection for Large Adenoma not Suitable for Standard Endoscopic Removal: Results on 15 Patients

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Aims: Endoscopic resection represents the gold standard treatment for benign polyps of the colon. Nevertheless in case of large villous lesion, especially when located on the right colon, mucosectomy can be cumbersome as it could lead to perforation or bleeding. The combination of laparoscopic intra-abdominal view and endoscopic control not only allow to made possible correct localization of the polyp, but also give the surgeon the ability to perform a targeted resection of the caecal wall, being sure that the whole polyp and its implant basis are fully included

Methods: We have considered 15 patients from November 2010 to November 2012. All patients were initially admitted to the Internal Medicine department for increasing weakness and dyspnea; anemia was found in 11 patients, with Hb value between 7.9 and 8.5 g/dL. Colonoscopy revealed a large sessile polypoid lesion located on the anterior (9 patients), posterior (4 patients) et lateral (2 patients) caecal wall, not endoscopically removable and covered by fragile and bleeding mucosal layer. Biopsies where taken and pathology described the specimen as tubulo-villous adenoma with severe displasia. Toraco-abdominal CT scan were also carried out and they confirmed thickening of the colonic walls at the level of caecum.

These patients underwent to laparoscopic wedge caecal resection with intraoperative colonoscopic assistance.

Patients are placed as in standard laparoscopic right colectomy. Exploratory laparoscopy is performed and the right colon mobilized to give 360 degree access to the cecal region; terminal ileum is clamped using an atraumatic forceps to reduce air insufflation during colonoscopy. Intraoperative colonoscopy is carried out to identify the polyp and, using a biopsy forceps, to push the lesion outwards facilitating the bowel resection. Laparoscopic surgical stapler is placed and the full removal of the lesion is completed under colonoscopic guidance. The suture line is reinforced by re-absorbable continuous suture and the specimen is placed in an endobag and removed from one of the trocar.

Results: The removal of the whole lesions was obtained without complications.

Conclusions: Laparoscopic wedge colonic resection with intraoperative colonoscopy is a fast and safe procedure that can be performed for large polyps that could not be treated endoscopically.

P093 - Different Endoscopic Approaches

Single-Incision Laparoscopic Surgery for Colorectal Malignancy: A Single Surgeon's Experience of 87 Consecutive Cases

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Aims: Along with open colectomy, laparoscopic colectomy is currently the standard operative technique for malignancy. Single-incision laparoscopic (SIL) surgery is a recent advance in minimally-invasive surgical techniques. The aim of this study is to compare SIL surgery with conventional laparoscopic (CL) surgery in patients with colorectal cancer.

Methods: This study was a retrospective analysis of data from our prospectively-collected colorectal surgery database. Between January 2008 and August 2012, 87 patients who had undergone primary SIL surgery for colorectal cancer by one board-certified colorectal surgeon were matched according to sex, age, and operation with controlled patients who had undergone CL surgery, and the outcomes were compared.

Results: There were no significant differences in the general characteristics of the SIL and CL surgery groups, including in age, sex, BMI, ASA score, mean postoperative hospital stay, previous abdominal operation, and diagnosis. The most common operation type was anterior resection (52.9 %). The proportion of early T stage was significantly greater in SIL surgery, especially after endoscopic polypectomy or submucosal dissection. There were no cases that required conversion from SIL or CL surgery to another operative procedure. Operation time was significant longer in SIL surgery (123 and 141 min, $p < 0.001$), but procedure time was not longer than CL surgery after eliminating closure time (22 and 32 min, $p < 0.001$) from the operation time. There was no significant difference in post-operative complications between the two groups (5.7 and 10.3 %, $p = 0.177$). The mean numbers of harvested lymph nodes were 24 for both SIL and CL surgery, respectively ($p = 0.986$).

Conclusion: SIL for colorectal malignancy can be applied for various types of operations. SIL surgery for colon cancer is safe and can provide equivalent oncologic resection and peri-operative outcomes compared with CL surgery.

P094 - Different Endoscopic Approaches

Short-Term Perioperative Outcomes of Single-Incision Laparoscopic Anterior Resection Comparing with Conventional Laparoscopic Surgery for Malignancy

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Background/Purpose: This study aimed to compare the perioperative outcomes of patient with colonic malignancy who underwent single-incision laparoscopic (SIL) anterior resection vs conventional multiport laparoscopic (CL) anterior resection.

Materials and Methods: Between September 2009 and June 2012, consecutive patients who underwent SIL anterior resection at Samsung Medical Center were case matched to patients who underwent CL anterior resection by age, gender, stage and surgeon. Each group were consisted of 140 patients and surgery was performed by two colorectal surgeons who have had enough experience of multiport laparoscopic surgery of colorectal diseases. Medical records of patients were analyzed retrospectively.

Results: Two groups had no significant differences in general characteristics (age, gender, weight, BMI, stage). It showed that there was no significant difference between SIL and CL group in postoperative complications including leakage and post-operative ileus during 4 weeks. (6.4 and 3.7 %, respectively; $p = 0.412$). But, there was significant difference between SIL and CL group in length of hospital stay (6.0 and 6.7 days, respectively; $p < 0.05$). There was no significant difference of oncologic factor such as number of harvested lymph nodes, specimen length and proximal/distal margins length. The operation time of each group were 136.5 (SIL) minute and 134.2 (CL) min, respectively ($p = 0.593$). Only one case of SIL was converted to hand-assisted laparoscopic surgery due to variceal bleeding.

Conclusions: Single-incision laparoscopic anterior resection for malignancy is feasible and safe comparing with multiport laparoscopic surgery. Overall perioperative outcomes were equivalent or better than CL anterior resection. Further prospective studies are needed to evaluate long-term oncologic outcome and safety.

P095 - Different Endoscopic Approaches

Laparoscopic Assisted Modified Duhamel Technique Using Transanal Staplers

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Background: Recently, laparoscopy has been used in the treatment of Hirschsprung disease (HD). Modified Duhamel procedure is one of the most commonly used technique for the treatment of HD that respects the anatomy and physiology of the rectum. The purpose of this study was to present our early experience with laparoscopic assisted modified Duhamel procedure for the treatment of HD using transanal circular and linear staplers.

Material and Methods: The study included 35 children with diagnosed rectosigmoid HD. All patients were subjected to laparoscopy for identification of transitional zone and mobilization of the diseased colon. An endo GIA stapler was applied to the colon at the pelvic peritoneal reflection. A 10-mm trocar was inserted into the posterior wall of rectum, 2.5 cm above the dentate line into the retro rectal space. The colon was pulled out through this trocar, where the aganglionic segment was resected extra-anally. A circular stapler was used to form end to side colorectal anastomosis after laparoscopic correction of any colonic twisting. Another circular stapler was applied between the upper end of the rectal stump and the anterior wall of the colon. A linear stapler was inserted through the anus to create a side-to-side anastomosis between the rectum and the pulled through colon.

Results: The study included 35 children with proved rectosigmoid HD. They were 25 males and 10 females. Their mean age was 2 ± 19 years old (range; 3–72 months). All cases were completed laparoscopically without conversion. The mean operative time was 55 ± 12 min. (ranged from 50 to 120 min). No intraoperative complications were reported, no post-operative anastomotic leakage, post-operative barium enema showed a very smooth rectal pouch without residual spare with normal bowel habit.

Conclusion: Laparoscopic assisted modified Duhamel procedure for the treatment of HD by staplers is feasible, safe and rapid technique.

P096 - Different Endoscopic Approaches

Clinical Results Between Single Incision Laparoscopic Cholecystectomy and Traditional Laparoscopic Cholecystectomy in our Department

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Purpose: The aim of our study was to compare single incision laparoscopic cholecystectomy (1port) and traditional laparoscopic cholecystectomy (4port) with respect to clinical outcomes.

Methods: A retrospective study was performed of all patients who underwent laparoscopic cholecystectomy (1port and 4port) from January 2009 to May 2012. 145 patients underwent single incision laparoscopic cholecystectomy (1port) and 188 patients underwent traditional laparoscopic cholecystectomy (4port).

Result: There was no significant difference in the blood loss, number of conversion case, length of hospital stay and complication case. Operative time was significantly longer in the 1port group (1port group 142 ± 24 min 4port group 122 ± 36 P < 0.001). Operative costs was slightly lower in the 1port group.

Conclusion: Single Incision Laparoscopic Cholecystectomy seems to be acceptable alternative to traditional laparoscopic cholecystectomy. However, it is not enough to any propose any real benefits of 1port when compared with 4port in operative time.

P097 - Different Endoscopic Approaches

Laparoscopic Radiofrequency Ablation of Focal Hepatic Lesions: Technical Aspects and Early Oncologic Results

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Aims: Radiofrequency ablation (RFA) of hepatic lesions represents an interesting alternative to surgery in the treatment of primary or secondary hepatic malignancies.

This study is a retrospective analysis of clinic and oncologic outcomes in a selected series of patients treated by laparoscopic RFA (L-RFA)

Methods: Patients were proposed for local treatment by a multidisciplinary oncologic staff. L-RFA was realized if lesions were subcapsular or adjacent to the gallbladder or the transverse colon.

If nodules were larger than 3 cm, or close to a big venous branch, RFA was preceded by a superselective transarterial embolization (TAE).

All the procedures were performed under ultrasonographic guidance.

Results: From November 2009 to January 2013, twenty-seven patients with 39 hepatic lesions were treated with L-RFA.

Tumours were hepatocellular carcinoma in seven patients and metastatic lesions in the remaining 20: from colorectal cancer (n = 6), from breast cancer (n = 8), from ovarian cancer (n = 2), from neuroendocrine tumours (n = 3), from thyroid cancer (n = 1).

In nine patients RFA was preceded by a TAE, performed at the same surgery session.

L-RFA was well-tolerated, without adverse events. Postoperative hepatic function was normal even in the cirrhotic patients, median hospital stay was two days.

The CT scan at one day after surgery demonstrated a wide necrosis area with adequate margins in all the patients. Follow up was realized with a CT scan one month after surgery, and thereafter every 3 months.

Two patients had a local recurrence, after 7 and 4 months, and were re-treated by RFA (one percutaneous, one laparoscopic). Two other patients had a local recurrence with concomitant systemic or hepatic relapse, treated by systemic chemotherapy.

At a median follow up of 13 months (range 1–38), overall survival is 89 % and disease-free survival is 41 %

Conclusions: L-RFA, eventually combined with TAE, is a safe and feasible technique for the treatment of hepatic lesions suitable for local approach. It maintains the benefits of minimally invasive surgery and offers the advantage, over the percutaneous approach, of an accurate staging of the disease by intraoperative ultrasonography.

Early oncologic follow up is promising.

Further studies are needed to compare L-RFA with minimally invasive liver resections.

P098 - Different Endoscopic Approaches

Single Incision Laparoscopic Cholecystectomy (SILC) - Can We Afford It? Economic Evaluation of Different Surgical Techniques

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Background: It is generally agreed that single-incision laparoscopic cholecystectomy (SILC) still requires further studies to set its role in everyday surgical practice. The purpose of our paper was to evaluate cost-effectiveness of this method in Polish financial reality. We have analyzed costs of three different surgical techniques: conventional (multi-incision) laparoscopic cholecystectomy, SILC and no-port SILC.

Methods: We conducted a retrospective study that compared three groups of patients who underwent treatment with conventional laparoscopic cholecystectomy (n = 20), SILC (n = 20) and no-port SILC (n = 20). These groups were matched by age, sex and body mass index. Following parameters were analyzed: complication rate, operative time, operative costs, length of hospital stay, hospitalization costs. The SILC cases were performed using one of the three-trocar SILC ports available on the market. The no-port SILC cases were performed by single skin incision in the umbilicus, insertion of one 10 mm trocar for the operating instrument, another instrument and scope were inserted directly through small incisions in the aponeurosis without a dedicated port.

Results: The average operative cost was significantly higher in the SILC group comparing to the conventional laparoscopy group and the no-port SILC group. There was no significant difference in the complication rate, operative time, the length of hospital stay, or the hospitalization costs between the three groups.

Conclusions: Currently the cost of the dedicated SILC port does not allow a regular use of this procedure in Polish financial reality. According to our experience, improved cosmesis is the only advantage of the single incision laparoscopy, therefore we believe that it is reasonable to consider this technique in a very selected group of patients.

P099 - Different Endoscopic Approaches

Application of the Single Access Technique in Laparoscopic Surgery

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Aims: Laparoscopic single access technique is a next step in development of minimally invasive surgery. The aim of the paper is presentation of the results of different laparoscopic single incision procedures and evaluation of this technique application.

Methods: 102 patients (15 males and 87 females) operated on laparoscopically with single incision technique from 15th October 2009 to 31st December 2012 were included in the study.

Results: In the analyzed period we performed 72 cholecystectomies (70.6 %), 8 left adrenalectomies (7.8 %), 3 right adrenalectomies (2.9 %), 7 splenectomies (6.9 %), 5 spleen cysts unroofings (4.9 %), 2 appendectomies (2.0 %), 1 Nissen fundoplication (1.0 %), 1 removal of the adrenal cyst (1.0 %) and 3 concomitant splenectomies and cholecystectomies (2.9 %). There were 3 technical conversions to multiport laparoscopy, and no conversions to open technique. Complications were observed in 5 patients (4.9 %). Average operation time was 79 min (SD = 40), average hospitalization time 2.4 day (SD = 1.4).

Conclusions: Laparoscopic single incision technique is a safe method and can be used as a reasonable alternative to multiport laparoscopy in different minimally invasive procedures especially in young patients to whom an excellent cosmetic effect is particularly important.

P100 - Different Endoscopic Approaches

Percutaneous Transhepatic Biopsy by Choleidoscope in Intrahepatic Biliary Tumors

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Intraductal papillary mucin-producing neoplasm (IPMN) of the bile duct is a rare disease. The precise diagnosis of biliary IPMN is not easy, especially in intrahepatically located, by conventional endoscopic retrograde cholangiopancreatography. We report two cases of intrahepatic IPMN diagnosed before operation by using percutaneous transhepatic choleidoscopic biopsy. A female-63 year old patient admitted to our hospital complaining of right upper quadrant abdominal pain and fever. Abdominal computed tomography (CT) scan showed both common bile duct and both intrahepatic bile duct dilatation and endoscopic retrograde cholangiopancreatography showed a mucin like soft mass projection after endoscopic sphincterotomy yet biopsy did not reveal malignancy. Further evaluation with magnetic resonance imaging (MRI) suggested biliary IPMN or distal CBD cancer involving the right hepatic duct. Percutaneous transhepatic biliary drainage (PTBD) catheter was inserted and choledochoscopic biopsy was done revealing adenocarcinoma in the peripheral right hepatic and common hepatic duct. A 52 year old man admitted to our hospital due to intrahepatic duct dilatation on annual abdominal sonographic check-up. Liver CT scans revealed distal CBD narrowing near the ampulla and there were longitudinal filling defects on both IHD and CHD on ERCP, after EST pus like discharge was found. Biliary parasitosis was suspected due to his history of ingestion of raw fish liver and praziquantel trial was started. After a follow loss of 20 months the patient was readmitted due to jaundice. Liver CT and ERCP showed mass like findings at the common hepatic duct with both intrahepatic duct dilatation. MRI findings suggested biliary IPMN or atypical cholangiocarcinoma. Choledochoscopic biopsy after PTBD was done revealing intraductal tumor in the peripheral right hepatic.

Before operation, the pathology and the extent of the tumor were confirmed and surgical strategy was easy to set up to right hemihepatectomy with caudate lobectomy. Both patients were discharged with no postoperative major complication.

P101 - Different Endoscopic Approaches

Evaluating the Effectiveness of Different Endoscopes While Performing Minilaparoscopy-Assisted Natural Orifice (Manos) Cholecystectomy

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The first laparoscopic cholecystectomy (LC) was performed in 1987 by Mouret. After its introduction in surgery, LC has become the main method of treatment of cholelithiasis. Despite the obvious success of this technique, surgeons around the world have tried to even more minimize effects of operations for the patient, holding their principle—safety of surgery.

One of these aspects was the miniaturization of working instruments to the diameter of the needle, resulting in a birth of a new technology—mini-laparoscopic surgery. A hybrid between mini-laparoscopic surgery and NOTES, has resulted in minilaparoscopy-assisted natural orifice surgery (MANOS). First NOTES cholecystectomy were performed using flexible endoscopes. In the acquisition of surgical skills, many surgeons prefer to use a rigid oblique-viewing optics. However, the evolution of instruments was parallel, leading to invent an entirely new generation of endoscopes with the changing angle.

Purpose: To evaluate the results of using different endoscopes in 65 MANOS cholecystectomy.

Materials and Methods: Our study involving 65 patients who underwent MANOS cholecystectomy. All operations were performed in 2010–2012 years. The average age of patients was 34.2 years, body mass index (BMI) from 24.4 to 35.2 kg/m². All patients had a history of delivery.

We used a flexible endoscope (Olympus) in 15 cases. Forward-Oblique Telescope 30, extra length (Karl Storz) was used in 30 cases. The new ENDOCAMELEON was used only 20 operations.

The inclusion criteria in our study were the presence of chronic calculous cholecystitis and/or polyps of the gallbladder, which requires surgical treatment, age 18 and older and a history of delivery. Exclusion criteria were: ASA III and IV, jaundice in history or ultrasound picture of choledocholithiasis, acute pancreatitis or pancreonecrosis, BMI over 40 kg/m², inflammatory diseases of the genital organs.

Criteria for evaluating the effectiveness of using different scopes were: stability, picture clarity, change the camera's port, rendering the surgical field, cost effectiveness.

All of our results prove, that using a variable direction of view, during the minimal invasive cholecystectomy have significant advantages over conventional scopes.

P102 - Different Endoscopic Approaches

Minilaparoscopy-Assisted Natural Orifice (MANOS) Cholecystectomy - A New 'Word' in the Treatment of Gallstone Disease

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The first laparoscopic cholecystectomy (LC) was performed in 1987 by Mouret. Despite the obvious success of this technique, surgeons around the world have tried to even more minimize effects of operations for the patient, holding their principle—safety of surgery. One of these aspects was the miniaturization of working instruments to the diameter of the needle, resulting in a birth of a new technology—mini-laparoscopic surgery. A hybrid between mini-laparoscopic surgery and NOTES, has resulted in minilaparoscopy-assisted natural orifice surgery (MANOS), and it's starting to take its first steps.

Purpose: To evaluate the results of the 65 MANOS cholecystectomy.

Materials and Methods: Our study involving 65 patients who underwent MANOS cholecystectomy. All operations were performed in 2010–2012 years in the Swiss University Clinic (Moscow). The average age of patients was 34.2 years, body mass index (BMI) from 24.4 to 35.2 kg/m². All patients had a history of delivery.

The inclusion criteria were the presence of chronic calculous cholecystitis and/or polyps of the gallbladder, which requires surgical treatment, age 18 and older and a history of delivery. Exclusion criteria were: ASA III and IV, jaundice in history or ultrasound picture of choledocholithiasis, acute pancreatitis or pancreonecrosis, BMI over 40 kg/m², inflammatory diseases of the genital organs.

Criteria for evaluating the effectiveness of operations are: the total operating time, number of complications, pain intensity (NRS), cosmetic effect.

All of our results prove, that minimal invasive methods of treatment used on stricked indications have significant advantages over conventional laparoscopy.

P103 - Different Endoscopic Approaches

Development of Laparoscopic Surgery Through a Single Incision: The Key Point is Progressive Introduction of Complex Procedures

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Introduction: Throughout the years several laparoscopic procedures have been described using one or more ports of entry. Single incision laparoscopic surgery (SILS) is an area of abdominal surgery of increasing interest. Our institution has been pioneer in the introduction and development of these techniques, making the complexity of procedures rise after completing the initial learning curve in less complex surgical interventions. We believe that this is a logic and attractive strategy to assure the surgical standards and safety for the patient benefits.

Materials and Methods: A study was made between December 2008 and April 2012 with patient admitted to the hospital that agreed to participate in the study. All patients where informed about other surgical options (open or laparoscopic surgery) and accepted the new technique. The patients where all intervened by 4 laparoscopic experienced surgeons. The umbilicus was the port of entry in most of the patients and the same surgical technique was used. All variables were analyzed in a prospective manner.

Results: A total of 341 SILS procedures were done in the study time period: 127 urgent appendectomies, 148 elective cholecystectomies and 4 acute cholecystitis, 4 exploratory laparoscopic surgeries, 3 drainage of acute diverticulitis and 24 appendectomies with supra pubic incision and 31 adrenalectomies. Surgeries were completed successfully in most of the patients. There were 2 surgeries with open conversion, 20 surgeries that needed the use of accessory ports and in 14 cases intra abdominal drainage collocation was needed.

Conclusion: The safety and efficacy standards for the patients benefit make necessary the gradual introduction of surgical techniques, specially SILS, for the progressive increase in complexity of procedures which also depends on the surgical team experience

P104 - Different Endoscopic Approaches

Comparison of Single Port and Three Port Laparoscopic Splenectomy in Patients with Immune Thrombocytopenic Purpura: Clinical Comparative Study

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Aim: Single-port laparoscopic surgery (SILS) has become increasingly popular during the last decades. This prospective study was undertaken to evaluate the feasibility of single-port laparoscopic splenectomy compared with conventional multiport laparoscopic splenectomy.

Methods: Between February 2, 2009 and August 29, 2011, a total of 40 patients with the diagnosis of immune thrombocytopenic purpura were included to study. Patients were alienated into two groups according to the procedure type including SILS and conventional multiport splenectomy.

Results: There were 19 patients in group 1, and 21 in group 2. Operative time was significantly shorter in group 1 versus group 2 (112.4 ± 13.56 vs 71.2 ± 18.1 min, respectively, $p < 0.05$). One patient in group 1 had converted to laparotomy due to per-operative bleeding. Postoperative pain analyses (VAS Score) revealed superiority of SILS in the early post-operative days ($p < 0.05$)

Conclusion: SILS splenectomy is a safe and effective alternative to standard laparoscopic splenectomy.

P105 - Different Endoscopic Approaches

Evaluation of Clinical Results of Single-Incision Laparoscopic Surgeries in General Surgery

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Aim: The single-incision laparoscopic surgery (SILS) is a less invasive alternative to conventional laparoscopic surgery. This technique provides decreased incisional morbidity and better cosmetic outcomes. Herein we would like to present our results of the patients who underwent single incision laparoscopic surgery (SILS) and show its feasibility.

Methods: Between 1 January 2009 and 30 December 2012, data of the 141 patients who were operated through SILS were collected prospectively and evaluated retrospectively. There were 63 males and 78 females with an average age of 43 (18–62) years. Sixty-seven cholecystectomies, 22 splenectomies, 17 hernia repairs, 11 appendectomies, 8 colonic resection, 5 distal pancreateosplenectomy, 3 liver resection, 3 subtotal gastrectomies, 3 adrenalectomy, 2 funduplications were carried out. SILS was carried out successfully in 140 patients. Only in one patient who has diagnosed as ITP, conversion was required owing to bleeding.

Results: All procedures were carried out through a 2 cm umbilical incision. In some cases incision was enlarged up to 5 cm to extract the specimen through incision. There was only one conversion to open surgery owing to bleeding in an ITP patient. In 6 patients high levels of drain amylase and in 1 patient bile fistula was occurred. They were treated conservatively. In late postoperative follow up 3 port site hernias occurred in a gastrectomy patient, an appendectomy patient and a cholecystectomy patient. There was no mortality.

Conclusions: Even though SILS have better results in cosmesis and postoperative pain; to adopt the exact clinical results and safe feasibility of this procedure, multi-institutional randomised controlled trials with large series are needed

P106 - Different Endoscopic Approaches

Refractory Chronic Fistula After Sleeve Gastrectomy Successfully Closed with Multiple Endoscopic Devices

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Introduction: Post-operative fistulas are conservatively managed at endoscopy with covered self expandable metal stents or standard endoclips.

Aims and Methods: The present case-report concerns the successful endoscopic closure of a refractory gastro-cutaneous fistula secondary to a sleeve gastrectomy through the use of multiple devices and materials.

A nitinol over-the-scope (OTSC) clip with traumatic teeth loaded on a transparent cap mounted onto the endoscope tip. A fully covered retrievable self-expandable metal stent (SEMS) with a 24 mm diameter and a length of 23 cm, with an unique design to prevent stent migration. Two acellular collagen membranes from bovine pericardium: size 12×8 cm and 8×6 cm.

Results: A 26-year old woman underwent a laparoscopic sleeve gastrectomy for morbid obesity. A gastro-cutaneous fistula developed 5 days post operatively. CT showed a fistula at the esophago-gastric junction and an abdominal abscess. Patient was asymptomatic. Gastroscopy performed 3 weeks later demonstrated a large 15 mm dehiscence of the surgical staple line. A traumatic OTSC was posed to close the fistula. The orifice was partially closed due to the hardness of the margins, so a long fully covered SEMS was placed.

SEMS was removed 6 weeks later, when fistula orifice was smaller. Four ml of fibrin glue were injected for obliteration. A second OTSC was placed at the intestinal orifice to reduce the glue removal. A mild leak persisted and a third endoscopy was performed. The fistula passed through by a guidewire and then with a guided Dormia basket to grasp two collagen membrane. The fistula closed completely after this final session of treatment, and did not recur within 6 months.

Conclusion: The present case demonstrates that OTSC and SEMS placement significantly reduced the size of the fistula, which was finally occupied and healed by the placement of a biologic material that promoted cicatrization and tissue regeneration.

P107 - Different Endoscopic Approaches

Hybrid Technique of Treatment in Compound Ventral Hernias V. Anishenko, A.I. Shevela, S.A. Semenov, M.S. Razumachina Novosibirsk state medical University, NOVOSIBIRSK, Russia

At the present for the treatment of difficult ventral hernias apply the technology of IPOM, in which the mesh prosthesis is placed preperitoneally. Main advantages of IPOM includes: small trauma, physiology u unstraining technology, reducing the frequency of relapses and complications, decrease the duration of hospital treatment and period of disability. But also there are negative sides, such as increased risk of injury hollow organ in the expressed commissural process and absence tactile sensitivity. To resolve this problem in our clinic we use « hybrid » surgical treatment—the place of « helping hand ». We have the experience of performance of this technology in the following complex hernias:

- Relapsing combined hernia after the traditional straining plastic
- Abdominal hernia after acute pancreatic necrosis, several relaparotomy, purulence and eventration
- Paracolostomic hernia.
- Multichamber hernia with the transposition of the organs of the abdominal cavity.

In the first case, the hybrid technology has helped to quickly and efficiently to place the mesh prosthesis of the big sizes and incorrect configuration, at that we « helping hand » hand assist placed to paracostal mini-access to the right. In the second case, a « helping hand » put in a right iliac region and helped delicately separate cicatricial adhesions with loops of a thin and thick intestines, to perform palpatory revision of the pancreas (to exclude postnecrotic cyst) and also comprises of prosthesis (IPOM) incorrect configuration. In the third case, paracolostomic hernia with several strangulation (more than 1.2 meters of the small intestine) in past history has separated, resection of colostoma (external invagination to 40–50 cm), adhesiotomy and restore the continuity of the colon with the used of IPOM Proceed had made. In last case, the « hand of help » places in the hernial defect after appendectomy, then 3 defects after upper-mediamediatly laparotomy are separate, and after leading of prosthesis defect after appendectomy had closure and mesh prosthesis had fasten on the closed defect through 3 fivemillimetric trocars.

P108 - Different Endoscopic Approaches

The Friday Evening Case - A Laparoscopic Approach to a Rare Entity

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Aims/Background: 69-year old female patient presenting with acute anemia in upper gastrointestinal bleeding.

History: laparotomy for perforated appendicitis many years ago. Urgent endoscopy shows pedunculated large duodenal polyp, at the moment bleeding has stopped. Endoscopic polypectomy is considered as high-risk-procedure and should be performed only in election. The following day rebleeding and therefore indication to surgery after interdisciplinary discussion.

Methods: Laparoscopy, 10 mm port at umbilicus, 3 × 5 mm port in upper abdomen (as in cholecystectomy), large adhesions between abdominal wall, liver, stomach, gallbladder and duodenum, adhesiolysis to get access to duodenum. Intraoperative Gastroduodenoscopy is performed to clear anatomy and locate the peduncle of the polyp. Full mobilization of bulb and upper knee of duodenum, identification of pylorus, stay-stitches and longitudinal duodenotomy in between at the level of the bulb, exploration of the duodenal lumen, identification of the polyp's peduncle. Its body itself is hidden down in the lower knee. Luxation of it into the abdominal cavity. Polypectomy with roeder-loop and electrocautery. Extraction of specimen to histological exam. Closure of the duodenum in transversal direction by resorbable extramucosal single stitches. Omentum-flap. Drainage at Winslow's foramen. Completion of procedure as usual.

Results: No complications in the postoperative period, normal functional result. Histological finding: ulcerated lipoma, normal mucosa at the base of the peduncle. EGD follow up after 3 months: small stump visible, biopsies show normal mucosa. Patient stays well.

Conclusion: In a difficult situation laparoscopic approach is a safe alternative to risky endoscopic polypectomy.

P109 - Different Endoscopic Approaches

Minimally Invasive Surgery Using CT Guidance for Adhesional Small Bowel Obstruction - A Novel Approach T.E. Platt, A.V. Ariyathenam, M. Armstrong, G. Sanders Plymouth Hospitals NHS Trust, PLYMOUTH, United Kingdom

Introduction: Laparotomy and extensive adhesiolysis for non-resolving adhesional small bowel obstruction (ASBO) carries significant risk and morbidity along with high rates of recurrent adhesions. Through the standard midline laparotomy, however, extensive adhesiolysis is often necessary either to gain access to distant transition points or because discrete transition points may not be obvious to the naked eye. Meanwhile, the safety of laparoscopic adhesiolysis in the obstructed patient is disputed and rates of conversion to open in the presence of distended bowel are high. We propose an alternative minimally invasive operative technique with Computer Tomography (CT) guidance.

Technique: This technique utilises pre-operative CT to identify the presence of a definitive single transition point. Localised mini-laparotomy to gain access to the transition point is undertaken with selective division of only the obstructing adhesions. Other, "non-pathological" adhesions are not divided. From 9 patients acutely admitted under a single surgeon and requiring surgical intervention for ASBO over a 2 year period, 3 were identified by CT imaging as suitable for this technique. 2 patients had small transverse incisions away from the previous scar site and 1 underwent a limited midline incision over a small part of the previous scar. Recovery was uneventful and all patients were fit for discharge at post-operative Day 4. At 6-month follow-up all patients were well with no further adhesion related presentations.

Discussion: Due the complications and recurrence rates associated with open extensive adhesiolysis, some authors have argued for selective division of only pathological or access-limiting adhesions. Such an intention would advocate a small, localised approach. While limited adhesiolysis has been described during laparoscopic surgery, this is the first report to present highly selective adhesiolysis through a minimally invasive open approach. This technique of pre-operative CT followed by focused mini-laparotomy is safe and beneficial in selected patients and may be preferential to laparoscopy in those with significant abdominal distension.

P110 - Education

Antibiotic Prescribing on the Surgical Wards for Patients Undergoing Laparoscopic Surgery: Room for Improvement

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Aims: Antibiotic administration is routine clinical practice in management of patients undergoing laparoscopic surgery. The standardised drug charts have improved the antibiotic prescribing practice on the surgical wards. Despite the established protocols and procedures mistakes are made and recommendation are overlooked. Our aim was to audit the clinical practice of prescribing antibiotics and re-audit to improve the outcome following the feedback.

Methods: In the first phase 50 patients undergoing laparoscopic surgery (elective and emergency) were reviewed for antibiotic prescription on the surgical floor using the standard proforma. The results were reviewed and the feedback was provided to all the junior doctors involved in the management of the surgical patients. A re-auditing was performed on the surgical wards and the compliance to the local guidelines and protocols was recorded.

Results: In the initial phase 50 patients (23 elective, 27 emergency) were reviewed. 7 (14 %) had no documentation of patient allergy status. For 19 (38 %) patients no explanation was provided for the duration of the course of antibiotics. The details of the prescriber for their identification were not legible in 26 (52 %) cases. The feedback was provided at the departmental level and recommendations were made. Re-auditing was performed in 100 patients (39 elective, 61 emergency). 96 % compliance was observed at this stage.

Conclusions: The feedback helps to improve compliance. Re-auditing helps to assess the actual and meaningful difference achieved. The involvement and training of the medical staff can improve outcome in the management of the surgical patients.

P111 - Education

Robotic Surgery Training in a Virtual Reality Setting

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Over the last two decades advances in surgery (laparoscopic, robotic surgery) created new and more complex procedures with significantly steeper learning curve. This created a need for a new theory in surgical training outside of the traditional “see one, do one, teach one”. The new theory brought the surgical trainee outside the surgical theatre and into computer and virtual reality environment. The purpose of this study is to explore this new and rapidly developing training environment and the precautions this bears to surgical training.

P112 - Education

A Way to be a Operator of Laparoscopic Colorectal Surgery for a Surgical Resident in a Low Volume Hospital

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Introduction: Laparoscopic colorectal surgery (LCS) has been widely accepted in Japan, mainly because of its decreased post-operative pain and improved cosmetic results. This trend is also true not only in high volume hospitals but also in rural low volume hospitals including our hospital. On this basis, it is no exaggeration to say that surgical residents under PGY-5 have to acquire techniques for LCS. However, there are problems in low volume hospitals when learning LCS. For example, we have only 40 cases of LCS in a year, and there are no specialists of LCS. These are because we are trying to devise a better way to learn LCS

Methods: Learning how to deal laparoscopic devices such as electrocautery and ultrasonic scalpel from laparoscopic basic surgeries such as laparoscopic appendectomy, cholecystectomy and hernia repair. Taking part in animal lab training and hands-on seminars with surgical team to learn procedures of LCS. Reflecting all cases of laparoscopic surgeries by shearing operation videos.

Results: PGY2-3 surgical residents in our hospital can perform LCS after the training. Learning curve is improving as residents gain more experience of LCS.

Conclusions: It is very important for surgical residents to learn basic laparoscopic techniques sufficiently, to take part in animal lab training and hands-on seminars, and to share every laparoscopic operation before performing LCS. We believe that a surgical resident in low volume hospitals can be a good operator of LCS by a right way of practice.

P113 - Emergency Surgery

The Use of Ultrasound Scanning and Videolaparoscopic Appendectomy in Patients with Appendicular Abscess

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Aim: Improvement of the results of surgical treatment of the patients with severe acute appendicitis

Materials and Methods: During the period from 2011 to 2012 were treated 668 patients with acute appendicitis. In this number of cases appendiceal abscess with dense pyogenic capsule was detected in 21 (3.1 %) patients. Approach for the management of patients with localised forms of appendicular peritonitis was determined by the results of clinical and instrumental studies. The basic method of investigation was an ultrasound of the abdomen. Signs of appendiceal abscess with dense pyogenic capsule revealed by ultrasound were contraindications to videolaparoscopy and required open, usually extraperitoneal drainage. In the last two years, as an alternative to the open method, we performed percutaneous puncture of abscess with local anesthesia under ultrasound control. Drainage catheter was removed after controlling with ultrasound examination at 10–14 day. This technique was used in 8 patients.

Results: There were no morbidity after percutaneous drainage. For patients, this procedure is virtually painless, requires no traumatic dressings, reduces the duration of hospitalization, and has undoubted cosmetic effect. Delayed laparoscopic appendectomy (after 3 months) was undertaken in 13 people, including 6 patients after transcatheter puncture under ultrasound control. The other 8 cases were treated by open appendectomy. During laparoscopic dissection of the appendix in patients with previously transcatheter puncture under ultrasound control there were loose membranous adhesions, easily shared by the tip of aspirator-irrigator or dissector, which facilitated the mobilisation of the appendix from the surrounding tissues. There were no morbidity after laparoscopic appendectomy. After open surgery were observed severe scar-adhesions in this area. The use of traditional appendectomy after opening appendiceal abscess had no advantages compared with laparoscopy, duration of operation was similar. In 2 cases there purulent complications in surgical wounds.

Conclusion: The use of ultrasound for diagnosis and treatment of appendicular abscess, followed by delayed laparoscopic appendectomy is feasible and safe method of treatment. This technique is preferred in patients with localised forms of appendicular peritonitis and dense capsula.

P114 - Emergency Surgery

Comparison of the Surgical Outcomes of Laparoscopic and Open Surgery for Colon Perforation Following Colonoscopy

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Aims: Colonoscopy is a safe and commonly used method for the screening of colon cancer, but sometimes major complications, such as, colonic perforation or hemorrhage occur during the procedure. The aim of this study was to compare the surgical outcomes of laparoscopic and open surgery for colon perforation after colonoscopy.

Methods: A retrospective review of patient records was performed on 25 patients with iatrogenic colon perforation during colonoscopy during the 7-year period from January 2005 to June 2012. Demographic data, operative procedures, operation times, postoperative complications, hospital course, and morbidities. In the laparoscopic group (LG) and open group (OG) were compared.

Results: Seventeen of the 25 patients underwent laparoscopic surgery (68 %) and 8 patients open surgery (32 %). Time to surgery after diagnosis was 11.4 min in the LG and 169.4 min in the OG. The sigmoid colon was affected in 11 patients (64.7 %) in the LG and in 4 patients (50 %) in the OG. Mean perforation site lengths were 2.0 and 1.6 cm in the in the LG and the OG, respectively. The most common surgical methods in the two groups were primary repair and Hartmann's operation, respectively: 14 patients (82 %) in the LG underwent primary repair and 3 patients (38 %) in OG underwent Hartmann's operation. Average operation time was 161.2 min in the LG and 190 min in the OG. Average time to first flatus was 2.9 days in the LG and 4.5 days in the OG, and average times to first meals were 4.5 and 5 days, respectively. Mean hospital stays were 10.8 days in the LG and 17 days in the OG. After surgery, complications occurred in two patients in the LG, but no complication occurred in the OG. Before surgical treatment, endoscopic treatment was attempted in one in the LG and two in the OG after perforation.

Conclusion : Laparoscopic surgery for colonic perforation during colonoscopy is comparable to conventional open surgery in terms of its safety and effectiveness. However, a further large-scale, prospective, randomized trial is necessary to better define the benefits of laparoscopic surgery.

P115 - Emergency Surgery

New Laparoscopic Procedure for Fundal Variceal Bleeding

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Background: The most common hemorrhagic complication of liver cirrhosis is esophageal variceal bleeding, which can be controlled with endoscopic sclerotherapy or band ligation. Endoscopic control of gastric variceal bleeding often fails, resulting in massive hemorrhage with a high mortality rate.

Aim: The study was to propose new laparoscopic procedure to control gastric variceal bleeding.

Methods: From 2007 to 2012 a series of 532 patients were treated for variceal bleeding secondary to liver cirrhosis. Among them, 26 patients (4.9 %) were treated for massive bleeding from gastric varices. 10 of these patients had gastric varices mainly in the cardia and the lesser curvature with esophageal varices (gastroesophageal varices type 1). The remaining 16 patients with fundal varices were included in this study. There were 12 male and 4 female patients with the mean age of 49.8 ± 8.6 years (33–68 years). 4 patients were admitted with their first hemorrhage, the remaining 12 patients had a history of previous hemorrhage (from 2 to 5 episodes). 5 patients underwent emergency surgery, 11 patients had elective surgery. To perform the operation, we used 4–5 trocars. Wide devascularization of great curvature was done. Periesophageal vessels were also devascularized. In addition, the left gastric vein and artery were clipped. Resection of fundus was done 60 mm linear stapler. To control full excision of fundal varices, intraoperative endoscopy was used.

Results: Mean operative time of the was 94 ± 12 min. Mean blood loss was 260 ± 70 ml. There were one death due to leakage from staple line, sepsis and hepatic failure. Conversion to open procedure was present in one case due to massive bleeding from large varices in cardiac part of stomach. Mean follow-up of the patients was 18.6 months (range, 6–32). During follow-up, there was 1 recurrent bleeding from gastric varices, and 1 case of hemorrhage from esophageal varices.

Conclusion: Laparoscopic periesophageal devascularization and fundectomy offers an alternative operative method for cirrhotic patients with variceal hemorrhage from the gastric fundus.

P116 - Emergency Surgery

Laparoscopic Approach to Small Bowel Obstruction; For Establishment Extensively Indications for Laparoscopy

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Aims: Although laparoscopic treatment of small bowel obstruction (SBO) may be associated with early recovery and quicker return to bowel function, it has been proposed in extremely selected patients. We evaluate an experience and tries to establish extensively indications for laparoscopy.

Methods: The records of 28 patients with SBO in Obama Municipal Hospital between 1 October 2008 and 30 September 2011 were retrospectively reviewed. Histories of previous surgery, obstruction causes, operation time, and postoperative complications were retrospectively analyzed.

Results: Treatments for SBO were implemented completely by laparoscopy in 12 patients. Conversion to laparotomy was required in 7 patients. The causes of obstruction were adhesion (group A: 7 cases) and bands (group B: 5 cases). On the other hand, 16 patients underwent a direct open approach. The causes of obstruction were adhesion (group C: 5 cases), bands (group D: 6 cases) and bowel volvulus (group E: 5 cases). Bowel resection were performed in 2 cases of group C, 2 cases of group D and 1 case of group E. Interestingly, all patients with a history of laparoscopic surgery had no bowel adhesions. The average operating time (minutes) was 217.9 in group A, 87.4 in group B, 115.0 in group C, 78.5 in group D and 107.6 in group E, respectively. The median duration (days) of postoperative ileus was 2.71 in group A, 2.00 in group B, 7.00 in group C, 4.67 in group D and 7.25 in group E, respectively.

Conclusions: Laparoscopic surgery for SBO was the best treatment for patients who underwent laparoscopic operation and who suffer from obstruction by bands. However, it was impossible to get firm grasp on the degree of adhesions and ischemia. Accordingly, laparoscopy should, first of all, be performed to assess the intra-abdomen as a diagnostic laparoscopy. Once we verify no widespread adhesions and no bowel gangrene, we can safely perform by laparoscopy. Our results will hopefully provide important clues leading to extend farther indication of laparoscopic treatment for SBO.

P117 - Emergency Surgery

Laparoscopic Appendectomy in Patients Over 65 Years Old: Clinical and Surgical Characteristics

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Aims: Studies on laparoscopic appendectomy exclusively among the elderly population are scarce. The aim of this study was to evaluate the clinical, pathological and surgical characteristics of patients over 65 years old with acute appendicitis.

Methods: This was a prospective observational study (January 2010–December 2011). Patients ≥ 65 years old with suspected diagnosis of acute appendicitis were enrolled. Demographic, clinical, surgical and postoperative characteristics were evaluated under a univariate analysis comparing the elderly (65–79-year-old) with the super-elderly (≥ 80 -year-old) patients.

Results: A total of 512 patients were diagnosed with acute appendicitis in our emergency department. 51 patients (10 %) were evaluated: 35 (69 %) belonged to the elderly and 16 (31 %) to the super-elderly group. Super-elderly patients had higher rates of peripheral vascular disease (25 vs 6 %, $p = 0.047$), dementia (19 vs 3 %, $p = 0.049$), chronic lung disease (25 vs 6 %, $p = 0.047$), and a higher median Charlson comorbidity index (3 vs 5.5, $p < 0.001$). Atypical presentation was evidenced in 85 % of the patients, and abdominal ultrasound and/or computed tomography were employed in the 81 %. The laparoscopic approach was completed in 97 % (34/35) and in 94 % (15/16) of the elderly and super-elderly group respectively, without conversion to open surgery. Although there were no differences in the means of time for the total surgical delay, super-elderly patients had higher rates of perforation (81 vs 42 %, $p = 0.022$) and peritonitis (88 vs 60 %, $p = 0.045$). Postoperative complications were present in 23 % (8/35) and 44 % (7/16) of the patients for each group ($p = 0.19$), being the 65 % of them grade I. Two patients died in the postoperative period because of medical complications, both patients presented perforated appendicitis, peritonitis and severe septic shock, and underwent emergent exploratory laparotomy. Medians for hospital stay were 3 and 5.5 days for the elderly and super-elderly group, respectively ($p = 0.06$). The same differences were found in the subgroup analysis of patients with perforated appendicitis.

Conclusion: Laparoscopic appendectomy could have a positive impact on the number and grade of postoperative complications, shorting the hospital stay of complex elderly patients with evolved acute appendicitis, and importantly preventing through the potential lost of individual performance in this special group of patients. These results should be confirmed by randomized and prospective population based studies.

P118 - Emergency Surgery

Total Extraperitoneal (TEP) Hernioplasty with Intestinal Resection Assisted by Laparoscopy of a Strangulated Richter Femoral Hernia

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Aims: Richter femoral hernia defined as an entrapment of only part of the circumference of the bowel in the hernia orifice, is a rare clinical condition with the highest strangulation and mortality rates. Due to the physiopathologic characteristics, clinical and radiological diagnosis would be difficult to perform prior its complication, highlighting the importance of surgical treatment. Laparoscopic approaches as the transabdominal preperitoneal (TAPP) and the total extraperitoneal (TEP) are safe and feasible for the non-complicated and incarcerated femoral hernias. Controversies remains about the best surgical approach. We describe the first clinical case of a TEP hernioplasty combined with intestinal resection assisted by laparoscopy for a strangulated Richter femoral hernia.

Methods: The patient was a 94-year-old woman admitted to the emergency room with sings and symptoms of acute small bowel obstruction without systemic inflammatory response. Diagnosis of a strangulated left Richter femoral hernia was only possible during the initial exploratory laparoscopy. The remaining small bowel was normal and no other ipsi- or contra-lateral hernias were observed. We elected to perform an extraperitoneal approach for the mesh positioning, gaining access through the infraumbilical 12-mm trocar incision, and generating the preperitoneal space by standard dissection. With assistance of two 5-mm laparoscopic ports at hypogastrum and right flank, the TEP hernioplasty was achieved without incidents. Laparoscopy was resumed and non-viability of the affected bowel was confirmed. Segmental intestinal resection with end-to-end manual anastomosis through the infraumbilical incision extended to 3 cm was performed with previous protective bag insertion and confirmation of correct mesh position. No intraoperative complications were present.

Results: Pathology evaluation demonstrated transmural ischemic necrosis with severe acute congestion and resection borders without ischemic changes. The patient recovered without immediate complications, with correct tolerance to the oral intake. She was discharged home at the 4th postoperative day. No wound complications were present.

Conclusion: TEP approach for the acute hernioplasty completed with segmental bowel resection with laparoscopic assistance was successful in our particular case; suggesting its use for emergency hernia repair. However, factors as laparoscopic surgical experience, careful patient selection and correct preoperative diagnosis, must be considered before clinical studies in the emergency setting.

P119 - Emergency Surgery

Meckel's Diverticulum Mimicking Umbilical Hernia

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Introduction: Meckel's diverticulum is the most common congenital anomaly in gastro intestinal tract. We present a rare event of umbilical hernia containing a strangulated Meckel's diverticulum

Case Report: 59 years old lady presented to A&E with umbilical pain and tenderness with raised inflammatory markers. CT scan done which revealed a small umbilical hernia with small bowel and inflammatory changes features consistent with strangulated umbilical hernia. During open surgery patient was found to have a small umbilical hernia containing a gangrenous Meckel's Diverticulum which was resected. Post-operatively patient had uneventful recovery and was discharged home within 4 days

Conclusion: Meckel's diverticulum is a congenital diverticulum present in 2 % of the population. It is the most common outcome of a wide range of Omphalomesenteric (Vitalline) Duct malformations which include umbilical cyst, umbilical sinus, ileo-umbilical fistula, fibrous cord connecting ileum to umbilicus and umbilical hernia. Differentiation between these entities preoperatively can be challenging even with the help of imaging especially in acute cases.

P120 - Emergency Surgery

Are Additional Perioperative Considerations Needed in Emergency Laparoscopy in In Vitro Fertilization Pregnancy

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In vitro fertilization and embryo transfer (IVF-ET) is prone to some serious obstetric and gynecologic complications during pregnancy, especially heterotopic pregnancy and injury of adjacent pelvic organs. On the other hand, acute surgical conditions in normal pregnancy increase maternal and fetal morbidity and mortality. Due to the rare occurrence of surgical acute abdomen in IVF-ET pregnant patients there are no recommendations and guidelines for such situations. Current guidelines do not recommend prophylactic tocolysis in pregnant population with acute abdomen but there is no mention of the IVF-ET subpopulation of patients which is prone to obstetric complications such as abortion and preterm delivery. Also, there are no guidelines for thromboprophylaxis in such patients with increased risk of thromboembolic accidents due to hormonal changes caused by hormonal load during the IVF process. We present several topic for further discussion and possible consensus for recommendations of IVF-ET pregnant patients with acute abdomen treated by laparoscopy.

P121 - Emergency Surgery

Laparoscopic Management of Acute Abdomen in Colorectal Surgery - Case Reports

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Introduction: According to literature about 15 % of left-sided colorectal cancer patients present as acute abdomen - in 15 % as inflammation (peritonitis, abscess), in 85 % as bowel obstruction. The aim of the surgical treatment is to remove the focus of inflammation or the tumour and purify the abdominal cavity. Some of the procedures can be performed laparoscopically. It always depends on the state of pathological finding, on patient's condition and on the experience of the surgical team. In our case reports we demonstrate possibilities of minimally invasive approach towards colorectal cancer patients with bowel perforation and peritonitis.

Conclusion: In our case reports we demonstrate advantages of laparoscopic approach to acute abdomen in colorectal surgery. Our results correspond with studies of Czech and also foreign authors. Oncological outcome of laparoscopy is comparable to open surgery even in emergency situations such as acute abdomen. To perform laparoscopic procedure a surgical team experienced in colorectal surgery reachable 24 h a day is essential. Minimally invasive laparoscopic approach minimizes postoperative morbidity and is associated with shorten hospitalization time and with decreased pain.

P122 - Emergency Surgery

Two Success Cases Undergoing Emergent Laparoscopic Surgery for Trauma and Multiple Small Bowel Intussusceptions

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It is sometimes difficult to undergo emergent surgery for the patients who visited to ER for acute abdomen. We experienced two success cases undergoing emergent laparoscopic surgery for trauma and multiple small bowel intussusceptions. A 45-year-old female visited to ER due to blunt abdominal trauma when playing with her 15-year-old son. Abdominal findings showed acute abdomen and abdominal pain was uncontrollable by herself. No abnormal findings were identified by blood test and abdominal X-ray, however, abdominal free air and peritoneal fluid collection around Treitz ligament were observed by CT. Small bowel injury was suspected and emergent laparoscopic surgery was done 8 h after onset. It revealed a jejunum perforation and fluid collection locating close to Treitz ligament, and primary closure was done by laparoscopically. Patient recovered uneventfully and discharged 10 days after surgery. A 21-year-old female who was diagnosed and being treated for myelodysplastic syndrome (MDS) visited to ER due to repeated abdominal pain and vomiting. The abdomen was almost soft and no palpated mass except diffused tenderness. The bowel sound was slightly hyperactive and blood test showed slight leukocytosis and severe anemia due to MDS. CT demonstrated multiple portions of remarkable swelling of the intestinal wall with target signs. Under the impression of widely spread small bowel intussusceptions, emergent surgery was done. Laparoscopic findings revealed jejunojejunal and ileoileal intussusceptions over 1 meter in length each. Surprisingly, both intussusceptions were occurred from both side of the small bowel, which meant even anal side of the intestine were invaginated to oral side at each portions. Invaginated intestine was safely and totally reduced by laparoscopically, and multiple small bowel tumors were observed. After placing small skin incision, partial resections of small bowel were done including 8 tumors. Pathological findings revealed granulocytic sarcoma. Patient recovered uneventfully and discharged 11 days after surgery. Laparoscopic intervention is valuable and is widely used in the diagnosis and management of abdominal emergencies. However, emergency operations have been associated with a significantly high likelihood of morbidity and mortality. Careful judgment should be required to decide the surgical indications by emergent laparoscopic operation for acute abdomen.

P123 - Emergency Surgery

Laparoscopic Management of an Unusual Internal Herniation of Small Bowel

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Introduction: Internal herniation is an unusual presentation of intestinal obstruction. Some herniations causing apertures has been described. Herein we describe a very unusual internal herniation formed between greater omentum and jejunal meso.

Case Report: A 73 year old male patient was admitted to emergency department with complain of right upper quadrant abdominal pain and intermittent nausea and vomiting. His medical and surgical history included unregulated diabetes mellitus and no previous surgery nor abdominal trauma. On physical examination he had normal blood pressure, pulse rate and body temperature. His abdomens had hypoactive bowel sounds and diffuse abdominal tenderness with rebound. Laboratory examinations showed an elevated white blood cell count (18,000/mm³) and plain radiography showed dilated small bowel loops with air-fluid levels. Meanwhile the patient underwent an emergency contrast-enhanced abdominal computerized tomography (CT) scan. CT demonstrated a distended closed loop at the right upper quadrant. According to these findings a diagnostic laparoscopy was performed. Laparoscopy showed a strangulated approximately 20 cm bowel segment (jejunum) between a tunnel created by great omentum and jejunal meso. The tunnel formation which caused strangulation of intestinal segment has been destructed by endo grasper. The jejunal strangulated segment was washed with hot saline and observed. The color of the intestine has changed normal and bowel movement at this segment was minimal so it was decided not to resect the bowel segment but have a second look the day after. After the second look there was no abnormality. The patient was discharged on the 5th post operative day.

Conclusion: Although internal herniation is a rare reason of intestinal obstruction, the main problem of these patients is poor clinical management and delay in diagnose. Recently CT has gained a key role in diagnose of internal herniations but in some cases it is almost impossible to have the correct diagnose. Diagnostic laparoscopy gains importance in such cases and prevent delay of diagnose.

P124 - Emergency Surgery

ENDOVIDEOSURGICAL TECHNOLOGY IN THE TREATMENT OF ACUTE APPENDICITIS

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From 2008 to 2012, in surgical department of Central Clinical Hospital of Velikiy Novgorod was treated 1766 patients with acute appendicitis and in 818 cases appendectomy was performed using laparoscopic method. The age of patients ranged from 15 to 83 years. The duration of disease before treatment of patients in the hospital ranged from 2 h to 10 days. All operations were performed by standard methods under endotracheal anesthesia. In the group of laparoscopic appendectomy (818 people) during intraoperative revision of the abdominal cavity in 25.2 % of patients was diagnosed appendicular peritonitis, loose periappendicular infiltration was revealed in 9.8 % cases and periappendicular abscess was detected in 3.8 % patients. These complications were not considered as a reason for conversion, the final decision was made after a trial dissection process. For dissection of appendicular mesenteriolum in most cases was used monopolar coagulation. Appendiceal base was closed by ligature technique. Appendix was removed from the abdominal cavity through 10 or 20 mm trocar. Abdominal drainage was performed in the presence of periappendicular infiltrate or abscess and widespread forms of appendicular peritonitis. Retrospective analysis of the results showed that laparoscopic appendectomy was feasible intervention in 97 % of patients. The main reason for the conversion were technical difficulties of intraoperative dissection of the appendix. Wound complications were encountered only in 0.6 % of patients and intra-abdominal morbidity after laparoscopic appendectomy does not exceed 2.5 %.

P125 - Emergency Surgery

Complex Surgical Treatment of Appendicular Peritonitis: Role of Laparoscopic Technologies

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Aim: To study the effective ways of applying different laparoscopic techniques in surgical treatment of generalized peritonitis of appendicular origin.

Methods: Between V.2000 and I.2012 119 patients (m—67, f—52, age 14–83 years, mean 37.1 + 17.5) with general peritonitis of appendicular origin (perforative—74) were treated using videolaparoscopic methods. Disease duration before hospital admission ranged from 10 to 160 h, mean 76.8 + 33.4. Initially, the diagnostic laparoscopy was performed in all patients. According to its results further surgical tactic was selected. Laparoscopic appendectomy was a tactical priority. Inadvisability/infeasibility of laparoscopic appendectomy was considered an indication for traditional appendectomy through local surgical approach. Inability to perform of adequate laparoscopic peritoneal cavity sanitation due to substantial adhesive process, massive abscesses/infiltrations or significant small bowel dilatation, demanding total intestinal intubation, was midline laparotomy indication.

Results: Laparoscopic appendectomy with laparoscopic sanitation (LA + LS) was performed in 51 (42.9 %) patients, local surgical approach appendectomy with laparoscopic sanitation (TA + LS) - in 38 (31.9 %), surgery through midline laparotomy followed by laparoscopic abdominal sanations (LT)—in 30 (25.2 %). Mean operation time was 80.0; 86.6 and 104.1 min respectively. Recurrent sanitation operations performed in 92 (77.3 %) patients, from 1 up to 6 sanations per patient, mean 1.4 + 1.0. No intraoperative or general complications; 3 (2.5 %) surgical complications: LT group - early acute adhesive small bowel obstruction (1), successful laparoscopic treatment; intraabdominal abscess formation (1), successfully drained under ultrasound guide; TA + LS group—one suture line disruption without eventration (1), no complications in LS + LT group. 118 patients successfully treated, 1 death in LT group—peritonitis progression. Mean hospital stay 9.7; 13.2 and 14.9 days for LA + LS, TA + LS and LT groups respectively.

Conclusion: final selection of operative laparoscopic content in patients with generalized appendicular peritonitis is advisable to perform only after diagnostic laparoscopy. The concept of as-much-as-possible use of laparoscopic treatment decreases the number of median laparotomy cases and thus reduces lethality and complications rate, shortens hospital stay, improves life quality in this group of patients.

P126 - Emergency Surgery

Traditional and Videoendoscopic Appendectomy - Results of Performing First 1000 Laparoscopic Appendectomies

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The aim of the study is improvement of treatment results of patients with acute appendicitis by application of laparoscopic technique in diagnosis and treatment of the disease.

Methods: Performance of laparoscopic appendectomies for acute appendicitis is possible in 95.9 % of patients. Intracorporeal technique of appendectomy was used in 1,037 (94.8 %) patients, extracorporeal—in 55 (5.2 %). In 9 (0.9 %) patients appendix have not been found cause of different reasons. Conversion to the open surgery was made in 35 (3.2 %) patients. The appendix stump closure method was assigned in accordance with appendix base inflammatory changes. The patients were divided into 4 groups according to stump securing method. The appendix stump was controlled by using two or three titanic clips in 522 patients (52.1 %), two separate ligatures—in 285 patients (28.4 %), using a linear stapler in 138 (13.7 %), and immersion into the caecum cupola by a purse-string suture was performed in 57 patients (5.7 %). Operation time and complications were analyzed.

Results: Duration of laparoscopic appendectomy—(51.2 ± 7.6) min does not differ from open surgery—(47.4 ± 8.7) min ($P > 0.05$). Duration of in-hospital treatment after laparoscopic appendectomy—(2.4 ± 0.9) days is shorter than after open surgery—(5.2 ± 1.2) days. The rate of postoperative complications after laparoscopic appendectomy is lower than those after traditional open surgery -3.1 and 6.1 % accordingly ($P < 0.001$).

Conclusions: Laparoscopic appendectomy should be the initial procedure of choice for most cases of acute appendicitis.

P127 - Emergency Surgery

Appendiceal Abscess: Immediate or Delayed Laparoscopic Appendectomy?

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Background: Appendiceal abscess is a challenging situation and criteria for immediate or delayed operation vs. conservative treatment are not well established. There is a lack of evidence in literature and clinical decision rely on available resources, history and clinical findings. Imaging, interventional maneuvers and laparoscopy also impact on the choice.

Materials and Methods: Three patients (2 males, 1 female; age 27, 42, 82) with appendiceal abscesses were observed. Delay from the beginning of symptoms was 7 to 35 days. The oldest pt had significant cardiologic comorbidity. All patients had a confirmed diagnosis by US, thereafter CT for better defining abscess anatomy. Abscess caliper ranged from 8 to 4.2 cm.

Results: Conservative treatment was initially undertaken in all pts, due to delay time, anatomical situation and related risk of intraoperative complications or extended bowel resection. Percutaneous US-guided drainage was placed in 2, percutaneous aspiration done in 1. Bedside US and clinical monitoring was performed in all pts. After abscess resolution, pts were discharged and clinical and US follow-up planned. Two pts (27 and 42 year-old) underwent elective laparoscopic appendectomy 3 mo. after discharge on the basis of US findings; the oldest one was not readmitted for surgery and is well one year later. Video-clips of the sequential US evolution and of laparoscopic operations are shown.

Conclusion: No randomized studies are available and are difficult to design. Two decisions are critical: initial management and indication for eventual delayed operation. In our experience, surgeon-performed US really help in diagnosing, treating (percutaneous drainage/aspiration) and following the evolution of the abscess, which should be initially treated w/o operation whenever possible, for the high risk of surgical complications both by minimally invasive and open surgery. Interventional radiology addresses the septic foci and allows anatomical recovery. Percutaneous aspiration could be reserved to abscesses less than 5 cm, as for other sites. Surgeon-performed US follow-up allows to visually confirm the anatomical restitutio ad integrum. Delayed appendectomy, preferably laparoscopic, can be proposed on the basis of the expected risk of recurrence, based on life expectancy, residual symptoms and surgical risk for comorbidities

P128 - Emergency Surgery

Laparoscopic Hartmann's Procedure for Fecal Peritonitis Resulting from Perforation of The Left-Sided Colon

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Aims: Traditional treatment for fecal peritonitis resulting from perforation of the left-sided colon has been performed using Hartmann procedure to reduce the high mortality. However, morbidity accompanied with the abdominal incision, such as wound infection, dehiscence of abdominal fascia has been high. We describe using laparoscopic surgery with Hartmann procedure which might reduce the high morbidity.

Methods: 18 consecutive patients (the median age was 83 years) suffered from fecal peritonitis resulting from perforations from the descending colon to the rectum from various causes. The ASA score was IV or V for every patient. Patients underwent laparoscopic Hartmann procedure. Specimens were extracted through the stoma site. Irrigation of the abdominal cavity was performed, as was insertion of three drains via the port scar site.

Results: The median total surgical time was 166 min (range, 123–250). There were no intra-operative complications and no need to convert to open surgery. Survival and mortality were 16 and 2, respectively. There was no wound infection or dehiscence of abdominal fascia.

Conclusions: This laparoscopic Hartmann procedure is a promising surgical strategy.

P129 - Emergency Surgery

Laparoscopic Surgery for Gastrointestinal Emergencies

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Introduction: Laparoscopic surgery has been applied to gastrointestinal emergencies as a less invasive treatment, but problems such as appropriate indication for surgery, difficulty in setting up equipments and inadequate support of staffs remain to be settled. After a board-certified surgeon of Japan Society for Endoscopic Surgery joined in April 2011, percentage of laparoscopic colectomy has increased from 50 % to 80 %. Percentage of laparoscopic surgery for gastrointestinal emergencies has also increased. Laparoscopic surgeries for gastrointestinal emergencies in our hospital were reviewed.

Methods: One hundred fifteen laparoscopic procedures for gastrointestinal emergencies performed between January 2011 and November 2012 were retrospectively reviewed. In gastrointestinal emergencies except massive bowel ischemia and bowel obstruction without decompression, we first choose laparoscopic surgery if pneumoperitoneum is not contraindicated. Our points of view are no hesitation to add ports and to convert to open procedure and frequent use of devices developed for reduced port surgery.

Results: Fifty five males and sixty females were included. Median age of patients was 62 (9–91) years. Diagnoses included 53 appendicitis, 32 bowel obstruction (11 small bowel, 21 large bowel), 15 peritonitis, 9 perforation, 1 bleeding. Performed procedures were 49 appendectomies, 14 stoma formations, 35 bowel resections (8 small bowels, 27 large bowels (16 right side, 11 left side)). Number of reduced port surgery were 14 appendectomies, 4 stoma formations, 3 bowel resections (2 small bowel, 1 large bowel). Six cases were converted to open procedure. Postoperative complications were 15 wound infections, 5 intra-abdominal abscesses, 7 bowel obstructions. Percentage of laparoscopic surgery in gastrointestinal emergency has increased from 17 % during January to March 2011 to 56 % during April to June 2011. After July 2011, the percentage continues to keep 50–60 %.

Summary: Laparoscopic surgery for gastrointestinal emergencies has increased on the background of staff proficiency, now half of procedures for gastrointestinal emergencies are laparoscopically performed. Reduced port surgery was mainly done in appendectomy and stoma formation. Next steps are reduction of postoperative complications, introduction of reduced port surgery to other procedures than appendectomy and stoma formation and education to residents.

P130 - Emergency Surgery

Emergency Surgery for Obstructive Colon Cancer. A Personal Series

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Aim: About 10–20 % of colon cancers with ileus going to an emergency department. Operations that are performed under emergency conditions known to increase morbidity and mortality rates. This study examined interventions implemented by a single author's obstructive colon cancer.

Patients and Methods: Between from 1994 to 2012 years, 34 cases were operated on for obstructive colon cancer. Patient records were reviewed retrospectively.

Results: Twenty five obstructing tumours in the left colon and rectum, and 9 obstructing tumours were in the right colon (before splenic flexure to the right). Primary resection and anastomosis were performed on the 12 patients. Primary resection and anastomosis and protective ostomy were performed on the 13 cases. On the six cases, Hartman procedure was performed. Three patients underwent decompressive colostomy. All cancers in the right colon were performed with resection and primary anastomosis. Two perioperative mortality were seen due to pulmonary infection and cardiac pathology. Important morbidity was seen in the 7 cases. Anastomotic dehiscence was observed in 2 two cases and surgical site infections were observed in 5 cases.

Conclusion: Obstructed right colon cancer, after making hemodynamically stable after resuscitation, resection and primary anastomosis performed safely. However, the addition of obstructive left colon cancer treatment appears to be necessary protective ostomy.

P131 - Emergency Surgery

Emergency Laparoscopic Approach for Ectopic Colonic Pregnancy

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Aim: To evaluate the feasibility of emergency laparoscopic management of complicated ectopic pregnancy.

Methods: An unusual case of haemoperitoneum is reported. A 26 years old female, primiparous, no abortions was admitted for metrorrhagia and right iliac fossa pain. On clinical examination tenderness and swelling of the Douglas pouch and intangible adnexae were observed. The suspicion of ectopic pregnancy was established on dynamic elevation of β -hCG values, positive pregnancy test together with emergency transvaginal echography revealing fluid collection in the recto-uterine *cul de sac*, normal fallopian tubes and the absence of the gestational sac in the uterine cavity.

Results: Fresh blood in the peritoneal cavity, normal fallopian tubes and a 2/1.5 cm tumor on the serosa of the ascending colon were identified during laparoscopy. The surgical procedure consisted of laparoscopic tumoral excision and drainage. No colonic repair was needed. The microscopic examination confirmed ectopic pregnancy. Postoperative course was uneventful, with patient discharge at the 3rd postoperative day. During the next 2 weeks consecutive determination of β -hCG indicated normalized values (<10 mU/ml), with ultrasonography indicating no peritoneal fluid.

Conclusions: Laparoscopy is a feasible diagnostic and therapeutical tool for early abdominal pregnancy, especially in case of surgical emergency.

P132 - Emergency Surgery

Combined Endoscopic and Laparoscopic Approach as the Treatment of a Third Portion Duodenal Perforation Due to a Foreign Body

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Aim: We present the case of a 75 years old man, attended in the emergency department with acute abdominal pain, associated with fever. A CT scan was performed, and perforation of the third duodenal portion with free retroperitoneal air and inflammatory process, associated with an impacted foreign body (probable a fish bone) was diagnosed.

Method: under this diagnose we decided to perform a combined endoscopic and laparoscopic approach under general anesthesia. A foreign body in the third duodenal portion was found in the endoscopic exam, and it could be retracted into the stomach leaving a minimal duodenal perforation.

A 3 × 4 cm portion of a plastic pill blister pack was identified. Due to the risk of esophageal damage a laparoscopic 5 cm gastrotomy was made and the blister could be retrieved in a plastic bag by the 12 mm trocar. The stomach was then sutured and we proceeded for an intense laparoscopic lavage of the cavity. An aspirative drain was then placed by the perforation site, which didnot need to be sutured.

Result: Postoperative time was uneventful and the patient was discharged in the 5th postoperative day. No further complications have been described after 10 months.

Conclusion: The combined endoscopic and laparoscopic approach is feasible and safe, and could be an option for cases of duodenal foreign body perforations.

P133 - Emergency Surgery

Acute Abdomen Caused by Through and Through Small Bowel Perforation Due to Clinically Unsuspected Fish Bone: Laparoscopic Resection and Anastomosis

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Objective: We aimed to present a patient with acute abdominal pain secondary to small bowel perforation caused by fish bone penetration through the jejunal wall.

Case: A 52-year-old man presented to the emergency department with a 3-day history of abdominal pain. He had no nausea, vomiting or diarrhea. The abdominal examination revealed diffuse tenderness and muscle guarding. The plain abdominal X ray showed free subdiaphragmatic air. His laboratory results revealed an elevated white blood cell count (11,700 with 78 % neutrophils) and normal serum amylase (43 U/L). The presumptive diagnosis was peptic ulcer perforation and the patient underwent diagnostic laparoscopy. Laparoscopy showed several inflamed, edematous jejunal loops with a foreign body causing through and through perforation of the jejunum and protruding from the two opposite wall on the anti-mesenteric side. It also caused impaction and obstruction at the same level and could not be removed. Intracorporeal resection and anastomosis with a laparoscopic linear stapler, which was inserted through two small enterotomies approximately 5 cm proximal and distal to the stricture site, was performed using a 15, a 10 and a 5 mm trocar. The segment of resected bowel was removed through the 15 mm trocar site. The postoperative period was uneventful, and the patient was discharged on the fourth day.

Conclusion: Through and through perforation and obstruction of small bowel is a unique presentation of fish bone. In the current case it caused acute abdominal symptoms and free subdiaphragmatic air on the plain abdominal X ray and was managed laparoscopically.

P134 - Emergency Surgery

Laparoscopic Operations in Patients with Polytrauma and Abdominal Blunt Trauma

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Improvement of results in treatment patients with polytrauma and abdominal blunt trauma is urgent problem of surgery.

The aim of our work was decreasing the mortality of this category of patients.

Methods and Materials: We performed 538 video laparoscopic operations in patients with polytrauma and abdominal blunt trauma. In 231 cases we found the trauma of the liver complicated with bleeding. We also observed in 92 of 231 patients that massive liver rupture was accompanied with ruptures of the spleen, mesenterium and hollow organs. In these 92 cases we performed urgent laparotomies with suture ligation of bleeding points, suturing of ruptures of the liver and hollow organs, splenectomy and drainage of the abdomen cavity.

Results: We performed laparoscopic operations in 139 patients. In 39 cases we made laparoscopic electrocoagulation and in 34 cases argon-plasma coagulation of the liver ruptures. In 45 cases we performed laparoscopic suturing of bleeding points of the liver. In 43 cases we made electrocoagulation of small liver ruptures with packing of the omentum to its surface. During the operation in 23 cases we found hepatic subcapsular hematomas which were opened and sutured laparoscopically.

Mortality was in 7 cases because of severe polytrauma with multiply abdominal trauma, craniocerebral trauma and severe blood loss.

Conclusion: Laparoscopic operations in patients with polytrauma and abdominal blunt trauma decrease mortality and number of postoperative complications.

P135 - Emergency Surgery

Spontaneous Esophageal Perforation (Boerhaave's Syndrome). Laparoscopic Treatment

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Objectives: We present a case of spontaneous perforation of the esophagus with severe clinical criteria which was satisfactorily treated by laparoscopic surgery

Clinical Case: A 85-year-old male presented to our hospital with epigastralgia square and vomiting, followed by thoracic pain of 20 h of evolution. Low grade fever. Tachypnea. Hemodynamically stable, subcutaneous emphysema in neck, oligoanuria. A CT scan showed subcutaneous emphysema, pneumomediastinum, hydropneumothorax with a free contrast study leak from right poster lateral wall of the lower third of esophagus into the pleural space. Emergency bilateral intercostal drainage insertion was done and laparoscopic intervention was performed. The esophageal hiatus is opened leaving purulent and hematic material from thorax. Liberation and traction of the esophagus is made showing a full tear of about 3 centimeters on the posterior right wall of the distal esophagus. Suture with six extracorporeal points and check the tightness are made. Washing and aspiration of the mediastinum is done and, previous section of the short vessels and liberated the gastric fundus, is practiced a covering of the esophageal suture with a gastric patch by way of posterior hemifunduplicatura type Toupet and two drains are placed in the mediastinum.

Results: After 24 h he is extubated with good clinical and analytical evolution within 72 h. Control TC on the 6th postoperative day reveals a spill residual bilateral pleural and absence of leakage of contrast. gastroscopy on the 7th postoperative day is done showing esophageal scab with watertight suture and duodenal ulcer. oral feeding was initiated and pleural drains were controlled until the patient was discharged on the 18th postoperative day. He was asymptomatic a month after intervention with normal diet and normal Rx thorax. Gastroscopy in 3 months shows a residual esophagitis with a non pathological barium transit.

Conclusions: Spontaneous esophageal perforation has a high morbidity and mortality, especially in the present cases as the presented (elderly patient, septic shock and not early diagnosis). However, the laparoscopic approach minimizes surgical trauma and allows the ideal treatment for perforation (suture and gastric patch) without added morbidity compared to other techniques.

P136 - Emergency Surgery

Efficacy of the Laparoscopic Approach to Intestinal Invagination with Adults

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Goals: The intestinal invagination is not usual with adults, it represents only the 1 % of all the reasons of intestinal obstruction and in most cases it presents a tumor lesion in its head.

The preoperative diagnosis is difficult although diagnostic imaging tests are used and in many cases it is done during an urgent surgery by means of occlusion, hemorrhage or perforation.

Material and Methodology: It is presented the case of a 49 years old woman, who arrives at Emergency with predominantly epigastric abdominal pain together with intestinal closing. During the initial study a CT scan is performed and it shows an occlusive profile. An urgent exploring laparoscopy is prescribed. A jejunum-ileal invagination is demonstrated and a disinvagination is performed. The patient was discharged in 7 days.

During next months, the patient feels more or less intense colic abdominal pain. Nine months after the intervention, the patient comes again to Emergency presenting an obstruction intestinal profile. The radiology tests show another intestinal invagination that requires a new urgent surgery. It is performed a new exploring laparoscopic and disinvagination of 30 cm loop resection since it is found a subserosal tumor responsible for the symptoms, with jejunumileal laterolateral anastomosis

Results: The patient made satisfactory progress and was discharged 8 days after the surgery. The final result was a fibroid polyp with abundant inflammatory component of lymphocyte predominance and presence of mesotelial cells without atypias.

Conclusion: Although the advantages of laparoscopy are evident in urgent surgery as well as in elective surgery, in the presented case, laparoscopy didn't prove more efficacy than laparotomy, since the presence of an intestinal tumor responsible for the symptoms cannot be demonstrated on palpation.

In many occasions, the diagnosis of these symptoms is intra-surgery, so all the possible tests must be reinforced until identifying the etiology of the profile, which can be limited by laparoscopy.

It's important to remember that between 70 and 90 % of the intestinal invagination cases of adults are caused by a neoplastic lesion. Therefore, either the approach is done by laparoscopy or laparotomy, it has to be always identified the cause that provoke it.

P137 - Emergency Surgery

New Technique of the Single-Port Perforated Duodenal Ulcer Repair

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Background: Improvement of surgical methods of treatment of a perforated duodenal and gastric ulcer remains an actual problem. Use of SILS at perforated duodenal ulcers isn't widespread.

Patients and Methods: Between August 2012 and December 2012 four patients with perforated duodenal ulcers were operated by new SILS technique. All patients were men, age from 22 till 31 year, BMI from 21.2 to 24.3 kg/m². Perforation duration before operation was made from 3.5 to 8 (4.8 ± 1.3) h. Through incision of the muscle in right hypochondrium the reusable SILS system of X-Cone (Karl Storz) is inserted. After imposing a carboxi-peritoneum, the videolaparoscopy with use of the extended 5 mm Karl Storz laparoscopy is carried out, the perforation is visualized. By the 5 mm aspirator and curved atraumatic grasper inserted through the X-Cone, with change of a tilt angle of the operating table, the lavage and clearing of the abdominal cavity is performed. If it is indicated, drainage is carried out. The silicone tube is applied to drainage depending on expressiveness and prevalence of peritonitis and is established through additional port. Than the X-Cone system is taken from a wound and perforation repair is led with use of one or two layers absorbable suture via the same access on classic fashion. Access wound layer-by-layer close in.

Results: At all patients the perforations was localized on an anterior duodenal wall. The stage of an abdominal cavity clearing at all patients is executed through X-Cone system, without using additional trocars. Additional 5-mm trocar inserting in the right hypochondrium was required at 3 patients and is executed for the purpose of drainage of subhepatic space. Operation time was 32–70 min. There was no intraoperative and postoperative complications need to extend an approach. The level of postoperative pain was 1 POD- 2.8, 2 POD- 2.0, 3 POD- 1.4 points. Postoperative hospital stay were 5–9 (7.2 ± 1.7) days.

Conclusion: Our video assisted one-port perforated ulcer repair technique is safe, feasible and rather easy to perform even by beginner surgeons, because it doesn't demand intracorporeal suturing ability.

P138 - Emergency Surgery

Initial Experience of SILS-Cholecystectomy for Acute Cholecystitis

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Background: Acute cholecystitis is considered by the majority of experts as contraindication for SILS-cholecystectomy. Indications and expediency of use of SILS technique for acute cholecystitis aren't defined.

Material and Methods: Between February 2012 and December 2012 the SILS-cholecystectomy was performed in 18 patients with acute cholecystitis by X-CONE (Karl Storz). The assessment of expressiveness of a postoperative pain syndrome was carried out on a 10-ball numerical rating scale by the patient independently 4 times per day for 72 h. For 4-5 days after operation at all patients ultrasonic control of subhepatic space was carried out. The cosmetic result was estimated by the patient on the 5th ball scale for the 10th days.

Results: Urgent SILS-cholecystectomy was executed at 17 of 18 patients, delayed—at one. There were 17 (94 %) women and 1 men. Mean age was 42.6 ± 15.3 years (19–80 years). Mean BMI was 28.5 ± 4.9 (20.1–39.2). Disease duration before operation was 16–171 (54.5 ± 38.9) h. Flegmonous cholecystitis is revealed at 17 (94 %) patients, gangrenous—at 1 (6 %), paravesical infiltrate—at 5 (27 %), the local not delimited peritonitis—1. Pure SILS cholecystectomy without additional trocars or drainage was performed at 7 (38 %) patients, with one additional trocar 10 (55 %), with two—one. Intraoperative complications was noted at 6 (33 %) patients: perforation of gallbladder wall—5, bleeding from a cystical artery—1. Conversion to a standard laparoscopic technique was performed in 1 case due to cystical artery bleeding. Main operative time was 40–150 (79.8 ± 25.9) min. Length of a wound of umbilical access was made 24.9 ± 8.2 mm. Drainage of subhepatic space was required at 11 (61 %) patients. The pain syndrome was made in the first days 3.8 ± 1.9 points, 2.6 ± 1.5 on the second and 1.9 ± 1.3 for the third days. Duration of anesthesia did not exceed 3 days. There was no postoperative complications. Postoperative stay was 3–9 (5.8 ± 1.8) days.

Conclusion: We consider that use of SILS for acute cholecystitis is feasible, safe and isn't contraindicated.

P139 - Emergency Surgery

Amyand's Hernia

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Introduction: The presence of the appendix in an inguinal hernia sac referred to as Amyand's hernia. This is an extremely rare condition and often misdiagnosed. Very few cases have been reported in the literature.

The incidence of having a normal appendix within the hernia sac varies from 0.5 to 1 %, whereas only 0.1 % of all cases of appendicitis present in an inguinal hernia. The mortality rate is estimated between 14–30 %, and almost all cases occurs in the right side.

Case Report: We report a case of 48 years old man presented to us with painful irreducible right inguinal hernia associated with abdominal pain and vomiting.

His Investigation: HB: 17, WBCS: 14.4, CRP: 55.3. CXR&PFA were normal.

He had exploration via RT inguinal incision showed hernia sac contains appendix.

Appendicectomy and hernia repair performed. Histology reported acute appendicitis and hernia sac.

He made a good recovery.

Conclusion: Amyand's hernia is extremely rare condition and often misdiagnosed.

The surgeon should be aware of this condition to be able to offer the appropriate treatment.

P140 - Emergency Surgery

Misdiagnosis of Testicular Torsion in Old Age

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Introduction:

- Testicular torsion can occur at any age.
- Even though rare, orchidopexy does not exclude re-torsion of fixed testis, regardless of age, employed operative technique and suture used.
- The diagnosis workup and management of acute testicular pain should not be different after orchidopexy regardless of age.
- We report a case of 58 year-old man with unexpected and misdiagnosed testicular torsion lead to orchidectomy.

Case Report: A 58 year old man presented with 15 h of sudden onset of left testicular pain, with no vomiting, nor urinary symptoms, nor trauma.

Background History: orchidopexy 34 years ago, Vasectomy few years after that.

O/E: both testes in scrotum, tender left testis, no hydrocoele.

Investigations: MSU:Normal, Tumor Markers:Normal, U/S non-conclusive.

Patient was treated conservatively with analgesia and antibiotics.

Few days later, he became pyrexia. Repeated U/S scan reported: ?abscess, ?Torsion.

Patient underwent surgical exploration, which showed gangrenous torsted left testis. Orchidectomy was performed.

Conclusion:

- Testicular torsion should be considered in the differential diagnosis of any male patient with testicular pain, regardless of age.
- Recurrent testicular torsion after orchidopexy may appears many years after the primary procedure.
- Previous orchidopexy does not always prevent re-torsion.
- Misdiagnosis of testicular torsion in adults raises the incidence of orchidectomy.
- Increased awareness regarding this possibility is imperative for early diagnosis and prevention of testicular loss.

P141 - Emergency Surgery

Synchronous Gall Bladder (G.B) Stone Ileus and Carcinoid Tumour

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Introduction: Synchronous Gallbladder stone ileus and carcinoid tumour of small bowel is extremely rare condition. No known pathological reasons for the two conditions to be associated with each other in a single patient. Up to the best of our knowledge only one case had been reported.

Case Report: We report a 75 years old lady who presented to us with two days history of central colicky abdominal pain associated with nausea and vomiting. O/E :B.P-166/71 P-70/ M R.R-20/M TEMP.36.5C Abdomen was distended and tender.

Investigations: HB 13.9 WBC 10.8 CRP 0.8 U&E normal, LFTS normal PFA-Loop of dilated small bowel CT-G.B Stone ileus 4 × 3 cm in terminal ileum.

Laparotomy Finding: Omental adhesion, free serous peritoneal fluid. G.B stone impacted in terminal ileum, terminal ileum stricture. Limited right hemi colectomy performed without intervention to biliary system. Histology reported carcinoids tumour of terminal ileum T4 N1 M1. The patient made a good recovery.

Conclusions: The association of gall bladder stone ileus and carcinoid tumour in a single patient is extremely rare condition. Small bowel carcinoid tumour are usually found incidentally. Small bowel carcinoids have the greatest malignant potential compared to other G.I carcinoid.

P142 - Emergency Surgery

Laparoscopic Splenectomy for Severe Blunt Trauma After Failure of Conservative Management, A Case Report

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Introduction: Spleen injury is a frequent consequence of blunt abdominal trauma. Non operative treatment is the current standard of care for hemodynamically normal patients. Several factors may affect the success of this approach including high CT spleen injury grade and hemoperitoneum >300 ml. When conservative management failed, laparoscopy may have a role in order to full investigate the abdominal cavity, evacuate hemoperitoneum and allow spleen removal or repair.

Progress in surgical skill and new developments in equipment allows us to treat patients with severe splenic injury in a minimally invasive fashion.

Case presentation: A 14 years old man was admitted to the Emergency Department with the diagnosis of blunt splenic injury. He was hemodynamically normal and the CT scan showed a III grade (AATS score) spleen laceration and moderate hemoperitoneum. During the first 48 h, pseudoaneurysms at the upper pole of the organ were seen at repeated CT scan. The patient underwent to transcatheter embolization of splenic artery branches. New CT scan obtained 4 days after the procedure revealed new multiple punctate areas predictive of vascular injury in mid and lower pole of the spleen. A multidisciplinary decision-making turned to radical splenectomy.

With a semilateral decubitus and 4 trocar arrangement, laparoscopic splenectomy was successfully performed in 155 min. The specimen was placed in an endobag and retrieved through a Pfannenstiel's incision. The postoperative period was uneventful and he was discharged four days after surgery.

Conclusion: This case report confirms that totally laparoscopic splenectomy performed in hemodynamically normal patient with a splenic injury is an effective, safe procedure for whom conservative management is failed. However it required adequate laparoscopic and emergency surgical expertise.

P143 - Emergency Surgery

Life Saving Laparoscopic Treatment of Internal Bleeding in Trauma Patient

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An 17 year old patient taken to theatre as an emergency following an RTA, he was in grade 2 shock and this was thought to be due to intra abdominal hemorrhage. On laparoscopy he was found to have 1600 ml of blood in the abdomen and a large liver laceration. This video demonstrates safe use of laparoscopy for examination of the abdomen and management of internal bleeding from a liver laceration utilising spray diathermy in the emergency setting.

P144 - Endocrine Surgery

Comparison of Standard and New Approach for Transperitoneal Left Adrenalectomy

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Background: Sometimes laparoscopic left adrenalectomy is technically difficult because of need to dissect splenic ligaments and due to proximity of splenic flexure of colon tail of pancreas.

Aim of study was to compare standard technique and new approach to left adrenal gland via the lesser sac.

Methods: From 2007 to 2012, a total of 43 left laparoscopic adrenalectomies were performed (incidentalomas—19, pheochromocytoma—16, aldosteroma—6, metastasis of lung tumour—2). Retroperitoneal approach was used in 11 patients, transperitoneal approach - in 32 patients. Standard transperitoneal approach was used in 12 patients (group A), novel approach was used in 20 patients (group B). New approach is performed by transection of gastrosplenic ligament, posterior leaf of parietal peritoneum, and dissection of adrenal gland.

Results: Mean operative time was 76 min (range, 52–130) in group A, and 55 min (range, 40–86) in group B ($p < 0.05$). Mean blood loss was 95 ml (range, 15–480) in group A, and 26 ml (range 10–45) in group B ($p < 0.05$). Complication were in 3 cases (trauma of the tail of pancreas—2, trauma of the spleen—in 1) in group A, and were none in group B ($p < 0.01$). Mean hospital stay was 6.2 days (range, 3–14 days) in group A, and 4.6 days (range 3–6) in group B ($p < 0.05$).

Conclusion: Our results show some benefits of new transperitoneal approach for laparoscopic adrenalectomy.

P145 - Endocrine Surgery

Laparoscopic Surgery of Pancreatic Endocrine Tumors: Is There a Benefit?

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Background: Although minimally invasive surgery is widely adopted for the treatment of many surgical diseases, results of laparoscopic procedures for pancreatic endocrine tumors (PET) are published only in small series.

Objective of the study was to reveal and estimate the benefits of laparoscopic resection of PET and to compare it with the open approach by reviewing the available data.

Methods: Medline search for the words laparoscopic resection and pancreatic endocrine tumors was performed. 52 relevant papers were identified and studied from 2000 till 2012.

Results: Four non-randomized studies compared laparoscopic and open approach for resection of PET comprising totally 384 patients—81 laparoscopic and 303 open. There were no cases of postoperative mortality. Mean operative time was estimated in three studies where there has been a significant difference ($p < 0.5$) in favor of open technique (121 min vs 92 min) in one study, in favor of laparoscopic technique in the other study (188 min vs 305 min.) and with no difference in the third study. Mean hospital stay was estimated in four studies, where it reached a significant difference ($p < 0.05$) in one study in favor of laparoscopic group (11 days vs. 14 days). Rate of postoperative pancreatic fistula was significantly higher in open group in two studies reaching up to 100 % in comparison to only 14.2 % in laparoscopic groups ($p < 0.05$).

Conclusion: Laparoscopic resection of PET is at least as feasible and safe as open surgery with possible benefits in terms of operative time, length of stay and rate of pancreatic fistula.

P146 - Endocrine Surgery

New Approach in Single Incision Endoscopic Thyroidectomy Using Lifting Method by Original Retractor via Small Anterior Chest or Axillary Incision

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We have developed single incision endoscopic thyroidectomy (SIET) via small anterior chest (C-) or axillary incision (A-) using the lifting method without carbon dioxide since 2001. We created and have used an original retractor and a new approach in recent cases. In this study, we presented and verified our method with regard to surgical outcome and patients' complaints.

Method: Our procedure of C-SIET and A-SIET was performed in 76 patients (mean age 55, male 14 female 62). An original retractor was used in 29 patients of 76. In new approach, 10 patients of 29 were operated. The patients are placed in a supine position with the neck extended. The arm on the tumor side is raised over the forehead to expose the axilla in A-SIET. A 30 mm(C-) or a 40 mm (A-) vertical incision is made in the anterior chest or the axilla. After the subcutaneous tissue is dissected, the skin is lifted up by an original retractor (Takasago Medical Co. Japan). Flexible scope (Olympus Co. Japan) is used through 5 mm trocar detached the retractor. In new approach, the thyroid is exposed through the avascular space between sternal head and clavicular head of sternocleidomastoid muscle (SCM), then the skin and sternal head of SCM are lifted up. Partial or hemi thyroidectomy is performed using an ultrasonic scalpel.

Results: No scars in the neck were left in all cases. Benign and hemilateral tumors sized to less than 6 cm and micropapillary carcinoma sized to less than 1 cm were operated. Operation time is 172 ± 14 min. in new approach including many difficult cases, 170.9 ± 15 in an original retractor, 167.6 ± 10 in previous method. Five complications (temporary hoarseness 2 cases, skin injury 2, and artery injury 1) were experienced in previous method, no complications were demonstrated in new approach method.

Conclusion: New approach is useful to operate and make the working space. An original retractor can be introduced easily in most hospital, because it is not so expensive. Most of women satisfied cosmetic results, young ladies especially prefer to our axillary method.

P147 - Endocrine Surgery

Robot-Assisted Thyroidectomy with Novel Camera-Port Retractor

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Background: We performed gasless transaxillary robot-assisted thyroidectomy with a novel camera-port retractor. Herein, we describe the new instrument and its efficacy, which was evaluated by performing robot-assisted thyroidectomy.

Methods: From October 2009 to August 2012, 12 patients underwent robot-assisted thyroidectomy with a novel camera-port retractor (CP retractor) using the da Vinci surgical system. The retractor system consists of two parts: a designed pipe (12 mm in diameter) and a detachable handle. The pipe can be atraumatically inserted through a skin incision using the detachable handle, and immobilized by means of the da Vinci camera arm. This unique retractor-mounted da Vinci camera arm that functions as a camera port and a retractor consistently enhances the visualization of the thyroid gland and surrounding tissue. The CP retractor was used in all cases, and we use the Maryland bipolar forceps and the micro-bipolar forceps on both arms for dissection of the surrounding tissues as well as for cutting and coagulation to avoid injury to the vessels and nerves (double bipolar methods).

Result: Successful robot-assisted thyroid operation depends on excellent and consistent exposure of the thyroid gland and the surrounding tissue and organs. This simple and easy-to-handle CP retractor provides excellent visualization of the surgical field without impinging on the robot arms, and can be removed when not required for the procedure. An ultrasonic surgical device is often used in open and endoscopic surgery for simultaneous cutting and coagulation, and the da Vinci surgical system also provides an ultrasonic energy instruments. However, these instruments do not have wrist articulation because of their mechanical structure. The double bipolar methods instead of the use of ultrasonic energy instruments made dissection, cutting and coagulation very easy and convenient. The novel retractor is useful and safe, and the use of bipolar instruments instead of an ultrasonic device is an effective option for robotic dissection around nerves in robot-assisted thyroidectomy.

P148 - Endocrine Surgery

New Method of Patients with Diabetic Foot Surgical Treatment

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Aims: To increase the efficacy of patients with diabetic foot (DF) treatment through lower extremities blood flow improvement using indirect revascularization method.

Methods: We're made the layer-by-layer incision from skin towards muscular fascia length by 5-7 mm inside the area of the ilia crest under the peridural anaesthesia. The area of the ilium bone (IB) future perforation is carefully processed with the help of raspator. After IB perforation we took away the bone marrow aspirate (average volume equal to 250-300 ml) using syringe with metal 4G needle. On both the frontal-medial and frontal-lateral shin surfaces we're made 4-5 dissections (with the length less than 10 mm long) through the skin, hypoderm and shin personal fascia in the 'chess' order, from each side following proximal-to-the distal segment of shin approximately on one line.

The bone marrow aspirate (average volume equal to 40 ml) is injected subfascially through the upper cut of the dissection with the help of the endovascular catheter (4–5 Gsize). Each cut is using for the shin frontal muscles' group infiltration (average volume equal to 10 ml). An aspirate is injected intramuscularly inside the done cuts on the shin back surface from the top till down in the 'chess' order to reach the maximal fibers of the m. soleus and m. gastrocnemius. The typical rotational osteotrepation of the tibia we're made through the cuts placed on the shin frontal-medial surface. All cuts of the shin are sutured using separate knot-like sutures.

We're made the incisions till 5 mm length on both the lateral and medial surfaces of the calcaneus bone through which foot muscles were infiltrated in distal direction. These events preceded to calcaneus bone rotational osteotrepation. Wound and cuts inside the ilia crest are layer-by-layer sutured with the help of separate knot-like sutures. The rubber drainage left inside the wound for the certain time.

Results: All the DF patients revealed the after operational wounds healing without complications. The sensitivity was completely restored, pain syndrome disappeared.

Conclusions: The data obtained show comparatively safe, effective and more clinically efficacious method of DF patients treatment using our original method.

P149 - Endocrine Surgery

Laparoscopic Adrenalectomy in Cushing's Syndrome

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Background and Aims of the Study: The diagnosis of endogenous Cushing's syndrome requires demonstration of an increased cortisol secretion rate, best achieved by urinary free cortisol excretion determinations. In borderline cases, loss of diurnal cortisol rhythmicity, a combined dexamethasone/corticotropin releasing hormone (CRH) test can be helpful.

Methods: We retrospectively reviewed a prospective database of laparoscopic adrenalectomy in Cushing's syndrome and Cushing disease between January 2002 and December 2012. Laparoscopic adrenalectomy was performed in lateral position: transperitoneal for 35 patient and retroperitoneal for 3 patients.

Results: 38 patients were submitted to laparoscopic adrenalectomy, 6 for Cushing's disease and 32 for Cushing's syndrome.

2 patients with Cushing's disease underwent neurosurgical intervention or Gamma Knife radiation for pituitary tumor before adrenalectomy. 4 patients with Cushing syndrome and 3 with Cushing's disease had a bilateral adrenalectomy, the mean time before the first and the second intervention being 2 months, 19 left adrenalectomy, 12 right adrenalectomy.

The mean age was 49,8 years (between 17 and 72 years). The mean operative time was 98 min (between 45 and 220 min), 95,5 min for left adrenalectomy, 91,5 min for right adrenalectomy, 200 for bilateral adrenalectomy. The histopathological findings were 13 cortical nodular hyperplasias (34,2 %), 25 adenomas (65,6 %).

The mean adrenal gland size was 3,8 cm (between 2 and 8 cm)

We had 1 reintervention with conversion to laparotomy for bleeding control after a left adrenalectomy.

The postoperative morbidity was 7.8 % (3/38)—1 postoperative adrenal insufficiency, 2 postoperative bleedings; the postoperative mortality was 2.6 %—1 case with pulmonary embolism.

The mean post-operative hospital stay was 4.5 days, between 2 and 47 days.

A immediate postoperative substitution treatment with cortisone has been administered for all the patients.

Conclusions: Laparoscopic adrenalectomy is a safe surgical technique which provides a better comfort for the patients and a faster recovery after the surgical procedure. In order to obtain the best results a perfect cooperation between surgical, endocrinological and anesthesiological teams is needed.

P150 - Endocrine Surgery

Transperitoneal Laparoscopic Adrenalectomy: Our Experience in Ten Years

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Aim: The authors evaluate the effectiveness of laparoscopic approach in the treatment of the various kind of adrenal pathology.

Methods: Over the period from November 2002 to January 2013 we treated 55 patients with adrenal pathology. Mean age was 53 years (range: 17–77 years), 31 females and 19 males. We have performed 30 laparoscopic adrenalectomy (LA) with lateral transperitoneal approach (18 right, 12 left) and 25 anterior laparotomic adrenalectomy (ALA) (13 right, 10 left, 2 bilateral). The pathologic features were: 24 adenomas, 14 pheochromocytomas, 2 carcinomas, 8 nodular hyperplasias, 1 lymphoma, 2 hemorrhagic pseudocysts, 2 oncocytomas and 2 myelolipomas. Nine patients had further diseases: common biliary duct lithiasis, HCC, acute cholecystitis, colonic and rectum cancers.

Results: among the immediate results a blood loss was evident with the open approach and another similar episode with laparoscopic approach. Conversion to laparotomic procedures was necessitated in four cases (7.3 %). The median operative time was 130 min in LA (range: 90–250 min) and 180 min in ALA (range: 150–300 min). Mean hospital stay in LA was 4 days (range: 3–6 days) while in ALA was 6 days (range: 5–8 days).

Conclusions: LA is technically feasible and reproducible. We evaluate the effectiveness of LA for a variety of endocrine disorders except in the case of invasive carcinoma or large masses. The advantages of a laparoscopic approach can be found in a minor surgical stress, minor hospital stay and lower morbidity than the open technique.

P151 - Endocrine Surgery

The Course of Type 1 Diabetes Mellitus After Laparoscopic Gastric Plication. Our Experience

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Aim: Analysis of course type 1 diabetes mellitus (DM1) after laparoscopic gastric plication (LGP).

Method: From September 2011 to January 2013 we operated 5 patients (1 male and 4 female) with DM1: A, B, C, D, E. LGP was performed in all patients. One patient had no antibodies to pancreatic β -cells. The age of patients was from 18 to 40 years old. BMI in all patients was less 35. The patients suffered from DM1 from 2 to 12 years. Daily doses of insulin were from 40 to 90 IU. Operation time from 70 to 110 min. There were no morbidity and mortality.

Results: The patient A with 9 years anamnesis of DM1 and absence of pancreatic β -cells antibodies received 90 IU of insulin before the operation and had episode of ketoacidotic coma. 4 months after operation the patient stopped insulin taking. The patient follow-up for 18 months with normoglycemia, but we noted hyperglycemia during acute respiratory disease.

The patient B with 5 years anamnesis of DM1 complicated with retinopathy needed 72 IU of insulin before the operation. Three weeks after operation improvement of vision was noted. Three months after operation patient received 20 IU of insulin only.

The patient C with 11 years anamnesis of DM1 and diabetic foot 2A received 64 IU of insulin. Three weeks after operation we noted foot ulcer healing; patient received 18 IU of insulin.

The patient D with 2 years anamnesis of DM1 received 60 IU of insulin. In 3 months after operation she received 20 IU of insulin, and in 9 month following-up she received 18 IU of insulin only.

The patient E with 12 years anamnesis of DM1 complicated with retinopathy and diabetic foot 2A received 40 IU of insulin. One month after operation improvement of vision was noted. Three months after operation we noted foot ulcer healing; patient received 28 IU of insulin.

Conclusion: Laparoscopic GP is effective in patients with DM1. The mechanism of action after laparoscopic gastric plication on pancreatic endocrine function requires further deep study.

P152 - Endocrine Surgery

Lymphatic and Testicular Artery Sparing Laparoscopic Varicocelectomy in Children and Adolescents

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Background: The division of lymphatic vessels during pediatric varicocelectomy is complicated by hydrocele formation, testicular hypertrophy due to intratesticular edema and decline in testicular function. There is wide variation in the reported incidence of hydrocele after varicocelectomy (0 to 29 %). We present our lymphatic and testicular artery sparing laparoscopic varicocelectomy in children and adolescents.

Material and Methods: Twenty-nine children with primary varicocele were subjected to laparoscopic lymphatic sparing varicocelectomy. Their mean age was 15 years. Varicocele grade was 3 in 21 cases and grade 2 in 6. Indications for intervention were pain in 19 cases and family preference in 10. Half cm of 1 % Methylene blue (Each ml solution contains 10 mg of methylene blue) is injected into the test just after induction of anesthesia. The operation was performed via a transperitoneal laparoscopic approach, using 5 mm 30 degree telescope and 2-3 mm instruments. The spermatic veins were isolated and stripped of the surrounding colored lymphatics and artery and secured with ligaclips. Any other tortuous veins around the internal ring were also ligated at the time of operation.

Results: Lymphatic sparing was accomplished in all cases. Stained lymphatics are easily seen running alongside the spermatic artery and vein. Operative time varied from 12 to 35 min (mean 20 \pm 26 min). No intra or perioperative complications were noted. On average follow-up of 15 months a residual varicocele was noted in 1 case, with no hydrocele formation in any case.

Conclusion: This study demonstrates that lymphatic and testicular artery sparing laparoscopic varicocelectomy is easily accomplished and technically feasible. It appears that preservation of a single spermatic lymphatic vessel is sufficient to prevent post-operative hydrocele formation.

Key Word: Methylene Blue, Lymphatic Sparing, Laparoscopic Varicocelectomy

P153 - Endocrine Surgery

Spleen Conserving Surgery. The Evaluating the Effectiveness of Laparoscopic Method

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Aim: The first laparoscopic splenectomy was performed in 1992 by Carroll. Since then, laparoscopic splenectomy has become the 'gold' standard for treatment of spleen diseases. The possibility of using of laparoscopic method for organ saving operations, nowadays are not wide enough discussed in the literature, in addition, numerous data suggest that spleen organ saving operations associated with a lot of intraoperative complications.

Purpose: To evaluate the effectiveness of implementation of the spleen organ saving operations using the laparoscopic approach.

Materials and Methods: During the period from 1997 to 2012 in the clinic of the Ryazan Regional Hospital (Ryazan), Centre of Clinical and Experimental Surgery (Moscow), Swiss University Clinic (Moscow), we performed 208 operations on the spleen. The structure of operations: 132 splenectomy, including 23 operations with splenic autotransplants, in 64 cases - splenic cyst excision, in 12 cases were performed laparoscopic partial resection of the spleen.

Results: As a criteria for evaluating the effectiveness of operations, we used: the total operating time, the number of intra-and postoperative complications, organ function or the implanted tissue, the assessment of pain intensity using a numeric rating scale (NRS), the postoperative hospital stay. Extras were evaluated various energies during splenic tissue dissection and several types of hemostasis of splenic wounds.

Conclusion: All of our results the possibility for performing such operations, using minimally invasive techniques. Each species-conserving surgery has its indications and contraindications, so for every surgeons is vital to hold each of them perfectly.

P154 - Endocrine Surgery

Evaluating the Effectiveness of Laparoscopic Method Performing the Conserving Operations on the Adrenal Glands

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Aim: Currently adrenalectomy is the standard treatment of hormonally active adrenal disease. In recent years, laparoscopic method of treatment has become more widespread. Most laparoscopic adrenalectomy includes the complete removal of the adrenal gland and the amount of publications of laparoscopic adrenal conserving surgery is insignificant. That's why we offer you our experience in adrenal conserving surgery.

Purpose: To evaluate the possibility of performing laparoscopic adrenal organ saving surgery.

Materials and Methods: During the period from 2000 to 2012 in the clinic of the Ryazan Regional Hospital (Ryazan), Center of Clinical and Experimental Surgery (Moscow), Swiss University Clinic (Moscow) we performed 48 organ saving operations on the adrenal glands. The structure of operations: in 27 cases were performed partial adrenalectomy, in 21—laparoscopic removal of adrenal cysts. All operations were performed by one surgeon. There were no intra- or postoperative complications.

Results: The criteria for evaluating the effectiveness of operations were: the total time of surgery, intra- and postoperative complications. Extras were evaluated various energies during tissue dissection of the adrenal gland, and several species of hemostasis of the adrenal wound.

Conclusion: Conserving surgery for adrenal gland can be safely performed through laparoscopy, using appropriate methods of dissection of tissue and various methods of hemostasis.

P155 - Endocrine Surgery

Single Incision Laparoscopic Hernia Repair in Children; a Preliminary Report

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Background: Laparoscopic surgery has the benefits of decreased postoperative pain, improved cosmetic results, and decreased convalescence. The desire to reduce incision related morbidity and pain while achieving improve cosmetic results has recently led to the introduction of single incision laparoscopic surgery (SILS). There have been recent reports that SILS is feasible also for children. Herein, we present our preliminary experience with the application of single incision laparoscopic hernia repair in children (SIL).

Patients and Methods: One-hundred and forty patients with 170 hernias were subjected to single incision hernia repair at Al-Azhar University Hospitals from April 2010 to October 2010. The main outcome measurements were; feasibility and safety of the technique, operative time, postoperative hydrocele formation, recurrence rate, and cosmetic results.

Results: Ages ranged between 6 months and 3 years (mean 1.6 ± 1.3 years). They were 101 males and 39 females. Seventy cases presented with right sided inguinal hernia, 30 cases with bilateral hernia, 20 cases with recurrent hernia and 20 cases with left sided hernia. The mean operative time was 27.6 ± 1.7 min in the beginning of the procedures then reduced to 13 ± 2.3 min after mastering the technique. No wound complication. Follow-up was 3-7 months (mean 4.6 months). On follow-up, no recurrence was detected and the scar is nearly invisible.

Conclusion: This preliminary study showed that SIL hernia repair in childhood is very promising to achieve scarless surgery. Further comparative studies with a larger patient series are mandatory before the technique can be generally recommended.

Keywords: Single Incision, Laparoscopy, Congenital Hernia, Children

P156 - Endocrine Surgery

Laparoscopic Assisted Anorectal Pullthrough for High Anorectal Malformation; a New Simplified Technique

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Background: Laparoscopic-assisted anorectal pull-through (LAARP) is becoming an increasingly common procedure to correct high and intermediate anorectal malformations. Recently, several studies on LAARP have been reported. Laparoscopy allowed minimal perineal dissection, excellent visualization of the rectal fistula and surrounding structures, and preservation of the distal rectum with accurate placement of the rectum within the center of the levator sling without dividing the sphincter muscles.

Objective: The objective of this study is to present our experience with LAARP and to introduce a new instrument that facilitates gradual dilatation of the perineal tract and pulling the colon into the perineum through anal sphincter.

Patients and Methods: The study was conducted at Al-Azhar University Hospitals during the period from April 2007 to April 2009. It included 35 children with high and intermediate anorectal malformation. Their ages ranged from 6 to 9 months. They were 25 males and 10 females. All cases have had colostomy in the neonatal period. All patients were subjected to laparoscopic-assisted anorectal pull-through using telescope No. 5-mm, 30 degree and 2 accessory trocars No. 3-mm. The colon was pulled into the perineum after ligation and division of the fistula by our innovated instrument easily.

Results: Our initial results are encouraging. The mean operative time ranged from 40 to 60 min. All the procedures were completed laparoscopically without conversion. The use of our new instrument resulted in decrease of operative time as it facilitated gradual dilatation and easy pulling of the colon through the levator sling to the perineum.

Conclusion: Laparoscopically assisted anorectal pull through is a safe and effective alternative for patients with high and intermediate ARM. Our new technique resulted in marked reduction of operative time.

Keywords: Laparoscopy, Pullthrough, High Imperforate Anus

P157 - Endocrine Surgery

Tumor Size Predict Malignancy in Pheochromocytoma?

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Most data from literature indicate that adrenal tumors larger than 6 cm are more likely to be malignant but even so laparoscopic adrenalectomy seems to gain more partisans regardless the size of tumor. Is this statement true for pheochromocytoma?

Material and Method: In past 10 years we performed 215 laparoscopic adrenalectomies, 31 of them for pheochromocytoma. From this 31 pheochromocytomas demonstrated clinical, biochemical and with histology examination we found only one case with malignancy.

Results: We performed 16 right adrenalectomies, 14 left adrenalectomies and one bilateral adrenalectomy and we convert to open approach 4 cases, 2 on the right side and 2 on the left side. In only one case the reason for conversion to open procedure was a larger tumor size. Median tumor size was 6, 38 cm with limits from 1 to 14 cm and almost half of cases (15 cases) had a tumor size larger than 6 cm. Histology examination found only one case of malign pheochromocytoma but we had no morbidity or mortality.

Conclusions: Laparoscopic adrenalectomy is this days performed safely even for pheochromocytoma. Most pheochromocytomas larger than 6 cm from our study were benign although there are articles stating the opposite.

P158 - Endocrine Surgery

Laparoscopic Splenectomy Without Preoperative Platelet Transfusion is Feasible in Patients with Platelet Count Lower than 109/L

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Background: laparoscopic approach has become the gold-standard for hematological disease. Few series are available regarding laparoscopic splenectomy for patient with extremely low platelet count. The aim of this study was to investigate the feasibility and safety of laparoscopic splenectomy without preoperative platelet transfusion, in patients with very low platelet count.

Patients: From January 2009 to June 2012, all consecutive patients who had laparoscopic splenectomy for haematological with no preoperative platelet transfusion in our department were prospectively recorded.

The 27 patients were divided into 2 groups according to whether their preoperative platelet count was under or over $10 \times 109/L$. Preoperative, perioperative, and postoperative datas has been reviewed and analysed.

Results: There was no significant difference between the 2 groups of laparoscopic splenectomy, in postoperative clinical efficacy (12/13 vs 13/14 $P > 0.9$) neither surgical procedure including mean operating time (192 vs 205 min $p = 0.57$), rate of conversion (3/12 vs 2/14 $P = 0.63$), surgical complication (1/13 vs 1/14), postoperative platelet counts ($260 \times 109/L$ vs $223 \times 109/L$ $P = 0.83$) and median postoperative hospital stay (4 vs 5 days $P = 0.2$). However patients of the group $< 10 \times 109$ had more estimated blood loss (300 ml) than the other group (100 ml) ($P = 0.022$) with no significant difference in ratio of intraoperative blood transfusion (3/13 vs 1/14 $P = 0.31$).

Conclusions: Laparoscopic splenectomy without platelet transfusion can be feasible and safe procedure in patients with a platelet count lower than $10 \times 109/L$. It may increase estimated blood loss with no clinical impact. It can be allowed in patients with a normal prothrombin preoperative time status, with no preoperative bleeding tendency nor severe coagulopathy.

P159 - Endocrine Surgery

Adrenal Tumor Size a Reason for Conversion in Laparoscopic Adrenalectomy?

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We know that laparoscopic adrenalectomy became gold standard for adrenal tumor mass smaller than 6 cm although there are favorable studies for larger tumors.

Material and method: in past 9 years we performed in our general surgery department of Emergency Hospital Bucharest 215 laparoscopic adrenalectomies for patients with different adrenal pathology diagnosed at the National Institute of Endocrinology C.I.Parhon.

Results: We counted 19 conversions (8,83 %): 11 on the left side, 6 on the right side and 2 from bilateral approach. Reasons for conversions were: bleeding, unclear anatomy, adhesions, local invasion, heart rhythm disturbance, larger tumor size. Overall tumor size was 5,26 cm, 46 over 6 cm (23,46 %) and in converted cases was 7,71 cm (1 to 20 cm) 9 (47,36 %) of them over 6 cm. Average postoperative stay was 5 days and in converted cases 10,73 days. From 7 postoperative complications only 2 were in cases with tumor size larger than 6 cm.

Conclusions: Although laparoscopic approach for larger adrenal tumor mass is not generally accepted the tumor size is not the only reasons for conversion in laparoscopic adrenalectomy.

P160 - Endocrine Surgery

Concomitant Adrenalectomy and Other Laparoscopic Interventions

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Adrenalectomy is mostly a planed surgery but sometimes there are cases with associated pathology that need surgical correction.

Material and method: Among our 215 laparoscopic adrenalectomies we performed in 5 cases another concomitant laparoscopic surgery: 3 cases of gallstones, 1 ovarian cyst and 1 renal cyst although there were no acute pathology involved.

Results: We had 4 female patients and one male patient with a median age of 51,2 years old having an adrenal pathology of incidentaloma 3 cases, Conn syndrome 1 case and 1 Cushing syndrome and we performed concomitant 3 cholecystectomies, 1 cyst evacuation for a renal cyst and one ovariectomy, all of them by laparoscopic approach. Average operating time was prolonged to 120 min comparing with our median time of 85 min for laparoscopic adrenalectomy itself. Postoperative hospital stay was similar to that for adrenalectomy itself ie 3,6 days and we counted no morbidity, mortality or recurrence till date.

Conclusion: Although there is no absolute indication for concomitant surgery when laparoscopic adrenalectomy is performed, in our cases besides prolongation of the operating time we counted no significant outcome.

P161 - Endocrine Surgery

Laparoscopic Adrenalectomy: Initial Single Team Experience of 42 Cases

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Introduction: The aim of this study is to evaluate post operative outcomes of laparoscopic adrenalectomy in a general surgical department during 6 consecutive years.

Materials and Methods: Forty two laparoscopic adrenalectomy were performed between January 2006 and December 2012. Transperitoneal approach was used in 40 patients, and retroperitoneal was performed for 2 patients. All datas were assessed regarding demographics (ASA, ECOG score, tumor size, indication), operative time, post-operative complications, and conversion to open surgery.

Results: Adrenalectomy was performed in 20 (47.7 %) cases for pheochromocytoma, 18 (42.8 %) cases for functional and non-functional benign adenoma, 3 (7.1 %) cases for pituitary acth hypersecretion and in one (2.4 %) case for adrenal hepatocarcinoma metastasis. We performed 33 unilaterals adrenalectomy (78.5 %) and 9 bilateral resections (21.5 %). Mean size of removed adrenal tumor was 6 cm. Mean operative time was 184 ± 81 min. Three (7.1 %) patients underwent conversion to laparotomy (difficulties regarding tumor size in 2 patients and hemorrhage in the other case). Postoperative Morbidity occurred in 5 (9.5 %) patients, and one patient deceased of air embolism during surgery.

Conclusion: Laparoscopic adrenalectomy is surgically feasible and can be applied for different adrenal pathologies. The procedure can be performed with a reasonable operative time, and an acceptable rate of complications. It should be adopted as a gold standard procedure for adrenal neoplasm in developing countries.

P162 - Endocrine Surgery

Improvements of Gasless Endoscopic Thyroid Surgery According to Model Changes of Ultrasonically Activated Scalpels

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Background and Methods: Appearance of an ultrasonically activated scalpel (UAS) enabled Professor Kazuo Shimizu to perform gasless endoscopic thyroid surgery in 1997. We had performed approximately 200 cases of gasless endoscopic thyroid surgery since 1999 by using the UAS. We have modified and improved our surgical techniques by making various surgical instruments and advocating 'safety margin', and those data have been reported previously. We have used various types of UASs in the market. We reviewed those UASs by our medical records and will present historical changes of the clinical results of gasless endoscopic thyroid surgery from the viewpoint of UASs.

Results: The UAS used at first in 1999 was a scissors-type (Harmonic™ Shears) with a rod 10 mm in diameter and its activated tip was rather short and straight. At that time the mean operative time was 151 min. After a few years, a new type of UAS (Harmonic Ace™) was put on the market. Its active blade was longer and curved and its rod was 5 mm in diameter. The Harmonic Ace provided more precise surgical maneuvering. The operative time became shorter (mean 127 min) and showed no statistically significant difference compared with conventional thyroid surgery. Recently a newer UAS (Harmonic Focus™ Long Curved Shears) was put on the market. The Harmonic Focus was made with the active scalpel blade above the inactive side so as not to injure important anatomical structures. And its blade was longer and more precise at the tip. This new UAS could be inserted from a 3.5 cm-working port. Gasless endoscopic thyroid surgery could be performed more precisely and comfortably.

Conclusion: Gasless endoscopic thyroid surgery was improved not only due to surgeons' efforts at making surgical instruments but also by the improvement and model changes of ultrasonically activated scalpels by manufacturers.

P163 - Flexible Surgery

OTSC Clip for the Treatment of Peptic Ulcer Bleedings Compared to Hemoclips

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The mechanical compression of vascular stumps or the tissue around a GI-bleeding caused by peptic ulcers is a approved method for endoscopic hemostasis. Especially for visible vascular stumps (Forrest IIa) the endoclip which is applied through the working channel of the endoscope is the treatment of choice. The OTSC-Clip encompass more tissue and is a new treatment in the endoscopic hemostasis.

Material and Methods: 57 patients were treated because of peptic ulcer bleedings (Forrest I or II) with a clip in a period from 2004 to 2011 at the university hospital of Tuebingen. 39 patients were treated with an endoclip, 18 patients were treated with the OTSC. The results of primary haemostasis, recurrence and number of clips were evaluated.

Results: 39 of 57 patients have been treated with an hemoclip versus 18 patients with the OTSC-Clip. Primary success in hemostasis was reached in 97.4 % versus 77.8 %. The recurrence rate was 5.3 vs. 7.1 %.

Conclusion: Mechanical compression of tissue around the bleeding site of peptic ulcers may be an alternative to injection therapy or coagulation techniques. However, in our collective the hemoclip seems to be favourable in the treatment of Forrest I or II peptic ulcer bleedings in comparison to the OTSC-Clip.

P164 - Flexible Surgery

Simultaneous Tapp and Cholecystectomy - Feasible and Safe Procedure

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Background: Inguinal hernia operations and cholecystectomy are the most common surgical procedures performed in the world. Detection of these diseases has increased due to prevalent ultrasound. The aim of this study is assess of safety and possibility of performance it simultaneously.

Methods: Eight patients (M = 100 %) were included in the study. In all cases inguinal hernia was present, in two patients bilateral one. Presence of the gallstones were confirmed in clinical imaging. The average age was 61.75 years (ranging from 47 to 72). Simultaneous laparoscopic cholecystectomy and transabdominal preperitoneal hernia repair was performed in all patients. Postoperative complications were noted to assess safety and feasibility of the procedure.

Results: The average hospitalization stay 3.625 days (ranging from 2–7). To perform the cholecystectomy 1–2 additional trocars were used. We did not noted any intraoperatively complications. In the control visit seven days after surgery, in one patient a small hematoma (10 ml of blood was punctured) in the right groin was noted. Another patient developed fever in the postoperative period, conservatively treated with antibiotics.

Conclusions: Simultaneous TAPP and cholecystectomy revealed to be safety and feasible. An acceptable operating time and hospital stay suggest and no influence on the length of convalescence offers the patients valuable alternative to two separate procedures.

P165 - Flexible Surgery

Intraoperative Endoscopy in the Treatment of Upper Gastrointestinal Tract Pathology

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Aims: Intraoperative endoscopy (IOE) is a less frequently used treatment method for a variety of special conditions in upper gastrointestinal tract pathology. Our aim is to enlighten indications, benefits and risks of this modality in our cohort of patients.

Material and Methods: Retrospective evaluation of 73 consecutive IOE performed in 69 patients. Indication included epithelial (13) and submucosal (12) tumors of the stomach, epithelial (7) and submucosal (13) tumors of the esophagus, 3 tumors of the cardia and 4 polyps of the stomach, gastrointestinal bleeding (5), esophageal diverticula (3), perforations (3), hiatal hernias (3), mediastinal tumors (2) and volvulus of the stomach, mediastinal abscess, ulcer disease and jejunal tube placement.

Results: Endoscopy started preoperatively in 43 (59 %) and preoperatively in 30(41 %) cases. This resulted in sole endoscopy in 16 cases. Lesion was localised in 68 cases, localisation failed in 3 cases (4.1 %). Based on IOE, therapy was altered to a wider resection (8), smaller resection (2), localisation and surgical therapy of bleeding (4), conversion to open surgery (3), or allowed minimally invasive treatment by laparoscopy (14) or thoracoscopy (6). We observed no specific intraoperative complications of endoscopy, postoperatively we distinguished perforation of the stomach after endoscopic submucosal dissection (1), positivity of resection line after mucosal resection (1) and recidiving bleeding (1). 30 day mortality was observed in 2 patients (2,7 %) without a specific cause in IOE.

Conclusion: Despite a heterogenic cohort of patients, we distinguish IOE as a meaningful complementary method in interventional treatment of upper gastrointestinal tract pathology. It allows a decrease in the conversion rate, provides minimally invasive operations and enables individualization of treatment. IOE expects a wide cooperation between surgeon and endoscopist and is demanding on technical skills.

P166 - Gastroduodenal Diseases

Laparoscopic Repair for Internal Hernias After Gastrectomy with Roux-En-Y Reconstruction for Gastric Cancer

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Roux-en-Y reconstruction is a safe and effective method for use in total or distal gastrectomy for gastric cancer. However, the development of internal hernias after Roux-en-Y reconstruction is a topic issue not only in bariatric surgery, but also in cancer surgery. Even when gastrectomy is performed using laparoscopic surgery, the majority of surgeries to repair internal hernias are performed using open surgery due to concerns regarding adhesion or poor intra-abdominal space associated with dilated intestines. We herein report our experience of two cases of laparoscopic repair for internal hernias developing after gastrectomy with Roux-en-Y reconstruction for cancer.

Case 1: Laparoscopically-assisted distal gastrectomy with antecolic Roux-en-Y reconstruction was performed in a male patient with gastric cancer (T1 N1 M0). Fourteen months later, the patient was admitted with upper abdominal pain and vomiting. Decompression with an ileus tube relieved the patient's symptoms; however, gastrographin images showed complete obstruction around the Roux-en-Y anastomosis. The laparoscopic view revealed a strangulated ileum through the mesentery defect of the Roux-en-Y anastomosis. There were no findings of ischemic changes in the herniated intestine; therefore, we replaced the ileum through the mesenteric defect laparoscopically. Closure of the mesentery defect was performed through a 4-cm incision. The patient was discharged uneventfully.

Case 2: Total gastrectomy with antecolic Roux-en-Y reconstruction was performed for gastric cancer (T1 N0 M0). Twenty-seven months later, the patient suffered repeated abdominal pain and vomiting. A CT scan revealed dilation of the upper jejunum and the whirl sign. We diagnosed the patient with an internal hernia, and performed surgery. The laparoscopic view revealed a strangulated ileum through the mesentery defect of the Roux-en-Y anastomosis. We replaced the ileum through the mesenteric defect and closed the hernial orifice using continuous sewing. All procedures were completed laparoscopically in Case 2.

The use of the laparoscopic approach is feasible for internal hernia repair after Roux-en-Y reconstruction in patients with complete decompression of the bowel.

P167 - Gastroduodenal Diseases

A Comparison of Long-Term Quality of Life After Laparoscopy-Assisted Distal Gastrectomy and Open Distal Gastrectomy for Early Gastric Cancer

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Aims: Laparoscopy-assisted distal gastrectomy (LADG) has been thought to be less invasive than open distal gastrectomy (ODG). The quality of life (QOL) after LADG as compared with ODG is still controversial. The aim of this study was to clarify whether LADG gives gastric cancer patients better QOL than ODG in long term follow up.

Methods: We studied 100 patients with distal gastrectomy for stage I gastric cancer, divided into 2 groups: Group A (n = 46); LADG, Group B (n = 54); ODG. We compared LADG with ODG as to QOL (food intake, body weight change, dumping syndrome, esophageal reflux) in more than 1 year after surgery. The incidence of bowel obstruction was evaluated.

Results: (1) % food intake in Group A (84 ± 14 %, mean \pm SD) was not significantly different from Group B (77 ± 16 %). (2) % body weight change in Group A (91.9 ± 6.0 %) was not significantly different from Group B (92.0 ± 6.7 %). (3) The incidence of dumping syndrome in Group A (19/46, 41 %) was not significantly different from Group B (22/54, 41 %). (4) The incidence of esophageal reflux in Group A (8/46, 17 %) was not significantly different from Group B (13/54, 24 %). (5) The incidence of bowel obstruction in Group A (1/46, 2.2 %) was significantly less than Group B (9/54, 16.7 %).

Conclusion: Long-term QOL in LADG patients was not significantly different from ODG patients. The incidence of bowel obstruction in LADG patients was significantly less than ODG patients.

P168 - Gastroduodenal Diseases

Laparoscopic Esophagojejunostomy Using a Newly Developed Endo-Psi-Slim and a Circular Stapler

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A laparoscopic total gastrectomy is not as popular as a laparoscopic distal gastrectomy because of the difficulty associated with reconstruction. In particular, laparoscopic anvil insertion and fixation are reportedly difficult to perform in cases where the anastomosis is made using a circular stapler. We previously reported a laparoscopic esophagojejunostomy using an "Endo-PSI-II", which was developed in 2007 for laparoscopic purse-string suturing. Here, we report a laparoscopic esophagojejunostomy using a newly developed "Endo-PSI-Slim", which is a next-generation model of the "Endo-PSI-II". Compared with the previous model, the Endo-PSI-Slim has a narrower jaw and a shaft, making the insertion of the Endo-PSI-Slim into the abdominal cavity easier and safer.

The improvement of the device has enabled the method used for anvil insertion and fixation to also be improved. Previously, anvil insertion was very difficult, because it was performed after the entire abdominal esophagus had been cut. The risk of esophageal injury was also a concern. Using 6 trocars (the new method, after a purse-string suture of the abdominal esophagus has been completed, only the anterior wall of the esophagus is cut and the anvil head is inserted. Once, the purse string suture has been closed, the posterior wall of the esophagus is cut. Thus, the risk of esophageal injury at the time of anvil insertion is minimal with this method.

The laparoscopic total gastrectomy was performed using 6 trocars (bilateral subcostal, bilateral mid-abdominal, infraxiphoid, and umbilical trocars). After a radical lymph node dissection, the stomach was removed by pulling it out through the mini-laparotomy at the umbilicus. The reconstruction was performed using the Roux-en-Y method. In most of the cases, the jejunojunal anastomosis was performed extracorporeally. The body of the circular stapler was introduced into the distal limb of the jejunum extracorporeally, and it was inserted through the mini-laparotomy at the umbilicus and combined with the anvil head laparoscopically. The jejunal stump was closed using an endoscopic linear stapler laparoscopically.

Between November 2010 and December 2012, we used this procedure to perform laparoscopic esophagojejunostomies during 36 laparoscopic total gastrectomy procedures. None of these surgeries required conversion to a conventional open procedure.

P169 - Gastroduodenal Diseases

Safety and Feasibility of Reduced Port Laparoscopic Gastrectomy for Early Gastric Cancer

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Aims: Reduced port surgery (RPS) in which the number of used ports is fewer than that in conventional laparoscopic procedure is spreading in various surgeries, however, RPS in the field of gastrectomy is still underdeveloped. We started laparoscopic gastrectomy through an umbilical port plus another 5 mm port (dual port laparoscopic gastrectomy: DP-LG) since 2009. So we report the procedure and the operative outcomes of DP-LG.

Methods: The indication of DP-LG was preoperative clinical Stage IA gastric cancer. All patients underwent D1 + lymph node dissection. We have performed 77 cases of DP-LG (66 cases of DP-laparoscopic distal gastrectomy: DP-LDG and 11 cases of DP-laparoscopic total gastrectomy: DP-LTG). A SILS Port was inserted into an umbilical incision, while another 5-mm port was inserted in the right flank region. Roux-en-Y reconstructions were performed in all patients. In cases of DP-LDG, gastrojejunostomy was performed laparoscopically using an endlinear stapler. In cases of DP-LTG, esophagojejunostomy was performed laparoscopically by side-to-side anastomosis using an endlinear stapler.

Results: The mean operation time of DP-LDG was 214 min and the mean blood loss was 32 mL. The mean operation time of DP-LTG was 241 min and the mean blood loss was 28 mL. There were 2 cases of additional port because of adhesion and bleeding from left gastroepiploic artery. There was no case of conversion to open surgery. There was 1 case of postoperative pancreatic juice leakage.

Conclusion: We succeeded DP-LG safely without large prolongation in operation time.

P170 - Gastroduodenal Diseases

Totally Laparoscopic Simultaneous D2 Subtotal Gastrectomy with Hepatectomy and Cholecystectomy for Gastric Neuroendocrine Tumor with Liver Metastases

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Introduction: Synchronous resection of primary neuroendocrine tumors (NET) with liver metastases remains controversial although recent studies have demonstrated its safety in selected patients. Synchronous laparoscopic gastric and liver resection has been rarely reported.

Methods: We report a case of successful simultaneous D2 subtotal gastrectomy with hepatectomy and cholecystectomy for metastatic gastric NET.

Case: A 65-year old male presented with upper gastrointestinal bleeding and was found to have a 3-cm gastric NET in the antrum. Preoperative staging demonstrated regional lymph node involvement with liver metastases. The patient underwent successful resection of the primary tumor and its secondaries.

Conclusion: This is the first reported case of totally laparoscopic simultaneous D2 gastrectomy with hepatectomy and cholecystectomy for metastatic gastric NET. Laparoscopic simultaneous gastrectomy and hepatectomy is feasible and safe in selected patients with metastatic gastric NET.

P171 - Gastroduodenal Diseases

Our Procedure in Laparoscopic Distal Gastrectomy (D2) for Gastric Cancer Patients Using Coaxial Scope Setting

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Introduction: Laparoscopic distal gastrectomy (LDG) with dissection of the regional lymph nodes has become a common procedure among endoscopic surgeons. But it has still some technical difficulties in dissecting lymph nodes at the supra-pancreatic area especially for beginners. To reduce this difficulty, we have stuck to coaxial scope setting.

Surgical Procedure: 1. A 12-mm trocar was inserted below the navel for a laparoscope. Two 5-mm trocars were inserted in the upper right and left abdomen. Two 12-mm trocars were inserted in the middle right and left abdomen. In total, five trocars were used in this procedure.

2. The operator was located between patient legs and the monitor was located over the patient head. Under laparoscopic view, the left gastroepiploic vessels were clipped and cut by LCS and the dissection for lymph nodes along the left gastroepiploic vessels was made. The right gastroepiploic vessels were clipped and cut by LCS and the inflapyloric lymph nodes were dissected. The duodenum was cut with a endoscopic linear stapler.

3. The lesser omentum was cut and the right crus of the diaphragm was exposed. The lymph nodes along the proper hepatic artery was dissected and the right gastroepiploic vessels were clipped and cut by LCS. The inflapyloric lymph nodes were dissected. The common hepatic artery and the splenic artery were exposed, and the lymph nodes along these vessels were dissected. The left gastric vein was clipped and cut by LCS. The lymph nodes around the left gastric artery and the celiac artery were dissected. The left gastric artery was divided after double-clipping. Then the dissected lymph nodes were attached to the resected stomach and the stomach was cut by the endoscopic linear stapler.

4. The duodenogastrostomy was made with a method of intracorporeal gastroduodenostomy, the delta-shaped anastomosis, in which only endoscopic linear staplers are used. After the anastomosis was made, the resected stomach was taken out from the body through the widened navel port site.

Results: We have performed LDG (D2) for gastric cancer patients. Dissecting lymph nodes at the supra-pancreatic area was easier in our procedure with coaxial scope setting.

P172 - Gastroduodenal Diseases

Laparoscopy-Assisted Gastrectomy for Advanced Cancer: Assessment of Safety, Lymph Node Dissection Quality and Short-Term Results

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Background: During the limited number of randomized studies was shown the safety and efficacy of laparoscopic surgery in the treatment of early gastric cancer (GC); nevertheless in advanced GC some uncertainty in potentialities of laparoscopy-assisted gastrectomies (LAG) remains due to technical difficulties, especially in performing of lymph node dissection.

The objective of this research was the assessment of safety and radicalism of the LAG for advanced GC in single centre study. Since December 2010 to November 2012 34 patients were underwent LAG for GC pT1b-4aN0-1M0. Radical laparoscopic interventions were fully performed in 29 cases. 11 patients were underwent the laparoscopy-assisted total gastrectomy, 18 patients—laparoscopy-assisted subtotal distal gastrectomy. D2 lymph node dissection was made in 26 patients, D1+—in one patient, D1—in two patients. The volume of a lymph node dissection was defined according to Japanese Gastric Cancer Treatment Guidelines 2010 (ver. 3). Control of a lymph node dissection volume was carried out by count of removed regional lymph nodes and by independent assessment of intervention on video records.

Results: Conversion rate was 14.7 % (5 patients). The reasons of the conversions were uncontrollable bleedings (n = 3) and technical difficulties during intracorporeal anastomoses forming (n = 2). The operating time was from 160 to 410 min. The intraoperative blood loss was 150 ± 90 ml. The total number of removed regional lymph nodes was 30.5 ± 12.4. Morbidity rate was 10.3 % (n = 3)—postoperative pancreatitis in one case, late duodenal stump leakage in one case, and profuse bleeding from the line of stapler suture of gastroenteroanastomosis, resulted in laparotomy in one case. There were no deaths. The mean time-to-first flatus was 2.5 days. Oral feeding in the most of patients was started from 3rd to 5th day. One patient had long-lasting enteroparesis. During the research period were developed some methods of surgery to facilitate manipulations and assure the quality of the intervention.

Conclusion LAG in GC is safe and feasible method providing the adequate volume of a lymph node dissection in circumstances of specialized oncology centre with well-trained staff experienced in open gastrectomy and advanced laparoscopic surgery.

P173 - Gastroduodenal Diseases

Our Procedure in Laparoscopic Total Gastrectomy (D1+) for Gastric Cancer Patients Using Coaxial Scope Setting

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Introduction: Laparoscopic total gastrectomy (LTG) with dissection of the regional lymph nodes has some technical difficulties in dissecting lymph nodes at the supra-pancreatic area. To reduce this difficulty, we have used coaxial scope setting.

Our procedure is shown as follows:

Surgical Procedure:

1. Five trocars were used in this procedure.
2. The operator was located between patient legs and the monitor was located over the patient head. Under laparoscopic view, the left gastroepiploic vessels were clipped and cut and the dissection for lymph nodes along the left gastroepiploic vessels was made. The right gastroepiploic vessels were clipped and cut and the inflapyloric lymph nodes were dissected. The duodenum was cut using linear stapler.
3. The lymph nodes along the proper hepatic artery was dissected and the right gastroepiploic vessels were clipped and cut. The inflapyloric lymph nodes were dissected. The common hepatic artery and the splenic artery were exposed, and the lymph nodes along these vessels were dissected. The left gastric vein was clipped and cut. This procedure was performed under a very nice surgical view by pulling up the gastropancreatic folds to the anterior abdominal wall. The lymph nodes around the left gastric artery and the celiac artery were dissected. The left gastric artery was divided after double-clipping.
4. The abdominal esophagus was exposed and clamped. The esophagus was cut and sutured as a preparation for 25-mm anvil. Then 25-mm anvil was placed in the esophagus. The stomach was put into the plastic bag not to contaminate the peritoneal cavity.
5. The small 45-mm incision was made below the navel and the stomach was taken out from the body. The jejuno-jejunostomy of Roux-en Y anastomosis was made first and the small incision was sealed using the glove. Under a very nice laparoscopic view the esophago-jejunostomy was made by 25-mm circular stapler inserted through the glove.

Results: We have performed LTG with dissection of the regional lymph nodes (D1+) for gastric cancer patients. Dissecting lymph nodes at the supra-pancreatic area was easier in our procedure with coaxial scope setting.

P174 - Gastroduodenal Diseases

Experience with Transumbilical Single-Incision Laparoscopic Local Resection of the Stomach for Gastrointestinal Stromal Tumor

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Background: Single-incision laparoscopic surgery (SILS) is an emerging procedure developed to decrease parietal trauma and improve esthetic outcomes. Gastrointestinal stromal tumor (GIST) of the stomach is a good indication for SILS. We reported our experience with transumbilical single-incision laparoscopic local resection of the stomach for GIST.

Materials and Methods: From May 2011, we performed above procedure in 5 patients. They are 2 males and 3 females, and the mean age was 65 years (range: 39–83 years). The gastric tumor located in the anterior wall side of the body in one patient, posterior wall sides of the body and fornix in each 2. Under general anesthesia, a 2.5-cm longitudinal skin incision was made at the umbilicus. Lap-protector was applied and covered by the glove. Two 5-mm ports and one 12-mm port were inserted into the peritoneal cavity through the glove. We used hands-free retraction system, flexible port and pre-bending forceps to retract the stomach or divide the greater omentum. Depending on the location of the tumor, local resection of the stomach including GIST was performed by a linear cutter. The specimen was retrieved through the umbilicus using a plastic bag.

Results: There was no additional port or conversion to standard laparoscopic procedure and open procedure. The mean operation time was 177 min (range: 93–281 min) and the estimated blood loss was within 50 ml. There were no intra- and postoperative complications. The hands-free retraction system made a better operative field by retracting the wall of the stomach in case of the tumor located in the posterior wall side. The crushing between the instruments or laparoscope and 5-mm instruments was reduced by flexible port and pre-bending forceps. The mean postoperative hospital stay was 7.6 days (range: 4–12).

Conclusion: Transumbilical single-incision laparoscopic local resection of the stomach for GIST is a feasible and safe procedure with a better esthetic outcome by experienced laparoscopic surgeons.

P175 - Gastroduodenal Diseases

Application of Single-Incision Laparoscopic and Endoscopic Cooperative Surgery (Si-LECS) for Gastrointestinal Stromal Tumor (GIST) of the Stomach

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Aim: Laparoscopic wedge resection has been increasingly applied for GIST of the stomach. However, laparoscopic wedge resection should not be adapted for GISTs located near ECJ or the pyloric ring. When tumor is resected by use of the conventional laparoscopic liner stapler technique, it may cause gastric obstruction and also a resection of relative large section of healthy stomach may be required. What is worse, when the tumor is of intraluminal growth type, it is difficult to recognize from the location and the accurate line to be cut off. We have therefore adopted Si-LECS in order to solve these problems.

Methods: A 20-mm incision was made in the umbilicus. A SILSPort (Covidien) was placed through an open approach, and a 5-mm laparoscope and two 5-mm ports were inserted through the SILS port. The location of the tumor was confirmed by intraluminal endoscopy. Blood vessels in the excision area around the tumor were cut by using an ultrasonically activated device (LCS). When the tumor was located at posterior of the fornix, for example, the short gastric vessels should be cut to provide a better working space. Accordingly, both mucosal and submucosal layers around the tumor were circumferentially dissected by using IT knife via intraluminal endoscopy. Subsequently, the seromuscular layer involving three-fourths of the line of incision around the tumor was laparoscopically dissected by using LCS. The Resected tumor was collected into Endo-catch. The incision line was then properly closed with EndoGIA. An air leakage test was performed by use of endoscopic insufflations.

Results: There were 4 patients with the mean age of 60.5 (range; 51-73). All procedures were completed successfully without any perioperative complications. During the surgery, we converted to neither the conventional laparoscopic surgery nor the open surgery. The mean operative time was 140.1 min.

Conclusions: Taking it into consideration that Si-LECS for dissection of GIST can be performed in safety and also that a success by this procedure is not attributed to the location of the tumor, we came to the conclusion that Si-LECS is an excellent procedure to be adopted for the dissection of GIST

P176 - Gastroduodenal Diseases

The Use of Robotic Surgery for Resection of Gastric Submucosal Tumors

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Aims: Gastrointestinal stromal tumors (GISTs) represent 80 % of sarcomas of the gastrointestinal tract with the majority found in the stomach in submucosal location. Treatment includes surgical resection with negative margins. We hypothesize that robotic surgery enables minimally invasive resection of GISTs, especially in difficult locations that would otherwise require open resection. This pilot series describes our initial experience.

Methods: Clinicopathological data of all patients undergoing robotic procedures for gastric tumors (non-adenocarcinomas) in our institution since August 2008 were retrospectively analyzed. A total of 19 patients (10 male) with a median age of 60 (range 31–79) and a median BMI of 38 (range 18–44) underwent partial laparoscopic -robotic assisted gastrectomies with primary closure.

Results: The tumors were classified intra-operatively by their anatomic location with seven in zone 1 (cardia and GE junction), nine in zone 2 (body) and three in zone 3 (antrum). Thirteen were located on the anterior and six on the posterior gastric wall. 63 % were true GIST tumors on final pathology with the remaining being leiomyomas, one lipoma and one polyp. In the GIST group two patients (16.6 %) had a focally positive margin. The median tumor size was 4.95 cm (range 2.5–14 cm) and the median estimated blood loss was 60 ml. The mean OR time was 241 min with a mean robotic console time of 119 min. Postoperative major morbidity was 26.5 % with the following complications: two gastric bleeds managed non-surgical, 2 strictures with one requiring re-operation and one death due to an embolic stroke. Patients were hospitalized for a median of 4 days (range 2–9) and resumed a diet at 3.5 days. With a median follow up of 19 months (2–32) in the GIST group all patients remain without evidence of disease.

Conclusion: Our data suggests that the use of robotic technology allows for partial gastric resection in a minimally invasive approach, especially in cases with difficult tumor location where the use of laparoscopic staplers would not be possible and an open approach may be necessary. This technology widens the application of minimally invasive surgery in the treatment of gastrointestinal malignancies.

P177 - Gastroduodenal Diseases

Single Port Access (SPA™) Total Gastrectomy for Gastric Cancer

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Background: Single incision laparoscopic surgery is an advance where in laparoscopic surgery is carried out through a single small incision hidden in the umbilicus. Advantages of this technique over standard laparoscopy are still under investigation. The objective of this study is to describe the short term outcomes of single port access (SPA™) total gastrectomy in a single community based institution.

Method: Single-port laparoscopic total gastrectomy with D1α lymphadenectomy was successfully performed using a transumbilical single incision. Straight and prevented tipped laparoscopes were used to obtain off-axis views of the operative field. A flexible tipped stapler and curved instruments were used to reconstruct Roux en Y esophagojejunostomy. The procedure was performed without compromising standard, oncological principles. A total of 3 cases diagnosed with gastric cancer.

Result: The average surgical time was about 210 min. In almost all operations, we successfully managed to get an adequate operative field. There were no additional trocar in single port surgery cases. Proximal and distal resection margins were tumor free. Furthermore, 36 tumor-free lymph nodes on an average were harvested. The patient was discharged on postoperative day 9.

Conclusions: SPA™ appears to be a promising alternative to conventional laparoscopic total gastrectomy with acceptable. This operation could be safely performed today with prevented instrumentation.

Further improvements in the instrumentation should improve the outcomes and adoption of this procedure.

P178 - Gastroduodenal Diseases

4-Port Laparoscopic Gastrectomy for Gastric Cancer

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Background: Laparoscopy-assisted gastrectomy (LAG) has been widely accepted as one of the treatment for gastric cancer in Japan. Many surgeons accept a standard 5-port technique in LAG. The procedure needs not only an assistant surgeon but a scopist.

Herein we demonstrate an operative technique of a 4-port laparoscopic gastrectomy (4-Port LG) with two surgeons for gastric cancer.

Operative Procedure: Excepting optical port made in the umbilicus, 4-Port LG needs another three trocars inserted through abdominal wall, two in the left upper quadrant, another one in the right upper quadrant. We need only one 12-mm trocar placed in the left subcostal region for the surgeon and two 5-mm trocars. The surgeon operates from the left side of the patient. The assistant who manipulates the 10-mm flexible laparoscope in his right hand is positioned on the right side. The operator standing on the left side of the patient performs all procedures intracorporeally, mobilization of the stomach, regional lymph node dissection and reconstruction using linear staplers.

In the case of total and proximal gastrectomy, the Nathanson Liver Retractor placed in the subxiphoid is recommended for reconstruction.

Results: From August 2007 to December 2012, 230 patients underwent 4-Port LG with lymph node dissection. The surgical approach was as follows: 149 patients underwent distal gastrectomy, 29 underwent pylorus preserving gastrectomy, 18 underwent proximal gastrectomy and 34 underwent total gastrectomy. Of these, 4 (1.7 %) patients required additional port placement and 5 (2.1 %) required conversion to open surgery with a locally advanced cancer in 3 and a technical failure of the anastomosis in 2. The average operation time in pneumoperitoneum was 193 ± 62 min. There was no postoperative mortality. Median postoperative hospitalization was 7 ± 10 days.

Conclusion: 4-Port LG that needs only two surgeons is a feasible technique for surgery in patients with gastric cancer.

P179 - Gastroduodenal Diseases

A Case of Laparoscopy and Endoscopy Cooperative Surgery for Early Duodenal Cancer

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Introduction: Early duodenal cancer is a rare malignant tumor, and no standard therapy is established. Endoscopic submucosal dissection (ESD) is a therapeutic option, but it is not popular owing to the risk of perforation. We report a case of early duodenal cancer that was successfully treated by laparoscopy and endoscopy cooperative surgery (LECS).

Case: A 65-year-old asymptomatic man received screening esophagogastroduodenoscopy, which showed a small protruded lesion in duodenal bulb. Biopsy of the lesion revealed adenocarcinoma cells in the submucosal layer covered with normal mucosa. As metastatic cancer was suspected, whole body evaluation including colonoscopy, computed tomography, and positron emission tomography was performed. However, no other primary lesion was detected. On the other hand, swollen lymph nodes in the jejunal mesentery had been pointed out four years before and had been gradually increasing in size, but it was not certain whether the lymph nodes were related to the duodenal lesion. Then, for the purpose of therapeutic diagnosis, LECS was performed. In the operation, the periphery of the duodenal lesion was marked endoscopically using ESD technique, and artificial perforation was closed by laparoscopic hand suturing technique. At the same time, one of lymph nodes in the jejunal mesentery was picked up laparoscopically. Histopathological examination demonstrated primary duodenal cancer (moderately differentiated tubular adenocarcinoma, 2 mm in diameter, submucosal 600 μ m invasion, no lymphatic-vascular invasion, negative surgical margin) and Follicular lymphoma. We thought radical excision was achieved for duodenal cancer, and started chemotherapy for Follicular lymphoma.

Conclusion: LECS is an effective procedure for resecting a gastroduodenal tumor with minimum removal of normal wall. This approach may be a therapeutic option for early duodenal cancer.

P180 - Gastroduodenal Diseases

The Ways of Improvement of Patients with Acute Appendicitis Destructive Forms Laparoscopic Treatment

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Aims: To estimate the efficiency of using of Coliproteophage in the laparoscopic appendectomy (LA) among the patients with acute destructive appendicitis.

Methods: The comparative characteristic of two groups of patients to whom LA for acute destructive appendicitis was performed, was conducted. There were 37 male and 131 female patients aging from 18 till 64 years. Acute phlegmonous appendicitis was diagnosed in 126 patients, gangrenous appendicitis—in 34 patients, perforation of appendix with peritonitis was observed in 8 patients. Patients were randomized on two groups according to appendicitis destructive forms types. In the main group (n = 85) the operation with irrigation of the inflammation locus with Coliproteophage of 20–200 ml was performed. In the group of comparison (n = 83) 38 patients the irrigation of the inflammation locus wasn't performed, in 45 patients the irrigation with solution of Decasanum was applied. LA with ligatured method was performed. According to indications laparoscopic sanitation of abdominal cavity was applied.

Results: In the study group normalization of body temperature, reducing of leucocytes were noted in 55 patients in the first day, in 26 patients—in the end of the second day, in 4—in the third day after surgery. The average bed day was 6.2. In the group of comparison the reducing of body temperature and leucocytes in the end of 2–3 days were noted in 36 patients, in 5 patients—in the 4–5th days. In the 5th day after normalization of inflammatory changes in blood 4 patients had only once hyperthermia 38C. 2 patients had persistent hyperterms till 38 C in the postoperative period, during for 4 days. The average bed day was 8.7. Septic complications after surgery in both groups were absent.

Conclusions: The use of Coliproteophage in LA can improve the results of treatment of patients with destructive forms of appendicitis, and thereby reduce the bed days.

P181 - Gastroduodenal Diseases

Feasibility and Safety of Laparoscopic Esophagejejunostomy: Hand-Sewn Purse-String Suture for Insertion of Anvil Head Followed by Circular Stapler

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Background: While laparoscopic distal gastrectomy has been widely performed in clinical practice, laparoscopic total gastrectomy (LTG) and proximal gastrectomy (LPG) are not familiar because of difficulties in esophagejejunostomy (EJ). The objective of the present study is to assess short-term outcomes of our procedure of intracorporeal EJ with hand-sewn purse-string suture for insertion of anvil head followed by circular stapling device.

Surgical Procedures: We perform reconstruction during total gastrectomy (LTG) by a Roux-en-Y and during proximal gastrectomy (LPG) by a jejunal interposition. After clearance of surrounding connective tissue of the esophagus, two-thirds or three-quarters of the esophageal wall is transected with laparoscopic coagulating shears, but not completely to avoid a retreat of esophageal stump into the mediastinum. A hand-sewn purse-string suture of the esophagus using 3-0 VYCRLY is made. The needle is passed through the wall from the outside to the inside and from the inside to the outside at the 4-5 times. Because the esophagus is not incised to entire circumference, good operative field around the esophagus is provided with traction of the stomach by assistant. A 4-5 cm vertical median incision is made and the anvil head of a 25 mm circular stapler is inserted into the abdominal cavity. The anvil head is introduced into the esophagus and the purse-string suture is tied. Then the remnant esophageal wall is cut. Endoscopically esophagejejunostomy is completed using circular stapler inserted into the abdominal cavity through the minilaparotomy

Results: Between April 2011 and December 2012, this product was used in 37 patients (30 men and 7 women). 35 patients had cancer and 2 patients had GIST. LTG was performed in 28 patines and LPG in 9. The mean operation time was 211 \pm 39 min and estimated blood loss was 32 \pm 30 ml. No anastomotic leakage was observed, but anastomotic stenosis developed to 2 patients after discharge and underwent endoscopic balloon dilation.

Conclusion: This procedure is the similar method as conventional open surgery, and feasible and safe.

P182 - Gastroduodenal Diseases

Effectiveness of Laparoscopic Fundoplication in the Treatment of Hernias of the Diaphragm Esophageal Opening

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Aim: To estimate the possibility of applying different forms of laparoscopic fundoplication in the treatment of ruptures of the diaphragm esophageal opening.

Methods: From 2006 to 2010 there were operated 262 patients with the ruptures of the diaphragm esophageal opening in the clinic; 123 men and 139 women; aged from 20 to 74; average—42.6 + 6.1 years. The disturbance of the motor activity of the gullet was revealed in 8.5 % of patients. According to the data of endoscopy, esophagitis of I st. was in 23 % of patients, II st.—in 58 % of patients; esophagitis of III st.—in 12 % of patients, Baretta gullet—in 7 %. All operations were performed with the use of the laparoscopic technology: fundoplication by Nissen—in 132 patients, fundoplication according to Nissen-Rosetti—in 91 patients, fundoplication by Toupe—in 39 patients.

Results: There was no lethal outcome after laparoscopic fundoplication. The complication rate after operations was 5.5 %; conversion was in 3 (6 %) patients. Causes for the conversion are: rupture of the diaphragm esophageal opening of IV degree with the displacement of more than 2/3 of the stomach in the pleural cavity. The average hospital stay made up 3.8 \pm 2 days. The long-term results are studied in 238 (91 %) patients in 12–48 months after the laparoscopic fundoplication. Good results were in 92 % of the patients, the relapse of ruptures of the diaphragm esophageal opening—in 3.5 % of the patients. The study of the intra-esophageal pressure in the zone of esophageal-stomach passage showed a reliable increase in this index from 8.4 \pm 3.0 mm Hg to 15.2 \pm 4.0 mm Hg (p < 0.05). Excellent and good results (Visick I-II) were in 92.3 % of the patients after fundoplication by Nissen, in 70 % after fundoplication according to Nissen-Rosetti and only in 66.6 % after fundoplication by Toupe.

Conclusions: The results are evidence of the great effectiveness of the laparoscopic fundoplication. In the long-term period the functional results are better in the patients after the laparoscopic of fundoplication by Nissen.

P183 - Gastroduodenal Diseases

Peculiarities of Course of the Mallory-Weiss Syndrome

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Aims: Studying of the Mallory-Weiss syndrome peculiarities of course in different patient groups.

Materials and Methods: It was included 2882 patients in research gastro-intestinal bleedings, which received to the clinic of the gastro-intestinal bleeding from March 2007 till December 2009. Conducted retrospective analysis of 114 history of patient illnesses in which was revealed Mallory-Weiss syndrome (4.3 %).

Results: Mucous gap was located in the front wall 2.3 times less—18 (15.8 %) patients, middle-left wall 2.7 times less—15 (13.2 %) patients comparing with first-right gap wall. During the analysis the Mallory-Weiss syndrome of course was set in 85 (74.6 %) occasions it was complicated concomitant gastroduodenal pathology, the most gastroduodenitis—40 (47 %) patients, erosive esophagitis in 10 (11.8 %); 13 (15.3 %) patients had erosive esophagitis and gastroduodenitis, 2 (2.4 %) varicose veins of esophagus, 2 (2.4 %)—hernia of esophagus hole of diaphragm. It was diagnosed bleeding stomach ulcer in 11 (12.9 %) cases, in 7 (8.2 %)—bleeding duodenum ulcer. Among all 85 patients that had concomitant gastro-duodenal pathology, hernia of the esophageal opening of diaphragm is diagnosed in 7(8.2 %) patients.

Conclusions: 1. The moderate degree of difficulty of blood loss (78.9 %) in patients with the Mallory-Weiss syndrome in 9 times more often met than heavy blood loss (8.8 %). 2. Stable haemostasis FIII (68.4 %) in 15.5 times appeared more often than lasting bleeding FIx (4.4 %). 3. Gaps of mucous membrane mostly localized on first-right (35.9 %) and back (35.1 %) walls—in 71 % of patient. 4. The Mallory-Weiss syndrome at the 21.1 % cases of the complicated motion in combination with other pathology combined with a bleeding gastric (12.9 %) ulcer and bleeding duodenal (8.2 %) ulcer, that came forward as the second source of bleeding.

P184 - Gastroduodenal Diseases

Laparoscopy Total Gastrectomy with Extended Lymph Node Dissection for Gastric Cancer

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Laparoscopy-assisted total gastrectomy (LATG) with extended lymph node dissection has yet to be widely adopted for the treatment of gastric cancers because of the perceived complexity of the procedure. Lymph node dissections of No. 10, 11p, 11d and esophagojejunal anastomosis are the most important and demanding procedures in this approach. To perform a secure extended lymph node dissection in LATG, we employ intracorporeal mobilization of pancreas and spleen and a left-sided approach for dissection of lymph nodes in the left gastropancreatic fold. To facilitate intracorporeal esophagojejunal anastomosis, we developed a circular-stapled esophagojejunal anastomosis using a flip top anvil. In this procedure, an anvil head was introduced into the esophagus trans-orally, and esophagojejunal anastomosis was performed using a hemi-double stapling technique. The jejunoejejunal anastomosis was also performed intracorporeally using side-to-side anastomosis technique with linear staplers.

Between April 2010 and December 2012, a total of 30 patients had undergone LATG, mean operating time was 338 min and mean blood loss was 179 ml. The mean postoperative hospital stay was 23 days.

LATG with extended lymph node dissection is a feasible and safe procedure as a treatment of gastric cancer.

P185 - Gastroduodenal Diseases

Reduced Port Distal Gastrectomy Using EZ Access Oval Type Versus Conventional Laparoscopic Distal Gastrectomy: A Comparison of Short-Term Outcomes

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Aim: To compare the short-term surgical results between reduced port distal gastrectomy (RPDG) using an EZ access oval type and conventional laparoscopic distal gastrectomy (LDG) for gastric cancer and to evaluate the feasibility of RPDG for gastric cancer.

Methods: The EZ access oval type device is a novel multichannel port device developed to reduce clashing between the working ports during reduced port surgery (RPS). We performed laparoscopic distal gastrectomy through an umbilical port plus another 5 and 2 mm ports as an RPDG. Between April 2010 and November 2012, 34 patients underwent LDGs that were performed by a single surgeon. Of these, 17 patients underwent RPDG using an EZ access oval type, and the remaining 17 patients underwent conventional LDG (12 mm ports × 5). The short-term outcome was compared between the two groups.

Results: All routine procedures of conventional LDG were achieved in RPDG. The length of the operation, blood loss, hospital stay, complication rate and number of dissected lymph nodes were similar in both groups. The VAS score was reduced in the RPDG group compared with the LDG group (2.1 vs. 2.8), but this difference was not statistically significant ($p = 0.21$).

Conclusion: Reduced port surgery using the EZ access oval type procedure was successfully applied for gastric cancer without prolonged operation time. This method is technically feasible and produces superior cosmetic results. The EZ access oval type procedure may, therefore, have several advantages for performing reduced port surgery.

P186 - Gastroduodenal Diseases

The Role of Laparoscopy in Preoperative Staging of Gastric Cancer

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Background: The stage of disease is the most important prognostic factor in upper-GI malignancies. Peritoneal carcinomatosis is commonly associated to a very poor prognosis. The preoperative detection of peritoneal metastases is crucial in order to give the patient the best current medical treatment, avoiding surgical morbidity.

The aim of our study was to assess the diagnostic performance of staging laparoscopy in detecting peritoneal carcinomatosis with respect to multi-detector CT-scan.

Methods: Two hundred and forty-two patients out of a consecutive series of 1800 patients with gastric adenocarcinoma underwent a preoperative staging CT followed by a staging laparoscopy. We assessed the diagnostic performance of laparoscopy with respect to gold standard pathological examination.

Results: The diagnostic performance of staging laparoscopy in our case series was as follows: accuracy 94.2 % (CI 95 % 94.17–94.23), sensitivity 65 % (CI 95 % 64.94–65.06), specificity 100 %, positive predictive value 100 % and negative predictive value 93.5 % (CI 95 % 93.46–93.53). No grade III surgical complication was observed.

The diagnostic performance of multi-detector CT scan as found in literature range as follows: accuracy 60–80 %, sensitivity 55–80 %, specificity 50–75 %, positive predictive value 25–40 %, negative predictive value 80–95 %.

Discussion: Preoperative laparoscopic staging of gastric cancer is indicated for patients with potentially resectable gastric cancer so as to avoid unnecessary palliative surgery.

P187 - Gastroduodenal Diseases

Endoscopic Resection for a Periapillary Malignant Villous Adenoma

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Introduction: Primary malignant tumors of the duodenum represent 0.3 % of all gastrointestinal tract tumors but up to 50 % of small bowel malignancies. The most frequent tumor of the duodenum is adenocarcinoma.

Method: We present a case of periapillary duodenal villous adenoma admitted in Emergency Hospital for jaundice. The case is discussed in terms of the literature review.

Results: A 83 years old patient is admitted for jaundice after a laparoscopic cholecystectomy 2 months before. Colangio-MRI revealed a dilated common bile duct (2 cm) and a duodenal tumor with size 3/1.5 cm. An endoscopic retrograde cholangiopancreatography was performed with snare resection of the villous adenoma and stenting the CBD with 10 Fr stent for biliary drainage. After that the patient developed an asymptomatic pancreatitis with elevated blood amylase (2332U/L) which was subsequently submitted under conservative treatment. The patient was discharged after 8 days of hospitalization. Histopathology revealed a villous adenoma with high grade dysplasia.

Conclusions: The treatment of periapillary adenomatous tumors is challenging and in selected cases endoscopic snare resection may be feasible.

Keywords: Periapillary tumor, Endoscopic snare resection, High grade dysplasia

P188 - Gastroduodenal Diseases

Laparoscopy Assisted Proximal Gastrectomy Using Open Esophagogastronomy with Formation of Angle of His

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Purpose: Proximal gastrectomy for early gastric cancer in upper third of stomach can preserve the function of stomach and improve the nutrition and quality of life. However, reflux esophagitis has been frequent in proximal gastrectomy. We assess the feasibility of laparoscopy assisted proximal gastrectomy (LAPG) with formation of Angle of His.

Methods: Four patients received the LAPG between July and December 2012. After the laparoscopic dissection of lymph node, we made the upper midline incision. Proximal stomach was resected and esophagus was anastomosed to anterior stomach at 3 cm below the resection line. Greater curvature side of resection line in stomach was fixed to diaphragm for artificial Angle of His.

Results: LAPG with formation of Angle of His was successfully performed in 4 patients without any postoperative complications. There was no reflux symptom in 3 patients during a follow up period of 3 months. Anastomotic stenosis developed at postoperative 3 months in 1 patient and improved after the endoscopic balloon dilatation.

Conclusion: LAPG with formation of Angle of His was feasible. Long term follow up result will be needed.

P189 - Gastroduodenal Diseases

LADG(Laparoscope-Assisted Distal Gastrectomy) Performance in our Institute

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LADG is becoming popular in Japanese medical institutes. But the technique of LADG is very difficult. So not many surgeons can perform the operation.

In our institute, from 2010 we have invited the operation staff for LADG of Iwate medical university. In 2010 we had five times of LADG operation by LADG specialist operator, and we assisted the operation.

And we studied many time of video clinic and dry labo technique. But, in 2011 we had the East Japan earth quake disaster and tsunami.

Our institute got sever damage and could not have operation from May, 2011 to September. And had no operation of LADG.

But in 2012, We operated LADG 5 cases. Operator was the specialist in one case, and the operators of other 4 cases were our staff.

All cases got clinically good course after operation.

P190 - Gastroduodenal Diseases

Endoscopic Methods at Alien Bodies of Department Path of Alimentary

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During hospital 354 patients with alien bodies upper a department of a digestive path have acted. In the age of from 6 months till 80 years. Men was 51.4 %, women 48.5 %. Many patients are hospitalized in the first day 79 %, for the second day 12.4 %, in 3–4 day and more than 7.9 %. The alien body was in a gullet at 81.9 %, in a stomach 16.3 %, in a duodenal gut—at 1.6 % patients.

Method have been removed at 63.4 % patients and are reduced in a stomach at 33,8 %. For removal of coins, badges and other metal subjects at 88 patients we used nippers of type 'rat tiph'.

At 86 patients slices of bones, nails took polipectomy a loop or basket Dormia. Sewing needles at 9 patients deleted biopsy torn.

In one case for extraction sharp cutly a subject (edge) on distal the end phibroscope put on a tube and 3 a polymeric material.

At 8 patients at extraction method there has come punching of a wall of body: at 5 from them owing to formation at a long finding of an alien body, at 3—because of rough manipulation with endoscope. All patients are operated under intubation a narcosis. Link sided colotomy it is applied at 5 patients, thoracotomy—at 3. At 1 patient with punching a forward wall of a duodenal gut by a sewing needle it is executed laparoscopy removal.

Thus, carrying out medical-diagnostic gastroscopy at alien bodies of the top department of a digestive path promise their importance, relative safety and high efficiency.

P191 - Gastroduodenal Diseases

Laparoscopy Assisted Gastrectomy in Island of Japan

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Laparoscopic surgery for gastric cancer is one of the established routine procedures in large center hospitals in Japan, although not always applicable in rural districts.

Our institution is an small island hospital, and is concerning with medical affairs for 35,000 people who live in a smaller island in a rural region of Japan.

When our islanders get serious disease, certain proportions of them would visit urban central hospitals, searching advanced medical care. But other islanders who had gotten serious disorders would prefer our country hospital within the island where they live. For those who pursue medical care in our country hospital, we introduced laparoscopy assisted gastrectomy (LAG) since 2008. We now explain 5-year experience and clinical results in our in-island institution.

After 10 years practice as a general surgeon, the author received six-month training course at a mega-center cancer institution in Tokyo, and experienced 75 cases as scopist, 25 cases as assistant, and 16 cases as chief operator. After 6 month training course, the author returned to the island hospital and commenced LAG in early April, 2008. At first LAG in our island hospital, the author invited one of instructors from training center and received practical instructions.

After that, we performed 23 LAG in 5-years. Mean Operation time was 272 min, whereas mean blood loss was 42.5 ml, indicating the safety of this procedure, even in our in-island country institution. All patients are living disease-free, except one who expired of unrelated disease.

Our results that the people who reside even in a rural island could receive advanced medical care encourage health-care, relief of inhabitants, and continuity of the district.

For safe introduction of a new procedure, training is indispensable in a high volume center, where all works and procedures are constructed with fixed form.

P192 - Gastroduodenal Diseases

Laparoscopic Gastrojejunostomy to Palliate Malignant Gastric Outlet Obstruction

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Aim: In the palliative setting the main clinical goal for patients with malignant gastric outlet obstruction is to restore oral intake. Laparoscopic gastrojejunostomy (LGJ) has been introduced as an alternative with improved outcomes in these patients but there is still few data to adequately compare LGJ with other conventional techniques. The aim of this study is to share our experience on LGJ in terms of clinical outcomes.

Methods: We have performed LGJ in nine consecutive adult patients with malignant gastric outlet obstruction between June 2008 and Jan 2013. Only three ports have been used. Suitable jejunal part was found and approached to the gastric wall with intracorporeal stay sutures and holes were opened on both gastric and jejunum walls. Gastrojejunostomy was established by using linear staplers. The staple hole was closed with laparoscopic sutures. No drains were placed.

Results: LGJ technique was successfully used in all nine patients. Mean age was 60 (range 51–73), mean blood loss was 50 (range 20–150) ml. No patients required conversion to open surgery. Median operative time was 95 (range 70–135) min, median postoperative hospital stay was 5 (range 3–10) days. 5 patients had pancreatic tumor, 2 had duodenal tumor, 1 had metastatic breast cancer and 1 had metastatic lung cancer. Two patients suffered respiratory tract infections, one had upper gastrointestinal bleeding, two had delayed gastric emptying during postoperative course. No mortality at 30 days.

Conclusion: The LGJ is well tolerated and restores oral intake quickly in patients with malignant gastric outlet obstruction. With few complications it provides short hospital stay without negative impact on survival. Randomized trials may be needed to estimate the efficacy of LGJ compare to other conventional techniques in these patients.

P193 - Gastroduodenal Diseases

Rupture of Gastrointestinal Stromal Tumor During Laparoscopic Gastric Resection as a Result of Misplaced Stay Stitch

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Aim: Laparoscopic resection has become a preferred method for the resection of gastric stromal tumors (GIST) recently. However concern exists for technical feasibility related to location, number of tumors and also tumor size. We present an interesting cause of tumor rupture during laparoscopic gastric wedge resection which can effect oncologic outcome.

Method: 54 years old male patient underwent laparoscopic gastric wedge resection for stromal tumor located at the anterior wall of gastric fundus. The tumor size was 4.0 cm. Tumor was resected with negative margins by using endoscopic linear staplers. Resection line was enforced with nonabsorbable sutures.

Result: Once the Endo GIA jaws were squeezed for the last fire, the tumor capsule was ruptured by the “string like” stay stitch which is placed about 3 cm beyond the tumor margin. The stay stitch acted like a scalpel and damaged tumor integrity. Resected specimen was placed in endobag immediately and operation field was flushed with saline.

Conclusion: Laparoscopic gastric wedge resection for gastric GIST is feasible and safe, when performed by experienced laparoscopic surgeons. Surgery remains as a curative treatment for non metastatic gastric GIST. The integrity of tumor capsule and negative margins are important factors in terms of long terms oncologic safety and efficacy. Great attention should be focused on preserving tumor integrity during laparoscopic resection.

P194 - Gastroduodenal Diseases

Results After Laparoscopic Fundoplication with Transposition of the Left Liver Lobe

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To prevent relapses and to support the hiatoplasty in laparoscopic hiatal hernia surgery synthetic and biological meshes are increasingly recommended. Mesh associated complications such as perforation, migration and infections are potential drawbacks.

A recently published “hepatic shoulder technique” makes use of the mobilized left liver lobe to cover the hiatoplasty. We present our experience with this alternative technique.

We prospectively evaluated 11 patients operated between 2010 and 2012. All patients had large hiatal hernias between 4 and 8 cm (1 upside-down stomach, 1 recurrent hernia). In 7 cases a Nissen fundoplication was performed, in 4 a partial Toupet fundoplication.

After suture hiatoplasty the left liver lobe was mobilized laparoscopically and the left triangular ligament was dissected. The remnant of the ligament was armed with a non-absorbable suture and drawn to the left side between hiatus and distal esophagus thereby interposing the left liver lobe. The left triangular ligament was then sutured to the left diaphragm with 1–2 non absorbable sutures. All operations could be completed laparoscopically without any adverse intra- or postoperative events.

Nearly all patients underwent a clinical and radiologic follow up by CT scans (~75 %). Clinical assessment was evaluated after a media follow-up of 6 month. All patients reported of an absence of typical symptoms like heartburn, reflux an acid regurgitation. All their accessory symptoms have been documented in a 10 questions GIQLI pre and post surgery. In one case a radiologic recurrent hernia was documented without clinical worsening of symptoms.

Our series shows that the hepatic shoulder technique offers a safe alternative for patients with large hiatal hernias and surgeons who want to avoid mesh associated complications.

* “hepatic shoulder technique” *P. Quilici surg endosc 2009 nov. 23:2620–2623*

P195 - Gastroduodenal Diseases

Laparoscopic Surgery Gists of Stomach and Duodenum

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Introduction: Gastrointestinal stromal tumors (GISTs) are the most common mesenchymal neoplasms of the gastrointestinal tract, which compose 1 % of all masses of this localization. Approximately 50–70 % of GISTs originate in the stomach. The small intestine is the second most common location, with 20–30 % of GISTs arising from the jejunum. Malignant potential of this kind of tumors have determined active surgical tactics directed for its removal. Diagnostic of early neoplasms and exclusion dissemination from gastrointestinal stromal tumor granted different minimally invasive methods, particularly laparoscopic approach.

Materials and Methods: Since 2008 till October 2012 13 patients suspicious GIST were treated. All patients underwent EUS, which confirmed presumptive diagnosis. Abdomen CT showed non metastatic GIST in all cases. 12 patients had tumor in stomach, 1—in duodenum. In 2 cases lesions located in anterior gastric wall in stomach body, next 3 cases—subcardia area in posterior (2) and anterior (1) gastric wall, also 2 cases—gastric fundus and on one occasion greater curvature and four in angle of the stomach. Tumors sizes ranged from 1.5 to 6.5 cm.

All patients underwent laparoscopic wedge resection of affected organ (in 1 case—transgastral tumor removal under double endoscopic control). Labeling of tumor margins was carried out with the help of laparoscopic ultrasound. Wedge resection was performed using ultrasound scissors, intending 1 cm of the tumor margin.

Tumors were extracted in container from abdomen cavity. Gastotomy was closed up by double-rowed interrupted sutures.

Results: Operation time was ranged from 75 to 320 min. Histology and immunohistochemistry (IHC) confirmed GIST in 11 patients, 1 patient had aberrant pancreas. Tumor in duodenum was Brunner's gland adenoma. According to IHC results none of the patients required adjuvant therapy.

Postoperative follow-up was during 1–3 year.

Abdomen CT and upper GI endoscopy showed no pathological changes. Recovery was uneventful.

Conclusion: Laparoscopic surgery is feasible, safe and effective technique for GIST removal in selected patients.

P196 - Gynaecology

Technical Aspects of Laparoscopic Treatment of Retrocervical Endometriosis

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Laparoscopic treatment of retrocervical endometriosis is often as difficult as oncological procedures. Multidisciplinary approach, good knowledge of anatomy, high level of equipment, highly skilled surgeon and well trained team is needed.

When talking about surgical treatment of retrocervical endometriosis questions that are usually raised up are following: which type of energy to choose (bipolar, ultrasound etc.), which tactic (direct or reverse resection) and is total resection of lesion is necessary.

In 2008–2013 we have treated 165 patients with retrocervical endometriosis with rectum and sigmoid involvement in 68 cases. “Shaving” procedure was performed in 38, wedge resection in 12 and circular resection in 18 cases.

In our experience the ultrasonic scissors are more preferable to use for this type of surgery. Compared to LigaSure, RoBi instruments, monopolar hook they allow to dissect tissues more accurately, not loosing the plane of dissection, even in difficult anatomical situations. Ultrasound leaves less tissue burned, there is no risk of electrosurgical complications, no need to change cutting and coagulating instruments.

When excising the infiltrating endometriosis we do not follow only direct or reverse technique. The only obligatory steps are prior dissection of ureters. We prefer reversible mode, moving from easy to difficult zones. While untwisting the bowel, that is involved in the process in a snail form, difficult planes can become easy ones.

Very important is the choice of the safe layer of sigma and rectum dissection. Nerve sparing technique is performed inside the visceral layer of peritoneum, not touching the pararectal cellular tissue and nerves.

P197 - Gynaecology

Use of a Wound Retractor During Isobaric Laparoendoscopic Single-Site Surgery With The Abdominal Wall Lifting Method For Adnexal Tumors

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Aims: Transumbilical laparoendoscopic single-site (LESS) surgery is a recent advancement in minimally invasive surgery. However, this procedure usually requires a specialized multichannel port for introducing the laparoscope and instruments. In an isobaric (gasless) procedure using the abdominal wall lifting method, a wound retractor alone can conveniently be utilized for transumbilical single-site access. Here we report our experience with isobaric LESS surgery in 6 patients with adnexal tumors.

Methods: We made a 2.0-cm vertical midline umbilical skin incision and performed three isobaric LESS unilateral ovarian cystectomies (dermoid cyst, 2; serous cystadenoma, 1) and three LESS unilateral salpingo-oophorectomies (dermoid cyst, 1; serous cystadenoma, 1; simple cyst, 1) with multiple instruments inserted through the wound retractor (Lap Protector 1–2 cm; Hakko Medical Co., Ltd., Nagano-Ken, Japan). We performed intracorporeal adnexal surgery and, if necessary, moved the wound (“moving windows method”) to the lower abdomen and performed extracorporeal suturing.

Results: No conversion to either conventional laparoscopic surgery or laparotomy was necessary in this series. There were no port-related complications, and cosmetic results of the surgical wounds were satisfactory.

Conclusion: Use of a wound retractor provides easy access during isobaric LESS for adnexal tumors and is safe and reliable.

P198 - Gynaecology

Complications After Laparoscopic Rectal Resection of Deeply Infiltrating Endometriosis

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Purpose: Deep infiltrating endometriosis with colorectal involvement is a complex disorder often requiring segmental bowel resection. Anastomotic leak represents the most serious complication after bowel resection.

Methods: A retrospective analysis of patients with deep infiltrating endometriosis with rectal involvement, who underwent laparoscopic surgery in the years 2002–2011 was made.

Result: Laparoscopic partial rectal resection was performed in 95 patients with deep infiltrating endometriosis. The mean age of patients was 34.4 years (range 22–62 years). Preoperative symptoms included dysmenorrhea, dyspareunia, chronic pelvic pain, rectal bleeding and infertility. The laparoscopic procedure was converted to formal laparotomy in 3 patients (3 %). Three patients (3 %) developed post-operative anastomotic leakage, two of them with recto-vaginal fistula, which required temporary ileostomy. All three cases of anastomotic leakage occurred in the first 33 patients operated by the laparoscopic technique in the period between 2002 and 2006. In this group of patients the number of previous abdominal procedures was higher than in the group of patients operated after 2006.

Conclusion: Laparoscopic rectal resection for deep infiltrating endometriosis is a relatively safe procedure. Learning curve and surgeon's experience are of extreme importance. Postoperative fast-track surgery results in significantly lower complication rate, quicker recovery and shorter hospital stay.

P199 - Gynaecology

Efficacy and Safety of Pressurized Intraperitoneal Aerosol Chemotherapy in Women with Recurrent Gynaecological Cancer and Peritoneal Carcinomatosis

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Introduction: Peritoneal carcinomatosis (PC) is common in ovarian (OC) and other gynaecological cancers. We have developed an innovative therapy, Pressurized Intraperitoneal Aerosol Chemotherapy (PIPAC), which improves local tumor drug uptake and can be combined with systemic chemotherapy^{1,2}. PIPAC achieves outstanding local biodisponibility with low systemic exposure³. Liver and renal toxicity are minimal⁴. The procedure is safe for health workers⁵. We present first results obtained in end-stage PC from gynaecological origin.

Methods: Since 1.12.2011 we have performed 18 PIPAC applications in 9 end-stage patients with OC (n = 4), papillary (n = 3), tuba (n = 1) and cervix (n = 1) cancer. Mean age was 64.6 ± 16 years. In 4 instances, PIPAC was combined with cytoreductive surgery. Cisplatin 7.5 mg/m² and doxorubicin 1.5 mg/m² body surface were applied as aerosol for 30 min at 37 °C under 12 mmHg pressure. Patients were followed-up until Dec, 2012 or until death. Tumor response was assessed by macroscopy (PCI), microscopy and apoptosis determination (TUNEL).

Results: No intraoperative complication was noted. Mean operating time (PIPAC alone) was 97 ± 20 min. PIPAC could be repeated at 6-weeks intervals (4×: n = 1; 3×: n = 3; 1×: n = 5). In one case, adhesions prevented iterative PIPAC. No adverse event >2 CTCAE was noted after PIPAC alone. Six patients are alive. Median survival has not been reached after a mean follow-up of 8 months, actuarial survival after one year is 58.3 %. Four patients are eligible for response assessment after repeated PIPAC. One showed complete remission (CR), three partial remission (PR). Performance index (Karnofsky) increased from 62 ± 17 % to 82 ± 5 % after therapy.

Conclusion: These results are promising. PIPAC can induce a regression of PC in advanced gynaecological cancers. PIPAC is well tolerated and improves patient's performance. First survival data are encouraging. PIPAC will now be evaluated in a phase-II clinical trial with cisplatin and doxorubicine (EudraCT 2012-004397-26) in therapy-resistant, recurrent OC. References: 1. Solab W et al. Surg Endosc. 2012 Jul;26(7):1849–55.; 2. Solass W et al. Surg Endosc. 2012 Mar;26(3):847–52; 3. Blanco A et al. Ann Surg Oncol (in press); 4. data on file; 5. data on file

P200 - Gynaecology

Laparoscopic or Laparotomic Approach for Endometrial Cancer?

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Study Objective: To define indications for total laparoscopic hysterectomy for patients with endometrial cancer.

Three hundred eighty seven patients who underwent total hysterectomy, met the inclusion criteria and were enrolled in the study. The retrospective group—298 patients underwent total hysterectomy with laparotomic access, prospective group—89 patients underwent total laparoscopic hysterectomy. The baseline characteristics of the 2 groups were comparable. Comparison of radical hysterectomy and laparoscopic radical hysterectomy by the number of extracted lymph nodes yield the following data: on the average 5.6 ± 0.5 pelvic lymph nodes (1–13, median 5 lymph nodes) and 4.4 ± 0.5 (1–17, median 4 lymph nodes), respectively. Total laparoscopic hysterectomy indicated significantly lower blood loss and less postoperative pain than traditional open total hysterectomy. The duration of laparoscopic operations was slightly greater than the duration of open operations. Number of lymph nodes removed by selective pelvic lymphadenectomy are not significantly different. Intraoperation complications have arisen in 4 (1.3 %) patients after laparotomic interventions and at 2 (2.2 %) patients after laparoscopic. Early postoperative complications were observed in 10 (2.6 %) patients after laparotomic interventions and were absent in patients after laparoscopic operations. In the late postoperative period complications developed at 58 (19.5 %) and 4 (4.5 %) patients, respectively (the difference is statistically insignificant). Major importance for the patients had a greater surgical trauma of the anterior abdominal wall, as well as cosmetic defects, associated with laparotomic access.

Conclusion: laparoscopic technique is equal to traditional laparotomic total hysterectomy for patients with endometrial cancer and has all the advantages of minimally invasive method.

P201 - Gynaecology

Laparoscopy in Gynecological Emergency a Comparison Between 2 Departments

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Although gynecological emergency can be the privilege of gynecologists, there are situation when this pathology addresses first to general surgeons. The aim of this study is to make a comparison between a general surgery department and a gynecological department in terms of acute abdomen of gynecological origin.

Material and Method: A retrospective study is carried out for 20 patients with acute abdomen of gynecological origin treated in General Surgery Department of Emergency Hospital Bucharest (Group I) and for 20 patients with the same pathology treated in Obstetrics and Gynecology Department "Bucur" (Group II). The pathology includes: 15 complicated ovarian cysts and 5 ectopic pregnancies for each group.

Results: The mean age was 26.3 for Group I and 24.7 for Group II. In terms of localisations in Group I we counted 16 cases on right side (13 cysts and 3 ectopic pregnancies) and for Group II 12 cases on the right side (8 cysts and 4 ectopic pregnancies). Time admission to OR was 6.45 h respectively 8.12 h. The mean operation time was 56, 45 min for Group I and 74.5 min for Group II. In both Groups cystectomies and salpingectomies were performed and 2 patients with ectopic pregnancies needed blood transfusion in both Groups. There was no conversions, morbidity or mortality and median hospital stay was 4.74 days respectively 6.2 days.

Conclusions: Young female with right lower abdominal pain of gynecological origin presented as an acute abdomen addressed not always to a gynecologist and that is why also general surgeons face this type of pathology. In this study there are no significant differences in terms of treatment and postoperative evolution between this 2 Groups.

P202 - Intestinal, Colorectal and Anal Disorders

Color Doppler Sonography to Identify Vascular Structures During Laparoscopic Operation of Colorectal Cancer

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Backgrounds: In sigmoidectomy and proctectomy for colorectal cancer, to identify the vascularities of the intestine, structures of inferior mesenteric artery (IMA), left colic artery (LCA) and sigmoid artery (SA), is important to perform safe and curative operations. But, it is difficult to know laparoscopically, where the point of LCA branching off from IMA is and which artery SA branch off from, IMA or LCA. A laparoscopic color Doppler sonography (LCDS) was employed to identify the variation of vascularity during laparoscopic sigmoidectomy and proctectomy.

Methods: LCDS (PEF-704 LA; TOSHIBA MEDICAL CO.) was used in this study. This procedure using LCDS was performed in consecutive ten cases of the laparoscopic sigmoidectomy or proctectomy.

Results: The sensor of LCDS was touched back sides of vessels. In eight cases out of ten (80 %), points of LCA branching off from IMA were identified. IMA and LCA revealed opposite colors, red and blue, on LCDS. SAs were difficult to detect on LCDS due to its little blood flow. Mean the survey time was 8 min.

Conclusions: Preoperative 3D-CT angiography, need contrast media, is the standard method for detection of variation of vascularity. Using LCDS, we can identify the variation of the vascularity at real time without contrast media.

P203 - Intestinal, Colorectal and Anal Disorders

Laparoscopic Low Anterior Resection with Total or Partial Mesorectal Excision for Rectal Cancer-First Experience (20 Cases)

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Background: Multiple recent publications emphasize the safety, feasibility, high quality of life and superior oncologic outcomes after laparoscopic total mesorectal excision for rectal cancer.

Objective: This study aims to present our experience in laparoscopic total mesorectal excision for rectal cancer.

Patients and Methods: A series of 20 consecutive patients with resectable rectal cancer located over 5 cm from the anal verge underwent laparoscopic resection with total mesorectal excision. The key steps of laparoscopic total mesorectal excision and laparoscopic partial mesorectal excision with transanal extraction of the tumor, both followed by colorectal anastomosis with circular staplers are demonstrated in the following embedded videos.

Main Outcome Measures: Data included patients' and tumors' characteristics, operative technique details, postoperative morbidity, duration of hospital stay and recurrence.

Results: According to the TNM classification, most patients were identified with stage III (45 % of cases), stage II (35 % of cases) and stages I (20 % of cases). There has been no protective colostomy/ileostomy in any of the cases. Mean operating time was 150 min (range, 100–240 min) and mean intraoperative blood loss was 130 ml (range, 50–350 ml). Average length of stay was 5.9 days (range, 2–16) and average time to resume bowel function was 1.4 days (range, 1–2 days). Postoperative morbidity was 10 % (2 cases). None of the patients presented faecal incontinence. Mean postoperative follow-up was 10 months (range, 5–20 months). There has been no local recurrence or trocar site recurrence.

Limitations: The results are limited due to the small number of patients.

Conclusion: Laparoscopic TME is a feasible, safe and efficient procedure, with low morbidity and mortality while keeping all advantages of minimally invasive approach.

P204 - Intestinal, Colorectal and Anal Disorders

Audit of Enhanced Recovery After Colorectal Surgery in District General Hospital

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Aims: ERAS has become the standard for perioperative care at the majority of English NHS Trusts. The aim of this audit is to assess ERAS applicability in a predominantly elderly population at S & O NHS Trust.

Methods: All patients presenting electively for colorectal resections for benign or malignant disease between October 2011 to October 2012 under a single surgeon were included. ERAS checklist was included in patients case notes and filled prospectively by ward staff. Data were collected on a proforma. Patients' demographics, Length of stay, Complications, Readmission rates and unplanned return to theatre were monitored. Compliance with ERAS components was also documented. These included carbohydrate preload, no bowel prep, feeding on same day of operations, stopping parenteral fluids 24 h after surgery, removal of urine catheter on first postoperative day, planned mobilisation four times a day and no drains. Discharge planning was discussed in preoperative clinic visit.

Results: Some 45 patients were included, 19 Females with average age of 67 (range 17–92). Overall median length of stay was 5 days (3–21). No Bowel prep other than simple enemas was used. One patient developed anastomotic leakage (2 %), wound infection in 10 (22 %), Collection in 3 (6.6 %) treated conservatively, one port site hernia requiring return to theatre (2 %), one CVA and two Urine retention. Readmission rate occurred in 6 (13 %) and unplanned return to theatre in one (2 %) patient. Nine patients had a stoma with a median stay in this group of 7 days. Laparoscopic surgery was performed in 37/45 patients (82 %), six converted to open surgery and two open surgery. Twenty had Anterior Resection, 12 Right hemicolectomy, 9 Sigmoid colectomy and 4 extended Right hemicolectomy. Delay in discharge was mainly due to complications. Only two patients stayed a day longer due to social issue/ patient acceptance of discharge.

Conclusions: In our population, ERAS achieved comparable results to national standards. Results confirm the practice is easily applicable to a predominantly elderly population.

P205 - Intestinal, Colorectal and Anal Disorders

'Long Term in Use Seamguard Stapler in Colorectal and Small Vowel Anastomosis.'

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Background: During laparoscopic colorectal surgery, the anastomosis can be created intra- or extra- corporeally. The anastomotic leak remains one of the most serious and important complications of surgical excision in colorectal and small bowel level. The aim of this study is describe the quality and the low rate of complications in the performance of colorectal anastomosis and how the seamguard stapler system is improve the outcomes.

Methods: Retrospective collected data of 345 consecutive patients who underwent laparoscopic colorectal resection and total intracorporeal anastomosis using the seamguard stapler system, since 2004 were reviewed retrospectively.

Results: There were no differences in patients' demographics, surgical procedure, and anesthesia used. Complete data were available for 345 patients; 170 (49 %) female, 175 (51 %) male, 143 (41.4 %) were underwent to Right Hemicolectomy, 112 (32.4 %) Sigmoidectomy, 80 (23.1 %) Low Anterior Resection, 9 (2.6 %) Left Hemicolectomy, 1 (0.3 %) Transversectomy. The diagnoses of the patients were: Colorectal cancer 208 (59.4 %), Diverticulitis 75 (21.7 %) and Polyps 62 (17.9 %). A retrospective collected data in regards of these surgeries was performed. 318 (90.8 %) surgeries were elective. In 139 (40.2 %) patients the specimen was extracted through anal via. 16 (4.6 %) patients had complications: 6 (1.7 %) anastomosis obstruction, 4 (1.1 %) anastomosis bleeding, 3 (0.8 %) anastomosis stenosis, 2 (0.6 %) abdominal abscess and Anastomotic Leak 1 (0.3 %) anastomosis leak. Any of the patient's complications required surgery.

Conclusions: The use of Seamguard Staplers to performed anastomosis at colorectal and small bowel level is feasibly and safe, with a lesser recovery time of the patients and a lower rate of complications.

P206 - Intestinal, Colorectal and Anal Disorders

Outcomes of Laparoscopic Primary Tumor Removal for Disseminated Colon Cancer

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Background: The primary tumor resection, even in patients with synchronous multiple metastases in the liver and/or other organs, allows to increase two-year survival in comparison with symptomatic operations (colostomy or bypass). Adjuvant chemotherapy after cytoreductive surgery may improve the results of a two-year survival. The laparoscopic precision technique may minimize the surgical complications and to shorten the time to chemotherapy. It could helps to optimize treatment strategy and to expand the indications for cytoreductive operations, especially for elderly patient

The aim of the study is to determine the role of laparoscopic cytoreductive surgery in combined treatment for patients with colon cancer and synchronous distance metastases.

Materials and Methods: 44 patients (30–80 years old) underwent laparoscopic primary tumor removal: T₂-2 and T₃-42 patients, metastases in one organ (M_{1a}) were diagnosed in 37, two or more organs (M_{1b})-7 patients. Right hemicolectomy underwent 9 patients, left hemicolectomy-3, sigmoidectomy-24, rectal resection-3, Hartman's procedure-5. The pre-operative complications of the primary tumor were detected in 31 patients (bleeding-12, obstipation-14, toxicemia-7). Simultaneous R₀ resection performed in 2 patients, staged resection-10.

Results: The postoperative complications were diagnosed in 2 (4.55 %) patients (1-anastomosis leakage, 1-mesenteric ischemia) that is 2 times less as compared to open surgery. The average hospital stay in the clinic was 7 days. The time to start the chemotherapy reduced since 30 days after open surgery up to 14 days after laparoscopic procedure. The 2-year survival results after open and laparoscopic surgery were comparable: 69.5 % after laparoscopic and 61.5 %-after open surgery, p = 0.97.

Conclusions: the laparoscopic surgery can be included in combined treatment scheme for disseminated colon cancer especially for elderly patients.

P207 - Intestinal, Colorectal and Anal Disorders

Intra-medullary Spinal Cord Tumour as the Initial Presentation of Metastatic Colonic Cancer. A Case Report

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Objective: Intramedullary spinal cord metastases (ISCMs) are rare type of central nervous system (CNS) involvement of systemic malignant tumours. They are detected now more frequently with modern neuro-imaging techniques.

Method: The authors describe the case of a 56 year old man who was admitted presenting with neck pain and upper limb weakness. Magnetic resonance imaging of the spinal canal reveals involvement of most cervical and upper thoracic spine with impending cord compression.

Result: Whole body Computerised Tomography showed presence of ascending colon tumour confirmed with colonoscopy and biopsy. Patient underwent urgent radiotherapy to prevent cord compression, which improved the upper limb weakness. Patient was referred for further oncological treatment.

Conclusion: Although rare, spinal cord metastasis can be a first presentation of a colorectal cancer and should be considered in the differential diagnosis of ISCM.

P209 - Intestinal, Colorectal and Anal Disorders

Transanal Minimally Invasive Surgery (TAMIS) with Silstm-Port Versus Transanal Endoscopic Microsurgery (TEM): A Comparative Experimental Study

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Background: TransAnal Minimally Invasive Surgery (TAMIS) has been proposed as an alternative to Transanal Endoscopic Microsurgery (TEM) for resection of benign polyps and early cancers of rectum. Since clinical application has started in absence of any experimental validation, we assessed its feasibility and efficacy ex-vivo in a pilot study.

Methods: In a dedicated trainer box for transanal procedures, 10 surgeons with no experience in transanal surgery were asked to perform a dissection/suture task using both TAMIS and TEM in randomly allocated order. Surgeons were requested to dissect two identical drawn lesions of approximately 3 cm in larger diameter. Precision of dissection was assessed with a quantitative photographic method, while the time requested for dissection and suturing was considered measure of qualitative evaluation. Each participant expressed a subjective opinion regarding difficulty in dissection, difficulty in suturing, quality of the vision and conflict between instruments in a 1 to 5 scale.

Results: No difference was observed regarding accuracy of dissection as margin was interrupted along 4.1 % of circumferences in TEM group vs. 2.48 % in SILS group, $P = 0.271$. Dissection and suture were significantly quicker in TEM group (04:30 min. vs. 06:35 min., $P = 0.049$ and 14:34 min. vs. 19:18 min., $P = 0.003$). In three cases in the SILS group completing suture was considered not possible, and procedures were terminated by TEM. Subjective evaluation revealed a better appreciation of TEM in all proposed comparisons: dissection (2.6 vs. 3.5, $P = 0.004$), suture difficulty (3.1 vs. 4.6, $P < 0.001$), quality of vision (2.3 vs. 2.8, $P = 0.18$) and conflicts (3.1 vs. 4.0, $P = 0.054$).

Conclusions: In ex-vivo setting both techniques resulted comparable to achieve a good dissection, although TAMIS failed to prove effective in suturing the rectal wall. Moreover, TEM showed significantly quicker despite the small groups, and was better appreciated by surgeons.

P208 - Intestinal, Colorectal and Anal Disorders

Technical Feasibility of Laparoscopic Lateral Lymph Node Dissection for Locally Advanced Rectal Cancer

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Aims: In Western countries, preoperative chemoradiotherapy followed by TME is main stream for stage II/III rectal cancer. In Japan, standard treatment is TME without radiotherapy followed by adjuvant chemotherapy. Additionally, lateral pelvic lymph node dissection (LPLD) is indicated for the patients with stage II/III lower rectal cancer according to the Japanese guidelines, even for the patients without preoperative lateral lymph node swelling. Although laparoscopic rectal cancer surgery has widely spread in the world, laparoscopic LPLD is still technically difficult and not being generally practiced.

Methods: Between September 2011 and November 2012, a total of 16 patients (8 men and 8 women) with advanced low rectal cancer underwent laparoscopic LPLD. Among those, 3 patients underwent extended LPLD with combined resection of autonomic nerve and internal iliac vessels. In consequence, prophylactic LPLD with total autonomic nerve preservation was carried out in 13 patients. Of the 13 patients, robotic assisted laparoscopic LPLD (R-LPLD) was performed in 7 patients and conventional laparoscopic LPLD (L-LPLD) was carried out in the other 6.

Results: All of R-LPLD and 5 of L-LPLD were received preoperative chemotherapy without radiotherapy. Sphincter-preserving surgery was performed in 86 and 67 % in R-LPLD group and L-LPLD group, respectively. Operative time (792 vs. 774 min) and blood loss (131 ml vs. 175 ml) did not differ significantly in both groups. Median time for unilateral LPLD was 188 min. in R-LPLD, which was longer than that in L-LPLD (132 min). However, postoperative urinary dysfunction developed in 50 % of L-LPLD group, although it has never seen in R-LPLD group.

Conclusion: We presented the preliminary results of laparoscopic LPLD for locally advanced low rectal cancer. Both L-LPLD and R-LPLD were technically feasible although it took still quite long time. R-LPLD might be superior to L-LPLD from the viewpoint of functional preservation.

P210 - Intestinal, Colorectal and Anal Disorders

Transanal Endoscopic Microsurgery Using Different Ports in Single Incision Laparoscopic Surgery

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Aim: Recently, there is a new technique for transanal endoscopic microsurgery using a device in single incision laparoscopic surgery (SILSTEM). Although most laparoscopic surgeons have used the SILS™ port for this technique, we considered that this novel technique would be more advanced using different ports and experienced the eight cases. The aim of this study is to give an overview about this technique and its short-term results.

Methods: Eight patients with selected early rectal cancers, adenomas or carcinoid underwent SILSTEM. The distal margins of the tumors were located between 5 to 9.5 cm from anal verge. After anesthesia, the patient was placed in the adequate position. A SILS™, EZ access or GelPOINT Path port was introduced into the anal canal, and the bowel was extended by carbon dioxide insufflation. A 5-mm 30° or flexible laparoscope was set in the port. The tumors were completely excised from the rectal wall with the use of ultrasonic surgical scissors or monopolar cautery. The defect created by resection was irrigated with saline solution to prevent local recurrence and were closed with running sutures using a laparoscopic suturing device and an absorbable suture clips.

Results: The operation time was 134 (71–313) min., and the blood loss was 2.0 (1–71) ml. All patients recovered uneventfully and were discharged 7 (2–13) days after the operation. There was no fecal incontinence or soiling during postoperative follow-up in all patients. One patient had stenosis of rectum and was treated with balloon dilation. One patient had retroperitoneal emphysema and this complication gradually disappeared. Proctoscopic examination after operation showed no recurrence of adenocarcinoma or adenoma in all patients.

Conclusion: SILSTEM is suggested to be an effective technique for the resection of rectal tumors using the different types of port. However, further experience and clinical trials are needed to fully define the advantages, disadvantages, and indications of this procedure.

P211 - Intestinal, Colorectal and Anal Disorders

Elective Laparoscopic Sigmoidectomy for 40 Patients Affected by Severe Diverticulitis Without Peritonitis Analysis of Short-Term Outcomes

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Aims: The role of laparoscopic surgery has been shown to be safe, feasible and equivalent to open surgery for moderate diverticulitis, but its role in severe disease is still being elucidated. The aim of this study is to show our manner to treat by laparoscopy this complicated subgroup and our results about a consecutive and unselected series of 40 patients with severe disease.

Methods: All patients who had elective laparoscopic sigmoidectomy for severe diverticulitis between April 2003 and September 2011 at the University Hospital of Luxembourg were selected from a retrospective database. Severe Acute Diverticulitis (SAD) was defined as an episode of left-lower quadrant pain requiring antibiotic therapy and clinical and radiologic evidence of diverticulitis associated with abscess, phlegmon, perforation, fistula, obstruction, bleeding or stricture.

Results: A total of 40 patients underwent elective laparoscopic sigmoidectomy with primary anastomosis. The morbidity rate at 30 postoperative days (POD) was 15 % (6 patients). The mean length of stay was 7.7 days. The conversion rate to open surgery was 2.5 % (1 patient). There were no deaths within 30 POD.

Conclusion: Elective laparoscopic colectomy is safe and feasible for patients with severe acute diverticulitis and we believe that mini-invasive approach is suitable for diminishing morbidities.

P212 - Intestinal, Colorectal and Anal Disorders

Laparoscopic Endoscopic Cooperative Surgery for Colorectal Tumor (LECS-CR)

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Background and Aim: Some colorectal tumors which are difficult for endoscopic resection is supposed to be indication for laparoscopic colorectal resection. Upon recent drastic development of endoscopic and laparoscopic technique for colorectal lesions, we have tried a newly established safe wedge resection of the colon wall approached by both laparoscopic and endoscopic ways (Laparoscopy endoscopy co-operative colorectal surgery; LECS-CR) and herein report.

Patients: Four colorectal lateral spread tumor patients underwent LECS-CR. The factors affecting endoscopic submucosal dissection (ESD) were submucosal fibrosis because of previous ESD in one and surrounding many diverticula in 2 cases. Another case is the submucosal tumor suspected of gastrointestinal stromal tumor of the transverse colon.

Techniques: Patient is placed under general anesthesia and 5 ports are put. Following confirmation of the tumor location by endoscopy and laparoscopy, the colon wall at the lesion is exposed when a tumor located at the mesenteric side. Firstly in endoscopically, mucosal to submucosal dissection by using a hook knife is performed circumferential to the lesion with appropriate safety margin following to submucosal injection of the saline. Complete full thick dissection is sequentially performed associated with laparoscopic excision by using an ultrasonic activating scissors. The specimen is withdrawn intraluminally. The opened colon is closed in crossing direction to the colon by laparoscopic linear staplers. Sealing and patency of the closed region is confirmed in endoscopically at the last.

Results: The mean operating time and blood loss of this series were 185 min and 11 g, respectively. There were no intraoperative complications and they all spent their postoperative hospital stay without any event. Histological examination revealed tubular adenoma with severe dysplasia with sufficient surgical margin in three cases and benign schwannoma of the colon in the SMT case.

Conclusion: LECS-CR may be a feasible procedure for one-piece resection for some colonic lateral spread tumors expected for difficulty of the endoscopic resection and submucosal tumors with minimum removal of the colon.

P213 - Intestinal, Colorectal and Anal Disorders

Single-Incision Laparoscopic-Assisted Surgery for Colorectal Cancer Using Glove and Hand Made Fixing Board

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Aim: In single-incision laparoscopic surgery for colorectal cancer using a surgical glove, the peritoneal cavity is encountered after initial making a 4 cm skin incision.

The wound retractor (Alexis, Applied Medical, Santa Margarita, CA, USA) is placed on the edge of the abdominal incision and covered with a surgical glove. Each trocar is introduced intra-peritoneally through each finger of a surgical glove attached to the wound retractor. We call this technique for glove method. However, in this method, trocars are not fixed so the laparoscopic scope and surgical forceps are very unstable. We tried to improve the glove method to facilitate less stressful single-incision laparoscopic surgery.

Method: We developed a new method that used a hand-made round plastic board attached to the wound retractor (fixed glove method). This board has three holes and, after being covered by a surgical glove, the surgeon can insert surgical forceps through the glove and this plastic board. Surgical devices are fixed by this board, so forceps are fixed and not disturbed by each other and it can get longer distance from the other forceps as compared with SILS port. This method uses no other special appliance other than the hand-made board.

Result: For the first time, we undertook laparoscopic ileocecal resection for cecal cancer patient by using this fixed glove method. The operation was effected safely and smoothly. Until now, we used this method for five cases of laparoscopic surgery for colorectal cancer.

Conclusion: The fixed glove method could be utilised alongside preexisting devices and would be useful for safe and less stressful single-incision laparoscopic surgery.

P214 - Intestinal, Colorectal and Anal Disorders

Diverticular Disease in Young Patients. Should The Management Be The Same At All Age?

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Introduction: Diverticular disease (D.D.) in young patients is changing. It is not as rare as previously and continues to become more common. The timing and appropriateness of surgical treatment of sigmoid D.D remains a topic of controversy. Recent evidence is mixed, and the recommendation for routine elective resection following the first or second episodes of diverticulitis in young patients may not be indicated.

Aims: To estimate the prevalence of D.D in young patients and their presentation in our institution. To determine the options of treatment and if these patients need a different approach than older patients. To compare our practice of management of D.D in young patients with what reported in recent literature.

Methods: A retrospective review of clinical records (from January 2010 to June 2012) was performed to identify all patients diagnosed with diverticular disease and its complications confirmed by radiology, colonoscopy or surgery. Patients 40 years or younger were reviewed in detail. Information on demographics, investigations, treatment, follow-ups and recurrent episodes were analysed.

Results: 62 out of 1598 patients diagnosed with D.D were 40 years or less (aged 19–40 years): male 39, female 23. Only 3 out of 62 patients presenting with complicated diverticulitis required surgical treatment. (1.6 %).

First case, 37 year-old male who presented with a perforated diverticulum, had diagnostic laparoscopy and wash-out, but did not settle; Hartman's procedure performed 4 days later. Second case, 39 year-old male presented with large bowel obstruction, did not settle on conservative treatment; Hartman's procedure performed, histology (D.D with recurrent inflammation and subsequent stricture). Third case, 37 year-old male with recurrent L.I.F pain. C.T reported diverticular abscess; Hartman's procedure performed.

Conclusion: Diverticulitis at young age does not have a specific aggressive nature. Surgery for diverticulitis can be avoided in patients with uncomplicated disease, regardless of the number of recurrent episodes. Furthermore, the need for elective surgery should not be influenced by the age of the patient and the same guidelines should be used in the treatment of young and old patients.

P215 - Intestinal, Colorectal and Anal Disorders

Laparoscopic Colectomy for Chicken Bone in Sigmoid Colon: A Rare Case Presentation

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Introduction: The vast majority of ingested foreign bodies (fish bones, chicken bones, dentures tooth picks and cocktail sticks) pass through gastrointestinal tract spontaneously without clinical consequence (80–90 %). About 10 % may require endoscopic retrieval while less than 1 % require surgery. Similarly, less than 1 % result in perforation, usually at sigmoid colon, rectum or distal ileum. The majority of patients do not recall ingesting the foreign body.

Case Report: We present a case of 46 year-old man who had L.I.F. pain and altered bowel habits for a few months with a family history of CA colon. Colonoscopy showed scattered diverticulosis of sigmoid colon and a localised area of granulation tissue in the sigmoid colon. Multiple biopsies were taken and the histology suggested reaction to a foreign body (F.B). C.T scan showed a chicken bone in the wall of the sigmoid colon in the area of the granulation tissue. Laparoscopic sigmoid colectomy performed and he made a good recovery.

Results: The patient had an uneventful recovery.

Conclusion: Intestinal perforation by chicken bones are rare. If the F.B. is in the lumen of the colon, colonoscopic retrieval should be the procedure of choice. However, surgery remains an option in cases of failed endoscopic removal or in the presence of perforation or obstruction. While laparotomy had been the accepted procedure in the past in the hands of experienced surgeons, the laparoscopic approach may be considered as safe as open surgery.

P216 - Intestinal, Colorectal and Anal Disorders

Laparoscopic Transverse Colon Incision Aiming At Complete Cure, Safety, and Stylization: Opening Omental Bursa and Approaching Henle Vessel Trunk

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Laparoscopic surgery is being established as a standard treatment in various diseases. This is especially the case in lower digestive tract diseases. Stylizing operative procedures for middle and left transverse colon cancer is considered the most difficult, since surgical opportunities are few due to their rarity. Safe and effective lymphadenectomy can be achieved and pancreatic injury can be avoided by understanding the anatomy of membrane dissection. This leads to the stylization of laparoscopic transverse colon incision. We present our operative procedure. The patient was a female in her seventies with advanced cancer in the center to slightly anal side of the transverse colon (pre-operative staging was IIIa-b). Surgery began with 3 port + 2 at the lithotomic position, with the head slightly elevated. The omental bursa was grasped by a matador, incised, and opened. After exfoliating the anterior pancreatic and fusion fascia of the transverse mesocolon, the Henle gastrocolic trunk to the middle colic vein, accessory right colic vein were visually checked. The transverse colic falciform ligament was incised, and the colic liver flexura was exfoliated and mobilized. The transverse colon was unfolded to the cranial side. The mesenteric window was incised in front of the duodenal horizontal limb. After connecting the foramen to omental foramen, the superior mesenteric arteriovenous vasculature was exposed. The middle colic artery lymph nodes #223 were dissected and incised at the root. The transverse mesenteric window was incised at the inferior border of the pancreatic tail, and the anterior renal fascia was reached. The splenocolic ligament was incised. The descending mesocolon was incised and mobilized on the left side of the inferior mesenteric vein. Mobilization was completed with incision of the white line of the descending colon. The tumor was resected and removed through the umbilicus incision. The main advantage of this procedure is protecting and making space between the transverse mesocolon and pancreas, and an aggressive approach to the middle colic artery root is then possible. When the root is treated, the pancreas can be visualized clearly, and surgery can be performed with a wide operative view. This reduces the operator's stress.

P217 - Intestinal, Colorectal and Anal Disorders

Reduced Port Surgery Using Minilap Alligator for the Colon Cancer

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As the single port surgery has much restriction not only for an appropriate counter traction but also for the camera work, accurate surgical procedure is not always easy. MiniLap Alligator® (Stryker Endoscopy) is a needle forceps with a 2.3 mm outer diameter, provides a good grasping and traction and at the same time it causes minimally injury for the abdominal wall that is almost invisible after one postoperative month. We present our novel reduced port surgical technique for the colon cancer which enable conventional laparoscopic colectomy with minimally injury of the abdominal wall that is almost same as single port surgery.

Technique: A longitudinal incision (length 2.5 cm) is added around the umbilicus, which is protected with an ALEXIS® WOUND RETRACTOR SYSTEM (small size) (Applied Medical Co.) covering with 8.0 size elastic glove. Two trocars (12 mm) are introduced through the fingertips of the globe, that are tied with vessel tapes for keeping pneumoperitoneum. One trocar is for a camera port, and another one is for a operator's left hand's forceps and for the Endlinear stapler. Another trocar (5 mm) is inserted at right lower quadrant of abdomen for the operator's right hand's device, which wound is used for the route of drainage tube. Two MiniLap Alligator® forceps are inserted at the lt. upper and lower quadrant for the assistant's forceps. Using these technique, conventional laparoscopic colectomy can be done.

Results: From July 2011 to December 2012, we performed our reduced port technique in 4 cases of colon cancer; three cases of anterior resection, one case of sigmoidectomy. Male female ratio was 2:2. Mean operation time was 135 min (123–151). Mean blood loss was under 20 ml. No case encountered intraoperative accident. No case was converted to open surgery. There was no mortality. Postoperative course of every patient was uneventful and Mean hospital stay was 7.3 day(6-9). The abdominal wounds were recognized only at the umbilicus and rt lower quadrant after one postoperative month.(Conclusion) Our reduced port technique using MiniLap alligator enable us conventional laparoscopic colectomy with minimally invasive injury that is almost same as single port surgery.

P218 - Intestinal, Colorectal and Anal Disorders

Step-By-Step Introduction of Reduced-Port Laparoscopic Right Hemicolectomy - Final Stage - Single Incision Plus One Puncture Laparoscopic Surgery

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Background: Reduced-port surgery is currently being introduced following the development of small-diameter forceps. Since January 2011 our Department has been gradually introducing reduced-port surgery consisting of 3 ports + 1 puncture for right-side colon cancer. We reported the utility of "Step-by-step introduction of reduced-port surgery" at the last EAES. Now, a new device, E-Z access™ port (Hakko, Japan), is developed and single incision laparoscopic surgery has become more easier. So, as a final stage of reduced port surgery, we introduced "Single incision plus one puncture laparoscopic surgery" at December 2012.

Methods: We reduced the number of ports from the conventional 5 step-by-step. Since December 2012, we started Single incision plus 1 puncture operation. To date, we have performed 5-port, 4-port, 3-port + 1 puncture, and Single incision plus 1 puncture operation surgeries in 20, 5, 15, and 4 cases, respectively. We compared operation time, blood loss, and complications at different stages during this introductory period.

Results: The mean BMI was 18.9, 20.4, 21.9 and 23.6 for the Single incision, 3-, 4- and 5-port groups, respectively. The mean operation time was 185.3 min (range 117–250) for the Single incision operation, 271 min (range 182–229 min) for the 3-port group and 228 min (range 165–442 min) for the 4-port group. The mean blood loss was 18.8 g for the Single incision group, 15.2 g for the 3-port group and 13 g for the 4-port group. The 5-port group had a mean operation time of 274 min (range 184–362 min) and a mean blood loss of 85.4 g. In every group, there were no complications.

Conclusions: It was found that right-side colon cancer could be excised by Single incision plus 1 puncture laparoscopic surgery as safe as 3-port + 1 puncture or 4-port or 5-port approach. Moreover, it would be important that reduced-port surgery should be phased into laparoscopic surgery when it is introduced.

P219 - Intestinal, Colorectal and Anal Disorders

An Extended Medial to Lateral Approach to Mobilize the Splenic Flexure During Laparoscopic Low Anterior Resection

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Aim: The aim of this retrospective study of laparoscopic low anterior resection was to compare splenic flexure mobilization (SFM) carried out by an extended medial to lateral approach with a lateral approach.

Method: Records of patients with rectal cancer on a prospectively maintained database undergoing laparoscopic low anterior resection performed between January 2009 and November 2011 by a single surgeon were analysed. The extended medial to lateral approach involved continuing the medial-to lateral approach upwards to enter the lesser sac over the pancreas thus permitting detachment of the splenic flexure.

Results: 237 patients, including 164 undergoing a lateral SFM and 73 an extended medial to lateral SFM, were evaluated. Both patient groups had similar characteristics except for operative time (152.7 ± 32.7 min extended medial to lateral; 171.5 ± 40.8 min lateral, $p < 0.001$), postoperatively the interval to oral intake (3.1 ± 0.8 days extended medial to lateral; 3.7 ± 0.9 lateral, $p < 0.001$), and duration of hospital stay (8.2 ± 2.8 days extended medial to lateral; 10.3 ± 7.5 days lateral, [$p = 0.002$]) favoured the extended medial to lateral group.

Conclusion: A extended medial to lateral approach for SFM during laparoscopic low anterior resection of rectal cancer appears to be an improvement over the previously used lateral approach, because it may provides a shorter operation time and shorter hospital stay.

P220 - Intestinal, Colorectal and Anal Disorders

Vertical Transumbilical Incision Versus Left Lower Transverse Incision for Specimen Retrieval During Laparoscopic Colorectal Surgery

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Background: This study compared the short-term surgical outcomes of the vertical transumbilical incision with the left lower transverse incision for specimen retrieval in laparoscopic colorectal cancer surgery.

Methods: One hundred forty-seven consecutive patients scheduled for laparoscopic surgery for sigmoid colon and rectal cancer between April 2010 and December 2010 were classified into one of the two groups according to the site of the minilaparotomy: a transumbilical incision group ($n = 92$) and a left lower transverse incision group ($n = 55$).

Results Demographic data, operation time, estimated blood loss, frequency of transfusion, size of the tumor, number of harvested lymph nodes, distal resection margins, time to first flatus, and length of hospital stay were similar between the two groups. Postoperative pain scores were also similar between the two groups. The length of the minilaparotomy incision was shorter in the transumbilical group than the left lower transverse group at operation (mean, 4.6 vs. 6.2 cm, $p = 0.000$). The postoperative mean satisfaction score was higher in the transumbilical group, but this was not statistically significant (7.6 vs. 7.1, $p = 0.224$). Fourteen patients in the transumbilical group and 7 patients in the left lower transverse group developed wound-related complications ($p = 0.810$), including two cases of incisional hernia, both in the transumbilical group. High body mass index ($C25 \text{ kg/m}^2$) and longer operative time ($C180 \text{ min}$) were risk factors for wound complications on univariate analysis.

Conclusions: Transumbilical minilaparotomy in laparoscopic colorectal surgery is a good alternative approach with acceptable wound complications

P221 - Intestinal, Colorectal and Anal Disorders

The Efficacy AND Safety of Venous Thromboembolism Prophylaxis with Fondaparinux for Laparoscopic Colorectal Cancer Surgery

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Aims: Fondaparinux (FPX) is a synthetic factor Xa inhibitor used widely across the world for the prevention and treatment of venous thromboembolism (VTE). Recently, laparoscopic colorectal surgery has been increased many countries. But the efficacy and safety of FPX for the prevention of VTE after laparoscopic colorectal surgery is unknown. The aim of this study is to evaluate the clinical efficacy and safety of FPX in the prevention of venous thromboembolism patients undergoing with laparoscopic colorectal cancer surgery.

Methods: Between January 2009 and November 2012, 48 Patients underwent laparoscopic colorectal surgery at Osaka University hospital were included. Patients who had undergone surgery for lower limbs, abdominal surgery, cardiovascular surgery, and received any type of anticoagulant or fibrinolytic therapy or dextran within one week of planned administration of FPX were also excluded. FPX 2.5 mg/body was administered once daily for 4 to 8 days 24 ± 2 h after surgery. FPX 1.5 mg/body was administered when body weight <40 kg, CLCr <50 mL/min, age over 80, and liver dysfunction (Child C). We evaluated the incidence of all bleeding events (major and minor) and all symptomatic VTE events retrospectively.

Results: Symptomatic VTE and major bleeding were not detected. 3 patients had a minor bleeding (subcutaneous bleeding).

Conclusion: FPX was effective and safety for prophylactic of post-operative VTE in patients undergoing with laparoscopic colorectal cancer surgery.

P222 - Intestinal, Colorectal and Anal Disorders

Comparative Study of Laparoscopic and Open Hartmann's Operation for Colorectal Cancer

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Purpose: Hartmann's operation is relatively rare procedure for colorectal cancer. We assessed the Hartmann's operation for colorectal cancer according to open and laparoscopic approach. Indication of elective Hartmann's procedure was high risk patients such as over 80 years old, heart failure, renal failure, etc.

Patients and Method: There were 70 patients who had undergone the Hartmann's operation from January, 2007 to December, 2012. Laparoscopic surgery underwent in 21 cases, and open surgery was performed in 49 cases. Three cases were converted to open surgery from laparoscopic surgery. Assessment factors were operative time, blood loss count, diet start, postoperative hospital stay, and postoperative complications.

Result: There were no cases of emergency surgery in laparoscopic surgery, and 8 cases (16.3 %) in open approach. Concomitant resection of other organ was performed for 20 cases of open surgery, and no cases in laparoscopic surgery. The mean operative time was 245.9 min in laparoscopic and 250.2 min in open, respectively. Also blood loss count was 25.3 ml and 629.4 ml, the mean diet start date was 3.1 and 3.6, and postoperative hospital stay was 12.9 and 12.6, respectively. Laparoscopic surgery was performed with less blood loss and almost equal operative time to open surgery. No serious complication occurred in both group. There was no difference in diet start and hospital stay in both group.

Conclusion: Short-term result of laparoscopic Hartmann's operation is safe and feasible. More study is necessary regarding emergency patients and cases of concomitant resection of other organ.

P223 - Intestinal, Colorectal and Anal Disorders

Single-Incision or Single-Incision Plus One Port Laparoscopic Surgery for Colorectal Cancer

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Aim: Our institution began performing single incision laparoscopic surgery (SILS) for colon cancer in August 2010 and now routinely performed this procedure. For rectal cancer, we have developed single-incision plus one port laparoscopic surgery (SILS + 1) in which we can utilize the incision for drainage as an additional access route for laparoscopic procedures. In the present study, our initial experiences with SILS and SILS + 1 for colorectal cancer are reviewed.

Methods: 183 patients were treated with the SILS or SILS + 1 procedure between August 2010 and August 2012. The abdomen was approached through a 2.5 cm transumbilical incision. In SILS + 1 procedure, 12 mm port was inserted in right lower quadrant. Almost all the procedures were performed with standard laparoscopic instruments, and the operative procedures were similar to those employed in the standard laparoscopic colorectal surgery.

Results: Nine patients were converted to laparotomy, and four patients required an additional port insertion. The other 170 patients (93 %) underwent a curative resection of the colorectal cancer. Of these 170 patients, 108 patients underwent SILS and 62 underwent SILS + 1 procedure. The mean skin incision was 2.83 cm. Intra- or postoperative complications occurred in 10 patients (6 %). The patients were discharged after a mean period of 12 postoperative days.

Conclusions: Our initial experiences suggested that SILC and SILS + 1 are feasible and safe for colorectal cancer patients. However, further studies need to be undertaken to prove that it has non-cosmetic advantages over conventional laparoscopic surgery.

P224 - Intestinal, Colorectal and Anal Disorders

Single-Incision Laparoscopic Surgery for Stage IV Colon Cancer

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Aim: Single-incision laparoscopic colectomy (SILC) has recently been developed with the aim to further reduce the invasiveness of conventional laparoscopy. Recently, SILC was demonstrated to improve patient recovery by decreasing early postoperative pain and shortening the length of hospital stay compared with established laparoscopic techniques. However, the safety and efficacy of single-incision laparoscopic resections for patients with Stage IV colorectal cancer have not been explicitly examined. In the present study, we describe our experience with single-incision laparoscopic procedures for patients with Stage IV colorectal cancer.

Methods: A total 77 patients have performed single-incision laparoscopic colectomy for colon cancer (resection of the primary tumor) at Fukui Prefectural Hospital since August 2010. Eleven patients in clinical stage IV (ST4 group) who underwent single-incision laparoscopic colectomy between August 2010 and January 2012 were compared with 66 patients in clinical stages 0-III (control group).

Results: In ST4 group, two patients (11.8 %) were converted to laparotomy due to the intra-operative bleeding and bulky lymph node metastasis that had invaded the superior mesenteric vessels. The other 9 patients (81.8 %) underwent curative segmental colectomy without conversion to multiport laparoscopic surgery or open surgery. Of these 9 patients, 4 patients underwent ileo-colectomy, 3 underwent right hemicolectomy, 1 underwent sigmoidectomy, and 1 underwent left hemicolectomy. There were no differences in intra-operative and post-operative complications, 30-day mortality rate, number of the harvested lymph nodes, and duration of postoperative hospital stay between two groups.

Conclusions: Our initial experiences suggested that SILC is feasible for stage IV colon cancer patients. However, further studies need to be undertaken to prove that it has non-cosmetic advantages over open colectomy or conventional laparoscopic colectomy in stage IV colon cancer patients.

P225 - Intestinal, Colorectal and Anal Disorders

The Excision of a Lower Rectal Tumor by Use of Transanal Endoscopic Surgery with Silstm Port

M. Tochimoto, Y. Tomita, T. Watanabe, H. Shin, H. Katoh, K. Tawaraya, O. Hosokawa
Yokohama Sakae Kyouosai Hospital, YOKOHAMA, Japan

For laparoscopic abdominal surgery, many types of devices have reportedly been developed recently. Single Incision Laparoscopic Surgery port (SILS™ port, Covidien, Mansfield, MA) is one of such devices.

This is a report on our experience in two cases of a lower rectal tumor excision performed by use of transanal endoscopic surgery with the SILS™ port as follows:

Case 1: A 69-year-old man had a semicircular adenoma of the Is type which was measured 3 cm in diameter. It was located above the second Houston's valve (sited on Ra/b) and 10 cm from anal verge. The patient was placed in the prone jack-knife position under the total anesthesia. SILS™ port was gently introduced into the anal canal. CO₂ gas was insufflated into the bowel canal at 5-10 mmH₂O. Transanal excision was completed by use of Laparoscopic Coagulating Shears (LCS) and the Endo GIA stapler (Covidien, Mansfield, MA; 30 mm, white). The patient was discharged from our hospital on the postoperative 5th day without any complications.

Case 2: A 40-year-old man had a rectal carcinoid which was located 5 cm proximal to the anal verge. The tumor was completely resected by use of the same method as the one adopted in Case 1. The patient was discharged from our hospital on the postoperative 6th day without any complications.

In view of the foregoing, we came to the conclusion that such transanal tumor resection by use of SILS™ port is an effective procedure which can be easily performed and that it can be regarded as being useful as one of the options for transanal endoscopic resection in the future.

P226 - Intestinal, Colorectal and Anal Disorders

One-Stage, Totally Laparoscopic Colectomy and Hepatectomy for Colorectal Cancer with Synchronous Liver Metastasis

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Background: Simultaneous surgery for primary colorectal tumor with synchronous liver metastasis has been showed to be safe and effective. Laparoscopic approaches have become increasingly used in selected patients with either colorectal or liver tumor. However, the feasibility of one-stage, totally laparoscopic colorectal and liver resections remains unknown. In the present study, we evaluated the safety, feasibility and short-term outcomes of a small cohort of selected patients treated by one-stage, totally laparoscopic colorectal resection and hepatectomy.

Methods: From January 2009 to September 2012, 4 patients (3 women and 1 man) with primary colorectal neoplasm and synchronous liver metastasis underwent one-stage, totally laparoscopic approach. A retrospective analysis of prospective collected data was performed.

Results: There were no conversions to open procedures. All the patients underwent a one-stage laparoscopic resection. Among these, procedures were sigmoidectomy with left hepatectomy and partial hepatectomy, right hemi-colectomy and right hepatectomy, right hemi-colectomy and 2 partial hepatectomies, low anterior resection and partial hepatectomy. The median operation time was 372 min (range: 282–456 min), and the median duration of hospital stay was 10 days (range: 8–17 days). The median estimated blood loss was 50 ml (range: 20–165 ml) with no mortality observed. An R0 resection was achieved in all cases. There was no surgical mortality or morbidity, but one patient had bile leakage and another patient had minor anastomotic leakage both of which were conservatively controlled.

Conclusion: In selected patients, one-stage, totally laparoscopic colon and liver resection is a feasible and safe procedure for the treatment of primary colorectal cancer with synchronous liver metastases.

P227 - Intestinal, Colorectal and Anal Disorders

Needlescopic Surgery for Left-Side Colorectal Cancer

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Cancer Institute Ariake Hospital, TOKYO, Japan

Aims: Whereas laparoscopic surgery has become a standard technique for colorectal cancers, further minimally invasive surgery is pursued and expected. From June 2011, our institution started needlescopic surgery (NS) for better cosmetic. The aim of this study is to describe this technique and investigate feasibility for left-sided colorectal cancer surgery.

Methods: From June 2011 to December 2012, 56 sigmoid colon and upper/middle rectal cancer patient underwent NS in our institution. Definition of the NS is operation using one 5 mm port and three 3 mm ports, without 12 mm port. 10 mm size scope is used through the umbilical 12 mm port, which will be extended to small skin incision for specimen extraction later.

Procedure: A 12 mm port is put on the umbilicus, a 5 mm port on the right lower, and three 3 mm ports on the right flank, left flank and lower. Level of clipping of the inferior mesenteric artery depends on the tumor staging. After dissection of the left colon, a 5 mm scope is inserted through the right lower 5 mm port and a linear stapler is inserted through the umbilical 12 mm port for transection of the rectum. After transection of the rectum, the specimen is extracted through the small skin incision on the umbilicus, and the anastomosis is carried out intracorporeally by double stapling technique.

Results: The staging according to TNM classification is stage I/II/III/IV = 20/17/11/8. Thirty three patients underwent sigmoidectomy and 23 patients anterior resection. There was no conversion to open surgery, but in 1 patients, one of 3 mm port is changed to 5 mm. Thirty three patients required one cartridge of linear stapler, 21 patients required two and 2 patients required three when transecting the rectum. The mean operating time was 197 min and the mean estimated blood loss was 16 ml. There were 4 (7 %) postoperative complications: 2 anastomotic leak requiring reoperation, 1 anastomotic bleeding and 1 wound infection. There was no mortality.

Conclusion: NS for left-side colorectal cancer was feasible and may reduce postoperative pain with better cosmetic.

P228 - Intestinal, Colorectal and Anal Disorders

Our Resume After 44 Single Incision Laparoscopic Colonic Procedures

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Aims: The aim of this study was to determine the results after 44 single incision laparoscopic colonic procedures.

Methods: Between 12/2009 and 07/2012 selected patients (n = 44) with benign as well as malign indication for colonic surgery underwent single incision laparoscopic surgery using the GelPoint system and straight instruments. Data were collected in a prospective database. Points of interest were the mortality rate, the conversion- and reoperation rate as well as the operating time (OT), the lymph node yields (LNY) and the length of stay (LOS).

Results: Our conversion rate was 22.7 % (15.9 % to open surgery, 6.8 % additional ports). Reoperation rate was 9 % (n = 4). Our mortality rate was 2.2 % (n = 1) due to embolism of the pulmonary artery. Median OT was 133.7 min (range: 51–249) and median LOS was 8.9 days (range: 3–28). Median LNY were 18.5 (range: 4–41).

Conclusion: Single incision laparoscopic colonic surgery is feasible in our series, and the results are comparable to recent literature.

P229 - Intestinal, Colorectal and Anal Disorders

Laparoscopic Intersphincteric Resection for Ultra Low Rectal Cancer

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Aim: Ultra low rectal cancer present a technical challenge to treat if continence and avoidance of a permanent colostomy is targeted. We present our experience in Al Salam Oncology Center managing these cases.

Methods: 10 patients diagnosed as suffering from low rectal cancer were involved in the study. All patients underwent examination under anesthesia, received preoperative radiotherapy ± chemotherapy, underwent laparoscopic intersphincteric resection and a temporary ileostomy. All patients were sent to the physiotherapy department to exercise the anal sphincters by training and electrical stimulation during the period of adjuvant chemotherapy. After finishing all treatment, the ileostomy is closed.

Results: All cases were finished laparoscopically and we had no mortalities. The reported continence was excellent in 80 % of the cases to both stool and flatus. 2 patients reported moderate satisfaction as they suffer from minor occasional soiling. These 2 patients had anastomotic dehiscence one partial and one complete. The partial was treated conservatively and the complete necessitated placement of a rectal stent to bridge the defect.

Conclusion: the laparoscopic intersphincteric resection is an excellent approach to treat ultra low rectal cancer with excellent functional results.

P230 - Intestinal, Colorectal and Anal Disorders

Laparoscopic Surgery with a Prolapsing Technique for Colorectal Cancer - Alternative Procedure of Nose

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Background: Laparoscopic surgery for colorectal cancer has become common and one of the canonical modes of surgical treatment for colorectal cancer. Recently, reduced port surgery has been developed with the aims of offering additional benefits compared to conventional laparoscopic surgery. A prolapsing technique is an alternative procedure of Natural Orifice Specimen Extraction (NOSE) via anus, and has a potential for a contribution to reduce the additional abdominal skin incision. We herein evaluate the safety and usefulness of this procedure.

Methods: Between Dec 1993 and Dec 2012, we had 1832 with colorectal cancer at our hospital; 70 patients underwent a prolapsing technique. The proximal bowel of the lesion is transected laparoscopically with an endoscopic stapler. The distal bowel, including the lesion, are everted and pulled transanally to outside the body. Distal margin of the rectum is divided and using a linear stapler under direct vision, the specimen is extracted and NOSE procedure is performed. The distal rectum is pushed back through the anus into the pelvis, and intracorporeal anastomosis is completed laparoscopically with a double stapling technique.

Results: There were no intra-operative complications related to this procedure. One case was difficult to evert the specimen through the anus because of an excessive amount of fat in mesorectum. We had only 1 (1.4 %) case of anastomotic leakage, repaired conservatively and no other major complications.

Conclusion: It is suggested that addition of the prolapsing technique helps to extract the specimen transanally, reduces the additional abdominal skin incision and contributes to reduced port surgery for colorectal cancer in selected patients.

P231 - Intestinal, Colorectal and Anal Disorders

The Excision of a Lower Rectal Tumor by Use of Transanal Endoscopic Surgery with Silstm Port

M. Tochimoto, T. Watanabe, Y. Tomita, H. Shin, H. Katoh, K. Tawarayaya, O. Hosokawa
Yokohama Sakae Kyouzai Hospital, YOKOHAMA, Japan

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Case 2: A 40-year-old man had a rectal carcinoid which was located 5 cm proximal to the anal verge. The tumor was completely resected by use of the same method as the one adopted in Case 1. The patient was discharged from our hospital on the postoperative 6th day without any complications.

In view of the foregoing, we came to the conclusion that such transanal tumor resection by use of SILS™ port is an effective procedure which can be easily performed and that it can be regarded as being useful as one of the options for transanal endoscopic resection in the future.

P232 - Intestinal, Colorectal and Anal Disorders

Difference of Postoperative Complication Between Laparoscopic and Open Surgery After Colon Cancer Resection

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Background: Generally one of the advantages of laparoscopic resection is short postoperative hospital stay (POHS). However the reason why laparoscopic resection has this advantage is still unclear.

Purpose: In our institution, we are using same clinical pathway for laparoscopic and open colectomy. Discharge is planning at postoperative day 7. In this study, patients with longer POHS were assessed about complications and personal reasons.

Methods: From April 2007 to December 2012, 801 patients underwent curative colon cancer resection which included 668 laparoscopic (L) and 133 open (O) surgery. Patients with concomitant other procedure were excluded. Mean age was 68.2 and there were 451 males and 350 females. Cancer locations were; cecum and appendix 75, ascending 195, transverse 110, descending 63, and sigmoid colon 358. There were 6 conversions to open (0.9 %) in L group because of severe adhesion and so on. Each L and O group patients was divided into 3 groups according to POHS; L-1, O-1) 7 day or less, L-2, O-2) 8 to 10 days, L-3, O-3) 11 days or more.

Results: Planned POHS was accomplished in 517/668 (77.4 %) of L-1 and 60/133 (45.15) of O-1 ($p < 0.01$). Prolonged POST was observed in 113 (16.9 %) of L-2, 38 (5.7 %) of L-3, 41 (30.8 %) of O-2, and 32 (24.1 %) of O-3. Most popular complications were wound infection (L: 4.8 %, O: 9.8 %, $p < 0.05$) and postoperative ileus with NG tube (L: 1.6 %, O: 5.2 %, $p < 0.05$). Frequency of each group was 3.9 %, 0 % in L-1, 7.1 %, 2.7 % in L-2, 21.1 %, 10.5 % in L-3, 6.7 %, 0 % in O-1, 14.6 %, 3.0 % in O-2, and 9.4 %, 18.8 % in O-3, respectively. Anastomotic leak was observed 7 patients (1.0 %) in L and 4 (3.0 %) in O (n.s.). Mortality within 30 day was 1 patient in O-group because of endocarditis. Prolonged POHS by individual reason without clinical problem was observed in 77.8 % of L-2, 10.5 % of L-3, 80.5 % of O-2, and 21.9 % of O-3, respectively.

Conclusions: Laparoscopic resection was less invasive from prolonged postoperative hospital stay and complications. Also more than 10 days POHS is almost 4 times in open resection group.

P233 - Intestinal, Colorectal and Anal Disorders

Laparoscopic Total Proctocolectomy with Lymphadenectomy for Ulcerative Colitis Related Colon Cancer

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Background: In case of the colon cancer with ulcerative colitis (UC), a total proctocolectomy with lymphadenectomy is required. A laparoscopic total proctocolectomy usually means only the resection of all parts of the large intestine and rectum, not including a lymphadenectomy.

Aim: We had performed total proctocolectomies by conventional open surgery or hand-assisted laparoscopic surgery (HALS) for UC in the past. We report two cases of the laparoscopic total proctocolectomy with lymphadenectomy in patients of UC related colon cancer in the single institution.

Operative Procedure: A position was lithotomy position. A 5-port method was used. The excision of the rectum was started at first part of the operation. The terminal ileum was removed, then cecum, ascending colon, transverse colon, descending colon, sigmoid colon were done successively in the clockwise direction. Since the early transverse colon cancer was found in both cases, the middle colic vessels were carefully ligated at near the root for a lymphadenectomy. After making Pfannenstiel's incision in the lower abdomen, the entire large intestine was pulled out. A J-pouch was created and the ileoanal canal anastomosis (IACA) was performed with double-stapled technique. A diverting loop ileostomy was constructed.

Results: We performed this procedure for the two patients with UC related early transverse colon cancer. Operative duration was 540 and 523 min. Amount of bleeding was 355 and 80 g, respectively. One patient had discharged at 23 post-operative days with good post-operative course and another patient had a complication of deep vein thrombosis after operation and discharged at 66 post-operative days safely.

Discussion: A total proctocolectomy is a combination of each procedure of colectomy. A total laparoscopic surgery is superior to HALS in respect of that a more attentive handling is possible and it had the advantage of less amount of bleeding. We recommend that the resection of rectum should be started at first part of the operation because it requires the relative long operative duration and the prudent preservation of the autonomic nerve.

Conclusion: A laparoscopic total proctocolectomy with a lymphadenectomy is feasible and less invasive under substantial experience of laparoscopic colon surgery.

P234 - Intestinal, Colorectal and Anal Disorders

The Safety of Laparoscopic Surgery for Colorectal Cancer in Patients Older Than 80 Years

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Aim: Colorectal cancer usually presents in the elderly patients and laparoscopic surgery for colorectal cancer has become popular, thus recently laparoscopic surgery for colorectal cancer in elderly patients is a challenging procedure. The aim of this study was to evaluate the safety of laparoscopic surgery for colorectal cancer in patients older than 80 years compared with open surgery.

Methods: We retrospectively reviewed 49 patients (≥ 80 years of age) underwent colorectal surgery from January 2008 and August 2012. Of these patients, 22 (44.9 %) were open surgery group, and 27 (55.1 %) were laparoscopic surgery group. Patients who underwent emergency operations were excluded. Two groups were compared by using the data on the patients' demographics, disease related data and preoperative cardiopulmonary risk, and in order to compare short-term outcomes we analysed operative details and postoperative complications. Preoperative cardiopulmonary risk was quantified by using the revised cardiac risk index (RCRI) and forced expiratory volume at 1 second (FEV1).

Results: There was no significant difference in age, sex ratio, American Society of Anesthesiology score, comorbidities, tumor location, type of resections and preoperative cardiopulmonary risk (RCRI and FEV1) except body mass index (23.0 vs 21.1, $p = 0.047$) between open surgery group and laparoscopic surgery group. In short-term outcomes comparing open surgery to laparoscopic surgery, postoperative hospital stay (16 days vs 8.8 days, $p = 0.000$), postoperative first gasout day (4th day vs 3rd day, $p = 0.037$), estimated blood loss (236 ml vs 103 ml, $p = 0.003$) were significant difference between two groups. Operative time and reoperation were not different, but open group had a longer operative time (169 min vs 141 min) and higher reoperation rate (29.1 % vs 0) due to anastomotic leak. Postoperative complications between two groups were no difference statistically, but there was one cardiopulmonary complication in the open surgery group, but laparoscopic surgery group was none.

Conclusions: For patients older than 80 years, laparoscopic surgery had a shorter post-operative hospital stay, earlier gasout and less intraoperative blood loss than open surgery and complication between two groups were no difference. Therefore the laparoscopic surgery for colorectal cancer is safe and acceptable as the treatment of choice for patients older than 80 years

P235 - Intestinal, Colorectal and Anal Disorders

Laparoscopic Total Colectomy with Trans-Anal Specimen Extraction in Young Lady

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Introduction: Laparoscopic colectomy with natural orifice specimen extraction (NOSE) can save an additional minilaparotomy and regarded this kind of surgery towards less invasive procedure. Laparoscopic total colectomy with NOSE is never reported before due to difficult intracorporeal ileorectal anastomosis by circular stapler. In this preliminary study, we will introduce our method for intracorporeal ileorectal reconstruction and analyze its short term surgical outcome.

Patients and Material: This is a prospectively designed study of young aged patients undergoing laparoscopic total colectomy for benign colon disease from January 2012 to Jun 2012 at China Medical University Hospital. All patients received trasanal specimen extraction and intracorporeal anastomosis after laparoscopic colon dissection. Postoperative course was recorded including first bowel movement, ascites culture, morbidity and hospital stay. Patients completed questionnaire including items concerning postoperative pain scale from day 1 to day 3 and their cosmetic satisfaction 3 months after operation.

Result: In this period, there were total five female patients including in our series with average age of 32.5-y/o (from 26 to 36-y/o). Four patients were diagnosed colonic inertia and one was familial adenomatous polyposis. Median BMI was 20.45 (from 18.22 to 24.26). Average operative time took 265.75 mins (from 240 to 290 min) and estimated blood loss was 30 ml. There was neither intraoperative nor postoperative complication and none need conversion. Postoperative ascites culture revealed negative in all patients and no any clinical sign of intraabdominal infection occurred. Median postoperative pain score from all patients revealed 6, 4, and 3 on POD1, POD2 and POD3. Postoperative hospital stay was 5.75 days in average. Patient's opinion of scar and overall satisfaction 3 months after operation reported no bother and very satisfaction.

Conclusion: In this pilot study, laparoscopic total colectomy with NOSE and intracorporeal anastomosis did not result peritoneal infection and any complications. This technique is safe and feasible for patients who need total colectomy for less pain and patient's satisfaction.

P236 - Intestinal, Colorectal and Anal Disorders

Complete Laparoscopic Surgery with a Rectum-Reversing Method for Lower Rectal Cancer

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Background and Aim: Laparoscopic surgery for lower rectal cancer is difficult due to the need to cut on the anal side, while maintaining adequate cancer-free surgical margins in the narrow pelvic cavity. When the rectum is resected using the rectum-reversing method and anastomosed anally, this problem is resolved, and the only wound present is the small wound for port insertion. We report our excellent results using this method.

Materials and Methods: This study included patients with rectal cancer who wished to maintain anal function. Small tumors, thin patients, and long colons with a lengthy anal canal were good indications for rectum reversal. After lymph node resection and mesenteric dissection, the oral side of the colon was cut with an endo linear stapler. The rectum was reversed; a surgical margin was made around the tumor; and the anal side of the rectum with tumor was resected. Reconstruction was performed using the double-stapling technique (DST) when there was adequate room or the hand-sewing method otherwise. In the DST technique, the anvil head was inserted into the enteric canal on the oral side of the colon, removed anally, and returned to the abdominal cavity. The rectum remaining on the anal side was closed using a linear stapler and returned to the anal canal. A circular stapler was passed anally and attached to the anvil head. The DST was then performed. The hand-sewing method was modified from the intersphincteric resection anastomotic technique. After resecting the rectum, the oral side of the colon was drawn out anally and anastomosed using the Gambee suture method with absorptive threads.

Results: The rectum-reversing method was performed in 31 patients: the hand-sewing technique was used in 12 patients and the DST in 19. Complications comprised one case of leakage with each method; no anastomotic strictures or peritoneal or surgical site infections occurred. There were no problems with anal function postoperatively. Patients were free from wound pain, and postoperative recovery occurred early. Cosmetic satisfaction was achieved.

Conclusions: The rectum-reversing method with anal anastomosis is effective in patients with lower rectal cancer.

P237 - Intestinal, Colorectal and Anal Disorders

Right Colectomy: Interest of the Full Laparoscopic Approach

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¹University Hospital Dijon, DIJON, France ²University Hospital, LUXEMBOURG, Luxembourg

Aims: The role of laparoscopy is still debated for right colectomy, mainly because there is no standard procedure between laparoscopy-assisted techniques with extra-corporeal anastomosis and full laparoscopy techniques with intra-corporeal anastomosis. The objective was to describe our experience with the full laparoscopic approach, with a focus on the parietal outcomes and a comparison between obese and thin patients.

Methods: All the pre, per and post-operative data of the patients operated on from 2004 were reviewed.

Results: 82 patients were studied, including 32 with a BMI > 30 kg/m² (39 %). The mean operative time was 113 min. The specimen was most frequently extracted through a suspensory Pfannenstiel measuring 4–6 cm. Three patients were converted to a laparoscopy assisted technique to safely control the ileo-caecal pedicle massively involved by neoplastic lymph nodes in 2 cases and for the palpation of a polyp in a case. Two T4 tumors with parietal involvement required en-bloc parietal resection after laparoscopic mobilization and intra-corporeal anastomosis. The overall morbidity rate was 29.3 %, including only 9.8 % of parietal complications, without differences between obese and thin patients. The mean length of hospital stay was 9 days and 2 hernias occurred on the extraction scar.

Conclusions: These excellent results show that the full laparoscopic approach is feasible and safe, even for the obese patients. The low parietal morbidity is also the advantage of this technique.

P238 - Intestinal, Colorectal and Anal Disorders

Laparoscopic Proctocolectomy for Ulcerative Colitis and Familial Polyposis - Our Results

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Aims: Proctocolectomy with terminal Brooke's ileostomy or ileal pouch anal anastomosis is the main surgical treatment for patients with ulcerative colitis and familial adenomatous polyposis. With the advancements of minimal-invasive surgery this demanding operation is increasingly being performed laparoscopically. The objective of the present study was to present our results and assess outcomes after laparoscopic proctocolectomies.

Methods: Nine laparoscopic proctocolectomy procedures performed between 2007 to 2012 were identified from a prospective surgical database. Operative time, length of hospital stay and complications were examined.

Results: The laparoscopic total proctocolectomy procedures were performed for ulcerative colitis in 4 cases and familial adenomatous polyposis in 3 cases. The remaining patient underwent surgical procedure with preoperative diagnosis of ulcerative colitis, however final pathohistological analysis confirmed Chron's disease. Among patients were 4 males and 4 females, with average age 39 years (ranging from 18 to 65 years). Average operative time was 4.5 h (ranging 3.5–6 h). No conversions to open technique occurred. Five restorative proctocolectomies with ileal J pouch anal anastomosis and temporary diverting ileostomy were performed, and in three cases total proctocolectomies with terminal Brooke's ileostomy were done. There was one surgical complication (12 %); due to problems with ileostomy, a correction was necessary. In one of the cases final histologic analysis confirmed Chron's disease and excision of ileal pouch was done. Length of hospital stay ranged from 8 to 52 days (average 14 days-due to one long term hospitalisation).

Conclusion: The results indicate that laparoscopic proctocolectomy can be performed safely with acceptable number of postoperative complications, which can occur more often at the beginning of learning curve. With increasing expertise, decrease in operative time, complication rate and length of hospital stay are expected.

P239 - Intestinal, Colorectal and Anal Disorders

Short-Term Results of Laparoscopic Colorectal surgical Intervention After Post Endoscopic Resected Sites(EMR,ESD) for Early Colorectal Cancer

M. Naito

Okayama Medical Center, OKAYAMA, Japan

Introduction: We report a short-term results of laparoscopic colorectal surgical intervention after post Endoscopic resection (ER) sites for early Colorectal Cancer.

Methods: We investigated 18 cases of laparoscopic surgical intervention after post endoscopic resected sites for early Colorectal Cancer.

Results: Between April 2004 and December 2012, 18 cases of Laparoscopic surgical intervention after endoscopic resected sites was performed. In 18 cases, 7 male and 11 female cases were observed. The mean age was 68.4 years old (range, 45–90). Post endoscopic mucosal resection site (EMR):11 cases and post endoscopic submucosal dissection site(ESD):7 cases. The mean size of the resected tumors was 10.5 mm in EMR cases and 31.5 mm in ESD cases. Resected sites of early colorectal cancer were cecum; 3 ascending colon: 1 transverse colon: 1 sigmoidcolon: 7 rectosigmoid: 2 and high rectum: 1 low rectum: 3. Reasons for surgical intervention was in EMR cases: positive margin 10, vessel invasion 1, ESD cases: positive margin 5, vessel invasion 2. Laparoscopic surgical procedure was ileocecal resection 2, right half colectomy 2, transversecolectomy 1, sigmoidcolectomy 7, high anterior resection 2, low anterior resection 4 with D1 lymphnode dissection 5,D2 lymphnode dissection 13. The mean operating time and estimated blood loss were 274 min (range,162–500 min) and 80 g(range,5–710 g). No conversion to open surgery was observed with no morbidity and mortality. Histopathological state of endoscopic resection sites, residual cancer 4 cases (EMR 3, ESD 1), lymphnodal metastasis 1case (EMR 0, ESD 1). In case of early EMR series, it was revealed that many case had positive margin for unskillful procedure and rudimentary devices. No recurrence was observed during the mean follow-up period of 40 months (range, 4–92 months).

Conclusion: All curative surgical intervention was performed safely using laparoscopic techniques.

P240 - Intestinal, Colorectal and Anal Disorders

Comparison of Laparoscopic and Open Surgery for Colorectal Cancer in Harvested Regional Lymph Nodes

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Aim: The degree of lymph node involvement is one of important prognostic factors. Therefore, the number of harvested regional lymph node (NHLN) is one of objective and important indicators showing the quality of a radical surgery for colorectal cancer. The aim of this study is verifying the quality of a radical surgery with comparison of NHLN between laparoscopic and open surgery for colorectal cancer.

Method: From January 2010 to December 2012, patients undergoing surgery for colorectal cancer with lymph nodes dissection of the root feeding artery (D3) were divided into two groups, laparoscopic surgery (group L) and open surgery (group O). These two groups were compared on each surgical procedure of colorectal cancer. Procedures having both two groups which consisted of four or more patients were analyzed by Mann-Whitney's U test.

Result: 113 patients underwent D3 lymph node dissection. Procedures having both two groups which consisted of four or more patients were right hemicolectomy (RH) and anterior resection of the rectum (AR). 93 patients underwent these procedures. Patients in Group L of AR were 20 and the average NHLN was 17.2. Patients in Group O of AR were 15 and the average NHLN was 16.9. There was no statistically significant difference among both groups of AR ($p = 0.726$). Patients in Group L of RH were 22 and the average NHLN was 23.9. Patients in Group O of RH were 36 and the average NHLN was 30.0. NHLN in Group O of RH was significant superior ($p = 0.026$). However, more than half patients in Group O of RH were stage III or higher. By contrast, Patients of stage III or higher in Group L of RH were only two. There was no statistically significant difference among both groups of RH in patients of stage II or lower ($p = 0.077$).

Conclusion: There was no difference among both groups of AR and of RH adjusted by the stage of the disease. In addition, the average NHLN of both groups in AR and RH were far beyond the twelve. The quality of laparoscopic surgery was comparable to open surgery in regional lymph nodes dissection for colorectal cancer.

P241 - Intestinal, Colorectal and Anal Disorders

Laparoscopic Surgery for Rectal Cancer

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Rectal cancer was and still remains a problem for both the surgeon and the patients. Advances in stapling devices brought great relief to lots of rectal cancer patients. Laparoscopic surgery of the rectal demands more experience and dexterity in skills compared with colon surgery. Rectum is in a confined space, but with the help of magnified view of the confined pelvis, and skills gained in laparoscopic surgery surgeons can now performed fine dissection in the pelvis, thus removing the whole mesorectum embedded in its fascia, as least as precise as in proper oncologic classic rectal surgery, if not more precise. Rectal surgery for neoplasm is divided according to the location of the tumor. Neoplasm till 12 cm from the anal orifice, in higher than T2 stages or with at least N1 are sent for preoperative radiotherapy. For neoplasm till 6 cm from the anal orifice a stapled colo-rectal or stapled colo-anal anastomosis. For tumors at 3 till 5 cm from the anal orifice where at least 1 cm of anal tissue above the pectineal line is present after the resection manual colo-anal anastomosis (Parks Percy) can be performed. Even during APR the abdominal part can be performed laparoscopically thus bringing major advantages in the patients recovery.

In our clinic we have an experience of 75 rectal cancer patients operated laparoscopically in the last 3 years, with 55 anterior rectal resections with colorectal anastomosis, 5 low rectal resections with manual pull through anastomosis and the rest abdomino-perineal resections. Our mean operating time went down from 200 min in the first 2 cases to about 95 min in the last 20, and the mean hospital stay of 5.3 days. Laparoscopic surgery for rectal cancer is feasible in our clinic and the benefits for the patient outweigh the shortcomings.

P242 - Intestinal, Colorectal and Anal Disorders

Laparoscopic Assisted Left Colectomy for Obstructive Colorectal Cancers After Decompression with Metallic Stent: A Case Report

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Laparoscopic assisted left colectomy for obstructive colorectal cancers after decompression with Metallic Stent: A case report.

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We report a case of laparoscopic assisted left colectomy for obstructive colorectal cancers after decompression of Metallic Stent. An 82-year-old man with underlying emphysema and congestive heart failure was diagnosed as having obstructive sigmoid colon cancer during further examination for anemia and admitted to our hospital. Total colonoscopy and barium enema revealed circular stenosis of tumor in sigmoid colon. Metallic Stent(10[GREEKX]90 mm) was placed and diet was started on the same day. 7 days after, laparoscopic assisted left colectomy was performed. Diet was started on postoperative day 5, and the patient was discharged on postoperative day 15 without complication.

Conclusion: Obstructive colorectal cancer was often treated with emergent laparotomy because enlarged intestine become an obstacle of operative field view for laparoscopic surgery. Metal stent placement and earlier diet starting lead to improvement of nutrition statement and obstructive colitis, then we can treat with laparoscopic surgery that is more safe and less invasive. Laparoscopic surgery also have a cosmetic advantage. This approach can avoid two stage surgery associated with colostomy, which reduce patient's quality of life. Especially for patients with cardiorespiratory depression, such as in this case, less invasive treatment is more beneficial. On the other hand, transition from emergency surgery to elective surgery reduce overtime work of surgeons. Laparoscopic surgery after decompression of Metallic Stent improve both patients' and surgeons' quality of life, and will be a new strategy for obstructive colorectal cancers.

P243 - Intestinal, Colorectal and Anal Disorders

The Tape Twist Method: A Simple Method To Resolve Fundamental Problems Associated With Laparoscopic Mesorectal Excision

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Aims: Laparoscopic surgery is advantageous over open surgery; however, it has certain fundamental disadvantages such as restricted direction of forceps, decreased speed of manipulation, and two-dimensional view with no visual perspective. Therefore, we devised a novel, simple, and precise method to achieve straight dissection of the mesorectum and rectum at one stapling point using an endostapler designed for laparoscopy. This helps in maintaining continuity during the procedure. We evaluated the advantages of this method in terms of manipulation and postoperative outcomes.

Methods: The tape twist method (TTM) comprised three elements: guide, isolate, and draw. The procedure is performed as follows. (1) After tying the rectum to the mesorectum with a polyester tape at the intended position for resection and fixing the tape ends using right-angled forceps, the tape is adhered to the rectum by twisting it and turning the rotating knob. (2) The mesorectum is dissected along the guiding tape to obtain a straight cutting line. (3) After irrigation is isolated from the tumor by the tape, the jaws of the endostapler are positioned around the rectum by drawing in. (4) To enable resection at one stapling point, the rectum is transected to adjust its width. The method was performed in 13 cases. The time interval between mesorectal resection and rectal dissection were recorded without interruption, and this was compared between TTM (n = 11) and non-TTM (n = 5) cases.

Results: The average time for mesorectal resection was significantly shorter in the TTM group (12 min, 21 s ± 8 min) than in the non-TTM group (21 min, 6 s ± 2 min, 56 s; p < 0.05). The average time interval between mesorectal resection and rectal resection was also shorter in the TTM group than in the non-TTM group, albeit not significantly. Anastomotic leakage, including nonsurgical site infection, was not observed in any TTM case.

Conclusions: Tightening of the rectum by tape twisting by turning the rotating knob appears to solve the fundamental problem of a two-dimensional visual perspective during laparoscopic mesorectal excision and facilitates laparoscopic rectal resection procedures.

P244 - Intestinal, Colorectal and Anal Disorders

Evaluation of the Laparoscopic Palliative Operation

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Aim: Palliative surgery for incurable malignancies is very useful in relieving symptoms. But, the patients who require palliative surgery has some pain, so surgical pain should be minimal. In addition, for the patient's condition is often poor, operation must be minimally invasive. It is considered that laparoscopic surgery is suitable for surgical palliation. The aim of this study was to assess the feasibility and efficacy of laparoscopic palliative operation.

Method: A retrospective analysis was performed on 43 patients who underwent laparoscopic palliative operation between 2006 and 2012 in our institution. These cases were compared to 28 patients who underwent open palliative operation during the same period.

Results: 25 cases of colorectal cancer, 6 cases of gastric cancer, 4 cases of urological cancer, 4 cases of uterus and ovarian cancer, 3 cases of pancreatic and bile duct cancer, and one malignant lymphoma case were included in the laparoscopic group. The percentage of colorectal cancer was larger and gastric cancer was smaller in the laparoscopic group than open group. The surgical procedures were 30 cases of stoma creation, 8 cases of gastrojejunostomy, 3 cases of intestinal bypass, 2 cases of colectomy in the laparoscopic group. The proportion of stoma creation was higher and gastrojejunostomy was lower in the laparoscopic group than open group. The average surgery time of laparoscopic group was shorter, the amount of bleeding was smaller and the time to start oral intake was faster than open group. There were no significant differences in the post operative stay and the incidence of postoperative complications between the two groups. Improvement rate of the symptoms were 97.7 % and hospital mortality after surgery was 23 % in the laparoscopic group. There were no significant differences in the improvement rate and hospital mortality.

Conclusion: The therapeutic outcomes for laparoscopic palliative operations were comparable to those for the control patients, and some parameters were surpasses. Thus suggesting that laparoscopic palliative surgery can be performed on patients with incurable malignancies provided a thorough sufficient preoperative assessment and well skilled operation by experienced laparoscopic surgeons.

P245 - Intestinal, Colorectal and Anal Disorders

Risk Factors for Conversion and Morbidity in Laparoscopic Rectal Surgery: Key for Selection of Patients in the Beginning of Experience

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Aims: Patient's selection is an important factor for beginner surgeon's experience in rectal surgery, since it may allow improving patients' outcomes. The aim of this study was to determine and analyse risk factors of conversion and postoperative morbidity, considering those two parameters highly influent on patients' outcomes. Thus the best candidates for an early experience in laparoscopic rectal resection for adenocarcinoma would be those associated with less conversion rate to open surgery and less post-operative morbidity.

Methods: All consecutive patients who underwent laparoscopic resection for rectal adenocarcinoma between 2005 and 2011 were included. The same surgeon operated them all. Risk factors associated to conversion and to surgical morbidity were calculated using to Chi-square test. Factors statistically found were included in the multivariate analysis (binary regression, CI 95 %). Results are considered statistically significant when p < 0.05.

Results: During this period, 58 patients underwent laparoscopic resection for rectal carcinoma. There were 29 men and 29 women and the median age was 56.5 years. Tumours were located in the low rectum (0 to 5 cm) in 25 (43.1 %) patients, mid rectum (6 to 10 cm) in 19 (32.8 %) patients and high rectum (11 to 15 cm) in 14 (24.1 %) patients. Forty-four (75.9 %) patients underwent sphincter-sparing surgery. Thirty patients were operated before 2009. Conversion to open surgery was performed in 11 (19 %) cases. Univariate and multivariate analysis showed that time period (before 2009)(p = 0.014; OR 9.4 IC (95 %): 1.5-56) and tumours located 8 cm above the anal verge (p = 0.017; OR 6.7 IC (95 %): 1.4-32) are independent factors associated to conversion. Surgical morbidity occurred in 21 patients (36 %). Only male gender is associated to surgical morbidity (51.7 % vs. 20.7 %; p = 0.014). Male patients had more surgical wound infections (5 % vs. 0 %), anastomotic leak (30 % vs. 12.5 %), reoperation rate (13.8 % vs 0 %) and urinary complications (17.2 % vs. 0 %).

Conclusion: Our study shows that conversion rate is influenced by surgeon's experience (time period), and height of the tumour, and that male gender is associated to higher morbidity. These results suggest that the best patients to start laparoscopic rectal surgery would be women with low rectal tumours.

P246 - Intestinal, Colorectal and Anal Disorders

Sigmoid Volvulus Treated With Endoscopic Detorsion and Subsequent Laparoscopic Sigmoid Resection: Case Series

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Aim: Acute sigmoid volvulus is a well-recognized cause of acute intestinal obstruction. In this paper we aimed to present 4 patients with acute sigmoid volvulus treated by endoscopic detorsion and subsequent laparoscopic sigmoid resection.

Method: Endoscopic detorsion and laparoscopic sigmoid resection was performed to 4 patients in general surgery department of Umraniye Training and Research Hospital in 2012. Demographic status of patients, complications, duration of hospital stay were evaluated.

Results: There were 3 male and 1 female patients. The mean age was 43 (range: 19–90). Chronic constipation, past abdominal surgery and down syndrome, mental retardation were detected as predisposing factors. Detorsion was performed in two patients three times whereas in another two patients once. Laparoscopic sigmoid resection was performed to all patients after successful endoscopic detorsion. Postoperative port site hernia was occurred in one patient. Mean duration of hospital stay was 12.75 days.

Conclusion: Because of the high rate of recurrence of sigmoid volvulus after initial successful non-operative management, definitive minimal invasive surgery after initial colonoscopic decompression should be considered for all patients.

P247 - Intestinal, Colorectal and Anal Disorders

Does Laparoscopic Low Anterior Resections Have Higher Rate of Anastomotic Dehiscence?

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Aims: Anastomotic leak is one of the most serious complications of colorectal surgery and may result in inadequate functional and oncological outcomes. The aim of this study is to assess the incidence and outcomes of clinical anastomotic leak in patients submitted to laparoscopic and open colorectal resections performed by single surgeon.

Methods: All colorectal resections with primary anastomosis (n = 180) performed between 2005. and 2012 were prospectively entered into database.

Results: Of 180 resections 92 pts was done by laparoscopic and 88 by open approach. In 87 pts anastomosis was hand-made and in 93 created by stapler. The most common procedures were low anterior resection (n = 61, open/lap 27/34), left and sigmoid resection (n = 60, open/lap 29/31) and right colectomy (n = 52, open/lap 27/25). Overall anastomotic leak rate was 5.0 %. Anastomotic leak mortality rate was 11.1 % (1/9). In univariate analysis, the following parameters were associated with an increased risk for anastomotic leak: (1) ASA score ≥ 3 (p = 0.05), (2) prolonged (>3 h) operative time (p = 0.03), (3) rectal location of the disease (p < 0.001). There was no difference in overall clinical anastomotic leak between laparoscopic (5.43 %) and open procedures (4.54 %). All cases of clinical anastomotic leak (n = 9) occurred after low anterior resections: after low colorectal in 6 and after coloanal anastomosis in 3 patients. Low anterior resection was performed in 61 patients: in 27 by laparoscopic and in 34 by open approach. Rate of clinical anastomotic leak after low anterior resections was 14.75 % (9 of 61). Leaks occurred in 18.51 % (5 of 27) after laparoscopic and in 11.76 % (4 of 34) low or ultra-low anterior resections. Eight patients required reoperation with two needing the anastomosis take down and 6 patients had the anastomosis defunctioned by loop ileostomy without taking down primary anastomosis.

Conclusion: In our series anastomotic leak occurred only after low and ultra-low anterior resections. Our data have raised concern that laparoscopic rectal resections are associated with increased risk of anastomotic leakage suggesting that we need more experience and better technical support in this type of surgery.

P248 - Intestinal, Colorectal and Anal Disorders

Comparison of the Open and Laparoscopic Operations of the Bottom and Middle Third Rectum Tumours After Neoadjuvant Treatment

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Introduction: The laparoscopic surgery of rectum tumours is a harder challenge for the surgeon, since the saving of the total mesorectal excision and the autonomic nerves can lead to proper functional and oncologic results.

Aim: Our aim is to compare the open and laparoscopic surgeries of the bottom and middle third rectum tumours after chemoradiation and to analyse the quality of the operations, the pathological characteristics of the specimen, the perioperative period, the survival of the patients after the operation and the recrudescence of the disease.

Material and Methods: The period between 1st January 2006 and 31st December 2011 was analysed. 196 patients received neoadjuvant treatment, 12 patients were not able to be monitored, therefore 184 patients were analysed. 182 operated patients were excluded from the analysis due to certain reasons. 132 male and 52 female patients were analysed. 66 laparoscopic (15 conversions) and 118 open operations were performed, as regards the type of the operation: 39 resections (8 laparoscopic + 3 conversions + 28 open), 70 resections with ileostomy (24 + 11 + 35), 71 extirpations (19 + 1+51), 2 open Hartmann resections, 1 open exenteration and 1 open proctocolectomy.

Reoperation occurred once in case of the laparoscopic operation, once in case of the converted operation and 9 times in case of the open operations. The mean length of the laparoscopic operations was 164 min and 184 of the open ones.

Death after the operation did not occurred in the laparoscopic group, and there were 6 ones in the open one. Recrudescence was found in case of 9 patients in the laparoscopic group and in case of 30 patients in the open and converted group. During the monitoring period 4 patients died in the laparoscopic and 20 patients in the open group due to the recrudescence of the tumour.

Conclusion: The laparoscopic operation is oncologically safe additionally to its short-term advantages. Although the laparoscopic operation is suggested only for medical centres and experts, results suggest that it should be a preferable procedure for all surgeons.

P249 - Intestinal, Colorectal and Anal Disorders

Significance of Sentinel Node Technique in Colorectal Cancer

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Introduction: Laparoscopic approach provides many advantages for patients, which is unquestionable in short-term and is equal to the open operation from the oncologic point of view. Sentinel technique has been proven to decrease the radicality of an intervention without oncologic compromise in other fields. Additionally, it may help to improve staging, especially if it is combined with the detection of micro-metastases, and can also influence the adjuvant therapy.

Materials and Methods: Between October 2009 and June 2012, sentinel lymph node sampling was performed in 188 cases of colorectal resections randomized either for open or laparoscopic approach. Right at the beginning of the operation, 1-1 ml of Patent blue dye was injected into the subserosal layer. Dyed lymph nodes were identified by a surgeon right after the operation and were fixed in formalin using specific markers. If the standard histology was negative, the detection of micro-metastases was also accomplished.

Results: If the tumor was in the T4 category, if there was a distant metastasis or if there was macroscopic lymph node positivity, the sentinel method had no use, since it did not influence the surgical technique, the extent of the resection or the postoperative treatment. In T1-T3 categories in lymph node negative cases, the micro metastasis in sentinel and marker lymph nodes can influence the postoperative treatment. In T1-T2 categories, the intraoperative examination of the sentinel lymph nodes can influence even the size of the resection, particularly in high-risk patients. The histologic category of the primary tumor did not show any changes in the metastatic lymph nodes. Significantly higher numbers of lymph nodes were detected in cases with sentinel sampling since the identification of the blue-coloured lymph nodes were easier.

Conclusions: Sentinel node technique was successfully introduced into daily practice. Beyond the regular sentinel nodes, so called marker nodes were found to give additional information. Regarding feasibility, there was no difference between the open and the laparoscopic approaches. Further research is planned to identify whether there is a possibility of intraoperative tumor cell scattering with the sentinel method.

P250 - Intestinal, Colorectal and Anal Disorders

Can Transanal Haemorrhoidal Dearterialisation (THD) as a Minimally Invasive Surgery be the Future of Perianal Haemorrhoidal Disease Management?

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Aim: To evaluate symptoms improvements, patients satisfaction and complications following management of symptomatic haemorrhoids with THD.

Method: A prospective data was collected for all patients with symptomatic haemorrhoids and failed medical or surgical treatment underwent THD in the period between February 2010 and December 2012 in a DGH. Overall median followed up was 6 months (range 1–12 months). Preoperative and postoperative symptoms were assessed, post-operative complication and patient satisfaction.

Results: Sixty seven patients underwent THD in this period. 28 % females age (range 17–79 years) with median of 49.

3 patients (4.4 %) showed symptoms improvement (SI) < 50 %, 19 patients (28.3) showed SI 50–75 % and 45 patients (67.3 %) showed SI > 75 %.

Patient satisfaction scoring (PSS) form 1-5 where one is least or no satisfaction and 5 is the complete satisfaction.

1 patients (1.4 %) PSS 1, 3 patients (4.4 %) PSS 2, 9 patients (13.4 %) PSS 3, 19 patients (28.3 %) PSS 4, 34 patients (52.5 %) PSS 5.

Postoperative Complications: Bleeding 5 patients (7.4 %) submucosal haematoma didn't require intervention. perianal abscess 1 patient (1.49), urgency 2 patient (2.9 %), pain 2 patients (2.9 %), fistula 1 patient (1.49 %) and discharge 1 patient (1.49 %).

All patients had the procedure as a day surgery case, discharge at the same day on oral analgesia; one patient had a residual symptomatic haemorrhoid that required further THD with good outcome.

Conclusion: THD is a minimally invasive surgical technique that targets the haemorrhoidal arteries guided by Doppler transducer in addition to rectal mucopexy, our study shows that THD is an effective method of dealing with symptomatic haemorrhoids with good patient satisfaction which can be done as a day case. A randomised control trial should be conducted to compare THD with other treatment modalities.

P251 - Intestinal, Colorectal and Anal Disorders

Short-Term Effects of Neoadjuvant Chemoradiation Therapy on Anorectal Function in Rectal Cancer Patients: A Pilot Study

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Purpose: Neoadjuvant chemoradiation therapy followed by curative surgery has gained acceptance as the therapy of choice in locally advanced rectal cancer. However, deterioration of anorectal function after long-course neoadjuvant chemoradiation therapy combined with surgery for rectal cancer is poorly defined. The aim of this study was to evaluate the physiological and clinical change of anorectal function after neoadjuvant chemoradiation therapy for rectal cancer.

Method: We analyzed 30 patients on whom preoperative anorectal manometry data were both before and after chemoradiation available from October 2010 to September 2011. All patients underwent the long-course neoadjuvant chemoradiation therapy. We compared manometric parameters between before and after the neoadjuvant chemoradiation therapy.

Results: Of 30 patients, 20 were males and 10 females. The mean age was 64.9 ± 9.9 years (range, 48–82). Before nCRT, the rectal compliance was higher in patients with ulceroinfiltrative type ($P = 0.035$) and greater involvement of luminal circumference ($P = 0.017$). However, there was the tendency of increased rectal sensory threshold for desire to defecate when the patient had decreased circumferential ratio of the tumor ($P = 0.099$), down-graded T stage ($P = 0.016$), or reduced tumor volume ($P = 0.063$) after neoadjuvant chemoradiation.

Conclusions: Neoadjuvant chemoradiation therapy did not significantly impair overall sphincter function before the radical operation. The relationship between tumor response of chemoradiation and sensory threshold for desire to defecate may suggest that neoadjuvant chemoradiation may be helpful for the defecatory function as well as local disease control, at least in the short-term period after the radiation in locally advanced rectal cancer patients.

P252 - Intestinal, Colorectal and Anal Disorders

Efficacy of a Retractor Sponge for Retraction of Small Intestine in Laparoscopic Surgery

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Aims: In laparoscopic surgery for colorectal diseases, retraction of the small intestine from the surgical field and maintenance of an appropriately expanded field of view is essential for safe and reliable procedures. Auxiliary devices for organ retraction are sometimes used without requiring extreme changes to body positioning. However, their efficacy remains unclear for ensuring a good field of view and helping lower the angle of the head down positioning. To address this question, we first created an evaluation model for intestine slippage using the small intestine of pigs in a laboratory study. We then investigated how the laboratory study data might apply to actual clinical practice in laparoscopic low anterior resection for the rectal cancer.

Methods: Efficacy of a cellulose sponge retractor (the Endoractor) in preventing small intestine slippage was evaluated with the experimental model gradually tilted from a level position to 30° at intervals of 3° in the laboratory study phase. Then the data was investigated in 20 case of laparoscopic low anterior resection for the rectal cancer whose procedures were divided into five modules in the clinical application phase. The efficacies were evaluated between the groups with and without a retractor.

Results: When a retractor was used, none of the intestine preparations moved until an angle of 18° was reached, and displacement was as little as 1.3 cm until the angle reached 24° . There was a statistically significant difference in displacement between the two groups in the laboratory study phase ($P < 0.05$). In the clinical application phase, the small intestine did not start slipping until 9.6° with a retractor that was half angle without a retractor, and thus the overall procedures were performed smoothly, especially in module 2 and 3. There was a statistically significant difference between the two groups in the angle at which the head was lowered ($P < 0.05$).

Conclusions: The retractor sponge sustainably enabled retraction of the organs to maintain the good surgical view and has potential efficacy to allow a decreased angle of head lowering and reduce intraoperative problems of cardiorespiratory dynamics in laparoscopic surgeries.

P253 - Intestinal, Colorectal and Anal Disorders

Robotic-Assisted Total Mesorectal Excision of Rectal Cancer: Oncologic Outcomes After Mid-Term Follow Up

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Aim: Robot-assisted surgery has emerged as an alternative minimally-invasive method for rectal cancer. The aim of this study was to evaluate the perioperative and oncologic outcomes of robot-assisted total mesorectal excision in patients with rectal cancer.

Methods: Eighty three consecutive patients with rectal cancer (stage I–IV) underwent robotic-assisted surgery between December 2007 and December 2010 at a single center. Data regarding patients, operations, and short-term and follow-up outcomes were analyzed.

Results: The mean distance of the tumor from the anal verge was 6.3 cm. Thirty-three patients received neoadjuvant chemoradiation. Except 1 patient who underwent abdominoperineal resection, all other patients underwent sphincter-saving surgery (55 low anterior resection and 27 intersphincteric resection). No patient required conversion during the robotic-assisted surgery. 7 patients had concomitant surgical treatment for clinically metastatic diseases. Anastomotic leakage occurred in 11 (13.4%) of 83 patients with anastomosis. Except 4 patients (4.8%) with circumferential resection margin less than 1 mm, 79 (95.2%) patients underwent R0 resection. The mean number of harvested regional lymph nodes was 17.5 ± 9.8 , and the mean length of the distal margin was 2.5 ± 2.2 . The 3-year overall survival rate was 98.8%, and the 3-year disease-free survival rate was 82.8%. Pelvic recurrence occurred in 5 patients with a 3-year local recurrence rate of 6.5%.

Conclusions: Robotic-assisted total mesorectal excision was a safe and effective procedure for sphincter-saving curative resection of rectal cancer. Future prospective controlled trials are necessary to delineate the benefit of enhanced dissection quality.

P254 - Intestinal, Colorectal and Anal Disorders

Laparoscopic Total Mesorectal Excision for Patients with Rectal Cancer After Concurrent Chemoradiotherapy

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Aims: Neoadjuvant concomitant chemoradiotherapy (CCRT) has become an acceptable treatment of locally advanced rectal adenocarcinomas leading to achieving complete resection and preserving anal sphincter. The study aimed to evaluate the benefits of CCRT and clinical outcomes of subsequent laparoscopic total mesorectal excision (TME) in patients with mid- and low rectal cancer.

Methods: 100 patients with clinical T2 ~ T4, or N1-2 rectal cancer were subjected to a preoperative CCRT protocol followed by a standardized laparoscopic TME procedure in the past 6 years. MRI or CT was used to assess the degree of down-staging after CCRT. Oncologic outcomes including surgical margins, lymph node harvest, local recurrence rates, and long-term survival were recorded.

Results: All patients completed the treatment protocol of CCRT and surgery. Laparoscopic TME was efficiently performed without technical difficulties caused by preoperative CCRT. The mean operative time was 197.4 ± 41.7 min, with acceptable median blood loss of 260 ml (range, 70–980 ml). Seven patients (7%) presented with postoperative complications including pelvic abscess, wound infection, anastomotic leakage, and perineal fistula. The CCRT regimen achieved a superior pathologic response for 98% of the patients (13 cases with complete response, and 85 cases with partial response). The serial data of local recurrence, disease-free survival, and overall survival in the follow-up period also demonstrate the effectiveness and feasibility.

Conclusions: Laparoscopic TME for rectal cancer after preoperative CCRT is safe and effective to achieve acceptable oncologic outcomes in terms of resection margin, local recurrence and quality of life.

P255 - Intestinal, Colorectal and Anal Disorders

Our Preliminary Data of Laparoscopic Lateral Pelvic Lymph Node Dissection

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Introduction: The effect of lateral pelvic lymph node dissection for lower rectum has been controversial. Particularly the result of prophylactic lymph node dissection has been unknown. But five-year survival rate of lymph node dissection is about 40 % in the case of metastatic pelvic lymph node. It is equivalent to hepatectomy for liver metastasis. Our preliminary data of laparoscopic lateral pelvic lymph node dissection (LLPLND) is reported.

Material and Method: Since the beginning of 2010, we performed 39 cases of laparoscopic pelvic lymph node dissection. The LLPLND was started after anterior resection of rectum. At first the ureter was isolated by tape. The laparoscopic coagulating shears was useful for dissection. The dissection proceeded along common and external iliac artery downward. And the adipose tissue between external and internal was dissected from lateral to medial. It was important to grasp the tissue strictly and keep traction. This made the border between dissected tissue and pelvic wall clear. The obturator artery and vein were resected. Finally the tissue between internal iliac artery and pelvic plexus was dissected. When pelvic lateral lymph nodes were diagnosed as metastatic, pelvic plexus and internal vessels were resected.

Results: The patients were 20 male and 19 female. Their age was 38 to 83 years (average 64 years). Unilateral dissection took about 60 min. And it took 180 min by resection with blood vessels. Blood loss was 5–100 ml (average 24 ml). Six patients had lateral lymph node metastases. Three needed self-catheter for neurogenic bladder. But all could terminate it within 2 months.

Conclusion: The most serious problem of LLPLND was time-consuming. But this procedure could be performed safely with little blood loss. Permanent neurogenic bladders have never occurred in any patients.

P256 - Intestinal, Colorectal and Anal Disorders

Single Port Laparoscopic Resectional Surgery for Patients with Complicated Crohn's Disease

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Background: Single port laparoscopic surgery is a modified access technique that allows grouping of instruments at a single, confined site on the abdominal wall. While intuitively appealing for patients with Crohn's disease (CD) needing surgery, there is sparse literature yet available for this cohort.

Methods: All patients presenting either electively or urgently for resectional surgery for CD over an 18 month period were considered for SPLS using a surgical glove port sited transumbilically and followed prospectively (including satisfaction scores). Standard, straight rigid laparoscopic instrumentation were used and no additional resources were allocated.

Results: Of 25 consecutive patients presenting for elective or urgent resectional surgery for ileal or segmental colonic CD, 23 (92 %) had their procedure by SPLS. The mean (range) age of these patients was 36.3 (17–69) years and the mean (range) BMI was 21.9 (15.4–30.2) kg/m². Eleven were planned cases while 12 required urgent operation. 16 procedures were done for stricturing Crohn's (of which 3 were reoperations for recurrent disease) and 7 were performed for fistulating disease (three of these patients had a coincident psoas abscess). 22 patients had an extracorporeal ileocolic anastomosis. Mean incision size was 3.5 cm. One patient needed one additional laparoscopic trocar while two needed extension of the wound over 5 cm for the purposes of specimen extraction. The modal (mean) postoperative day of discharge was 4 (4.8). Overall (including six month follow-up) there were seven complications by Clavien Dindo scoring (Class I: 5; Class II: 1; Class III: 1). Patient satisfaction scores were high.

Conclusions: SPLS allows intestinal resectional surgery for CD without additional parietal injury above that needed for specimen extraction in the majority of patients presenting electively or urgently. The surgical glove port performs capably and, by minimizing cost, can facilitate broad embrace of this approach.

P257 - Intestinal, Colorectal and Anal Disorders

Stoma Site Single Access Laparoscopic Total Colectomy for Medically Refractory Ulcerative Colitis

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Introduction: Patients requiring total colectomy for medically refractory ulcerative colitis (UC) are often debilitated but also are young and body-conscious.

Aims/Background: Stoma-site single access (SSA) total colectomy is likely advantageous in every perioperative and intermediate-term aspect for this specific cohort and perhaps most especially for those requiring urgent surgery. This 'scarless' approach should pay greatest dividends for these patients at high risk for wound complications and body image issues.

Method: Prospective record of patients undergoing elective or urgent SSA total colectomy for recalcitrant UC without neoplasia since February 2011. The stoma site trephine is the sole site for both surgical glove port access and specimen egress. Standard instrumentation perform the pericolic dissection and intracorporeal stapled rectosigmoid and ileal transections. Patients were formally questioned 6 months postoperatively re their satisfaction regarding the operative approach.

Results: 19 consecutive patients (10 males) were studied with 14 months mean follow-up. Patient mean (range) age was 40.5 (31–59) years and BMI was 23.2 (20–30.2) kg/m². Mean operating time was 155 min. Modal postoperative day of discharge was 4 while the mean postoperative length of stay was 5.5. Six month postoperative satisfaction scores were high while in the mean follow-up period there were only 4 Class II and 2 Class III complications (Clavien Dindo grading scale).

Conclusions: SSA 'scarless' total colectomy is very applicable to the acute setting and facilitates postoperative recovery regardless of timing of presentation. Its routine implementation does not require specialised instrumentation or facilities. Preservation of abdominal wall planes is likely too advantageous in facilitating any future surgery for pouch formation or completion proctectomy.

P258 - Intestinal, Colorectal and Anal Disorders

Single Port Laparoscopy-Assisted Colectomy Using the Planned Site of Stoma

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Background: Single incision laparoscopic surgery was reported which was better cosmetic result, because of invisible scar, than conventional laparoscopic surgery. However, single incision laparoscopic colectomy has not yet been standardized.

Purpose: We performed single incision laparoscopy-assisted colectomy using the planned site of stoma since May 2012. The aim of this study was to evaluate the feasibility of this surgical procedure.

Surgical procedure:

- 1) Port position: SILS port was placed on left or right lower abdomen where will be made on the colostomy or ileostomy. 5 mm trocar was inserted in the umbilicus.
- 2) Rectum mobilization: The pedicle of IMA held to abdomen side. Root of IMA was recognized, mesentery of sigmoid colon and rectum was detached from medial side approach. Sigmoid colon and rectum were completely mobilized to the level of the levator ani muscle.
- 3) Total colon mobilization: Descending colon was mobilized from sigmoid to splenic flexure. The mesentery of descending colon was cut by ultrasonic coagulation system. Ileum end was cut by end GIA, ascending colon was mobilized to hepatic flexure. The mesentery of ascending colon was cut by ultrasonic coagulation system. The mesentery of transverse colon was cut from left to right side. Total colectomy was carried out.
- 4) Anastomosis: Mucosectomy was performed 3 cm from pectinate line of anal canal. Total colon was removed from anus. Ileal pouch-anal anastomosis was carried out by hand-sowing. Ileostomy was made on the SILS port site.

Results: 6 patients were carried out in this surgical procedure, including two rectal cancer patients, two recto-vaginal fistula in Crohn's disease patients, one ulcerative colitis patient, and one FAP patient. Surgical methods were various (Total proctocolectomy: 2, APR: 4). Average age was 42 years old (23–78). Pre operative BMI (kg/m²) was 20.5 (16.2–23.8). Operative time was 295 min (233–391). Blood loss was 82 ml (20–130). The rate of conversion to open surgery rate was 0 %. Post operative complications were none. The length of post operative hospital stay was 17 day.

Conclusions: Our early experiences suggested that single incision laparoscopy-assisted colectomy using the planned site of stoma might be a technically feasible and safe procedure.

P259 - Intestinal, Colorectal and Anal Disorders

Single Port Transanal Tumor Resection (SPTTR) in Rectal Surgery

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Single incision laparoscopic procedures in various colorectal diseases are described. We started with Single Incision Laparoscopic Surgery (SILS) in 2009 and used the SILS Port also for transanal operations, which we performed until then with Transanal Endoscopic Microsurgery (TEM). Mainly benign colonic diseases and low risk early rectal cancers were treated with the new approach.

Between October 2010 and January 2013, a total of 16 patients (10 male and 6 female) with rectal lesions were operated by using the Single Port Transanal Tumor Resections (SPTTR). The operative procedures were performed by 2 surgeons who are experienced with TEM and with SILS-procedures. In all patients, the operation was successful, and there was no need for conversion to conventional TEM. The mean age of the patients was 67 (41-90) years with a mean Body Mass Index (BMI) of 27 (16-38). The ASA classification in this group was ASA 1 = 0, ASA 2 = 11, and ASA 3 = 5. Mean operating time was 99 min with a range from 35 to 182 min. There were 7 benign and 6 malign (5 patients with T1 and 1 patients with T3 carcinoma), and 3 patients with high grade neoplasia. The mean pain score (VAS) on postoperative day one was 2.3 (0–5), and on postoperative day three 1.4 (0–4). There were no postoperative complications.

In our series with 16 patients we have shown that Single Port Transanal Tumor Resection (SPTTR) is feasible for resection of locally resectable rectum lesions. SPTTR, performed by experienced surgeons is a promising alternative to TEM.

P260 - Intestinal, Colorectal and Anal Disorders

Indication for Surgery in Acute Complicated Diverticulitis: Laparoscopic Versus Open Surgery

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Introduction: During lifetime between 10 and 25 % of patients with diverticulosis will experience an episode of acute diverticulitis. Surgical treatment of complicated colonic diverticular disease is still debatable. The indication for laparoscopic surgery is well established for recurrent, uncomplicated diverticular disease, but is still debatable in complicated diverticular disease.

Aim: This study was designed to compare short-term postoperative results of laparoscopic and open surgery in the management of perforated acute complicated diverticulitis.

Method: A group of 70 patients were admitted to Emergency Clinical Hospital with acute complicated diverticulitis between October 2011 to January 2013. The patients treated conservatively were excluded from the study.

Results: Among the 70 patients admitted with acute complicated diverticulitis, Hinchey type I, II, III and IV, 20 underwent surgery, the rest of them going on conservative treatment. From this group 14 were open surgery and 6 minimally invasive. Abdominal abscess drainage was performed in 10 cases, the rest of 10 patients underwent colectomy. There was no semmificative difference in length of stay between the patients treated minimally invasive and the ones who underwent open surgery (mean 14.6 versus 13.3 days; $p = 0.153$). Minor postoperative complications, like wound infection, and intra-abdominal collections were encountered (16 % versus 44 %), but one patient with complicated acute diverticulitis staged Hinchey IV died within 24 h from the surgery.

Conclusion: The laparoscopic colectomy for complicated diverticular disease may be feasible in carefully selected patients Hinchey I-II. Laparoscopic non-resective procedures reduce the overall morbidity rate but does not reduce semmificatively the hospital stay and the recovering period.

Keywords: Complicated diverticulitis, Laparoscopic, Open surgery

P261 - Intestinal, Colorectal and Anal Disorders

Minimally Invasive Surgery Versus Non Operatory Management in Acute Diverticulitis

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Introduction: The treatment of acute diverticulitis has been change dramatically in the last decade. Initial medical treatment is preferred for uncomplicated cases, surgery being generally suggested after one to four episodes of diverticulitis. The appropriate timing of elective surgery, aiming for the laparoscopic procedure is still a controversial subject.

Aim: The aim of the study is the comparison of short-term outcome of minimally invasive surgery compared to conservative treatment in acute diverticulitis

Method: A group of 70 patients were admitted to Emergency Clinical Hospital with acute complicated diverticulitis between October 2011 to January 2013. The patients who underwent classic surgery were excluded from the study.

Results: From 70 patients a total of 56 patients matched the including criteria, from which 6 underwent minimally invasive surgery, the rest being treated conservatively. The main investigation used to establish the acute diverticulitis diagnostic, staged Hinchey I, II and III, was computer tomography (57 %), while colonoscopy was performed in 12.5 % of the cases for Hinchey type I, II. Both computer tomography and colonoscopy were performed in 12.5 % of the cases. From the total of 6 patients treated minimally invasive, 2 underwent intestinal resection and the rest had the abdominal abscesses drained. None of the patients initially treated conservatively needed surgery. Minor postoperative complications like wound infection, and intra-abdominal collections, were encountered; no deaths were noticed in the studied group.

Conclusion: For carefully selected patients, with acute diverticulitis staged Hinchey I and II, the minimally invasive surgical treatment can be delayed in favor of conservative treatment until elective surgery can be performed.

Keywords: Acute diverticulitis, Laparoscopic, Conservatory treatment

P262 - Intestinal, Colorectal and Anal Disorders

Laparoscopic Lateral Pelvic Lymph Node Dissection Following Total Mesorectal Excision for Advanced Rectal Cancer

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Aims: To evaluate the technical feasibility, safety, and oncological outcomes of laparoscopic lateral pelvic lymph node dissection (LPLND) following total mesorectal excision (TME) in patients with advanced low rectal cancer.

Patients and Methods: Laparoscopic LPLND were performed in 25 patients from April 2009 to September 2012. Data regarding patient demographics, operating time, perioperative blood loss, surgical morbidity, lateral lymph node status, functional outcome, and short-term oncologic result were analyzed.

Results: In all 25 patients, the procedures were completed without conversion to open surgery. Mean operative time was 599.1 min (range 444–809 min). The mean number of lateral lymph nodes harvested was 14.1 (range 4–23), and four patients (16.0 %) had lymph node metastases. Postoperative mortality and morbidity were 0 and 24.0 %, respectively. Two patients developed urinary retention following removal of the catheter and required catheterization. With mean follow-up period of 17 months, no patients experienced local recurrence.

Conclusions: Laparoscopic TME with LPLND is safe and feasible, with the advantage of a minimally invasive approach. Prospective controlled study comparing laparoscopy and conventional open surgery with long-term follow-up evaluation is needed to confirm the authors' results.

P263 - Intestinal, Colorectal and Anal Disorders

Influence of Intra-abdominal Adipose Tissue Distribution on Short-Term Outcomes of Laparoscopic Right Colectomy

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Aims: at present the impact of obesity on short term outcomes of colorectal surgery remains controversial, specially in the laparoscopic field. Most studies on the subject have used BMI to define obesity, without distinguishing between visceral and subcutaneous storage. CT volumetric analysis permits an accurate evaluation of site-specific volume of adipose tissue. The purpose of this study was to examine the influence of CT-volumetric fat parameters on short-term outcomes after laparoscopic right colectomy.

Methods: a retrospective analysis was conducted on 156 consecutive patients undergoing elective right colectomy, of which 55 with laparoscopic technique, from January 2007 to May 2011. CT-volumetric quantification of abdominal visceral and subcutaneous adipose tissue was performed. Intra-operative and peri-operative data were collected.

Results: operating time was found to be moderately correlated to both subcutaneous ($r^2 = .40$; $p = .008$) and visceral fat storage ($r^2 = .37$; $p = .014$). Conversion rate was 3.8 % and no associations were found with fat parameters. Length of hospital stay was associated only with visceral/subcutaneous adipose tissue ratio ($r^2 = .40$; $p = .007$). No associations were found between fat parameters and post-operative complication rate and mortality.

Conclusions: CT-volumetric fat parameters are associated with prolonged operating time of laparoscopic right colectomy, independently on intra-abdominal adipose tissue distribution.

P265 - Intestinal, Colorectal and Anal Disorders

Influence of Intra-abdominal Adipose Tissue Distribution on Short-Term Outcomes of Laparoscopic Left Colectomy

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Aims: at present the impact of obesity on short term outcomes of colorectal surgery remains controversial, specially in the laparoscopic field. Most studies on the subject have used BMI to define obesity, without distinguishing between visceral and subcutaneous storage. CT volumetric analysis permits an accurate evaluation of site-specific volume of adipose tissue. The purpose of this study was to examine the influence of CT-volumetric fat parameters on short-term outcomes after laparoscopic right colectomy.

Methods: a retrospective analysis was conducted on 169 consecutive patients undergoing elective right colectomy, of which 73 with laparoscopic technique, from January 2007 to May 2011. CT-volumetric quantification of abdominal visceral and subcutaneous adipose tissue was performed. Intra-operative and peri-operative data were collected.

Results: no correlation was found between operating time fat parameters. Conversion rate was 21.9 % and no associations were found with fat parameters. Visceral/subcutaneous adipose tissue ratio was found to be associated with length of hospital stay ($r^2 = .38$; $p = .003$) and post-operative surgical complications (OR 6.1, CI 95 %: 1.094–34.054; $p = .039$).

Conclusions: quantitative volumetric fat parameters and BMI failed to predict clinical outcomes after laparoscopic left colectomy, whereas increased visceral/subcutaneous adipose tissue ratio was found to be associated with prolonged length of hospital stay and higher surgical complication rate.

P264 - Intestinal, Colorectal and Anal Disorders

Laparoscopic Treatment in Rectal Prolapse

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Rectal prolapse is not a frequent disease but with important impact in quality of life. Surgical indication and procedure is essential for avoiding the recurrence. We are presenting the laparoscopic approach with Orr-Loygue procedure in 5 patients. It was no conversion, the mean operator time was 80 min (50–110). Follow up of 2 years showed no postoperative constipation or recurrence.

P266 - Intestinal, Colorectal and Anal Disorders

Safety and Effectivity of Reduced Port Surgery Using Port-Less Forceps for Resection of Colorectal Cancer

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Background: Compared to conventional open laparotomy, laparoscopic surgery had advantages such as less wound pain and better cosmetic after surgery. Recently, reduced port surgery (RPS) and single incision laparoscopic surgery (SILS) has been introduced to laparoscopic surgery to improve these aspects further more. The purpose of this study is to examine safety and effectiveness of RPS compared to conventional laparoscopic surgery for colorectal cancer.

Methods: We investigated sixty-four cases of colorectal cancers (CRCs) resected by laparoscopic surgery in our hospital in 2012, including twenty-two cases whose resections were performed by RPS using one or more port-less forceps (Endo-Relief; Hope Electronics, Japan).

Results: As for the safety, we have not been annoyed with EndoRelief at the weakpoints generally unsolved with other needlescopic forceps, such as lack of strength and risk of tissue injury while keeping counter traction. Not only the original purposes of introducing RPS such as (1) less wound pain and (2) better cosmetic after surgery, but also (3) higher cost efficiency and (4) easiness for using additional forceps to keep counter traction during laparoscopic surgery, could be also the advantages of RPS for CRCs. Due to its port-less system, frequent re-use of the forceps could lead high cost efficiency to RPS.

Conclusion: As for the introduction of RPS to laparoscopic colorectal resection, using port-less forceps for counter traction could be safe and effective.

P267 - Intestinal, Colorectal and Anal Disorders

Reduced Port Surgery for Laparoscopic Appendectomy

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Objective: Single-incision laparoscopic surgery (SILS) is a novel area of considering minimally invasive surgery and cosmesis benefit. A retrospective analysis was performed to evaluate our experience and surgical technique of reduced port surgery for laparoscopic appendectomy (RPS-LA).

Methods: Between November 2009 and May 2012, 26 patients who received RPS-LA were included (12 male and 14 female, median age: 31.9 years old). We performed operations using access port methods through an umbilical skin incision or addition one port at the place of suprapubic. The outcomes were evaluated in terms of operation time, intraoperative blood loss, length of hospital stay after operation, and surgical complications.

Results: 19 patients who had catarrhal appendicitis, 5 patients who had phlegmonous appendicitis and 2 patients who had gangrenous appendicitis were performed RPS-LA, which concluded 9 single incision laparoscopic appendectomy. Median surgery time was 62 min, and median intraoperative blood loss was 1 ml. Median length of post operative hospitalization was 4 days. There were no conversions to open surgery. There were no complications and mortality in relation to the operation.

Conclusion: Our experience and surgical technique suggests that reduce port surgery for laparoscopic appendectomy is a safe and feasible procedure for patients with appendicitis.

P268 - Intestinal, Colorectal and Anal Disorders

Transanal Endoscopic Microsurgery for Mid- and Lower Rectal Neoplasms

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Aims: Transanal endoscopic microsurgery (TEM) has been increasingly used in the management of rectal adenomas and in selected cases of rectal carcinoma, with good results. The study intended to assess the feasibility, safety and clinical results of this technique for mid- and low rectal neoplasms.

Methods: Between January 2006 and October 2012, 60 patients who had undergone TEM with standard equipments were included. Short-term peri-operative recovery, complications, local recurrence and systemic metastatic rates were prospectively recorded.

Results: The median height was located 10 cm above the dentate line (4–20 cm) and the median size of the tumor was 2.2 cm (0.6–5.4 cm). 35 % lesions were T1 and T2 carcinomas, and 65 % were benign tumors. The median post-operative stay was 2.8 days. No patient experienced long-lasting fecal soilage. With the median follow-up of 3.8 years, the local recurrence rate was 3.3 % for benign tumors, and 1.7 % for malignant cancers. Neither systemic metastasis nor perioperative mortality was noted.

Conclusion: TEM is a feasible and safe procedure and may represent one type of minimally invasive surgery for both benign and selected malignant rectal tumors in terms of local tumor resection, with lower recurrences rates, and lower complication rates.

P269 - Intestinal, Colorectal and Anal Disorders

Long Term Results of Laparoscopic Total Mesorectal Excision for Middle-Low Rectal Cancer

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Total mesorectal excision (TME) seems to be the best option considering recurrence rate and survival for patients with rectal cancer even if its role remains controversial and its spread proceeds slowly. The aim of this study was to evaluate the safety, the feasibility, the perioperative outcome and long-term results of laparoscopic TME.

Using a prospectively recorded database we reviewed 186 consecutive unselected patients undergoing laparoscopic TME for middle and low rectal adenocarcinoma between January 2002 and December 2012. Follow-up was done every 6 months for the first 5 years, then every year.

Laparoscopic TME was completed successfully in 203 patients. The overall morbidity and mortality rates were 23 and 2 %, respectively, with an overall anastomotic leak rate of 13 %. Intraoperative complications were < 1 %. In 171 patients (85 %) the resection was considered curative. The remainder had a palliative resection due to synchronous metastatic disease or locally advanced disease. Average number of lymph nodes removed was 19.8. Mean follow-up was 61 months (range 5–137). The local recurrence rate was 5 %. Overall 5-year survival rate was 75.9 % after curative resection and 33.3 % after palliative resection.

Laparoscopic TME is feasible and safe, and established oncological and surgical principles are respected.

P270 - Intestinal, Colorectal and Anal Disorders

TEM in T1 Rectal Cancer - Influence of the Cancer Grading

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The question about the indications for use of TEM in malignancies is a subject of ongoing discussion in the surgical society. The most popular and most common questions is in which stages of rectal cancer and in which cases TEM is method of choice.

Materials and Methods: This is a prospective clinical study for period of 84 months. We are analyzing 44 patients with rectal cancer undergone TEM. The T- contribution is: 16 patients—Tis, 12 patients—T1, 11 patients—T2, 1 patient—T3 and 4 patients—T4. The patients with T2 are over 75 years old with severe comorbidity. In these cases we used preoperative CRT. The patient with T3 rectal cancer is with dilatative cardiomyopathy and is absolutely contraindicated for conventional surgery. In the case with T4 we did performed palliative TEM because of ongoing rectohaemorrhage and ileus. Follow up was performed in 39 cases (88,6 %) for 3 to 84 months period.

In the patients of T1 and T2 groups we consider the influence of the cancer grading. We did not found relapse in the case with low-risk rectal cancer. On the other site the relapses in the cases with high-risk rectal cancer are as follow: T1—33 % (one of 3 patients); T2—42,86 % (3 of 7 patients).

Conclusion: In cases with high-risk rectal cancer in any stage greater than Tis-TEM is not applicable and a method of choice is anterior rectal resection with total mesorectal excision.

P271 - Intestinal, Colorectal and Anal Disorders

Colonic Electrical Pacing for Slow Transit Constipation

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Despite electrical stimulation was reported for the treatment of gastroparesis, the treatment of constipation with an electrical stimulation of the colon was never described before. Aim of the present study was to describe this new technique.

In two female patient (age 29 and 36), with a slow transit constipation that satisfies RomaIII criteria, clinically and radiologically confirmed, with less than one bowel movement per month, in which dietary, biofeedback and laxatives therapy were failed, with an unsuccessful 2 months Sacral Nerve modulation test, and a daily use of Peristeen irrigation kit (Coloplast Ltd), a colonic electrical stimulation was proposed, before total colectomy. Under general anesthesia two monopolar electrodes were laparoscopically placed between the descending colon and the sigmoid colon and extraperitoneally connected to a subcutaneous neurostimulator.

The follow up period was 15 months. No intraoperative or perioperative complications were reported. The first spontaneous defecation occurred 5 and 3 days after the operation. Since the procedure the patients had 2 or 3 spontaneous bowel movements per week with normal sensation and stimulus. Laxatives or enemas were no longer needed. Clinical symptoms are disappeared and transit time with markers performed 3 months after the operation was normal.

Colonic electrical stimulation could be a feasible solution for intractable slow transit constipation

P272 - Intestinal, Colorectal and Anal Disorders

Colonic Resection After Polyp Excision: An Overtreatment?

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There are no clearly defined surgical strategy for the radical treatment of endoscopically resected polyps with diagnosis of adenocarcinoma. Colonic resection could be considered the treatment of choice, even if in the majority of the patients there are no alterations in the histological specimens.

Aim of the present study was to evaluate the results of colonic resection after the resection of polyps with a malignant diagnosis.

From 2006 to 2012, 27 asymptomatic patients underwent laparoscopic colonic resection after occasional diagnosis of cancerized colonic polyps endoscopically removed during national screening colonoscopy. The clinical course and the pathological results of the whole group were evaluated in order to compare the clinical pre-surgical with the histopathological post-surgical stage.

All the patients had an early stage cancer, with initial submucosal involvement (T1). In 20 patients the polyps were peduncolated, and were completely one piece endoscopically removed. In the other 7 sessile polyps an incomplete or indefinite piecemeal resection was performed. In 26 patients the colon specimen did not reveal any evidence of cancer. In one patient a single lymph node metastasis was demonstrated, without any local residual of disease. The surgical complications was: one bleeding medically treated, 5 wound infections, 2 pneumonia and one conversion for spleen injury.

From these preliminary results about this topic we can conclude that the surgical radical treatment of cancerized colonic polyps might be more selectively proposed than what most of the authors have proposed up to now, because the surgical complications are sometimes superior to the real oncologic benefits, especially in case of early stage cancerized polyps.

P273 - Intestinal, Colorectal and Anal Disorders

Stapled Haemorrhoidectomy vs Open Haemorrhoidectomy our Experience

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Introduction: We did a retrospective review of all the haemorrhoidectomies done in our unit over last 5 years.

Aim: Main aim of the study was to compare Hospital stay, pain score, and complications between two procedures.

Material and Methods: All procedure were done by three colorectal consultants. Total 45 stapled and 27 open haemorrhoidectomies were done. All patients who were considered unsuitable for stapled procedure were excluded from study.

Results: Pain score Hospital Stay were much less in Stapled procedure as compared to open procedure where as statistically complication rate was almost same in both procedures.

Conclusion: Stapled haemorrhoidectomy is preferred procedure as compared to open procedure when there is no contraindication.

P274 - Intestinal, Colorectal and Anal Disorders

Laparoscopic Colo-Rectal Resection, Local Experience

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Aim: Review patients who had a laparoscopic colorectal resection in Hairmyres Hospital, district general hospital in Lanarkshire, Scotland and assess the outcome of this experience.

Method: Retrospective study of 100 patients who had a laparoscopic colorectal resection in Hairmyres hospital under one general surgical consultant over a 5 year period and observe their post operative recovery

Results: 100 patients were reviewed, 48 males to 52 females with average age of 61.4 years old (17-86) who had a laparoscopic colorectal resection. Patient recovered postoperatively using ERAS protocol (enhanced recovery after surgery), required TAP regional block with PCA (patient controlled analgesia) only and their average hospital stay was 6.1 days

Conclusion: Laparoscopic resection is has reduced hospital stay after colonic resection and with the introduction of SILS (single incision laparoscopic surgery) to our department our figures are expected to improve further

P275 - Intestinal, Colorectal and Anal Disorders

Mechanical Bowel Obstruction Following Transabdominal Preperitoneal Hernia Repair (TAPP) - How Tight Should We Close The Peritoneum? A Case Report

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Background: Laparoscopic hernia repair is a safe procedure. Major postoperative complications (Dindo classification III or higher) requiring surgical intervention are rare and include major hemorrhage and bowel injuries. Mechanical bowel obstruction caused by small defect in the closure of peritoneum is uncommon.

Methods: We describe a case of a male patient undergoing single-port TAPP procedure on the right side. Fixation of the mesh and peritoneal closure was performed using absorbable tackers. He developed a mechanic bowel obstruction on postoperative day four. Computer tomography showed a change of bowel diameter in the right lower abdomen. In our video we present the case and operative strategy of the redo surgery.

Result: Single-port laparoscopy was performed to explore the abdominal cavity. Laparoscopy showed a loop of the small bowel herniated through a peritoneal gap at the site of the mesh repair. The loop was adhesive to the mesh and strangulated by torsion. After retrieving the small bowel in to the abdominal cavity no signs of ischemia occurred. The peritoneal gap was tightly sutured. The further postoperative course was uneventful and the patient was discharged on the second postoperative day after second look procedure.

Conclusion: Single-port redo surgery is feasible and a safe method to explore the abdominal cavity. Laparotomy can be prevented with the presented method. Tight closure of the peritoneum is recommended with complete peritoneal coverage of the mesh in all patients. Some studies recommend a max. space of 0.5 mm between the stitches/tacks.

P276 - Intestinal, Colorectal and Anal Disorders

Single Port-Laparoscopic Colorectal Surgery: Experience from a Single Center

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Background: The reduction of interventional trauma is considered a main goal in modern surgery. Innovative techniques, such as Single Port-laparoscopy, have been developed to further minimize surgical access trauma. Whereas Single-Port appendectomy and cholecystectomy have reached considerable attention, experience with Single Port-access in traditionally more invasive procedures, such as colon resection, is fairly limited.

Method: From March 2011 to January 2013 a total of 55 colon resection were performed (25 male, 30 female). Mean age was 55 y(25–91) and mean BMI was 25.2. 33 % of patients had undergone previous abdominal surgery. In our study, 39 patients underwent surgery for diverticulitis, 11 for malignant intestinal neoplasia or polyps, 2 for CU, 1 iatrogenic perforation, 1 Volvulus and 1 anastomotic stenosis. 9 right sided, 44 left sided resections and two total proctocolectomies were performed. Data was collected in a prospective single center-database for Single Port-Procedures.

Results: Mean operation time was 135 min ranging from 60 to 294 min. 13 (24 %) of procedures were combined with specimen retrieval via the vagina. The rectum resection and total proctocolectomies were operated via the planned ileostomy position with one additional suprapubic trocar for the drainage. In 11 of the other cases one additional trocar was used in pre-existing scars, in 2 two additional trocars were used. No conversion to open surgery was necessary. Overall postoperative complication rate was 14.6 %. Severe complication rate (Clavien-Dindo IIIb or higher) was 6.3 % and led to 3 surgical interventions. In two cases anastomotic leakage was reoperated by laparoscopic drainage and transanal suturing with uneventful recovery, in one case open surgery was necessary due to post-operative ileus after pre-existing open surgery due to ileus. Mean discharge was at day 6. All three diverting ileostomies were closed between.

Conclusion: Single Port-access is an innovative and still evolving way towards further reduction of interventional trauma in colorectal surgery. The technique is safe and feasible.

P277 - Intestinal, Colorectal and Anal Disorders

Is There a Learning Curve in Single Port Laparoscopic Appendicectomy?

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Background: A major goal for the modern surgeon is to reduce the trauma to the abdominal wall caused by the surgical access itself. Offering this one of the most criticized points in Single Port Laparoscopic Surgery is the much-cited technical challenge for the surgeon to perform, especially for non-laparoscopic-skilled junior surgeons. Herein we report the learning curves of laparoscopic-skilled senior surgeons and non-laparoscopic-skilled junior surgeons by the means of recording operation-times of both starting to learn Single Port laparoscopic appendicectomy (SP-AE).

Method: Between July 2011 and January 2013 we recorded and compared operation-times of two laparoscopic-skilled senior surgeons and three non-laparoscopic-skilled junior surgeons starting to learn the SP-AE.

Results: In the time period two senior surgeons performed 52 respectively 14 procedures with an average operation-time during first half of 73 resp. 53 min, and the second half with 66 resp. 54 min. This refers to a small improvement (about 10 %) for the first surgeon and no difference in operation-time for the second surgeon.

Three junior surgeons performed 24, 20 and 17 SP-AE procedures with an average operation-time during the first half of 64, 77 and 64 min and the second half of operations showed no significant change with 84, 66 and 66 min operation-time. Looking on the course of procedures operation-times seem to depend on the difficulties of the single case more than the approach itself.

Conclusion: Single Port-technique for laparoscopic appendicectomy requires a certain kind of familiarization even for the laparoscopic skilled surgeon. Operation-times of the non-laparoscopic skilled junior surgeon could also be reduced with growing experience also depending on the experience of the assisting/teaching surgeon and the severity of the case. After a short period of practicing, Single Port-technique represents a safe alternative to conventional laparoscopic techniques and even provides the advantages of reduced abdominal wall trauma and cosmesis. Therefore, Single Port laparoscopic appendectomy is a good starting procedure well-suited for the training of non-laparoscopic junior surgeons.

P278 - Intestinal, Colorectal and Anal Disorders

Pelvic Organs Prolapse Surgery: Pelvic Organ Suspension (POPS), Laparoscopic Ventral Mesh Rectopexy or Starr?

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Background: Laparoscopic Ventral Mesh Rectopexy (LVR) corrects rectal prolapsed and improves obstructed defecation symptoms (ODS) and faecal incontinence. Similarly, Staped Trans-anal Rectal Resection allows resolution of ODS. Recently laparoscopic pelvic organs prolapse suspension with or without STARR has been proposed, but data are very scant. We present videos and our clinical experience with these procedures, tailored to patients' symptoms and findings, to better understand the ideal surgical approach and propose an algorithm.

Patients and Methods: One-hundred-six consecutive patients underwent surgery for rectal prolapse. All underwent preoperative evaluation with defecating proctography and/or pelvic dynamic MRI and anal physiology studies. End-points were surgical complications, functional Wexner Constipation Score and Faecal Incontinence Severity Index.

Results: Fifty-one patients underwent LVR, fifty underwent STARR and 5 underwent POPS. LVR patients (61 years median age, 12 months median follow up): thirty-one (61 %) had constipation score ≥ 5 ; 8 (16 %), a FISI score ≥ 10 ; twelve (24 %) had mixed OD and FI. One patient required conversion to open (2 %). One rectal perforation occurred. Median length of stay was 2 days. Overall morbidity rate was 22 % (3 subcutaneous emphysemas, 4 UTI, 2 transitory sacral pain, 1 wound haematoma and 1 SBO). Preoperative constipation (median Wexner score: 18) and faecal incontinence (median FISI score: 10) improved significantly at 6 months. Recurrence rate was 10 %. STARR patients (median age: 53, median follow-up: 12 months), all patients had a constipation score ≥ 5 (19 median). Overall complication was 12 % (3 bleeding, 3 temporary urgency). Preoperative constipation improved significantly at 6 months. POPS patients (median age: 67, median follow-up: 3 months), had constipation score ≥ 5 (16 median). No postoperative complications were observed. Preoperative constipation improved significantly at 3 months.

Conclusions: A tailored surgical approach should be guided by a preoperative algorithm.

P279 - Intestinal, Colorectal and Anal Disorders

Laparoscopic Non-resective Procedures, Pelvic Organ Prolapse Suspicion, for Obstructed Defecation Syndrome

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Obstructed defecation syndrome (ODS) may be caused by mechanical and functional rectal disorders including rectocele, rectal invagination and rectal prolapse.

The aim of this study was to determine the efficacy of laparoscopic non-resective procedures, pelvic organ prolapse suspicion (POPS), in selective cases of ODS.

From January 2011 to December 2012 we treated 75 consecutive patients affected with ODS. Stapled transanal rectal resection (STARR) was performed in 65 patients and POPS in 10 (mean age of 58 years).

Conversion to open surgery occurred in two cases. The mean duration of the procedures was 105 min (range 90–160). Early complications were one abdominal wall hematoma and one chronic pain. Mean recovery was 3 days (range 2–6).

Functional evaluation (Obstructed Defecation Score and Wexner Score) showed a significant improvement in 9 patients.

Laparoscopic treatment with POPS should be considered as a therapeutical option for ODS in selected patients.

P280 - Intestinal, Colorectal and Anal Disorders

Early Morbidity of Complicated Colonic Cancer- Minimally Invasive Surgery Versus Open Surgery

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Introduction: Laparoscopic surgery for colon cancer has also been demonstrated to be at least equivalent to traditional laparotomy in terms of adequacy of oncologic resection, disease recurrence, and long-term survival. In addition, numerous reports have validated short-term benefits following laparoscopic resection for cancer, including shorter hospital stay, shorter time to recovery of bowel function, and decreased analgesic requirements, as well as other postoperative variables. Occlusion, bleeding and perforation were the 3 forms of complicated colon cancer encountered.

Method: Retrospective study of patients admitted in Bucharest Clinical Emergency Hospital diagnosed with complicated colon cancer from February 2011 to January 2012.

Results: A total of 38 patients had complicated colon cancer at admission, most of them occlusions. The most frequent tumor localization was on sigmoid colon (41 %) and descendent colon (18 %). For 33 cases open approach was chosen, only 5 cases minimally approach was preferred. Laparoscopic interventions were right hemicolectomy (T2N0M0) and segmental colectomy (T4N1M0). Anastomotic fistula has developed in 2 cases after open surgery and only 1 case after laparoscopic approach (T4N1M0). Death rate was 5 % - no death was encountered after minimally invasive approach.

Conclusions: In selected cases of complicated colon cancer, laparoscopic surgery is feasible. There was no difference for leakage rate and 30 day hospital mortality in our study.

Keywords: Complicated colon cancer, Minimally invasive surgery, Morbidity

P281 - Intestinal, Colorectal and Anal Disorders

Early Morbidity due to Vicious Positions During Colorectal Minimally Invasive Surgery

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Introduction: In spite of recent advances in surgical technology and technique, laparoscopic colorectal surgery is associated with increased operating times when compared to open surgery. This comes with specific early morbidity, like lower limb compartment syndrome. The potential to produce long-term disability in a patient has important medicolegal implications, particularly if the complication is avoidable.

Method: Retrospective study of our hospital database. Inclusion criteria: (1) minimally invasive colorectal surgery, (2) complications related to patient position during surgery. We report also 2 cases of lower limb compartment syndrome after colorectal minimally invasive surgery. A MEDLINE systematic review was performed using the MeSH terms 'compartment syndrome', 'laparoscopic surgery'.

Results: Out of 31 colorectal laparoscopic procedures in one year, 2 cases of lower limb acute compartment syndrome was observed, after a prolonged operative time and related to patient lithotomy position on the operating table.

Case 1: 35 years old patient admitted for sigmoid diverticulitis. After a laparoscopic sigmoidectomy, the patient developed in immediate post anesthetic period, bilateral lower limb pain, calves contraction, and sensorial dysfunction. The serum Creatin kinase (CK) was higher than 20000 U/L, CK-MB = 1002 U/L and AST = 1077. Doppler ultrasonography showed muscle edema with diffuse liquid collection, with permeable superficial and profound venous system. Under conservative management the clinical evolution was favorable without neuromuscular dysfunction, the patient being discharged after 12 days. Case 2: 57 years old patient with lower rectal cancer, whom had performed laparoscopic assisted abdominoperineal resection. The patient accused also pain of left lower limb with calves contraction and paresthesia. Blood samples revealed ALT 151 U/L, AST 690 U/L, and LDH 2229 U/L. Under conservative management the muscle edema was submitted, the patient was discharged after 10 days with minimal limp. Due to favorable clinical evolution we have avoid fasciotomy in both patients.

Conclusions: Compartment syndrome after colorectal procedures is a rare but serious complication that can be avoided by proper positioning of the patient, performant operating tables and greater experience in laparoscopic colorectal surgery. Also is important that patients with this condition to be carefully watched to minimize the comorbidities.

Keywords: Colorectal surgery, Minimally invasive surgery, Compartment syndrome

P282 - Intestinal, Colorectal and Anal Disorders

Full Laparoscopic Right Colectomy for Colorectal Neoplasm in the Obese Patients: Technical Issues and Peri-Operative Outcomes

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Aim: to analyse the impact of obesity on technical issues, perioperative and short term oncologic outcomes in patients undergoing full laparoscopic right colectomy for colorectal neoplasm.

Materials and Methods: From January 2008 to January 2012, 440 patients underwent a full laparoscopic colon resection for colorectal neoplasm at our institution; of these, 149 (34 %) underwent a full laparoscopic right colectomy with an intra-corporeal ileo-colic anastomosis. This cohort was stratified according to BMI (Body Mass Index) using a cut off of 30 kg/m² in two groups: 44 (28 %) obese patients (Group A 1, BMI ≥ 30) and 105 (78 %) non obese patients (Group B, BMI < 30). A retrospective comparative analysis of a prospective collected database was performed.

Results: The two groups were found similar in terms of demographic and neoplasm characteristics except for BMI (P > 0.001) and ASA score (P > 0.005). There were no statistically difference between group A and B in terms of perioperative outcomes including: operative time, conversion rate, perioperative bleeding and transfusion, hospital stay, morbidity and mortality rates. With regards to oncologic outcomes we found no difference in terms of positive resection margin, number of lymph node retrieved, disease free survival and overall survival rate.

Conclusions: In contrast with reported data in literature, our results suggest that in dedicated centres, obese patients affected by right colon neoplasm can be safely treated with a right colectomy performed with a full laparoscopic approach.

P283 - Intestinal, Colorectal and Anal Disorders

Laparoscopic Polypectomy as a Choice of Treatment for Colonic Polyps Unable to be Resected by Colonoscopy

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Aim: We present a small series of five colonic polyps unable to be treated by an endoscopic resection, due to a difficult localization and failure to confront the polyp or to polyp characteristics. One polyp was found in the sigmoid colon close to a strong angulation. Three polyps were found close to the hepatic flexure, and one polyp was found in the transverse colon, close to the splenic flexure. All the patients were settled for an elective colonoscopy in order to mark the lesion prior to surgery.

Method: A laparoscopic approach was performed and the polyps were localized. A colostomy was made close to the origin of the polyp in order to achieve proper traction, and the polyp is resected by use of an endogia so that the base of the polyp is included in the specimen. The lesion is retrieved with the help of a plastic bag and the colostomy is then closed. The specimen is taken for intraoperative analysis in order to decide whether the operation is finished at this point, or is a standard colectomy needs to be done in the case of a carcinoma.

Results: Intraoperative analysis showed an intramucosal lipoma in one case, and the other four cases showed polyps with focal high grade dysplasia not affecting the implantation site or surgical margin. These findings were confirmed afterwards by the definitive analysis. The operation is finished by placing a tachosil layer in 2 cases and omentoplasty was performed in 3 cases. All patients were discharged within the following 24 h and no complications was recorded. No recurrence have been recorded.

Conclusion: Laparoscopic polypectomy with intraoperative pathological analysis is safe, and could be a treatment of choice for polyps unable to be resected by colonoscopy.

P284 - Intestinal, Colorectal and Anal Disorders

Laparoscopic Colorectal Resection - Analysis of a Prospective 12 Years Registry

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Aim: The rate of minimally invasive performed colorectal resection in Austria is estimated between 30 and 40 %. About 1 % is performed with new reduced port techniques. New techniques should be evaluated carefully and patients should be prospectively registered. With the beginning of laparoscopic colorectal surgery in our clinic, we started a prospective registry in 1999.

Patients and Methods: From Mai 1999 to 12/2012 798 Patients (m391, f 407, median age 62, range 22–92) have been operated laparoscopically. 499 due to complicated diverticulitis, 248 because of cancer or tumor. All other patients have undergone resection due to benign disease (Endometriosis, prolaps, stenosis, inflammatory bowel disease and others). Most operations performed: anterior resection 188, abdominoperineal amputation 18, leftsided hemicolectomy 471, right sided hemicolectomy 66, Hartmann's procedure 17, rectopexie including resection 17.

Results: In 36 patients no anastomosis has been made. Out of the remaining 762 patients, 17 had an anastomotic leakage (2.2 %). The overall morbidity was 16 %. The most common complications have been wound infection 19 (2.3 %), bleeding from anastomosis 14 (1.8 %), anaemia 13 (1.6 %) and ileus 13 (1.6 %). Overall mortality was 8 (1 %), mortality due to leakage and peritonitis was 4 (0.5 %). In case of complication, there was no difference in BMI, ASA or Age. Conversion rate was 9 (1.1 %).

Conclusion: LSK colorectal surgery has been successfully established in our clinic. Morbidity and Mortality are low and comparable with results from high volume clinics. Introducing new technologies like single incision surgery, morbidity and mortality should stay within these levels.

P285 - Intestinal, Colorectal and Anal Disorders

Combined Abdominal and Transanal Endoscopic Radical Resection of the Rectum with Sphincter Preservation for Very Low-Lying Rectal Tumors

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Introduction: Preservation of the anal sphincter may be a real challenge in very low-lying rectal tumors, especially in male patients with narrow pelvis and large masses.

Material and Method: Transanal endoscopic surgery (TEO) was added to radical trans-abdominal total mesorectal excision (TME) in an attempt to preserve the anal sphincter without compromising the extent of the resection in two male patients, the first one with a large middle rectal tumor after neoadjuvant radiochemotherapy and the second one with a large inferior villous rectal adenoma.

Results: Radical resection of the rectum followed by coloanal anastomosis were completed in both patients and the anal sphincter was successfully preserved. The final TME specimen was complete, with adequate lymph node yield and negative circumferential margins. The postoperative outcome was uneventful and the anal sphincter showed adequate function.

Conclusions: TEO allowed a very precise resection distal to the tumor and hence preservation of the anal sphincter without compromise of the radical TME dissection. From a local excision technique, TEO has become a key part of a radical procedure and the combined TEO/TEM approach has proven to be a valuable tool in patients with very low-lying large rectal masses. This is just the report of an initial experience and the results must be further confirmed on larger cohorts of patients.

P286 - Intestinal, Colorectal and Anal Disorders

Local Recurrence in Rectal Cancer Surgery: A Reflection of Surgical Quality, Tumour Aggression, Oncological Modulation or a Combination of All?

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AIM: We aim to compare the treatment outcome of patients with rectal cancer who had resectional surgery with a curative intent. Local recurrence(LR) is an important treatment indicator. We aim to analyse the factors affecting LR in this study.

Method: A retrospective analysis of 120 consecutive rectal cancer patients over a period of 69 months of which 47(n = 47) with locally advanced rectal cancer had MDT guided neoadjuvant therapy and curative resection as opposed to the other group who proceeded straight to surgery(n = 73) Radiological staging, histopathology, tumour marker levels and clinical assessment were parameters used for follow up to detect Local recurrence. Quality of surgical resection was assessed by CRM positivity(+) and radiological/clinical confirmation of postoperative anastomotic leak/pelvic collection. Dukes staging, presence of Extramural vascular invasion(EMV), Perineural invasion(PI) and presence of Complete Pathological Response(PCR+) on completion of neoadjuvant treatment were analysed with an intent to assess their effect on local recurrence.

Results: Mean age of patients was 63.8 years with male to female ratio 2:1.

A total of 8 patients(8/120, 6.4 %) had local recurrence, three patients(3/47, 6.3 %) in the neoadjuvant(3 PCR– group,0 in PCR+ group) and five patients(5/73, 6.8 %) in the non-neoadjuvant group(straight to surgery). 3/8(37.5 %) had CRM+ and 2/8(25 %)evidence suggesting anastomotic leak.

6/8(75 %) had Dukes C1,4/8(50 %)poorly differentiated tumours, 6/8(75 %)EMV+ and 4/8(50 %) perineural invasion+.

Conclusion: While quality of surgical resection, clearly manifested by CRM positivity and anastomotic leak rate have definitely been reported in larger series to be associated with a high local recurrence rate, this study demonstrates that other factors as response to neoadjuvant therapy, EMV positivity, presence of perineural invasion and more importantly Dukes' stage and tumour differentiation appear to have a significant bearing on local recurrence rate after rectal cancer resection. A larger prospective study is needed to validate such observation.

P287 - Intestinal, Colorectal and Anal Disorders

Laparoscopic Restorative Proctocolectomy: A Single Centre Experience

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Introduction: Laparoscopic restorative proctocolectomy (RPC) is challenging but beneficial for analgesic requirements, hospital stay, adhesion formation, general complications, cosmesis and preservation of fertility. Our experience regarding intra- and post-operative outcome is described.

Method: From a prospectively collected database, patients undergoing RPC performed by a single surgeon were analysed. Age, indication for surgery, operative stages, operative time, intra-operative and postoperative complications were recorded and given as mean \pm standard deviation (s).

Results: 22 patients (10 females), with mean age 37 ± 15 years, underwent a RPC; 21 (95 %) were laparoscopic and 1 open due to dense adhesions. Twenty patients had Ulcerative Colitis and 2 Familial Adenomatous Polyposis. Single, 2-stage and 3-stage procedures were undertaken in $n = 2$ (9 %), 12 (55 %) and 8 (36 %). A stapled 20 cm J-pouch was fashioned in all cases, and the pouch-anal anastomosis formed with a 29 mm circular stapler. Mean operative time including anaesthetic was 200 ± 64 min. Intra-operative difficulties were uncommon: in one patient, the rectal staple line disrupted requiring transanal suturing. Two (9 %) patients had radiological leaks detected prior to reversal of ileostomy that resolved with time. One patient developed pouch anal stenosis and a perineal abscess that became, after incision and drainage, a pouch perineal fistula. There were no cases of cuffitis. Stool frequency was, day: 4.9 ± 1.1 and night: 1.5 ± 1.9 . Clinical pouchitis with urgency was seen in 7 patients (32 %) during the follow-up period and 1 (5 %) had chronic pouch dysfunction and intolerance treated with a permanent ileostomy. One female had urge incontinence controlled with Loperamide, Codeine and dietary modification.

Conclusion: Our experience suggests that laparoscopic RPC is feasible as a single or 2-stage procedure with low incidence of intra-operative complication and low conversion rate. Pouch function and complications are similar to published data on open RPC.

P288 - Intestinal, Colorectal and Anal Disorders

A Novel Scoring System for Predicting Peri-operative Mortality in Acute Mesenteric Ischaemia

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Introduction: Emergency laparotomy is commonly performed for acute mesenteric ischemia (AMI), which traditionally has low survival rate. Prognostic factors of peri-operative mortality in AMI are poorly defined. The aim of this study was to define a novel prognostic scoring system that predicts an adverse outcome of AMI.

Methods: This is a retrospective study of 4 years from 2009 to 2012 of 103 patients (61 men, 42 women), with mean age of 71 (39–91). Only 49 patients that underwent emergency laparotomy with diagnosis of AMI were included in final analysis. Peri-operative variables such as age, major risks present, serum lactate, WBC count, pH, CRP, plasma D-dimer, serum amylase, clinical findings, radiological findings were recorded and assessed for novel mortality scoring system in AMI (MSSiAMI) for prediction of peri-operative mortality.

Results: Of 49 patients undergoing emergency laparotomy, 31 (63.2 %) died during the peri-operative period as a direct result of AMI. A mortality predictive scoring system (MPSS) was derived using log regression analysis to correlate patients' age, clinical findings, radiological findings, clinical pre-morbid conditions and acute laboratory parameters. A total score of more than 14 on (MPSS) had positive predictive value (PPV) of >92 % with mortality of >95 %. Significant univariate predictors of peri-operative mortality were age ($P = 0.01$), recent cardiac pathology ($P = 0.02$), pH ($P = 0.01$), CRP ($P < 0.05$) small and large bowel involvement ($P < 0.001$); arterial versus venous ischemia ($P = 0.008$). A total score of less than 10 on (MPSS) had a favorable predictive value of outcome.

Conclusion: There was a high correlation between factors of severe acute physiological impairment, chronic system organ failure and mortality after emergency laparotomy. This predictive scoring system can allow us to decide which group of patients will benefit from emergency surgery but will need validation. There could be a role of better diagnostic tools such as laparoscopy in deciding outcome of these patients.

P289 - Intestinal, Colorectal and Anal Disorders

What is the True Incidence of Lymphocytic and Collagenous Colitis?

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Aim: Increased incidence of both lymphocytic (LC) and collagenous (CC) colitis, often described under the umbrella term of microscopic colitis (MC), is being seen globally. The aetiology, pathogenesis and incidence of MC is yet to be well established. However, not all patients with diarrhoea undergo biopsies to check for MC. We aimed to investigate our patient population attending for colonoscopy with symptoms of diarrhoea to assess the proportion of patients undergoing random colon/rectal biopsies to look for MC as well as the incidence of LC/CC in our population.

Methods: Retrospective analysis of the endoscopy database was performed to identify patients presenting from January to December 2011 for colonoscopy with diarrhoea. Patients with a complete colonoscopy with macroscopically normal mucosa or findings unrelated to symptoms were included. MC patients were identified by histology.

Results: A total of 939 colonoscopies were performed during this period for either diarrhoea or undocumented symptoms. Of these, 313 completed colonoscopies were for patients with definite diarrhoea. Of these, 0.9 % were diagnosed with CC while 1.6 % had histological LC. However, only 33 % of patients actually had documented random biopsies performed.

Conclusions: Though there appears to be an increase in incidence of MC documented in literature, we did not find this in our endoscopy unit. This may be due to variability in endoscopists resulting in inadequate biopsies being undertaken during colonoscopy. We are currently undertaking an audit to ensure improved management of these patients as well as improve accuracy in assessment of true incidence of MC.

P290 - Intestinal, Colorectal and Anal Disorders

Laparoscopic Appendicostomy - Malone Procedure - Case Report

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Aim: Appendicostomies are an option for rectal incontinence patients who have established success in attaining an artificial way to keep them clean and in normal underwear through the bowel management program. The reasons for the surgery include problems such as constipation and fecal incontinence. A Malone antegrade continence enema (Malone procedure) is a surgical procedure used to create a continent pathway proximal to the anus that facilitates fecal evacuation using enemas.

Methods: The operation involves connecting the appendix to the abdominal wall and fashioning a valve mechanism that allows catheterization of the appendix, but avoids leakage of stool through it.

In the video presentation we would like to demonstrate this procedure in the case of a patient with traumatic incontinence of the III grade combined with neurogenic bowel obstruction.

Results: The postoperative course was uneventful. Third day after the operation patient started with enema application through the catheter. Three weeks after the operation the stenosis of the appendicostomy occurred. After the dilatation of the stoma there were no more complications.

Conclusion: The Malone Antegrade Continence Enema or MACE has been used for over a century in children who have difficulty either paging a bowel movement or who have chronic incontinence (accidents). Bowel management does not cure fecal incontinence, but can greatly increase quality of life and can be advantageously used at adults.

P291 - Intestinal, Colorectal and Anal Disorders

Laparoscopic Reconstruction of the GIT After the Open Abdomen Operations - Our Technique

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Aims: Reconstruction of GIT after open abdomen operations resulting with enterostomy demands extensive laparotomy, which involves significantly higher risk of morbidity. The aim of our message is to present our practical experience with renewing continuity of the bowel in laparoscopic way step by step.

Methods: In several video sequences we would like to show the ordinary procedure, possible pitfalls and the way we deal with possible complication during the operation. For the video presentation we have chosen patient who underwent the reconstruction of the GIT for leftsided stomy and another one with the rightsided stomy. We review the results obtained on patients, who underwent reconstruction of the GIT in retrospective study. We considered the early postoperative outcome, duration of the operation, type of the operation, peroperative data and postoperative follow up.

Results: Presentation of the technique in the video sequences and analysis of possible pitfalls.

Presentation of the postoperative outcome and follow-up, possible peroperative and postoperative complications.

Conclusion: Laparoscopic reconstruction of the GIT is demanding performance due to the numerous adhesions because of the previous diseases and revisions. Our results show, that this operation can be done safely with relatively low morbidity. That is why the laparoscopic way is a very good option to open access.

P292 - Intestinal, Colorectal and Anal Disorders

Meckel's Diverticulum Bleeding in Terms of Operative Technique

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Aims: To describe a case of laparoscopic management of Meckel's diverticulum bleeding in terms of operative technique and perioperative outcomes. Meckel's diverticulum is the most common anomaly of the small intestine, with an incidence of approximately 2 %. It is usually located on the antimesenteric side of the ileum and is 0.5–56 cm long. It is distinguished from other diverticula in being composed of all the layers of the intestinal walls and having its own circulation. Heterotopic tissue may be present in Meckel's diverticulum, most commonly including gastric mucosa (62 %), and less frequently pancreatic (6 %) or duodenal tissue. It is three to four times more common in men than in women. The most frequent complications include bleeding, intestinal obstruction and diverticulitis.

Methods: We present a case of a 20-year-old patient who had an emergency laparoscopic resection of the segment of small intestine containing a Meckel's diverticulum with bleeding. The patient with rectal bleeding was subjected to upper gastrointestinal endoscopy; colonoscopy, technetium Tc 99 m-labeled pertechnetate radionuclide scan, and also subjected to routine laboratory investigations.

Pneumoperitoneum was achieved by a Veress needle to a pressure of 12 mm Hg. An optic 10 mm trocar was placed at the level of the umbilicus, a 12 mm trocar in the right upper quadrant, a 5 mm trocar in the midline 5 cm below the umbilicus. During laparoscopy a quite large diverticulum in ileum 30 cm before the valvulae Bauhini was found. It was resected with harmonic scalpel and intracorporeal latero-lateral anastomosis with endo-GIA 45 stapler was performed.

Results: The patient did not develop any complication and he was discharge on post operation day 5. The operative time was 60 min. There were no intraoperative complications. The hospital stay was 5 days. There were no other complications during the follow up 12 months. Histological examination confirmed that ectopic mucosa was present in the diverticulum.

Conclusion: Meckel's diverticulum is the commonest cause of major gastrointestinal bleeding in children. Laparoscopic procedure is safe, compared with conventional laparotomy, it has the advantage of precise operative diagnosis, less traumatic access, fewer intraoperative and postoperative complications, and shorter recovery period.

P293 - Intestinal, Colorectal and Anal Disorders

Laparoscopic Reversal of Hartmann's Procedure: The Henri-Mondor Hospital Experience

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Aims: The reversal of Hartmann's procedure performed with an open approach remains a major surgery associated with high morbidity rate and long hospitalization. The study aimed to review our experience with laparoscopic reversal of Hartmann's procedure (LRH) to assess the feasibility and advantages of this technique.

Methods: After institutional review board approval, we analyzed the medical and surgical records of patients with an original diagnosis of diverticulitis, who underwent LRH between September 2006 and June 2012. All patients were administered with intravenous antibiotics and received bowel preparation 48 h before surgery. The same experienced colorectal surgeon performed all procedures, which started with the mobilization of the colostomy, the preparation of the hand-sewn purse suture for the anvil of the circular stapler, and the repositioning of the colonic stump into the abdominal cavity. After introduction of the optical trocar and two working trocars, the colorectal anastomosis was achieved with a circular stapler. No protective stoma was performed.

Results: A total of 24 patients (13 men, mean age 53.5, range 27–92; mean BMI 22.1, range 18.7–27.7) were treated by LRH. The LRH was performed an average 104 days (range 53–220) after the primary resection without anastomosis. The laparoscopic approach was successful in 23/24 cases (95.8 %). Only 1 patient (4.1 %) required conversion to open surgery due to impossible adhesiolysis. No intra-operative complications occurred. The mean operative time was 238.9 min (range 120–330). The mean estimated blood lost was 157 ml (range 60–280). Bowel function returned in a mean of 2.8 days (range 1–6). One patient developed in the first post-operative day an abdominal wall hematoma secondary to epigastric artery hemorrhage that required laparoscopic hemostasis. No anastomotic leak and no mortality were observed. The mean length of hospital stay was 7.2 days (range 5–12). At the six-month follow-up two patients presented a colostomy site hernia.

Conclusion: Although technically challenging, the LRH seems to be a safe and feasible procedure with the advantage of low complication rate and limited hospital stay. Further studies are needed to assess the role that the experience of the colorectal surgeon may play on the surgical and patient outcomes.

P294 - Intestinal, Colorectal and Anal Disorders

Neoadjuvant Chemoembolization and Laparoscopic Techniques for Combination Treatment of Rectal Cancer Complicated by Rectal Hemorrhage

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Rectal hemorrhages, an early symptom of rectal cancer are often rather profuse, leading to anemia in patients, which significantly aggravates their condition and may materially impact the treatment tactics, in particular, acute anemia may motivate a patient to refuse from neoadjuvant chemoradiotherapy.

As neoadjuvant treatment, we performed selective endovascular chemoembolization of the superior rectal artery that supplies the tumor in 32 patients with medium and lower rectal adenocarcinoma of different malignancy grades T2-T4 N1-2 M0, complicated by rectal hemorrhages.

In five T2-T3 patients, low laparoscopic resection was performed, using the standard technique, at three days after neoadjuvant chemoembolization. Open-sky intervention was used for the other T3-T4 patients, after the same delay.

Chemoembolization was made with the use of the most advanced high-absorption HepaSphere embolization material produced by BioShere Medical. HepaSphere are precisely calibrated spherical beads 50–100 µm in size, consisting of a superabsorbent polymer that absorbs a dissolved cytostatic not only on the surface of the microspheres, but in the entire volume of the bead. The bead size ultimately increases up to sixfold.

Histological study of the removed preparation showed, in all cases, major parabolic changes in the rectal tissue тканей прямой кишки, which points to necessity of surgery not later than 72 h after chemoembolization.

Assessment of the close results of the combination treatment of rectal cancer complicated by rectal hemorrhage leads to the following conclusions: chemoembolization of the tumor-supplying vessels is a safe manipulation and makes it possible to proceed with chemotherapy for rectal cancer cases complicated by hemorrhage, and thus to achieve a rapid hemostasis and reduction of the tumor size.

Administration of the chemical preparation causes no characteristic toxic effects, due to selective targeting of the tumor and the surrounding tissues. The surgical treatment should be performed not later than 72 h after the selective endovascular chemoembolization.

P295 - Intestinal, Colorectal and Anal Disorders

Laparoscopic TME: 10 Years Single-Center Experience

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Background: The adoption of laparoscopic resection for rectal cancer has been relatively slow, because of the technical difficulty of the procedure and its oncologic consequence. We present our ten years experience on Total Mesorectal Excision (TME) for middle and low rectal cancer, with regards to surgical and long-term oncologic outcome.

Material and Methods: We analyze patients from our prospective database after a laparoscopic surgical procedure for middle and low rectal cancer in the last 10 years. All cases underwent total-body CT, pelvic MRI and endoscopic EUS. Patients with stage II and III (UICC) were treated with neoadjuvant long-course chemoradiotherapy and operated after 10 weeks. Specimens were analysed according to AJCC Cancer Staging Manual. Postoperative 30-days complications and overall and disease-free survival (Kaplan-Meier method) were registered.

Results: A total of 516 patients (328 males and 188 females, mean age 63.8 + 11.9 years) was collected in our database after a laparoscopic surgical procedure for middle and low rectal cancer. In 250 patients (48.4 %) neoadjuvant long-course chemoradiotherapy was applied. The mean ASA score resulted 1.93 + 0.55. The surgical procedures consisted in 484 anterior resection (with 282 temporary colostomy or ileostomy) and 32 abdominal-perineal-resection. Among anterior resection we have 12 intersphincteric and 65 colo-anal hand-sewn anastomosis. The mean length of procedures was 240.7 + 66 min, with a mean bleeding of 239 + 249.3 mL. In 26 cases (4.8 %) a “conversion” in laparotomy was necessary. 160 patients showed a postoperative complication (30.9 %) and 57 (11 %) were re-operated. Anastomotic leakage (including radiologic ones) were 82/484 (17 %). Mortality rate was 1.7 %. Distal clearance was 2.9 + 2.5 cm with a nodal sampling of 15.5 + 9.3. We had 21 patients (4.1 %) with R1 resection. According to TNM classification we had 45 (8.7 %) stage 0 for complete response to neoadjuvant therapy, 88 (17.1 %) stage I, 194 (37 %) stage II, 144 (27.1 %) stage III and 45 (8.7 %) stage IV. With a mean follow-up of 69 months the overall survival results 71.3 % and the disease-free survival 63.4 %. Local relapse was seen in 20 patients (3.9 %).

Conclusions: Laparoscopic rectal resection with TME is safe and oncological appropriate.

P296 - Intestinal, Colorectal and Anal Disorders

Comparison of the Diagnostic Value of ‘Neutrophil Gelatinase Associated Lipocalin’ in the Patients with Colorectal Cancer Versus Normal Colonoscopy

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Aim: The aim of this prospective study is to evaluate the utility of the Neutrophil Gelatinase-Associated Lipocalin (NGAL) as a diagnostic marker in the patients with colon cancers and precancerous lesions.

Methods: Eighty patients who underwent total colonoscopy done for various indications at surgical endoscopy unit between September 2011 and September 2012 were enrolled. Patients with coexistence of other malignancies or signs of infection were excluded. In this process colorectal cancers detected in 28 patients were assigned as Group-1, polyps larger than 1 cm detected in 23 patients as Group-2 and 29 patients with normal colonoscopic findings constituted control group (Group-3). Serum NGAL, Carcinoembryonic antigen (CEA) and CA 19-9 levels were measured in all patients before colonoscopy. Kruskal-Wallis and Mann-Whitney U tests were used for the statistical analysis of data.

Results: The groups were comparable in terms of demographic features. NGAL levels of the patients in Group-1 was significantly higher than Group-3 ($p = 0.006$). The same differences was detected in terms of the levels of CA19-9 and CEA ($p = 0.001$ and $p = 0.003$), respectively. NGAL levels of the patients in Group-1 was statistically significant than patients with N0 and N2 ($p = 0.017$) according the number of metastatic lymph nodes.

Conclusion: Despite the limited number of patients, plasma NGAL levels seems to be useful for the scanning and diagnosis of colon cancer. Elevated NGAL levels is an important finding in patients with metastatic lymph nodes. In conclusion, plasma NGAL levels can be a pathfinder at colon cancer patients for determine the width of colon resection.

P297 - Intestinal, Colorectal and Anal Disorders

Laparoscopic Appendicostomy - Malone Procedure - Case Report

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Aim: Appendicostomies are an option for rectal incontinence patients who have established success in attaining an artificial way to keep them clean and in normal underwear through the bowel management program. The reasons for the surgery include problems such as constipation and fecal incontinence. A Malone antegrade continence enema (Malone procedure) is a surgical procedure used to create a continence pathway proximal to the anus that facilitates fecal evacuation using enemas.

Methods: The operation involves connecting the appendix to the abdominal wall and fashioning a valve mechanism that allows catheterization of the appendix, but avoids leakage of stool through it.

In the video presentation we would like to demonstrate this procedure in the case of a patient with traumatic incontinence of the III grade combined with neurogenic bowel obstruction.

Results: The postoperative course was uneventful. Third day after the operation patient started with enema application through the catheter. Three weeks after the operation the stenosis of the appendicostomy occurred. After the dilatation of the stoma there were no more complications.

Conclusion: The Malone Antegrade Continence Enema or MACE has been used for over a century in children who have difficulty either paging a bowel movement or who have chronic incontinence (accidents). Bowel management does not cure fecal incontinence, but can greatly increase quality of life and can be advantageously used at adults.

P298 - Intestinal, Colorectal and Anal Disorders

A Case of an Appendicular Mucocele. What Should We Do?

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Introduction: The term appendicular mucocele is referred to mucinous dilation of the appendicular lumen by secretion. It is not a true diagnosis but refers to the gross appearance of appendix distended by mucus inside it. The appendicular mucinous tumors range from mucinous cystadenoma to mucinous cystadenocarcinoma. Mucinous cystadenoma occurs in adults with a mean age of 53 years being the most common peak in seventy. The majority occurs as incidental finding in asymptomatic patients.

We report a case of a patient affected by an appendiceal cystadenoma of considerable size in which it was possible to perform laparoscopic surgery.

Patient and method: A 79 year old woman without allergies and a history of diabetes mellitus, hypertension, mitral valve insufficiency, atrial fibrillation, stroke, and operated by breast neoplasm. In abdominal CT during study of bladder tumor, appeared a lesion of 150 × 50 mm diameter in contact with the cecum that suggested an appendicular mucinous neoplasm. It was decided to perform surgical treatment of appendicular mucinous cystadenoma prior to neoadjuvant treatment of bladder, performing a right hemicolectomy due to the size and the possible involvement of the appendicular base and also because of elderly patient and the urgent requirement of bladder treatment which probably won't allow more than one surgery. Right hemicolectomy was performed laparoscopically with traditional approach prior abdominal cavity exploration aiming appendix mobility was free of adhesions. The extraction of the specimen began with a gentle traction of the appendix dragging the rest of the right colon.

Results: Pathological examination showed a mucinous cystadenoma without other injuries. A posterior colonoscopy was normal. Subsequent treatment of bladder progressed favorably.

Conclusions: Laparoscopic approach is feasible for appendicular cystic masses, always avoiding appendix injuries. Any appendicular cystic mass of more than 2 cm in diameter has to be suspected of neoplastic origin. Furthermore, if it is greater than 8 cm in length and exists possible invasion of appendicular base, should be considered a broader resection than simple appendectomy.

P299 - Intestinal, Colorectal and Anal Disorders

Laparoscopic Assisted Abdominoperineal Resection for Low Rectal Cancer?

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Aim: Abdominoperineal resection (APR), as described by Miles in 1908, is still the operation of choice for low rectal cancers. With advances in laparoscopy, a new approach to the Miles' procedures (laparoscopic abdomino-perineal resection) has been developed, with all oncological principles including TME. However, its feasibility & Oncological adequacy is still under-investigation. This prospective study was conducted to evaluate the technique, feasibility and short term complications of laparoscopic-assisted abdominoperineal resection for low rectal carcinoma.

Methods: Twenty patients with low rectal cancer underwent laparoscopic abdomino-perineal resection at Menufia University Hospital & El-Salam Cancer Center, from the period Of March 2010 to August 2012. 10 patients received neoadjuvant chemo-radiotherapy.

Results: The study conducted on 20 patients (M.8, F.12). Mean operative time 251 + 54.9 min, mean blood loss 325 + 140 cc. Two cases were converted to open surgery. No ICU admission was required, & mean hospital stay was 7 + 2.8 days. Mean lymph nodes harvest were 12.3 + 2.6 with adequate proximal surgical margin 5 + 2 cm. Post-operatively, 2 male patients have sexual dysfunction & no mortality.

Conclusions: Laparoscopic APR can be performed with good technical efficiency, quick functional recovery, and mild disability. The short-term oncologic results of laparoscopic APR is acceptable.

P300 - Intestinal, Colorectal and Anal Disorders

Open Versus Laparoscopic Assisted Colectomy for Colon Cancer

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Aim: Right hemi-colectomy & left hemi-colectomy are the standard for treatment of right & left cancer colon. With the advance in laparoscopic technology and stapler devices, the laparoscopic colectomy is now growing in many centers. The technique feasibility & Oncological safety is still under investigation & the debate between open versus laparoscopic colectomy is still hot issue for investigation.

Methods: Forty patients with colon cancer divided equally into 2 groups. Group I underwent laparoscopic assisted colectomy & group II underwent open colectomy. This prospective study was conducted at Menufia University Hospital & El-Salam Cancer Center, from the period of January 2010 to June 2012.

Results: There was a significant difference for operative duration & intra-operative blood loss. The mean operative time for LAC was 135 min versus 118 for open (P = 0.034). The blood loss for LAC was 267 cc versus 370 for open cases (p = 0.007). Also, there was a significant difference for the post operative ileus (p = 0.01), for parenteral analgesia 7 hospital stay (p = 0.001). There was no significant difference between the 2 groups for harvested number of lymph nodes & post operative complications.

Conclusion: The short-term outcomes of laparoscopic assisted colectomy are better than open colectomy. However the long term outcome was not evaluated in this study, therefore another study recruiting larger number for longer period of follow up is required for.

P301 - Intestinal, Colorectal and Anal Disorders

Longterm Results After Colorectal Surgery

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Since 2005 all patients who are scheduled to undergo colorectal surgery at our hospital are entered into a prospectively maintained database. Aim of this study was the statistical comparison of short and long term results between laparoscopic and open treatment of colorectal diseases.

529 (248 male, 281 female) patients met the inclusion criteria. 348 patients underwent surgery for colorectal cancer, 181 patients had non-malignant disease. The percentage of colorectal cancer was higher in male patients (79 %) than in female (63 %).

A laparoscopic procedure could be performed in 33.8 % of the cases (n = 179). We had a conversion rate of 10.6 % (n = 19). The overall complication rate was 19 % in open versus 9 % in laparoscopic cases. In cancer patients no statistical difference in 5-year survival rate was found between the two surgical methods.

In our opinion laparoscopic surgery is a safe technique for the treatment of colorectal diseases.

P302 - Intestinal, Colorectal and Anal Disorders

Experience of AIN Shams University in Laparoscopic Colorectal Surgery

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Background: Laparoscopic colectomy for colorectal disease technically is feasible but needs a very long learning curve. Despite the obvious benefits, acceptance of the laparoscopic approach for malignant disease has been gradual. It is a technically more challenging surgical procedure; could this, with other environmental factors, represent a compromise in oncological safety? Early problems during laparoscopic colectomy necessitating conversion were related to poor instrumentation; however, innovations by surgeons and industry have led to increased technical feasibility.

Methods: This study was performed to prospectively assess the results of our first 104 consecutive patients who underwent laparoscopic or laparoscopic-assisted colorectal operations. The parameters studied included the type and length of procedure, intra- and postoperative complications, conversion to open surgery, and length of ileus and hospitalization.

Results: 104 laparoscopic and laparoscopic-assisted procedures were performed between February 2009 and July 2012. The mean patient age range 16–65 years; there were 64 males and 40 females. Indications for surgery included inflammatory bowel disease in 5, colorectal carcinoma in 80, diverticular disease in 4, familial polyposis in 2, recurrent sigmoid volvulus in 2, rectal prolapse in 5, and reversal of Hartman in 6 patients.

The procedures included 7 total abdominal colectomies (TAC); 38 sigmoid resection; 15 APR; 10 Rt hemicolectomy; 17 Anterior resection. In 15 cases, the laparoscopic procedure was converted to a laparotomy (14.4 %); 35 patients (33 %) sustained different complications, which included: hemorrhage (3), intraabdominal abscess (4), prolonged ileus (6), wound infection (12), intestinal obstruction (2), anastomotic leak (3), medical complications (4) local recurrence (1). There was one case of mortality.

Conclusion: The feasibility of laparoscopic colorectal surgery has been well established, but it needs a steep learning curve and a lot of training to decrease the complication rate and reach the international standards.

P303 - Intestinal, Colorectal and Anal Disorders

Hand-Assisted Laparoscopic Restorative Total Proctocolectomy (Ileoanal Pouch) Dividing the Ano-Rectum with the Novel Radial Cartridge for Endo-Gia

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A 36-year old male, suffering from medically-resistant ulcerative colitis, had an elective laparoscopic restorative total proctocolectomy (CO₂ pneumoperitoneum 12-mm-Hg) in the Lloyd-Davies position (15° tilt, and 30°-reverse- or Trendelenburg position). Ports: an open approach for a 10-mm supraumbilical (optics), two 5-mm at the right and left abdomen, and 12-mm port near the anterior and superior right iliac spine. A 5-mm Ligasure device and an aspiration-irrigation hook were used to divide peritoneal fascias, dissect cleavage planes and achieve vascular haemostasis without clips.

A standard laparoscopic mobilization of the left and right colon was performed, dividing all segmentary branches of the inferior mesenteric artery and the ileocolic pedicle, while identifying both ureters and hypogastric nerves. Afterwards, a hand-assisted device (Gel-Port) was positioned in a suprapubic 8-cm midline laparotomy, and the surgeon's left hand assisted mobilization of the transverse colon and both colonic flexures, separating them from the stomach, duodenum, pancreas, spleen and Gerota's fascia bilaterally, and sealing the right, transverse, left colic arteries and the inferior mesenteric vein below the pancreas. Once the superior rectal artery branches had been divided at the level of the upper rectum, the rectum was dissected close to the muscular coat until the pelvic floor was reached circumferentially: the assistance of the surgeon's left hand was extremely useful for a safe pelvic dissection. Under control of the assistant's finger anal palpation, a novel Radial cartridge of the EndoGIA (Covidien) was applied to the anorectal junction in an anterior-to-posterior direction, secured and fired: the 55-mm wide Radial cartridge cannot fit from right-to-left (as would be done in open surgery with a 30-mm TA) in narrow pelvis. A remaining 1 cm of rectum had to be divided with another firing of a roticulated blue cartridge.

The surgical specimen was now excised through the Gel port, after dividing the terminal ileum with a linear stapler. A 20-cm-long ileal J-pouch was constructed with 3 firings of a 75-mm straight GIA. Hand-assisted orientation of the pouch and ileoanal anastomosis was performed transanally with a 29-mm circular stapler. A Turnbull ileostomy was raised in the right lower quadrant and the wounds closed.

P304 - Intestinal, Colorectal and Anal Disorders

Single Incision Laparoscopic Intersphincteric Resection Using Left Ileostomy-Site Port

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Aims: Single incision laparoscopic surgery (SILS) for colorectal cancer is now rapidly increasing operative technique. Usually umbilicus has been a preferred site for SILS-port. A few years ago, we began to use right ileostomy-site for SILS-port in low anterior resection that planned to have protective ileostomy before surgery. In this case, there is no wound except stoma. Despite of the cosmetic benefit, there were some difficulties when performing dissection of splenic flexure. Recently, there was an attempt to do SILS for low rectal cancer through left ileostomy-site port. So the authors explain how we do the operation.

Methods: The patient was a 58-year-old man with a body mass index (BMI) of 22.71. The tumor was located 3 cm from anal verge and the patient had preoperative chemoradiation-therapy. About 3.5 cm-sized elliptical incision was made in left ileostomy-site that marked before surgery. All the procedure was done with hand-made glove port adding one additional 12 mm trocar in right lower quadrant by one surgeon who had experienced 700 more cases of SILS. Organ retractors and fan retractors were used for the traction of peritoneal reflection. After performing intersphincteric resection, protective loop ileostomy was made at left SILS-port site.

Results: There was no intraoperative complication. The total operation time was 186 min. During the operation, it was somewhat difficult to performing ligation of inferior mesenteric artery and vein because of the angle. But it was more easier to dissecting the splenic flexure and holding the fan retractor by the assistant. The patient started oral feeding on postoperative day 2 and discharged on postoperative day 6. According to the pathologic report, the tumor stage was ypT3N0. Proximal and distal resection margin was 14 and 2 cm, respectively.

Conclusion: SILS for low rectal cancer through left ileostomy-site port is feasible and safe. It has some benefits especially offering excellent view when performing dissection of splenic flexure as well as cosmetic advantage.

P305 - Intestinal, Colorectal and Anal Disorders

Hand Assisted Laparoscopic Right Colectomy Using the S2 Octoport Device for the Treatment of a Failed to Mark, Untraceable Hepatic Angle Adenocarcinoma

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Aim: We present the case of a 50 years old male patient, diagnosed with an hepatic angle adenocarcinoma. Endoscopy revealed a right colon adenocarcinoma close to the hepatic flexure. CT scan showed no metastasis. The patient was programmed for a new colonoscopy with ink marking, and the patient was settled for elective surgery.

Method: We performed an elective laparoscopic right colectomy with three trocars, using the OCTOPORT S2 for extracorporeal anastomosis and removal of the specimen as we usually do in our group. The ink mark could not be found during exploratory laparoscopy, so we decided to introduce the assistant surgeon's hand in order to find the tumor. Once we have done so, and the tumor has been identified in the proximal transverse colon, we continue our standard right colectomy, without any need to convert to laparotomy or intraoperative colonoscopy. No pneumoperitoneum loss extra time was needed.

Conclusion: Hand assisted right hemicolectomy using the OCTOPORT S2 device is a safe option, and can be helpful in those cases were the tumor is difficult to find, without ant need for extra manoeuvres.

P306 - Intestinal, Colorectal and Anal Disorders

Transvaginal Extraction of the Specimen After Single-Port Right Hemicolectomy with Intracorporeal Anastomosis

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Background: Laparoscopic surgery for colonic disease has been spread worldwide being performed by surgeons trying to increase patient recovery, less pain, earlier ambulation, earlier bowel function, fewer complications, decreased narcotic use, and improved cosmesis compared with open colon surgery. Current techniques require an abdominal incision, although smaller than after open laparotomy. This incision could be related to postoperative pain and complications rates such as infection, hernia, and a less pleasing cosmetic result. The ability to perform a totally intracorporeal anastomosis will be an initial step to allow surgeons to perform natural orifice colon surgery. By combining the 2 techniques of totally intracorporeal anastomosis by single port and transvaginal extraction of the specimen, surgeons will have the option to perform a totally laparoscopic colectomy on female patients. It is the intent to further advance the technical options in the field of natural orifice surgery with the description of this technique. After completing a totally single port right colectomy with intracorporeal anastomosis and transvaginal extraction, an excellent post-operative recovery was demonstrated.

Method: We report two cases of single port right hemicolectomy with transvaginal extraction, one of them without previous hysterectomy, in which using a transvaginal trocar and an extraction bag for the specimen, with subsequent closure of the vaginal opening by an intracorporeal suture. In the other case, the patient had a previous hysterectomy without pelvic adhesions that would prevent such removal.

Conclusion: Transvaginal extraction of the specimen after right hemicolectomy resection by single port shows potential benefit in terms of reduction of potential complications related to the transumbilical incision. Data from prospective randomized trials are needed to support the routine use of this technique.

P307 - Intestinal, Colorectal and Anal Disorders

Intersphincteric Resection for a Low Rectal Tumor Using a Single Port Surgery Device

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Intersphincteric resection is a procedure for resection of tumors of the lower rectum. It is an alternative to abdominoperineal resection in tumors of the suprasphincteric part of the rectum and tumors extending into the anal canal.

The aim of this video is to show a novel approach for this technique using a single port surgery device to facilitate the intersphincteric dissection.

P308 - Liver and Biliary Tract Surgery

Our Standardized Procedure for Pure Laparoscopic Resection of Metastatic Liver Tumor in Segment 7

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Introduction: Pure laparoscopic resection for liver tumors located in the posterosuperior segment (segment 7) is difficult because handling of the laparoscopic forceps is more restricted than in other sites. This difficulty can be resolved by complete mobilization of the right lobe and use of the intercostal trocar. We report a case of totally laparoscopic partial resection of segment 7 using our standardized procedure.

Case: The patient was a 60-year-old female who had undergone surgery for rectal cancer. During a follow-up CT scan, a 13 mm tumor was revealed in segment 7 and diagnosed as a solitary metastatic liver tumor. For resection, the patient was placed in the left semi-lateral decubitus position with legs apart and the trocar for the scope was placed at the umbilicus. After 4 working trocars were placed along the right costal arch, one more trocar with a balloon was placed at the 9th intercostal area on the posterior axillary line for operator's left hand. Sufficient working space was acquired after complete mobilization of the right lobe, and the tumor was clearly detected by laparoscopic ultrasonography in segment 7 on the back of the right lobe. Partial resection could then be performed in almost the same manner as with tumors of the front edge. Operative time was 245 min., and blood loss was 50 ml. Her postoperative course was uneventful.

Discussion: Purely laparoscopic partial resection of poorly accessible liver segment 7 becomes safe and feasible using our standardized procedure. The balloon trocar placed at the intercostal area allows the operator to more easily lift the liver segment with the left hand during dissection of the parenchyma by acquiring wide latitude for movement of the forceps. Although this trocar penetrates the thoracic cavity, injury to the lung can be avoided by observing the motion of the lung through the laparoscope, and pneumothorax can be avoided by inflating the balloon.

P309 - Liver and Biliary Tract Surgery

Use of Laparoscopic Cholecystectomy in the Treatment of Gallstone Disease and Acute Cholecystitis in Diabetic Patients

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Surgery for gallstone disease and acute cholecystitis was performed in 195 patients with diabetes, of whom 104 had attempted laparoscopic cholecystectomy and 91 patients operated on open laparotomy method. In the group of 104 patients with gallstone disease and diabetes who underwent laparoscopic cholecystectomy transition to traditional access performed in 4 patients (3.8 %). Postoperative complications among patients operated on laparoscopically were noted in 6 (5.8 %), including obstructive abscess in 2 (2.5 %) patients and festering wounds in 4 (3.8 %) patients, with no Extra-observed postoperative complications. In the group of patients operated on an open method complications were noted in 10 patients, including intra-abdominal abscess in 2 (2.2 %), evisceration in 1 (1.1 %), suppuration of the wound in 5 (5.5 %) patients. In addition, this group had two heavy ekstrabdominalnyh complications of massive pulmonary embolism in 1 patient and acute myocardial infarction with severe arrhythmias and acute cardiovascular insufficiency in the second patient. Postoperative mortality in patients operated on an open method was 2.2 %, whereas among patients who had attempted laparoscopic cholecystectomy, deaths were not. Comparative analysis of treatment results showed that the use of Computer Assisted Surgery treatment in diabetic patients has several advantages over open method. There were no deaths, a statistically significant decrease in the time of surgery and the degree of intraoperative kropoteri, fewer postoperative complications (almost 2-fold) reduction in the hospital stay of more than 2 times.

P310 - Liver and Biliary Tract Surgery

Acute Obstructive Jaundice and Chronic Cirrhosis Protect Against the Adverse Renal Effects of Pneumoperitoneum: Role of Nitric Oxide

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Aims: Obstructive jaundice and cirrhosis are associated with impaired renal function. Previously we demonstrated that increased intra-abdominal pressure (IAP, pneumoperitoneum) in normal rats induced renal dysfunction. This study investigated the renal effects of pneumoperitoneum in rats with acute jaundice and cirrhotic rats.

Methods: Following baseline period, rats with obstructive jaundice or cirrhosis induced by acute or chronic bile duct ligation (BDL), respectively, and their sham-controls were subjected to consecutive IAPs of 10 and 14 mmHg for 45 min each. Urine flow (V), Na⁺ excretion (U_{Na}V), glomerular filtration rate (GFR), renal plasma flow (RPF) and urinary NO metabolites (U_{NO2+NO3}) and cGMP (U_{cGMP}) were determined.

Results: Elevating IAP from 0 to 10 and 14 mmHg in normal rats caused IAP dependent reductions in V, U_{Na}V, GFR, RPF, U_{NO2+NO3}, and U_{cGMP}. Basal renal function and hemodynamics were lower in rats with obstructive jaundice. In contrast to normal rats, application of elevated IAP of 10 and 14 mmHg significantly improved V, U_{Na}V, GFR, RPF, MAP along increased U_{NO2+NO3} and preserved U_{cGMP}. Similarly, when identical IAP conditions were applied to cirrhotic rats, no deleterious changes in V, U_{Na}V, GFR or RPF were observed.

Conclusion: Application of pneumoperitoneum to rats with acute BDL improves kidney function and renal hemodynamics. Likewise, increased IAP does not exert adverse renal effects in cirrhotic rats. These effects are distinct than the deleterious renal consequences of increased IAP in normal rats. Perturbations in the generation of NO/cGMP during IAP in normal rats but not in rats with BDL or cirrhosis, may contribute to these differences.

P311 - Liver and Biliary Tract Surgery

Digested Gallbladder by Clostridium Perfringens Sepsis Resulted in Auto-cholecystectomy

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Aims: Emphysematous clostridial cholecystitis, is an infrequent, insidious, and rapidly progressive form of acute cholecystitis. It is characterized by early gangrene, perforation of the gallbladder and high mortality. We report a case of digested gallbladder by clostridium perfringens sepsis resulted in auto-cholecystectomy.

Methods: A 63-year-old non-diabetic man presented with sever biliary sepsis. Blood cultures grew clostridium perfringens. CT scan showed Emphysematous Cholecystitis, with extensive inflammatory changes involving duodenum and hepatic flexure but no biliary dilatation. Due to poor American Society of Anesthesiologists score (ASA-IV), CT scan guided percutaneous cholecystostomy was performed the same day of admission. 6 days later, patient developed Pulmonary Embolism (P.E.) which was treated. 3 weeks later, Cholangiogram via cholecystostomy did not show CBD stones.

Results: After 6 weeks of directed antibiotic therapy and P.E. treatment, patient improved significantly and ASA became (II/III). However, he did not completely recover from the sepsis. In the 7th week, Laparoscopy was performed and showed abscess cavity at the area of gallbladder which was maturely walled off by duodenum, colonic hepatic flexure and omentum. The gangrened gallbladder was floating freely in this cavity and no bile leak noticed. The floating gallbladder was picked up (as shown in photos), the abscess was drained, the peritoneum was washed out and large peritoneal drains were left in situ. Patient was discharged home after full recovery (total hospital stay of 9 weeks).

Conclusion: Although this condition develops in approximately 1 % of all cases of acute cholecystitis, compared with typical acute cholecystitis, emphysematous cholecystitis is associated with much higher rates of gangrene and perforation of the gallbladder and significantly increased rates of mortality (15–25 %). Percutaneous cholecystectomy saved this patient's life during the critical sepsis period when he was ASA-IV. This served as a bridge for the definite surgical treatment.

P312 - Liver and Biliary Tract Surgery

Laparoscopic Common Bile Duct Exploration After Unsuccessful Endoscopic Sphincterotomy

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Background: ERCP/ES is a method of choice for treatment of common bile duct (CBD) stones. Sometimes the procedure is technically difficult leading to severe complications and prolongation of the time of hospitalization of patients.

The aim was evaluate effectiveness of laparoscopic CBD exploration in the patients after unsuccessful ERCP/ES.

Methods: Retrospective analysis of the treatment of 35 patients after unsuccessful ERCP/ES was performed. Unsuccessful cases were due to periampullary diverticula in 8 patients, too large and multiple stones—in 24 patients, after by-pass procedures—in 3 patients. There were 28 women and 7 men, mean age was 62.5 ± 10.2 years (range, 38–84). Intraoperative cholangiography (IOC) was done in every case. IOC helped to choose optimal method of laparoscopic CBD exploration.

Results: Mean operative time was 92.6 ± 15 min. Only in 5 patients we retrieved all stones through the cystic duct. Thus, laparoscopic choledochotomy was done in 30 patients. It was successful in 29 cases. Conversion to open procedure was done in 1 case. T-tube drainage was used in 18 patients. Primary closure of the CBD was done in 11 patients. There were 3 cases (8.5 %) of postoperative complications (2—bile leakage, 1—pancreatitis). Mean hospital stay was 5.2 ± 1.9 days. Retained stones were detected in 1 case within a mean follow-up period of 26 months (range, 6–32).

Conclusion: Laparoscopic CBD exploration is feasible and effective for the patients with choledocholithiasis in cases when preoperative ERCP/ES is unsuccessful.

P313 - Liver and Biliary Tract Surgery

Single-Incision Laparoscopic Cholecystectomy for Cholecystitis Requiring Percutaneous Transhepatic Gallbladder Drainage

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Background: Single-incision laparoscopic cholecystectomy (SILC) has been performed in patients with gallbladder stones without acute cholecystitis. We report our experience with SILC among the patients with cholecystitis requiring percutaneous transhepatic gallbladder drainage (PTGBD).

Methods: Surgical procedure was as follows. A single 2 cm-long vertical incision was made across the umbilicus. The SILS-Port was placed through the umbilical incision, and three holes of the SILS-Port were placed at the 1, 5, and 9 o'clock positions of the umbilical incision, respectively. After three 5-mm ports were placed into the holes of the SILS-Port with a 12-mmHg pneumoperitoneum using carbon dioxide, a 5-mm flexible scope was inserted through the port positioned at 5 o'clock to explore the abdominal cavity. An additional 5-mm forceps was inserted through the umbilical incision at the 7 o'clock position outside of the SILS-Port to lift the fundus. A 5-mm flexible instrument for the infundibulum was inserted through the port positioned at 9 o'clock and a 5-mm straight instrument was inserted through the port positioned 1 o'clock. The gallbladder was dissected from the gallbladder bed using laparoscopic coagulating shears and was placed inside the retrieval bag. After irrigation of the abdominal cavity, the specimen was removed through the umbilical incision. The umbilical incision was carefully closed without the use of any drainage tubes.

Results: We performed SILC in 10 patients with cholecystitis requiring PTGBD. All procedures were completed successfully. Mean operative time was 124 min (range, 78–169 min). There were neither intraoperative nor postoperative complications. Mean length of postoperative hospital stay was 2.7 days. All patients were satisfied with the cosmetic results.

Conclusions: Our procedure may represent an alternative to conventional laparoscopic cholecystectomy (CLC) in the patients who fervently demand the cosmetic advantages despite cholecystitis requiring PTGBD. SILC should be carefully performed to avoid bile duct injury because SILC has only cosmetic benefits in comparison to CLC.

P314 - Liver and Biliary Tract Surgery

Laparoscopic Cholecystectomy by Using Our Original Lifting Bars

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Background: This study aimed to evaluate the efficacy of laparoscopic cholecystectomy (LC) in which the abdominal wall is lifted with two original lifting bars, especially for patients with cardiopulmonary disease and severe inflammation.

Method: We developed our original lifting bar. It consisted of a bent stainless steel rod 5 mm in diameter. We used two lifting bars to get better surgical field.

We studied 350 patients (102 men, and 248 women) with an average age of was 56.8 years (range 28–85 years). Forty-five patient had been medicated with cardiopulmonary complications. Twenty-five patients showed a negative cholecystogram in preoperative intravenous cholangiography.

Results: Since 1994, We have performed 350 LCs with good results by the two-bar method. No severe complication occurred in any LC using the two-bar method. Only three cases were converted to conventional open surgery.

Conclusion: By traction teres ligamentum, the liver is lifted to the median abdominal wall. As a result, we can get a suitable surgical field to manipulate the inferior surface of the liver. In the cases of severe cholecystitis, such as xanthogranulomatous cholecystitis, we were able to complete LC using alternating jet-injection of saline and suction.

Our lifting method is suitable for not only cardiopulmonary compromised patients but also the patients with severe inflammation.

P315 - Liver and Biliary Tract Surgery

Laparoscopic Cholecystectomy - Review Over 20 Years with Attention on Acute Cholecystitis and Conversion

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Introduction: The first laparoscopic cholecystectomy (LC) in Austria was performed on March 22nd 1990 at the AKH Linz.

As the experience increased during time the scope of contraindications has been narrowed and the rate of conversion has been decreased. However, acute cholecystitis still leads to a higher conversion rate.

Patients and Methods: We retrospectively analysed all cholecystectomies from 1990 till 2010. All acute cholecystectomies have been carried out with regard to conversion, risk factors for conversion, morbidity and mortality.

Results: We performed 7541 cholecystectomies. 701 (9.3 %) patients had primary open cholecystectomy (OC) and 452 (6 %) had concomitant CHE without further evaluation for this study. From the remaining 6139 patients with LC 1775 (male 885 [36 %], female 890 [21 %]) have been operated due to acute cholecystitis. 141 (7.9 %, 78 male, 63 female, median age 66 years, range 20–94) of them led to conversion. The acute inflammation itself including difficulties in Calot's triangle was the most common cause for conversion (56 %) followed by adhesions (19.1 %). Two patients have been converted due to common bile duct lesion (1.4 %) in case of acute operation and conversion the mortality was 5 %, morbidity was 20 %. Out of the 4364 patients with elective LC 200 had to be converted (4.6 %). The overall conversion rate was 5.5 %. The Reoperation rate after conversion was 6.3 % (n = 9).

Conclusion: Acute cholecystitis leads significantly more often to conversion as in elective LC. Male patients present at the clinic more frequent than female with acute cholecystitis, but in the acute situation the conversion rate is equal.

P316 - Liver and Biliary Tract Surgery

Single Incision Laparoscopic Cholecystectomy: Technique Standardization with Two Curved Instruments

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Aim: Single-incision laparoscopic cholecystectomy (SILC) has emerged as an alternative technique to improve cosmetics. However, many technical constraints, such as lack of triangulation, instrument collisions, and cross-handing, hamper this approach. Using two curved instruments may overcome these problems. We describe our technique and experience using two curved instruments.

Method: An umbilical skin incision, 2 cm in length, was made vertically and LAP PROTECTOR (Hakko; JAPAN) which was silicone rubber-made wound margin protector was inserted to the peritoneal cavity. EZ ACCESS (Hakko; JAPAN) which was made of silicone rubber was attached to LAP PROTECTOR. One 5 mm port for laparoscope (5 mm 30 degree rigid long laparoscope) and three flexible ports were placed through EZ ACCESS. Assistant held the fundus of gallbladder by a curved grasper. The curved grasper disappeared from the laparoscopic monitor and didn't hamper other instruments or laparoscope. Surgeon used another curved instrument by left hand and electrical scalpel by right hand. The use of two curved instruments facilitates better triangulation and instrument handling. Calot's triangle was dissected in the usual manner to obtain critical view of safety. The specimen could be removed through LAP PROTECTOR without a bag.

Results: We performed this procedure for 49 cases. The median operative time was 75 min (range: 40–140 min), which was shorter compared with other techniques that we have ever performed. Minimal blood loss was noted in each patient. No mortalities were associated with the technique.

Conclusion: Using two curved instruments establishes a working triangulation inside the abdomen. This technique is safe and feasible.

P317 - Liver and Biliary Tract Surgery

Laparoscopic Liver Resection for Cancer

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Background: Laparoscopic liver resection has been proposed as a safe and feasible treatment option for liver diseases. Although most laparoscopic hepatic procedures are performed for benign disease, an increasing fraction is for malignant disease, including primary and metastatic liver tumors. The aim of this study was to analyze operative short-term outcomes of laparoscopic liver resections performed on patients for malignancies.

Methods: Laparoscopic liver resection was performed in 32 cancer patients. We performed a retrospective analysis of the recorded data of totally laparoscopic liver resections performed from April 2009 to December 2012.

Results: All liver resection was performed by a totally laparoscopic procedure. The laparoscopic liver procedures consisted of a partial resection (62.5 %), left lateral sectionectomy (33.3 %) and right hemihepatectomy (3.0 %). The mean tumor size was 2.5 cm. The rate of complications was 12.1 %; there was no case of laparoscopy-related serious complications. The mean blood loss was 105 ml (range 5–544). The mean hospital stays were 14 days between (range 8–42).

Conclusion: In properly selected patients, laparoscopic liver resection is safe treatment for cancer patients. The benefits of the laparoscopic approach seem to be shorter hospitalization, smaller incisions, and less blood loss. In the future, the long-term oncological outcomes should be analyzed.

P318 - Liver and Biliary Tract Surgery

Should Conversion of Laparoscopic Cholecystectomy to Open Surgery be Considered a Failure for Laparoscopic Surgeons?

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Introduction: Patient's safety should be the top priority for any surgeon. Laparoscopic cholecystectomy has become the Gold Standard for surgical treatment of Gall-Bladder (GB) disease. Conversion to open cholecystectomy is still inevitable in certain difficult cases, although it doesn't always guarantee the avoidance of biliary or vascular injuries. Conversion is not a complication but a mean of preventing more serious problems. The conversion rate varies from 1 to 8 %. Every institution must have a thorough understanding of the rate and cause of conversion to open surgery. Surgeons having a very high rate of unnecessary conversion may need to be retrained.

Aim: To study the conversion rate and its indications in our institution and compare it with those reported in the literature.

Methods: One thousand patients who underwent laparoscopic cholecystectomy in our institution from 2007 to 2011 were analysed retrospectively. We reviewed in details the converted cases; indications for conversion and complications. One case was excluded from the study as it was booked for open cholecystectomy because of extensive scar of previous anterior bowel resection.

Results: Laparoscopic cholecystectomy was performed on one thousand patients from January 2007 to December 2011, out of which 229 (22.5 %) were males and 771 (77.5 %) were females with an average age of 45.5 years (range 15–82 years). Laparoscopic cholecystectomy was successfully completed in 984 patients with completion rate 98.4 %. Laparoscopic procedure had to be converted to open procedure in 16 patients (8 Males and 8 Females) with a conversion rate of 1.6 %

Conversion had to be done for several reasons (Dense adhesion, contracted G.B. with difficult dissection, inability to proceed safely, in most cases. Difficult anatomy in 2 cases, empyema of G.B. with large stone in 1 case and Mirizzi syndrome in 2 cases.

Conclusion: The conversion rate in our institution falls in the acceptable normal range. Conversion should be taken as a step in the interest of the patient and not as an insult to the operating surgeon. The laparoscopic surgeon must be familiar with open surgery even though most cases are performed laparoscopically

P319 - Liver and Biliary Tract Surgery

High Risk Laparoscopic Cholecystectomy in a Patient with Multiple Giant Liver Haemangiomas: A Case Report

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Haemangioma is the commonest benign liver tumor. Haemangiomas more than 4 cm in diameter are called giant haemangiomas. In most cases, they are asymptomatic and recognized in routine examination or during surgical procedure like laparoscopic cholecystectomy. So, pre-operative diagnosis of haemangioma especially the giant one and its relation to the gall bladder is of great importance to prevent its injury and intra-operative hemorrhage. Magnetic Resonance Imaging (MRI) became the most accurate radiological modality with the highest specificity for diagnosis of focal liver lesions including haemangioma.

We are presenting a 35 year-old-female patient presented with picture of acute cholecystitis. She had repeated acute attacks treated conservatively with no trial for surgery as she has multiple liver haemangiomas. Ultra-sound & MRI revealed very thick walled gall bladder (G) with a stone impacted at the neck. She had 4 liver haemangiomas at segments 4, 7, 8, and the caudate lobe very close to the wall with few millimeters distance between the two. Three of them were huge. She insisted to have surgery in spite of explaining the risk of bleeding if any of the haemangiomas ruptured specially the one close to the G/B, especially that her surgery will not be easy due to the thick fibrotic wall. The hepato-biliary team was consulted. They advocated not doing surgery, but if you have to do it, we should not use diathermy. We discussed the possibility of open versus laparoscopic techniques and the hazards of pressure by gas on the haemangiomas. It was agreed to do it laparoscopically. Intra-operatively, The G/B was large with very thick fibrotic wall with omental adhesions. We proceeded slowly using blunt and sharp dissections. We did not use cautery at all. The liver surgeon was standing in the room all through the surgery. After meticulous dissection, the duct and the artery could be identified, clipped, and cut. Taking the Goff its bed was difficult and tedious. Finally, the was removed safely with no bleeding. The patient had smooth recovery and post-operative course. She was discharged happily.

P320 - Liver and Biliary Tract Surgery

Review of 500 Cases of Single Incision Laparoscopic Cholecystectomy

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Aims: There have been many reports regarding single incision laparoscopic cholecystectomy (SILC) published. However, most studies are case series with a limited number of cases. We have reviewed the outcome of 500 consecutive cases of SILC performed by a single surgeon in our center.

Methods: From April 2009 to October 2012, 1250 patients underwent laparoscopic cholecystectomy for symptomatic gallbladder (GB) disease by a single surgeon. SILC was performed in 500 cases via a 2 cm sized transumbilical port. SILC was chosen as the surgical modality unless there is evidence of acute cholecystitis or GB empyema, the patient has a prior history of upper abdominal surgery, has had endoscopic sphincterotomy for cholelithiasis or bile duct sludge, or has comorbidities with an ASA score of 3 or higher. The clinicopathologic features and perioperative data of patients were retrospectively reviewed.

Results: Mean age of patients was 42.7 years and mean BMI was 23.6 kg/m². There were 331 female patients (66.2 %). Mean operating time was 52 min (range 21–138 min). Mean hospital stay was 1.3 days postoperatively. An additional 2 mm trocar was inserted in the right anterior axillary line for retraction of the GB in 55 patients. Five patients had a prior history of lower abdominal surgery. One case was converted to open cholecystectomy for suspected Mirizzi syndrome. No complications such as incisional hernias have been observed in the patient population.

Conclusion: SILC is a safe and feasible procedure for cholecystectomy and can be considered as the main surgical strategy in a well selected patient population.

P321 - Liver and Biliary Tract Surgery

Torsion of the Gallbladder Can Mimic the Clinical of Acute Cholecystitis: A Case Report from Vajira Hospital

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Background: Torsion of the gallbladder is the very rare condition which the correct diagnosis could be made only at the time of operation. The patient usually comes to the hospital with sudden extreme abdominal pain or generalized peritonitis. Unlike the classic presentations of this condition, we would like to report our case which mimic the clinical of acute cholecystitis.

Aims: To report the rare condition during laparoscopy

Methods: A case was reviewed from in-patient chart and intraoperative records. The pictures were captured from operative video.

Case: A 72 years old lady, who came to our hospital with the clinical of abdominal pain at the right upper quadrant for 2 days, was diagnosed as acute cholecystitis by her clinical presentations and ultrasound findings. We decided to treat her conservatively by intravenous antibiotic but she did not meet satisfied clinical response within 24 h, so the strategy was changed toward the cholecystectomy. While laparoscopy was performed, torsion of the gallbladder was recognizing. The Laparoscopic cholecystectomy (LC) was started by detorsion of the gallbladder for widening the Calot's triangle, then the procedure was done as the usual LC without any difficulty.

Conclusions: Although, it is a rare disease, it should be suspected if the patient does not response well by the conservative treatment. Laparoscopic cholecystectomy can be performed safely in this situation.

P322 - Liver and Biliary Tract Surgery

Endoscopic Bile Duct Clearance and Gallbladder Drainage Change Emergency of Lap Cholecystectomy in Patients with Acute Cholecystitis and Jaundice

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Background: Sometimes it is difficult for surgeon to decide when and with what technique to operate patients with acute cholecystitis, complicated with biliary obstruction, especially elderly patients with high risk of surgery.

Aim of this study was to evaluate the effect of endoscopic treatment on the emergency of laparoscopic cholecystectomy in complicated with biliary obstruction acute cholecystitis (AC) that is not responsive to medical management.

Patients and Methods: Between 2006 and 2012, 407 patients with AC complicated with biliary obstruction were treated at our department. 78 patients had opened operations, 304 had undergone laparoscopic cholecystectomy (LC), and 25 discharged without operation. At the first step 375 patients had undergone therapeutic ERCP.

Results: Endoscopic therapy included sphincterotomy (303), balloon dilation of Vater's papilla (73), stones extraction (186). Endoscopic lithotripsy had 32 patients. In case of failed lithotripsy (11), left stone debris (9), especially in purulent cholangitis, the procedure finished with biliary stenting. In 3 elderly patients in ERCP the gallbladder was disobstructed and for prevention of repeated obstruction the internal drainage of gallbladder with soft double pig-tale stent was performed. After dissolution of biliary hypertension 307 (81.9 %) patients had marked improvement of general condition and relief of AC signs. 86 (22.9 %) patients had disobstruction of gallbladder with gradual disappearance of acute inflammation. Urgent operation had only 21 (5.6 %) patients. 94 (25.1 %) patients underwent LC in 2 and more days, that was used for the treatment of concomitant diseases and in 63 patients changed risk of surgery for 1 ASA class less.

Conclusion: Endoscopic bile duct clearance and gallbladder drainage as the first choice for acute cholecystitis complicated with biliary obstruction change the emergency of laparoscopic cholecystectomy, and reduce the surgery risk for patients with ASA 2 and 3.

P323 - Liver and Biliary Tract Surgery

From Open Cholecystectomy to Hybrid Notes Cholecystectomy

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Aim: The most changes in Surgery are applied in cholecystectomy (CHCE).

Method: Classic open CHCE was described by Langenbuch in Berlin in 1882. Over 100 years later was performed first laparoscopic CHCE by Mouret, Lyon, in 1987. In last 7 years come to our praxis new way—N.O.T.E.S. The most accepted is SILS (Single Incision Laparoscopic Surgery) and hybrid NOTES—like transvaginal access—TVG, described by Zorrón in 2007.

Robotic CHCE was performed in 1997, but except robotic SILS cholecystectomy (in 2011) is not widely used.

Result: We perform at our department all types of CHCE—from open to hybrid NOTES-CHCE. We perform laparoscopic and microlaparoscopic CHCE too—with 3 mm instruments. But we don't see any benefit in microlaparoscopy for patients and for Surgeons too. In 2 years we performed 90 SILS-CHCE. In 7 patients (7.8 %) we converted to laparoscopy by using one or two additional ports. But in 8 patients (8.9 %) was found haematoma in umbilicus. Pain after SILS-CHCE is the same or greater than after laparoscopic CHCE—because 3–3.5 cm long incision of fascia in umbilicus for special port.

In last 2 years we performed 20 TVG cholecystectomies without any complications. Pain was minimal, no complications in umbilicus—because only one 5 mm port.

Conclusion: in our experiences the most benefit for patients and Surgeons is “classic” laparoscopic CHCE. SILS is better for cosmesis, but pain or complications in umbilicus are higher. In indicated cases transvaginal CHCE is safe and advanced procedure with best cosmetic result and the minimal pain. TVG-CHCE is more easy to perform like SILS-CHCE.

P324 - Liver and Biliary Tract Surgery

Laparoscopic Management of a Cystic Artery Pseudoaneurysm with Simultaneous Cholecystectomy in a Patient with Calculus Cholecystitis

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Background: Cystic artery pseudoaneurysm (CAP) secondary to acute or chronic calculous cholecystitis is rare despite the high incidence of cholecystitis. Less than 25 cases have been reported in the literature. Interestingly only 2 cases reported an unruptured CAP being diagnosed as an ‘incidentaloma’ making our case the third in the literature. To our knowledge, we here describe the first laparoscopic simultaneous management of a CAP and cholecystectomy.

Case description: A 61-year-old female presented with a 24-h history of right-sided abdominal pain, vomiting and raised inflammatory markers. A contrast-enhanced CT revealed extensive cholecystitis and pericholecystic fluid. More importantly there was a 12 × 15 × 8 mm CAP with no obvious haemorrhage. Following a multi-disciplinary discussion we decided to treat the acute cholecystitis followed by elective laparoscopic cholecystectomy and simultaneous control of the CAP in 4–6 weeks.

Technique: The operation was performed jointly by an upper gastrointestinal and a hepatopancreato-biliary surgeon with extensive laparoscopic experience. A standard laparoscopic cholecystectomy set was used with the addition of a Harmonic® scalpel. A major laparotomy and vascular sets were kept on stand-by. The neck of the gallbladder was demonstrated, containing an 8 mm stone. Both the anterior and posterior branches of the cystic artery were defined. The pseudoaneurysm arose from the anterior branch of the cystic artery and was intact. Two 10 mm titanium clips were applied proximal to the pseudoaneurysm and one distally, adjacent to the gallbladder where the artery was divided. Similarly the posterior branch was clipped and divided. The rest of the operation was completed routinely and the patient made an uneventful recovery and was discharged the following morning.

Conclusion: CAP is a rare entity and as such there is no consensus on the clinical management of this condition. A variety of treatment strategies have been reported in the literature including radiologic selective embolization and coiling, open cholecystectomy and ligation of the aneurysm or a two-step approach of radiological and surgical management. Because of the high risk of pseudoaneurysm rupture surgeons have avoided the laparoscopic approach. In this report we have demonstrated that laparoscopic management of a CAP with simultaneous laparoscopic cholecystectomy is feasible and safe.

P325 - Liver and Biliary Tract Surgery

Laparoscopic Cholecystectomy for Confluence Stone by Cystic Duct Patching -Report of a Case

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We report a case of successful laparoscopic cholecystectomy for confluence stone by cystic duct patching.

Case Presentation: A 74-year-old male was consulted our hospital by abdominal pain. CT and ERCP showed the confluence stone of 8 mm at the root of cystic duct. The bilio-biliary fistula was also observed in ERCP. The diameter of the CBD was 8 mm.

Method: Laparoscopic cholecystectomy and the stone retrieval were done at a time. For repairing the CBD, we utilized the flap of cystic duct for the patching. The hole was closed by the sutures of 5–0 PDS.

Result: The post-operative course was uneventful, and the patient was discharged at five days after surgery. There were the reports of gall bladder patching for confluence stones in open surgery. We achieved the cystic duct patching under laparoscopy by its magnified view.

Conclusion: Laparoscopic cholecystectomy for confluence stone by cystic duct patching was efficient for the patient. This procedure may be alternative for T-tube drainage in the same cases.

P326 - Liver and Biliary Tract Surgery

The Role of Laparoscopic Ultrasound for Early Laparoscopic Cholecystectomy: Feasibility and Practical Considerations

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Aim: Increasing numbers of laparoscopic cholecystectomies (LC) are being undertaken during the initial emergency admission. Intra-operative imaging of the biliary tract is required to define anatomy, identify ductal stones and minimise complications such as inadvertent common bile duct (CBD) injury. Laparoscopic ultrasound (LUS) has been used in elective LC. The aim of this study was to assess its role in early LC.

Methods: A retrospective case note analysis was performed on patients who underwent index admission LC with LUS at Yeovil Hospital.

Results: A total of 151 patients underwent early LC with LUS. Median age at operation was 52 years. Median time to operation from admission was 3.7 days. Median operating time was 75 min (IQR: 47.5–90) and average time for the LUS was 5 min. The conversion rate was 4 %. 21 (14 %) patients had CBD stones detected on LUS which were not identified on preoperative ultrasound. There were no common bile duct injuries in this series.

Conclusions: LUS is a safe, reliable and practical tool in delineating biliary anatomy in early LC and accurately images the CBD. However, larger studies are required to validate its role and confirm that it is cost-effective

P327 - Liver and Biliary Tract Surgery

Laparoscopic Cholecystectomy for Acute Cholecystitis; When and Why?

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Aim: Laparoscopic cholecystectomy is the gold standard treatment for cholelithiasis and also for acute cholecystitis. The operation timing for acute cholecystitis is controversial. Different operation timings are accepted; 1—the first 72 h after the onset of symptoms, 2—in a week before the patient was not discharged from hospital, 3–4 to 6 weeks later. The aim of this study was to compare our results on timing of the surgery for early and delayed laparoscopic cholecystectomy (LC) for acute cholecystitis (AC).

Method: Medical records of Nevsehir State Hospital was searched and between December 2011 and December 2012, 210 laparoscopic cholecystectomies was analyzed. 76 of them were done for acute cholecystitis. Three of them were acalculous cholecystitis (3.9 %). Cholecystectomy was done by open technique in 6 patients because of previous upper abdominal surgery, and they were excluded. Early LC was done within a week at the first hospitalization in Group A, delayed LC was done after 4-6 weeks in Group B. The operation timing was changed according to the cases and the surgeons' choices.

Results: There were no significant differences between two groups in gender, age, additional systemic diseases and operation time. Early LC was done to 44.7 % (n = 34) patients. In 8.8 % (n = 3) of them, operation was converted to open technique. Delayed LC was done to 55.3 % (n = 42) patients and 9.5 % (n = 4) conversion to open technique. In Group B, 11.9 % (n = 5) patients were admitted to emergency room and hospitalized again in different times before the operation for AC or acute pancreatitis. The total length of hospital stay was significantly longer for patients in Group B (P < 0.05). There were no significant differences in either mortality or morbidity rates between two groups (P > 0.05).

Conclusion: Although, the mortality and morbidity rates were similar in early and delayed groups, early laparoscopic cholecystectomy can be performed safely and effectively to the patient's at initial hospitalization. Delay the operation can increase the complication rates of the cholelithiasis such as acute pancreatitis.

P328 - Liver and Biliary Tract Surgery

Laparoscopic Hepatectomy, Analysis of the Safety, Feasibility and Reproducibility in a Preliminary Study

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Aim: Hepatectomy is considered one of the most formidable surgical procedures both due to its complexity, trauma of access and the nature of the underlying pathology in which liver cirrhosis is usually present. Laparoscopic hepatectomy, although conceptually favorable in this subset of patients, was not accepted as standard, due to its complexity and for fear of haemorrhage that is difficult to control. Recently, many reports show excellent results for laparoscopic hepatectomy, regarding its safety and reproducibility. We decided to conduct a preliminary study to assess the safety, feasibility and reproducibility of this procedure.

Methods: 15 patients suffering from hepatic neoplasms indicated for surgical intervention were included. The pathology included hepatocellular carcinoma and metastatic adenocarcinoma from, colorectal, gastric, and breast cancer. All necessary work up was done to ensure the operability and the adequacy of the hepatic reserve. All procedures were completed laparoscopically, we had no mortality, only minor morbidity was reported, as mild bile leakage that was self limited. Major resections received blood transfusion. The early ambulation and early discharge were impressive.

Conclusion: Laparoscopic hepatic resections are feasible, safe and reproducible and we think that after randomized controlled studies, it might be the future standard of care in specialised centers.

P329 - Liver and Biliary Tract Surgery

Laparoscopic Treatment in Cases with Preoperative Unrecognized Ductal Lithiasis - Our Experience

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The standard surgical manner suggests in cases with choledocholithiasis the laparoscopic cholecystectomy to be done after ERCPG. In few cases the ductal lithiasis remains unrecognized in the preoperative period. We present our experience in 4 cases of choledocholithiasis diagnosed after laparoscopic cholecystectomy.

Material: For the 24-month period in the surgical department of the First MHAT Sofia, were performed 220 laparoscopic cholecystectomy. In 28 patients preoperatively ductal lithiasis was diagnosed and ERCPG with PST and extraction of gallstones was performed. In 4 patients ductal lithiasis was unrecognized. In one patient intraoperative cholangiography and transcystic drain were performed. On the third postoperative day an ERCPG was performed and 12 mm gallstone was extracted. After 8 days cholangiography was performed through the transcystic drain and the drain was extracted. In the other 3 cases choledochotomy with bile ducts revision and gallstone extraction was performed. A T-shaped drain was installed.

Perioperative complications were found in 0 cases.

Conclusion: We consider that in cases with unrecognized ductal lithiasis, choledochotomy with gallstone extraction and T-shaped drainage of the common bile duct is appropriate method. Failing to extract gallstones intraoperatively and/or suspected stenosis, we suggest the transcystic drain and ERCPG on second stage to be a appropriate method of choice.

P330 - Liver and Biliary Tract Surgery

Left Position of the Gallbladder During Single Incision Laparoscopic Cholecystectomy

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The case of young woman with lithiasis of the gallbladder with no distention of common bile duct or intrahepatic ducts was programmed for Single Incision Laparoscopic Cholecystectomy (SILS). A quadri-port was used for the procedure. The introduction of the laparoscope revealed a partially intrahepatic gallbladder. After grasping the fundus, was note that the gallbladder was located to the left of the falciform ligament. No other organ abnormality was observed. The procedure was performed with out any complications. The patient was discharged at the 1st post-operative day. Awareness of possible anatomical abnormalities can prepare us for potential complications during technically advanced operations, such as Single Incision Laparoscopic procedures. Diagnosis of this malformation is difficult to obtain pre-operatively. If an ectopia of gallbladder is encountered, the surgeon should consider the possibility of anomalies in the Callot's triangle.

Laparoscopic Cholecystectomy or more advanced approaches, such as SILS, are feasible. It is of great importance that the surgeon is experienced in this procedures and should consider conversion in 4-port laparoscopic cholecystectomy, or even to an open procedure in the case of anatomical uncertainty.

P331 - Liver and Biliary Tract Surgery

Incidence of Retained and Recurrent Stones After Laparoscopic Bile Duct Exploration

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Aims: Retained stones (RS) are an important outcome parameter after bile duct exploration. De-Novo (recurrent) bile duct stones are occasionally encountered after laparoscopic cholecystectomy or bile duct exploration (CBDE). They are usually labelled “retained stones”. We review the incidence and causes of RS and risk factors for recurrent stones in a large series of CBDE.

Methods: 734 laparoscopic explorations were performed by one surgeon using single session management of all comers with bile duct stones. Selective biliary drainage is done in some transcystic explorations and majority of choledochotomies, using transcystic tubes in most cases. All patients are followed up annually. Any patients with retained or recurrent stones are referred back to the biliary firm.

Results: Intraoperative cholangiography (IOC) was abnormal in 707 cases (96.3 %). TCE was done in 423 cases (58.7 %) and choledochotomy in 311 (42.35 %). Biliary drainage was done in 378 cases (51.4 %); using transcystic tubes in 204 (54 %) or T-tubes in 174 (46 %).

Postoperative cholangiography identified RS in 11 cases (1.5 %), RS were thought to have resulted from; impacted intramural cystic duct (CD) stones, some due to attempted transcystic clearance before choledochotomy, impacted intrahepatic duct stone and the absence of 3 mm choledochoscopy leading to blind Dormia basket TCE. ERCP was successful in 9 cases. In two cases RS were flushed into the duodenum after Glucagon administration (1). Follow up from 6 months to 16 years revealed 7 patients with recurrent stones. Recurrence occurred after intervals of 10 months to 6 years. ALL patients had had normal postoperative tube cholangiography after bile duct exploration. There were no specific risk factors for recurrence.

Conclusions: Most RS are impacted, overlooked in the intramural CD, or migrate into the intrahepatic ducts. Avoiding blind Dormia attempts and high pressure irrigation, and checking the cystic duct after choledochotomy are useful preventative measures. The incidence of retained stones can be less than 1 % through developing skills and availability of small transcystic choledochoscope.

(1) Mahmud S, McGlinchey I, Kasem H, Nassar AHM. Radiological Treatment of Retained Bile Duct Stones Following Recent Surgery Using Glucagon. *Surg Endosc* 2001, 15: 1359

P332 - Liver and Biliary Tract Surgery

Minimal Incision Laparoscopic Cholecystectomy - A New, Simple and Cost Effective Method for Elective Cholecystectomy

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Background: Modifications to conventional laparoscopic cholecystectomy (CLC) are aimed at decreasing abdominal wall trauma and improve cosmetic outcome. Although single incision laparoscopic surgery (SILS) provides excellent cosmetic results, the procedure is technically challenging and expensive compared to the conventional laparoscopic approach. We describe a novel, hybrid technique between SILS and conventional laparoscopy using minimal abdominal wall incisions.

Methods: Fifty patients diagnosed with symptomatic cholelithiasis were operated using two reusable 5 mm trocars inserted through a single 15-mm umbilical incision and a single 2-3 mm epigastric port. This technique was dubbed “minimal incision laparoscopic cholecystectomy” (MILC).

Results: MILC was completed in 49 patients (98 %). In 5 patients an additional 3-mm trocar was used and in 2 patients the epigastric trocar was switched to a 5-mm trocar. The procedure was converted to CLC in one patient. Mean operative time was 29 min (range: 18–60) and the average postoperative hospital stay was 22 h (range: 6–50). There were no post-operative complications and the cosmetic results were rated excellent by the patients.

Conclusions: MILC is an intuitive, easy to learn and reproducible technique and requires minute changes from CLC. As such, MILC may be an attractive alternative, avoiding the cost and complexity drawbacks associated with SILS.

P333 - Liver and Biliary Tract Surgery

Emergency Biliary Surgery in the Elderly: What is the Best Management Option?

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Aims: Advanced age is a recognised risk factor for patients undergoing emergency surgery. Elderly patients have increased incidence of peri-operative mortality and morbidity compounded by their co-morbidities. Our aim was to evaluate the safety of emergency biliary surgery in the elderly patients.

Methods: We collected a prospective database of 3607 patients who have undergone laparoscopic biliary surgery (elective and emergency) under the care of one surgeon. We analysed preoperative, operative and postoperative data for patients ≥ 70 years who have received emergency biliary surgery.

Results: 196 patients met the above inclusion criteria. The median age was 76 years (range: 70–89 years). There were 127 women (65 %) and 69 males. American Society of Anesthesiologists (ASA) score was 2 or 3 in two thirds of the patients. The presenting symptoms were chronic biliary symptoms in 79 patients (40 %), acute biliary pain in 35 (18 %), acute cholecystitis in 16 (8 %), acute pancreatitis in 36 (18 %), cholangitis in 3 (2 %) and jaundice in 27 (14 %). Intraoperative cholangiography was performed in 173 cases (88 %) and 27 (14 %) had common bile duct stones which required common bile duct exploration. The mean operating time was 60 min (range: 22–390 min, 95 % C.I: 64–77 mins). Only one conversion to open cholecystectomy was performed. There was only one death in the group; an 83 year old who had a successful exploration for bile duct stones resulting from Mirizzi Type2 abnormality, died of pneumonia after three weeks. One patient had clinical post-operative pancreatitis managed conservatively. Two patients had retained CBD stones which required post-operative ERCP. Only two patients required readmission for fever and pain management. Average in hospital stay was 4 days (range: 1–24 days).

Conclusion: Emergency laparoscopic biliary surgery can be safely performed in elderly patients. Age should not be considered as a factor to deny operative intervention. Optimisation of peri-operative care and risk assessment improves outcome.

P334 - Liver and Biliary Tract Surgery

Routine Intra-operative Cholangiography in Laparoscopic Surgery: Experience at a Single Institute

A. Mirza, S. Zino, A. Yehia, H. Qandeel, M.K. Nassar, A.H.M. Nassar
Monklands District General Hospital, AIRDRIE, United Kingdom

Aims: Intra-operative cholangiography (IOC) was once considered a routine part of cholecystectomy but has declined since the introduction of laparoscopic cholecystectomy (LC). Most centres have opted for pre-operative endoscopic cholangio-pancreaticography (ERCP) and, more recently, magnetic resonance cholangio-pancreaticography (MRCP) to diagnose common bile duct (CBD) stones. Our aim was to evaluate the routine use and clinical benefit of IOC in laparoscopic biliary surgery.

Methods: A prospective study of patients undergoing LC and IOC (n = 3607) over 18 years was analysed. A total of 3176 patients were identified who have undergone IOC. We collected the demographic details, pre-operative, intra-operative findings and post-operative course of these patients. A size 4 French ureteric catheter within an open cannula is used to perform IOC through the right subcostal port. Contrast is injected only after the start of fluoroscopy using a C-Arm.

Results: The median age was 49 years (range, 13–89). 764 (24 %) were males and 2412 (76 %) were female patients. A total of 1823 (57 %) were elective cases and 1353 (43 %) were emergency admissions. The main presentations were chronic biliary pain (N = 1963, 62 %), acute biliary pain (N = 800, 25 %), acute cholecystitis (N = 244, 8 %), acute pancreatitis (N = 235, 7 %) and jaundice (N = 533, 16.7 %). There were 1372 abnormal cholangiograms which identified filling defects (692), dilated ducts (545) stricture (22) and abnormal ductal anatomy (24). 1156 patients (36 %) had risk factors for CBD stones. IOC identified 652 (21 %) with CBD stones. 133 patients (4.2 %) with no risk factors for CBD stones were found to have CBD stones on routine IOC. 190 (6 %) IOC had to be repeated and 7 (0.2 %) repeat IOC were inconclusive (persistent air bubbles). The rate of unsuccessful IOC was 5 (0.2 %).

Conclusion: IOC can be routinely and safely performed with laparoscopic biliary surgery. It helps in the identification of CBD stones even in patients with no known CBD stone risk factors and facilitates single stage management of CBD stones.

P335 - Liver and Biliary Tract Surgery

Emergency Biliary Surgery in the Elderly: What is the Best Management Option?

A. Mirza, S Zino, A. Yehia, H. Qandeel, M.K. Nassar, A.H.M. Nassar
Monklands District General Hospital, AIRDRIE, United Kingdom

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Conclusion: Emergency laparoscopic biliary surgery can be safely performed in elderly patients. Age should not be considered as a factor to deny operative intervention. Optimisation of peri-operative care and risk assessment improves outcome.

P336 - Liver and Biliary Tract Surgery

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A. Mirza, S Zino, A. Yehia, H. Qandeel, M.K. Nassar, A.H.M. Nassar
Monklands District General Hospital, AIRDRIE, United Kingdom

Aims: Intra-operative cholangiography (IOC) was once considered a routine part of cholecystectomy but has declined since the introduction of laparoscopic cholecystectomy (LC). Most centres have opted for pre-operative endoscopic cholangio-pancreatography (ERCP) and, more recently, magnetic resonance cholangio-pancreatography (MRCP) to diagnose common bile duct (CBD) stones. Our aim was to evaluate the routine use and clinical benefit of IOC in laparoscopic biliary surgery.

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Conclusion: IOC can be routinely and safely performed with laparoscopic biliary surgery. It helps in the identification of CBD stones even in patients with no known CBD stone risk factors and the facilitates single stage management of CBD stones.

P337 - Liver and Biliary Tract Surgery

The Value of Intraoperative Cholangiography During Laparoscopic Cholecystectomy to Detect Biliary Tract Variations and Pathologies

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Aims: Intraoperative cholangiography (IOC) is the most useful way to determine bile duct stones and variations of the biliary tract. We aimed to share our laparoscopic cholecystectomies with IOC.

Methods: The patients who had no history of biliary tract disease were included to study. The patients with history of acute cholecystitis, biliary pancreatitis or biliary tract disease were excluded. Preoperative ultrasound and biochemical tests, operative findings and intraoperative cholangiography images of the patients were evaluated. Primary endpoints were verification of variations in biliary tract and bile duct stones, secondary endpoints were additional costs and time.

Results: From September to October 2011, 50 IOC were performed. The mean age was 50.2 (25–80) and male/female ratio was 8/42. The success rate of IOC procedure was 100 %. The mean length of additional time was 9 min and mean additional cost was 39 TL (Turkish Lira-\$ 22). Thirty six patients (72 %) have one or more bile duct variation and 10 patients (20 %) have common bile duct stone. No perioperative morbidity or mortality related to IOC occurred in the study.

Conclusion: In our study, we revealed more bile duct stones and variations than literature with lower costs. Laparoscopic IOC is a feasible and safe procedure with high success rates and a fast learning curve.

P338 - Liver and Biliary Tract Surgery

Reduced Ports Minilaparoscopic vs Conventional Laparoscopic Cholecystectomy. Preliminary Results of a Randomized Controlled Trial

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Introduction: Since laparoscopic cholecystectomy provides superb results in elective cases, the focus has switched towards alternative techniques which provide superior aesthetics and further reduction of surgical trauma. When compared with the single-port or NOTES cholecystectomy, minilaparoscopy has the highest potential to be easier accepted by the surgeons.

Material and Method: Patients with elective cholelithiasis requiring surgical treatment and operated by the same surgical team were randomly assigned into two groups: Group A (n = 8), operated through a standard 4-trocars laparoscopic cholecystectomy approach and Group B (n = 9), operated through a 3-ports minilaparoscopic technique. All patients were followed perioperatively for operative time, blood loss, satisfaction of the surgical team for the procedure, postoperative pain, hospital stay and aesthetic results.

Results: 3 patients from Group B needed insertion of a supplementary minilaparoscopy trocar for better exposure. With increasing experience, the quality of the exposure, operative time and satisfaction of the surgeon for the procedure improved in Group B. There were no differences in the perioperative outcome or hospital stay but the intensity of pain and aesthetic results were significantly better in Group B.

Conclusions: Reduced ports minilaparoscopic cholecystectomy is feasible, with superior aesthetic results and rather easy to be accepted by surgeons with expertise in conventional laparoscopic surgery. It avoids the disadvantages and limitations of the single-port or NOTES techniques and has the potential to become a new standard in elective cholecystectomies. These preliminary results need to be confirmed on larger cohorts of patients.

P339 - Liver and Biliary Tract Surgery

Single Session Laparoscopic Management of Gall Stone Pancreatitis in Elderly Without MRCP or ERCP is Safe and Feasible

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Aims: Surgical management of acute gall-stone pancreatitis (AGSP) in the elderly is a challenge. The presence of co-morbidities and advanced age makes the choice of operative intervention difficult. In the presence of risk factors for associated bile duct stones, MRCP and subsequent ERCP is still common practise in most centres. Laparoscopic management of AGSP by laparoscopic cholecystectomy, intraoperative cholangiogram (IOC) and common bile duct exploration (CBDE) in one-session is the other option. We aim to assess the feasibility and safety of single-session laparoscopic management of AGSP in patients ≥ 70 years at our institution.

Methods: Prospective data collected over 20 years (N = 3608) for patients undergoing laparoscopic biliary surgery. Data from all patients aged ≥ 70 years with AGSP was analysed.

Results: A total of 36 patients were identified who have undergone laparoscopic biliary surgery for AGSP. The median age was 75 years. 25 % of patients were males. The average number of episodes per patient was 1 (range, 1–3). One patient had elective admission and the remaining 35 were emergencies. Major associated symptoms were chronic biliary pain (22 %), acute biliary pain (8 %), acute cholecystitis (3 %) and jaundice (53 %). ASA grade was 2 in 36 % and 3 in 33 %. Pre-operative ERCP was performed in only one patient. No MRCPs were performed. IOC was performed in all patients. Cystic duct stones (8 %) and CBD stones (19 %) were identified and removed laparoscopically. T-tubes were used in 2 cases and cystic duct drains in 5. The median time for surgery was 60 mins (range, 15–185 mins). The median inpatient hospital stay was 7 days (range 3–40 days). There was no morbidity, mortality or readmissions.

Conclusions: These data indicate that laparoscopic common bile duct exploration can be successfully performed at index admission in the elderly patients diagnosed with acute gall stone pancreatitis. One-session management of pancreatitis in elderly patients is preferable to and safer than staged management. Laparoscopic bile duct exploration can be performed when necessary, allowing optimal utilisation of resources such as MRCP and ERCP. It reduces hospital stay, number of admissions and presentation to resolution intervals.

P340 - Liver and Biliary Tract Surgery

Unusual Complications of T-Tube Post Common Bile Duct Exploration

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Aims: A variety of T-tube complications have been reported, including premature dislodgement, bile leakage, sepsis, and fluid and electrolyte disturbance. Removal of T-tube may be followed by localized pain, biliary peritonitis and prolonged biliary fistula. We encountered unusual, previously unreported, complications of T-tubes.

Methods: In our practise biliary drainage after choledochotomy was achieved by using either T-tubes (54.6 %) or transcystic drainage (45.3 %). Biliary drains are inserted through the right subcostal port-site. They are placed within a small stoma bag rather than connected to the traditional drainage system, to avoid dislodgment. Post-operative-cholangiography is performed within 48–72 h, the patient is allowed home and the tube is removed as an outpatient on day 14.

Results: Case one: Spontaneous retraction of the T-tube on day four post operatively. The tube was reported to have disappeared. Under local anaesthesia the site was explored, the tip of the tube was found in the subcutaneous fat and retrieved. There were no wound complications and the tube was removed according to protocol.

Case two: Inability to remove the T-tube. Irregularities in the bile duct on post-operative-cholangiography lead to a delay in removal to allow for repeat cholangiography, which was normal after four weeks. In spite of multiple attempts it was impossible to remove the tube. Cholangiography showed the tip of the tube in the bile duct but raised the possibility of the tube looping around omentum or bowel. A further attempt was carried out 24 h later, in case patient movement resolved the looping. When this failed, laparoscopy was performed. T-tube was found plastered to the anterior abdominal wall, engulfed in the omentum and forming a loop before disappearing into adhesions at the gall bladder bed. The T-tube was freed from the abdominal wall and the fibrotic tract within the omentum towards the sub-hepatic space. The tube was pulled and came out of the bile duct. A 14G suction-drain was left in the abdomen. Drain was removed and patient was discharged 48 h.

Conclusions: We report two rare complication of biliary drainage by T-tube, hitherto unreported in the literature, although we have found T-tube drainage to be generally safe.

P341 - Liver and Biliary Tract Surgery

New Method of Four-Port Laparoscopic Cholecystectomy

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Aim: To present new method of four-port laparoscopic cholecystectomy (LC).

Methods: Medical records of 115 patients who underwent laparoscopic cholecystectomy between January 2005 and December 2008 were reviewed retrospectively. The patient population was comprised of 89 (77.4 %) women and 26 (22.6 %) men. The mean age (M \pm SD) was 54.65 \pm 14.98 years (range, 15, 62–95.78 years). The mean duration from the onset of acute cholecystitis to the LC operation (M \pm SD) was 5.79 \pm 3.38 days (range, 1–14 days). Technique of LC: laparoscope placed through the paraumbilical port. Assistant right hand provides cephalad retraction of the gallbladder fundus through the port placed on midclavicular line 7–8 cm below the costal margin, left hand traction of the infundibulum through port placed on anterior axillary line 2 cm below the costal margin. The surgeon carries out the basic stages of operation through the subxiphoid port. The second assistant manipulates the laparoscope.

Results: Acute catarrhal cholecystitis was verified morphologically in 20 (17.4 %), phlegmonous—in 70 (60.9 %), gangrenous—in 25 (21.7 %) cases. Intra-operative findings included adhesions in 81 (70.4 %) cases, empyema—in 28 (24.3 %) cases, pericholecystic abscess—in 9 (7.8 %) cases. The mean operative time (M \pm SD) was 80.03 \pm 27.66 min (range, 20–181 min). The perforation of gallbladder was observed in 18 (15.8 %) patients, spillage of gallstones—in 6 (5.3 %) cases. Bleeding from the gallbladder bed (with the volume of blood loss of 50 ml and more) occurred in 51 (44.3 %) cases. Bile duct injuries and bile leak in the postoperative period was not. Conversion to open procedure was 1 (0.87 %) cases. Hospital mortality was not. Postoperative wound infections were observed in 4 (3.5 %) patients. The mean duration of hospitalization was 3.81 \pm 1.61 day (range, 1–9 day).

Conclusion: New method offers a safe alternative to the traditional “American” and “French” LC. Improved ergonomic conditions of access and accessibility to the gallbladder help reduce physical and psychoemotional tension of surgeon. This enhances safety operations.

P342 - Liver and Biliary Tract Surgery

Urokinase via T-Tube for Thrombolysis of Blood Clots Inside the Bile Duct Post Laparoscopic Exploration: Safe and Effective Treatment

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Aims: Instrumentation of bile duct during laparoscopic exploration and extraction of stones may cause haemobilia and formation of blood clot inside the bile duct post operatively. This clot is usually discovered at T-tube cholangiography post-operatively. Endoscopic Retrograde Cholangio-Pancreaticography (ERCP) is the current treatment to remove the clots. We describe in detail a safer treatment which dissolves the clot completely and avoids ERCP.

Methods: Two female patients (30 & 68 years-old) underwent laparoscopic bile duct exploration, choledochotomy, extraction of stones and T-tube insertion. Post-operatively, the T-tubes were functioning and liver function tests improved dramatically but were not back to normal range. Two weeks post-op, T-tubes cholangiography showed large blood clots in their bile ducts. One vial of Urokinase (25,000 units) diluted in 40 ml of 0.9 % Saline was injected over 10 min via the T-tube of each patient. Then T-tube was immediately clamped for 30 min then released back to free drainage. Then T-tube Cholangiography was carried out the following day.

Results: Significant resolution of the bile duct clots was shown on the post-injection cholangiography. Liver function tests also improved further. The two patients were discharged home with T-tube in place. A repeat T-tube cholangiography two weeks later showed complete resolution of the clots and normal appearance of their bile ducts. Liver function tests became completely normal. The T-tubes were removed couple of days later. No related complications or side effects were noticed in these two patients.

Conclusions: Injecting Urokinase via T-tube, as a thrombolytic agent by the method described above, offers a safe treatment and effective resolution of blood clots inside the bile duct post laparoscopic bile duct exploration. It completely dissolves the clots and avoids the need for ERCP.

P343 - Liver and Biliary Tract Surgery

Early Experience of Robotic Surgery for Congenital Dilatation of the Bile Duct

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Since surgery for congenital dilatation of the common bile duct requires a large abdominal laparotomy, wound-related complications often becomes a problem. Besides, since the rate of this disease is higher in young women, a cosmetic result would be a significant impact. Although laparoscopic surgery for this disease is carried out from early 1990 s, it is not widely spread due to extra ordinal difficulties of its procedure, especially of hepatico-jejunostomy and confirmation of bilio-pancreatic duct junction. We introduced a laparoscopic procedure for this disease since September 2011, and the Robotic surgery since May 2012. Since we experienced 4 cases so far, two laparoscopic and 2 Robotic cases, here we report a technique and effectiveness of these procedures. In four cases, the average age was 36 y.o. (20-57 y.o.), and male-female ratio was 1:3. Todani classification was type-1 in all cases. Surgical technique was as follows: cholecystectomy was first carried out with Dome-down technique, then the upper side of bile duct was transected with a linear stapler. The bile duct was then retracted toward ventral side, and the intra-pancreatic bile duct was dissected with electric cautery. The bilio-pancreatic duct junction was confirmed with fluoroscopy, and transected by ligating the bile duct with 4-0 monofilament suture. Reconstruction was performed by Roux-en-Y hepatico-jejunostomy retro-colonic route with 4-0 monofilament suture by running fashion. The robotic surgery was performed in generally similar technique. The operation time was 321-min. in average in laparoscopic cases, while 527-min in robotic surgery cases. One case of robotic surgery developed post-operative intestinal obstruction of the biliary limb at the site where the limb passed through the mesocolon, and required laparoscopic enlargement of the mesocolon opening. Pancreatic fistula and anastomotic leakage has not been observed. The robotic surgery is highly useful in the operation in the narrow field, especially requiring the fine suturing. On the other hand, the limitation of energy devices, high running cost, and time consumption for setting remain questionable. However, the high motion stability and the scaling effect would be a great benefit for the hepatico-jejunostomy, which is the most, challenging procedure in this surgery.

P344 - Liver and Biliary Tract Surgery

Intraoperative Cholangiography in the Detection of Cholelithiasis - One-Year Experience from a Single Centre

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Aim: Selective use of intraoperative cholangiography (IOC) remains a controversial topic in the management of gallstone disease. We aimed to identify which patients at our institution were most likely to benefit from IOC.

Method: We retrospectively reviewed all patients who underwent IOC during laparoscopic cholecystectomy between January and December 2011. Data on demographics, pre-operative investigations and post-operative complications for these patients were analysed.

Results: Of 252 patients who underwent laparoscopic cholecystectomy during the study period, 58 patients had intraoperative cholangiography. 28 % (16/58) had deranged pre-operative liver function tests (LFTs) and 19 % (11/58) had a dilated common bile duct (CBD) on pre-operative imaging. 7 patients (12.1 %) had evidence of cholelithiasis on IOC. Of these patients, all 7 had derangements of pre-operative LFTs; 4 had evidence of CBD dilatation pre-operatively. Patients with deranged LFTs were more likely to have an abnormal IOC than those with normal LFTs (21.1 % vs 0 %, $p = 0.01$). There was no significant association between a dilated CBD on pre-operative imaging and an abnormal IOC. On multiple logistic regression, neither deranged LFTs or CBD dilatation were predictive of an abnormal IOC.

Conclusions: Our results do not support the use of routine intraoperative cholangiography for the detection of cholelithiasis in patients with normal pre-operative LFTs. The presence of a dilated CBD on pre-operative imaging was not found to be associated with an abnormal IOC.

P345 - Liver and Biliary Tract Surgery

Is Application of Intraoperative Cholangiography Mandatory During Laparoscopic Cholecystectomy?

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Aims: Intraoperative cholangiography (IOC) is a routine procedure applied to detect silent common bile duct (CBD) stones and anatomical variations during laparoscopic cholecystectomy (LC) in many countries. Preoperative endoscopic retrograde cholangiopancreatography (pERCP), however, is used in complicated cases such as impaired bile drainage (cholestatic liver enzyme elevation), biliary obstruction and acute biliary pancreatitis (ABP). In our clinical practice, IOC is not applied routinely together with LC. In this retrospective study, we wanted to examine whether omission of IOC during LC is associated with higher incidence of bile duct injury (BDI) or biliary obstruction (BO) caused by residual CBD stone than those seen in literature data.

Method: In our retrospective study, 1165 LC procedures (301 male, 864 female; 52 acute and 1113 elective) between January 2005 and January 2009 with a 3-year postoperative follow-up time are discussed. Ratio of acute and elective operations, conversion and reoperation rates and incidence of iatrogen BDI were reviewed. The incidence of both pre- and postoperative ERCPs (the latter being due to the presence of residual CBD stones) was also evaluated.

Results: Out of 1165 LCs, conversion was necessary in 36 cases (conversion rate: 3.09 %). In two cases, BDI with immediate reconstruction was also required. The number of reoperations was 6 (bleeding in 4 cases; bile leakage involving duct of Luschka and clip migration in 2 cases). Preoperative ERCP was carried out in 155 cases (13.3 % of all LCs) because of impaired bile drainage, BO and ABP (24.51, 46.45 and 29.03 %, respectively). In 11 of the cases (1 % of all LCs), postoperative ERCP had also to be performed because of residual CBD stones during the follow up period (impaired bile drainage and BO without BDI, in 5 and 6 cases, respectively).

Conclusion: Omission of IOC during LC is not associated with higher incidence of BDI than seen in the related literature. Major indications of IOC (residual bile stones) are responsible for not more than 1 % of postoperative complications. Our data indicate that IOC is not necessary in all patients with LC if the indications of preoperative ERCP (cholestasis, enlarged bile ducts, etc.) are strictly followed.

P346 - Liver and Biliary Tract Surgery

Proper on Time Recognition of Cholecystectomised Patients with Complication

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In our institution for 15 years was practice that we perform laparoscopic surgery as 48 h procedure. First day admission with repeating of necessary laboratory findings and pre-operative consultation with anesthesiologist and second day we perform laparoscopic cholecystectomy and on the third day in the morning we release patient. After reorganization and cutting number of beds from 110 to 15, we start doing these procedures as 24 h surgery. We push all necessary preparation as ambulatory procedures including consultation with anesthesiologist, changing oral anticoagulant therapy to low molecular heparins and all other preoperative activities.

We are accepting first patients to the hospital 60 min before the actual operation. In these circumstances we need thorough objective following of the patient and its postoperative status using night's clinics of doctor who perform operation and morning after operation control blood test—serum bilirubin level and control US examination.

In our institution we perform from 2010 till September 2012, 2.680 laparoscopic cholecystectomies as elective 24 h surgical procedures. Those procedures perform 6 experienced surgeons and 4 young colleges. Mean blood level of bilirubin is 60 % elevated in comparison to preoperative values and around 70 % of patients have some collection with localization at level of gall bladder bad. During this period we have 8 patient with bleeding in need for reoperation and 7 patients with bile leakage. There were no other patients discharged on postoperative day one that afterword's was recognized as patient with complication.

In conclusion we can say that transition from 48 to 24 h surgery did not changed in number of neither complication nor raising the percentage of unrecognized postoperative complication. Using this set of postoperative diagnostic and clinical evaluation from involved surgeon was satisfactory for early recognition of cholecystectomised patients with complication.

P347 - Liver and Biliary Tract Surgery

The Results of Our Experience with Laparoscopic Cholecystectomy, Intra- and Postoperative Complications

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Bile stone disease infected 10 % of our planet's population—more than twice the rate of growth and the importance of this trend every 10 years. Batumi Shota Rustaveli State University, Department of Surgery, laparoscopic cholecystectomy was introduced in private, as a method of surgical treatment of bile stone treatment of the disease since 1999. The aim of the study was the gall bladder and biliary tract during laparoscopic cholecystectomy cases of surgical pathology, early and long-term results of the study, particularly in cases of surgical and postoperative complications identification, study and analysis of the Republican Clinical Hospital Surgery Department in the years 1999-2012 research. The authors of the study are based on 906 Retrospective analysis of the patient's history, who underwent laparoscopic cholecystectomy for treatment.

Good and satisfactory results were obtained from 860 (95 %) cases, cases of surgical complications was 19 (2.1 %) cases. It became necessary to convert the 12 (1.3 %) cases. The post-operation complications early in 17 (1.9 %) cases of postoperative complications and long-term postoperative complications were noted in 10 (1.1 %) cases. The post-operation complications from early 10 (1.1 %) cases were relaparotomia, 1 (0.1 %) cases relaparoskopia. The post-operation complications far from 6 (0.7 %) if done plastic hernia sublain method. Under liver abscesses in 1 (0.1 %) cases in the area subkutaneuri under liver been punctured under ultrasound control, in one case sanation abscess, drainage of video endoscopy control, and 1 (0.1 %) if passed laparatomy. Sanation abscess. Abscess drainage.

The authors conclude their research results and experience that laparoscopic cholecystectomy remains the gold standard for treatment of calculous cholecystitis. Cases, The post-operation complications early and Post operating remote continuous monitoring and treatment improves the results of a detailed analysis of its operations.

P348 - Liver and Biliary Tract Surgery

Laparoscopic Cholecystectomy with Multiple Anatomic Variances: A Case Report

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The extra-hepatic vascular and biliary anatomy is well known to be highly inconsistent. The aim of this case report is to emphasize the importance of the careful dissection of the Calot's triangle and the gall bladder bed to detect any anatomical variation. Appropriate insight of the anatomy is of great importance to avoid both conversion due to hemorrhage and post-operative biliary leakage. Presented herein is a 31-year-old female with a history of repeated attacks of biliary pain. She was scheduled for an elective laparoscopic cholecystectomy. Intra-operatively, laparoscopic dissection revealed aberrant arterial branch to segment IV of the liver. From this branch, the cystic artery arises. The cystic artery was identified, clipped, and divided with preservation of the arterial branch of segment IV. During dissection of the gall bladder bed, an accessory cholecysto-hepatic duct (Duct of Luschka) was identified. It was clipped and divided. Also, the common hepatic artery was found anterior and to the right side of the common bile duct.

Conclusion: These multiple anomalies in one case represent an important reminder of the wide range of the anatomical variations of the extra-hepatic biliary and vascular systems and the importance of meticulous dissection during laparoscopy.

P349 - Morbid Obesity

Outcomes of Laparoscopic Simultaneous Treatment Morbid Obesity and Gastroesophageal Reflux Disease

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The aim was to compared the possibility of simultaneous treatment of comorbidity of obesity and gastroesophageal reflux disease.

Material and Methods: For the period from 2010 to 2012, 60 patients with comorbidity of obesity (class II–III) and severe gastroesophageal reflux disease were divided into two groups. In the first group of 30 patients were laparoscopic fundoplication combined with the greater curvature plication of the stomach. In the second group of 30 patients surgery was performed, which was limited only standard laparoscopic fundoplication by Nissen. The average age in the group was as follows: in the first 37.4 ± 5.1 years, in the second - 44.3 ± 7.2 years (P > 0.05). BMI in the first group was 42.1 ± 6.3 kg/m² and 41.6 ± 9.2 kg/m² in the second group (P > 0.05)

Results: The mean excess weight loss (%EWL) to 1 month after surgery was in the first group 20.2 ± 4.07 % vs. 3.87 ± 1.25 % in the second group. The 3-month data were 26.5 ± 4.35 % vs. 6.0 ± 1.6 % respectively in the first and second groups. %EWL at 6 months in the first group was 47.37 ± 6.45 % and 7.5 ± 1.6 % in the second group. After 12 months of data are distributed as 57.83 ± 4.7 % and 9.6 ± 1.9 %, after 18 months as 64.17 ± 3.3 % vs. 10.7 ± 1.7 %, respectively. At the maximum period of observation—24 months, the percentage of excess weight loss was 66.37 ± 3.1 % in the first group and 11.9 ± 1.4 % in the second group. In all cases was a high statistically significant difference (P < 0.0001).

Defined index DeMeester, reflecting the pH of the lower esophagus, which was the value of 12.0 ± 4.3 for the first group and 13.1 ± 9.3 for the second group (P > 0.05).

Conclusion: The developed laparoscopic antireflux fundocorporogastropliation has the same function as the 'standard' laparoscopic fundoplication, but far surpasses it in bariatric efficiency, which allows us to recommend it for the surgical treatment of comorbidity of morbid obesity and GERD.

P350 - Morbid Obesity

Is the Laparoscopic Sleeve Gastrectomy Without Over Sewing of the Staple Line Effective and Safe?

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Aim: Laparoscopic sleeve gastrectomy (LSG) as a single-stage procedure for the treatment of morbid obesity is a feasible bariatric/metabolic method for patients with BMI 40, BMI ≥ 35 respectively. On the base of presented studies LSG appears to be safe and significantly improves metabolic disturbances and T2DM of morbid obese (MO) patients. **Material and method:** 204 MO patients (156 females, 48 males) underwent LSG from 2006 to 2012. Average age was 43.2 years (19–65), height was 169.3 cm (151–191), weight was 128.7 kg (96–184) and average BMI was 44.9 (34.1–71.9). Dyslipidemia was pre-operatively diagnosed in all cases. T2DM was pre-operatively diagnosed in 49 patients (36 of them were on oral antidiabetic drugs (OAD) and 13 were on combined therapy by insulin and OAD. All LSG were done without over sewing of the staple line.

Results: Finally 175 MO patients after LSG from 2006 to 2012 were statistically evaluated, by reason that 29 MO patients were excluded because of incomplete data or short time (≤6 months) after procedure respectively. Average weight loss after 24 months was 35.2 kg (8–97), average %EBMIL reached 69.7 % (24.2–120.9), average %EWL was 66.8 % (22.5–113.8) and average decrease of BMI was 14.6 (4.5–24.1). Diabetes completely resolved in 74 % of preoperative diabetic patients during the postoperative period of 24 months and in rest (26 %) improved after surgery. Most frequent long time complication was in 14.7 % heartburn very good responds to treatment with PPI. Only one case of the staple line leak occurred at the beginning of the method.

Conclusion: The LSG is a safe bariatric procedure with long time good results in both weight loss, and improvement of metabolic co-morbidities of patients with obesity and the over sewing of the staple line is not necessary.

P351 - Morbid Obesity

Effects of Laparoscopic Sleeve Gastrectomy on Type 2 Diabetes in Japanese Population

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Background: The aim of the present study was to evaluate the effects of laparoscopic sleeve gastrectomy (LSG) on type 2 diabetes mellitus (T2DM) in Japanese population.

Methods: Between June 2008 and December 2012, 19 morbidly obese Japanese patients underwent LSG in our institute, in this series, 9 patients preoperatively had T2DM with a mean body mass index of 43 kg/m². The data collected included patient demographics, clinical outcomes, changes in fasting plasma blood glucose, insulin, HbA1c, Homeostasis model assessment-Insulin Resistance (HOMA-IR), C-peptide and glucagon-like peptide 1 (GLP-1). GLP-1 and insulin secretion levels were measured with an oral glucose tolerance test (OGTT). Complete remission of T2DM was defined as a fasting glucose level <100 mg/dl and HbA1c <6 % without any glycemic therapy.

Results: The mean duration of T2DM and the mean of the C-peptide in these 9 patients were 28 months and 4.3 ng/ml. The mean of ABCD score was also 7 preoperatively. The mean postoperative excess body weight loss at 1, 2, and 3 years after LSG was 58, 69, and 77 %, respectively. Complete remission of T2DM was achieved in all 9 patients at 1 month after LSG. GLP-1 levels significantly increased at 6 months after LSG compared with preoperative levels (7.9 vs 31.3 pM/L, $p = 0.007$), HOMA-IR was decreased at 1 month after LSG (14.4 vs 2.6, $p = 0.004$) respectively.

Conclusions: The effects of the surgery on body weight and metabolic function indicate that LSG may be a part of the treatment strategy for T2DM in Japanese population. Further studies are needed to confirm the effects of LSG in metabolic surgery on T2DM for lower BMI Japanese patients.

P352 - Morbid Obesity

Laparoscopic Roux En-Y Gastric Bypass, Technique and Results in 150 Cases

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Introduction: Because of an important burden of disease, obesity is a major public health challenge in the twenty-first century. Where medico-psychological management has shown its limitations, bariatric surgery is now acknowledged as the most efficient therapy potentially offered to severely obese patients. Among other options, Roux-en-Y gastric bypass (RYGBP) is the most frequently performed procedure.

Patients and Method: A retrospective study of 150 patients underwent a Laparoscopic RYGBP at the Saint Maria Nuova Hospital (Reggio Emilia, Italy) as well as Ain Shams University hospitals within 2009–2011, with one year follow up. The patients were 29 males (19 %) and 121 females (81 %) with age range (18–58) years. Their BMI (kg/m²) was 35–40 in 30 patients (20 %), 40–50 in 75 patients (50 %), 50–60 in 40 patients (27.7 %) and more than 60 in 5 patients (3.3 %). The outcome of this technique will be evaluated by incidence of early surgical post-operative complications and late postoperative complications after 12 months follow up. Weight loss follow up every 3 months, up to 12 months.

Results: The operative time range (75–90) min. No mortality in our series. Early postoperative intra abdominal hematoma in 3 cases (2 %). Anastomotic leaks at the gastro-jejunostomy site in three cases (2 %). No pulmonary complications or early postoperative wound infection. Up to 1 year follow up there was one case of incisional hernia after reoperation for leakage (0.6 %) and no Gastritis, no incidence for gastro-jejunostomy stricture or internal hernia. For vitamin deficiency there was no vitamin deficiency for 12 months follow up but 2 cases (1.2 %) of iron deficiency anemia that needs additional iron supplementation. For the weight loss, the mean weight loss after 12 months follow up is 35.2 kg and the mean BMI of the patients falling from 45 kg/m² preoperatively to 32.3 kg/m² after 12 months.

Conclusion: The primary desirable outcomes after bariatric surgery include low rates of perioperative and long-term complications, sustained and meaningful weight loss, significant improvement in quality of life, improvement or resolution of obesity-associated comorbidities, and extension of life span. All the five outcomes have been shown to be feasible results of Laparoscopic RYGBP.

P353 - Morbid Obesity

Laparoscopic Sleeve Gastrectomy in Patients Over 60 Years of Age

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Background: Bariatric surgery is the mainstay of treatment for morbid obesity. The 1991 NIH consensus statement set 55 as the cutoff age for surgery. Since, several reports and routine practice have pushed this limit to well beyond the age of 65 years. Laparoscopic sleeve gastrectomy (LSG) is a relatively new bariatric option, considered safer than bypass procedures. It is an appealing option for high risk patients and is utilized for the elderly morbidly obese. We herein report the outcome of LSG in patients over 60 years old in a high-volume bariatric center.

Methods: The aim of this study was to examine the morbidity, mortality and outcome of LSG in the elderly. Between 2006 and 2012, 72 patients, 60 years or older, underwent LSG (out of 1241—5.8 %). Data collected included patient characteristics, morbidity and mortality, length of stay (LOS) and percent excess weight loss (%EWL). All patients underwent preoperative multidisciplinary evaluation and postoperative follow-up, including medical and dietary consults and psychological cognitive behavioral treatment.

Results: Of the 72 patients, 40 were females (55.6 %). The mean age and BMI were 62.3 years (range 60–72) and 43 kg/m² (range 35–57), respectively. Median operative time and LOS were 65 min (range 45–90) and 2 days, respectively. There were 13 concomitant operations in 11 patients: 6 cholecystectomies, 4 ventral hernia repairs and 3 hiatal hernia repairs. Early postoperative complications occurred in 4 patients (5.5 %) and included bleeding, leak, pulmonary embolism, and trocar site hernia. No renal or cardiac complications were encountered. There were no mortalities. %EWL at 1, 3, 6, 9, 12 and 24 months was 23, 37, 49, 54, 57 and 51, respectively.

Conclusions: LSG performed in older patients is safe and feasible and can be performed with results comparable to those achieved in a younger population.

P354 - Morbid Obesity

Single Port Sleeve Gastrectomy a Valuable Procedure in the Treatment of Morbidly Obese Patients

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Background: Laparoscopic sleeve gastrectomy has been recently proposed as a sole bariatric procedure because of the resulting weight loss in morbidly obese patients. This procedure has quickly attracted considerable surgical interest because it does not require a gastrointestinal anastomosis or intestinal bypass and it is considered less technically challenging than Laparoscopic Gastric Bypass (LAGB). SILS has recently gained acceptance in bariatric surgery as the procedure has possible benefits. The purpose of our study was to evaluate the feasibility and safety of laparoscopic single incision sleeve Gastrectomy for morbid obesity.

Patients and Methods: From January 2010 to June 2012, single port laparoscopic sleeve Gastrectomy through the Covidian SILS port with a novel method for liver retraction was performed on 15 consecutive Morbidly Obese patients enrolled from Ain Shams University hospitals. The patients recruited in this study had a Body mass index (BMI) range :(35–50) kg/m. Their age range: (18–60) years. The patients were 11 females (73.3 %) and 4 males (26.6 %). Patients with major cardiac, respiratory, renal or hepatic co-morbidities interfering with anesthesia or laparoscopy were excluded. Postoperatively, patients had been monitored for Short-Term Complications (as hemorrhage, leakage, hyperemesis, deep venous thrombosis and wound infection). Regular follow up of excess weight loss (at 3, 6) month.

Results: A total of 15 single-incision laparoscopic sleeve gastrectomies were performed. The procedure was successfully performed in 12 patients (80 %) with 3 conversions (20 %), one case was converted to the traditional laparoscopic sleeve Gastrectomy and the other 2 cases were converted to open sleeve Gastrectomy. The mean operative time was 125 min. The hospital stay range :(2–4) days. There were no mortalities or early postoperative complications. For the weight loss, the mean weight loss after 6 months follow up is 28.2 kg.

Conclusion: Laparoscopic single-incision sleeve gastrectomy seems to be safe, technically feasible, and reproducible. Our technique for liver retraction provides adequate exposure.

P355 - Morbid Obesity

Concomitant Bariatric Surgery and Ventral Hernia Repair in Morbidly Obese Patients

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Introduction: Despite of the frequent incidence, the management of ventral hernias in bariatric surgery patients remains controversial and complicate to perform. On the other hand, hernia complications, particularly small bowel obstruction and aspiration can be particularly lethal after laparoscopic bariatric surgery. Intraoperative detected ventral hernias in morbidly obese bariatric patients are recommended to be repaired in a concomitant procedure. We would like to report our experience with patients who underwent concomitant bariatric surgery and hernia repair.

Methods: Data from 54 patients was compiled. Symptomatic hernias, empty hernia defects, and those with contents that had to be reduced to complete the bariatric surgery were repaired at the same surgery. Hernias were repaired using dual mesh (DynaMesh, Aachen, Germany) after reduction of the hernia contents. The mesh was fixed to the abdominal wall using resolved tackers.

Results: 54 patients (female/male ratio 34/20) were enrolled between the years: 2007–2012. The majority of the patients (48, 88.9 %) underwent laparoscopic sleeve gastrectomy, 2 had laparoscopic roux-en-y gastric bypass, 2-open roux-en-y gastric bypass and 2-laparoscopic gastric banding. 5 patients (9 %) had complications: 3 leaks, 2 abdominal wall hematoma, 1 pulmonary embolism. No mesh was removed due to infection. One patient had a recurrent hernia. Surgery time was elongated by 30 min, compared to stand alone bariatric surgery. Average excess weight loss post-surgery was 49.9 ± 10.3 % at 6 months and 57.7 ± 9.2 % at 12 months. The total number of co-morbidities was 110, including diabetes, hypertension, hyperlipidemia and sleep apnea. At 12 month follow-up 56 (50 %) were completely resolved and 42 (38 %) were partially resolved.

Conclusion: Concomitant bariatric surgery and hernia repair is a safe procedure, beneficial for the patient and does not interfere with the outcome of the original bariatric surgery. The rate of complications for the combination surgery is similar to that of bariatric surgery.

P356 - Morbid Obesity

Gastric Erosions After Laparoscopic Adjustable Banding

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Objective: Presentation of 3 gastric erosions occurring after 170 gastric banding showing that this surgery is not without risks.

Material and Method: Analysis of a series of 170 laparoscopic gastric banding performed in the Surgical Clinic Ist of University of Medicine and Pharmacy ‘V.Babeş’ Timisoara. We present 3 cases with gastric decubitus erosions requiring complex therapeutic solutions. All three were solved by conventional surgery. In the first two cases were sutured areas of erosion. The third case required total gastrectomy and esophageal-jejunal anastomosis (AKH Vienna) after a complex drainage of the peritoneal cavity with open abdomen method.

Results: early complications: 1 small intraoperative effraction of the stomach (0.58 %), 1 evisceration (0.58 %), 1 small lesion of the capsule to an adherent polycystic spleen (0.58 %); late complications: 7 access port infections(4,11 %), 3 erosions of esogastric junction (1,76 %), 3 slippages of the band (1,76 %), 3 incisional hernias (1,76 %), no weight loss in 10 cases (5,88 %)—failures. The erosions were the most difficult to be solved.

Conclusion: Although Gastric banding is safe with less risks compared to other surgical methods performed in the cure of morbid obesity some complications when there appear could be very serious and their resolution sometimes put serious therapeutic problems.

P357 - Morbid Obesity

Cost Comparison of Fully Robotic Versus Conventional Laparoscopic Gastric Bypass

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Aim: To compare the cost of a fully robotic gastric bypass to the gold standard conventional laparoscopic gastric bypass with stapled circular gastrojejunal (GJ) and linear jejunal anastomosis.

Methods: Data were prospectively collected for 20 patients. Ten patients underwent fully robotic (*daVinci*® Robot) gastric bypass (RYGBP: 9 patients) and mini gastric bypass (MGB: 1 patient) for morbid obesity between April and September 2012. Full robotic was considered when the gastrojejunal and the jejunojejunal anastomoses were entirely done robotically. Cost of conventional laparoscopic gastric bypass with a circular GJ anastomosis was calculated based on prospective acquired data from 10 procedures. All disposable and reusable materials were recorded for each procedure, allowing their cost evaluation (VAT included).

Results: For robotic procedures, a combination of Cadieere forceps, bowel grasper, needle driver were used, when precise bipolar forceps, monopolar curved scissors + tip cover accessory was added in two RYGBP and Harmonic ACE Curved Shears and Insert in seven RYGBP and one MGB. Cost of all disposable trocars, cannula seals, GIA stapler, calibration tube, threads, robot drapes (mean 1442€) was added to the cost of robotic instruments (mean 1398€). Mean cost for a fully robotic gastric bypass was 2840€ (2797€–2951€). The cost for a conventional laparoscopic gastric bypass with a circular GJ anastomosis (including single use trocars, GIA staplers, Orvil Circular anastomotic device and Ligasure®) was 2433€. Amortization of robot investment was not included since the same approach could not be done for the laparoscopic equipment.

Fully robotic gastric bypass was 407€ more expensive than conventional laparoscopic gastric bypass with a circular GJ anastomosis.

Conclusion: The commonly estimated “great” overcost of robotic compared to laparoscopy is not as significant when real cost are analyzed and robot cost investment not taken into account.

P358 - Morbid Obesity

Does Single Port Approach Make Sense in Bariatric Surgery?

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Introduction: Laparoscopic approach improved early outcome after bariatric surgery. Single-port Access (SPA), technically more demanding aims to reduce postoperative pain and improve cosmetic results of the multiport laparoscopic approach, maintaining the short and long term results.

Aim: To analyze the short and long term results, of the patients who underwent bariatric surgery through a SPA by an expert laparoscopic surgeon.

Material-Method: Prospective study of the patients who underwent bariatric surgery through a SPA in our hospital, with a transverse trasumbilical incision. Indication of this approach based on the xifo-umbilical distance (<28 cm), type of obesity (gynecoid), and BMI (<50). Selection of the surgical technique based on the Protocol of our unit, following the same standardized steps of our laparoscopic approach. In order to reduce the risk of developing an incisional hernia we placed a prophylactic PVP® mesh. We analyzed the general complications and those related to the surgical wound, in the short and long postoperative period.

Results: 41 patients were approached through a SPA (1 AGB, 20 GBP and 20 SG), 38 women/3 men, medium age 42.1yo and BMI 42.6, with gynecoid obesity predominantly and medium Xifo-umbilical distance of 21.7 cm. SILS® device used in 85 % of the cases, with roticulator forceps used in the left hand and straight in the right one. No conversion nor mortality. No drainage needed. Wound size at the end of the procedure 2.7 cm. Medium Surgical time 97 min, and blood lost 15 cc. Medium hospital stay 3.2 days.

Mayor Complications: 1 intraabdominal abscess after sleeve gastrectomy (2.4 %), solved after laparoscopic drainage and 1 leakage after gastric bypass due to a section of the nasogastric tube (2.4 %), solved after laparoscopic drainage and posterior stent placement for its resolution. Minor complications associated with the surgical wound: 1 seroma (2.4 %), without incisional hernias in the mid-term outcome, with a medium follow up of 12 month. Great satisfaction due to the cosmetic results in all the patients. Similar EWL (70 %/12 month) to our standard laparoscopic approach.

Conclusions: SPA in bariatric surgery, although technically demanding, is safe and effective in selected morbid obese patients, in expert laparoscopic hands, with excellent cosmetic results.

P359 - Morbid Obesity

Gastric Bypass Influence on Comorbidity

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Aim: Bariatric surgery is changing to metabolic surgery. The target is the treatment of comorbidities, especially diabetes mellitus type 2. The ideal operation is still seeking. The aim is to refer results in the group of patients after gastric bypass

Material and Methods: From March 2008 till September 2012 the authors performed 59 gastric bypasses. Roux-Y were 55, 4 were minigastric bypasses, all were done laparoscopically. The indication was failure or complications of previous restrictive procedure, or primarily metabolic syndrome. In the group there were 76.3 % women and 23.7 % men. Diabetes mellitus had 47.4 % of them. Hypertension was present in 54.2 % and dyslipoproteinaemia in 22 %.

Results: Average excess weight loss after 2 years follow up was 45 %. In all diabetics there was improvement of diabetes. The effect on hypertension was not as good as on diabetes. In the group was one death based on Wernicke's encephalopathy.

Conclusion: Metabolic effect of gastric bypass, especially positive influence on diabetes mellitus type 2 is unquestionable. The authors are convinced, that for patient with instable diabetes mellitus is combined operation better than purely restrictive procedure.

P360 - Morbid Obesity

Comparison of Use and Cost Effectiveness of Tisseel and Gore Seamguard Application in Laparoscopic Sleeve Gastrectomy

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Aims: Laparoscopic sleeve gastrectomy (LSG) has become a well accepted treatment modality for morbid obesity in recent years. Main objective of this study is to compare the complications and cost-effectiveness of use of Gore Seamguard and Tisseel for buttressing with staples.

Methods: Study population were consisted of 52 patient who underwent LSG between 2010 and 2012. There were 8 males and 44 females with a mean(range) age of 37 (23–57) years. 26 patients were enrolled in each group.

Results: No major surgical complication occurred in total series. Post-operative leak occurred in one patient of whom Tisseel were applied (3.9 %). Hemorrhage from surgical site occurred in one patient of whom Seamguard were used (3.9 %). There were no difference between two groups in regard of drainage volume (100–150 cc mean). Average hospital stay was 5 days, patients were mostly discharged following scopic control 4 days after the procedure. Cost of Seamguard is found to be approximately 4 times higher than Tisseel per patient. Operation time varied between 42 and 105 min with a mean of 62 min, without any significant difference between two study groups.

Conclusions: Reinforcement of staple line seems effective in both groups with no difference in hospital stay, complication rate, operation time and drainage volume. However, significant benefit obtained with use of Tisseel in material cost analysis.

P361 - Morbid Obesity

Efficacy of Laparoscopic Sleeve Gastrectomy (LSG) in Super Patients. A Mid-Term Analysis

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Aim: Laparoscopic sleeve gastrectomy is increasingly being used as a stand-alone procedure in bariatric surgery. However, its safety and efficacy in super-obese patients (body mass index [BMI] > 50 kg/m²) is less well defined. We aimed at evaluating the efficacy of LSG in super obese patients in a midterm period.

Methods: Three hundred forty nine patients underwent Laparoscopic Sleeve Gastrectomy for obesity between January 2009 and January 2011. Patients were categorized according to baseline BMI to severe obese (GROUP A, BMI < 45 kg/m²), morbid obese (GROUP B 45 ≤ BMI ≤ 50 kg/m²) and super obese (GROUP C BMI > 50 kg/m²). Patients were followed up at 1, 3, 6, 12, 18, 24 months post operatively. Demographic data, complication rate, presence and progression of comorbidity status were evaluated.

Results: One hundred eighteen patients were included in Group A with mean BMI 41.03 ± 0.17, 115 were included in Group B with BMI 46.52 ± 0.15 and 117 patients were included in group C with mean BMI 55.79 ± 0.45 kg/m². Complication rate was 10.2 %, with major complication (Grade II-) occurring in 13 patients (3.7 %). No death occurred. Mean total weight loss (TWL %) was 30.5 ± 0.75 %, 36.5 ± 0.86 %, 38.5 ± 1.09 % at 6, 12 and 24 months post operatively for group A, 28.31 ± 0.7 %, 35.28 ± 0.98 %, 36.98 ± 1.4 % respectively for group B and 28.46 ± 0.87 %, 36.75 ± 1.33 % and 39.88 ± 1.8 % in group C. No statistically significance occurred between groups. Mean BMI at 2 year-period was 25.2 ± 0.47 for group A, 29.19 ± 0.68 for Group B and 33.4 ± 0.9 for group C respectively. At 24 months hypertension, diabetes, sleep apnea and dyslipidemia were improved in 77.27 % (p < 0.001), 96 % (p < 0.001), 96.8 % (p < 0.001) and 84.37 % (p < 0.001) respectively. Twenty super obese patients had BMI < 30 kg/m² at 24 months.

Conclusion: Laparoscopic sleeve gastrectomy is efficient and safe in treating super obese patients. In same super obese patients it may be the single stand operation for treating both obesity and its comorbidity.

P362 - Morbid Obesity

Safety and Efficacy of Laparoscopic Adjustable Gastric Banding in Patients Age Over 70

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Aims: As life expectancy increases and obesity continues to become more prevalent, more elderly people are categorized as obese. Obesity causes multiple co-morbidities and decreased quality of life. Although bariatric surgery has an acceptable safety profile, few centers routinely perform surgery on patients over aged 70. We aim to demonstrate the safety and efficacy of laparoscopic adjustable gastric banding in this population.

Methods: Retrospective analysis of patients aged 70 years and over who underwent laparoscopic adjustable gastric banding at our institution between 2003 and 2011 was undertaken. Data including age, pre and post operative weight, body mass index (BMI) and percentage excess weight loss (%EWL) were collected. Operative data, length of stay, post operative complications and resolution of co-morbidities were analyzed.

Results: 55 patients aged 70 and over, median age 73 (range 70–82) underwent laparoscopic gastric banding at our institution between 2003 and 2012. The mean pre-operative weight and body mass index were 272 lbs (range 171–432 lbs) and 40 kg/m² (range 36–65). Each patient had on average 4 co-morbidities pre-operatively with hypertension (n = 49, 86 %), dyslipidemia (n = 40, 70 %) and sleep apnea (n = 31, 54 %) being commonest. Mean OR time was 49 min (21–92) with all patients discharged within 24 h. There was 0 % 30 day mortality and re-admission and 1 death at 4 years from cardiac disease. The mean %EWL at 1, 2, 3, 4 and 5 years were 36 (±12.7), 40 (±16.4), 42 (±19.2), 41 (±17.1), 50 (±14.9) and 48 (±22.6) respectively. Complications included 1 band slip at year 5, 1 band removed for intolerance and 1 port site hernia. 2 patients underwent cholecystectomy for gallstones at year 2. The resolution of hypertension, dyslipidemia, sleep apnea, lower back pain and non insulin dependent diabetes were 27, 28, 35, 31 and 35 % respectively.

Conclusion: Laparoscopic adjustable gastric banding as treatment for obesity in the elderly population is safe and effective with moderate resolution of co-morbid conditions and few complications.

P363 - Morbid Obesity

Gastroesophageal Reflux in Patients Undergoing Laparoscopic Sleeve Gastrectomy. A Two Year Follow-Up

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Aim: Gastroesophageal reflux disease (GERD) is highly prevalent in morbidly obese patients and a high body mass index is a risk factor for the development of this comorbidity. We aimed at evaluating the effect of LSG on GERD and upper GI symptoms.
Methods: One hundred twenty four patients were included in the study with preoperative esophagogastroduodenoscopy. All patients underwent LSG for morbid obesity. Patients were evaluated for upper GI symptoms regarding heartburn, dyspepsia, regurgitation, dysphagia (score 4-20) preoperatively and at 1, 3, 6, 12, 18 and 24 months post operatively.
Results: Mean preoperative BMI of the patients was 48.46 ± 0.78 with mean age 39.29 ± 0.9 years. Seventy seven (62.1 %) patients were females and forty seven (37.9 %) were males. Seventy five patients (60.5 %) had gastritis, 36 (29 %) had Helicobacter Pylori that was treated with antibiotics in 31 (25 %) patients. Mild esophagitis was present at 33 (26.6 %) patients, intermediate esophagitis at 15 (12.1 %) and severe at 4 (3.2 %) patients preoperatively. Twenty patients (16.1 %) used systematically PPIs while 10 (8.1 %) used PPIs occasionally. The score has been reduced statistically significant from 6 (median, range 4–17) preoperatively to 5 (median, range 4–10) at 12 months and to 4 (median, range 4–8) at 2 years post operatively ($p < 0.001$).
Conclusion: Laparoscopic sleeve gastrectomy for morbid obesity relieves the symptoms of GERD two years post operatively.

P364 - Morbid Obesity

Sleeve Gastrectomy-Single Center Experience with Good Results

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Background: SG relives larger group of patients; inclusion criteria for SG and other bariatric procedures are not precisely defined. The aim of the study is to improve patients preoperative preparation and to obtain good step and long term results.
Methods: 70 patients were operated in 4 years period between January 2008 and 2012, among them 6 % male and 94 % female patient, median age of 41,6 year, average male BMI was 53 and female 47.44 kg/m². 64.28 % of patients have comorbidity. Observation based on: psychological, physical(bioimpedance), behavioral characteristics, preoperative and postoperative weight lost, feeling of content, eating behavior, improvement of fysical activity, gastroesophageal reflux disease (GERD) and complications were recorded. Red-Cup statistics was used.
Results: Average preoperative weight los was 10.5 kg (12.3 % of expected EWL), average weight loss 1 year postoperatively was 51 kg (60 % EWL). Observation periods were 3, 6, 9, 12 months after SG. Loss of craving for sweets was achieved in 85 % of patients, improvement in social behavior in 90.5, 75.9 % improved physical activity, among them aerobic training was performed average 3–4 times per week. Bioimpedance showed improved lean body mass, decreased body water content, correlated to physical activity. GERB was observed 5.57 % patients. Eating behavior improved in all patients: average 6 meals, 80–100 g of different source proteins taken, 100 % self prepared food. Regular vitamin supplementation was prescribed. 95.7 % of SG patients expressed full content of prescribed pre- and postoperative program. Surgical complications were observed in 4.28 % of SG patients with one revisional surgery of bleeding from stapling line. No leak was observed. RedCup statistics is giving first indications for selection criteria to be used for bariatric patients selected for different surgical procedures. More data is needed.
Conclusion: Single center experience give excellent results to all observing criteria in all selected patients operated for SG in observational period. For longer period after that we recommend regular controls also after reconstructive body procedures. RedCup statistics is helpful for single step program of bariatric patients management and also to improve selection criteria for surgical procedures of bariatric (metabolic) surgery.

P365 - Morbid Obesity

Comparison of Use and Cost-Effectiveness of Tisseel and Gore-Seamguard Application in Laparoscopic Sleeve Gastrectomy

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Background: Laparoscopic sleeve gastrectomy(LSG) has become a well accepted treatment modality for morbid obesity in recent years. Main objective of this study is to compare the complications and cost-effectiveness of use of Gore Seamguard and Tisseel for buttressing with staples.
Methods: Study population were consisted of 52 patient who underwent LSG between 2010 and 2012. There were 8 males and 44 females with a mean (range) age of 37 (23–57) years. 26 patients were enrolled in each group.
Results: No major surgical complication occurred in total series. Post-operative leak occurred in one patient of whom Tisseel were applied (3.9 %). Hemorrhage from surgical site occurred in one patient of whom Seamguard were used (3.9 %). There were no difference between two groups in regard of drainage volume (100 -150 cc mean). Average hospital stay was 5 days, patients were mostly discharged following scopic control 4 days after the procedure. Cost of Seamguard is found to be approximately 4 times higher than Tisseel per patient. Operation time varied between 42-105 min with a mean of 62 min, without any significant difference between two study groups.
Conclusions:Reinforcement of stapleline seemseffective in bothgroupswithnodifference in hospital stay, complication rate, operation time and drainage volume. However, significant benefit obtained with use of Tisseel in material cost analysis.

P366 - Morbid Obesity

Time Impact of Robotic Assistance on Gastric Bypass

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Aim: To compare robot-assisted Roux-en-Y gastric bypass (RYGBP) to conventional laparoscopic RYGBP in terms of time of operating room (OR) occupation, time of surgery and duration of the different surgical steps.
Methods: Data were prospectively collected for 30 consecutive patients: 15 underwent robot-assisted (daVinci® surgical system) RYGBP and 15 conventional laparoscopic RYGBP between June 2012 and December 2012. In the robot-assisted group, the gastro-jejunal anastomosis (GJ) was fully robotic in all cases and the jejuno-jejunal anastomosis (JJ) was robotic in nine cases. Mean BMI was 46 kg/m² in the robot-assisted group and 43.5 kg/m² in the laparoscopy group. Patient entry and exit of the OR, start and end times of surgery, specific start and end times of the gastric bypass steps (creation of the gastric pouch, GJ, JJ, mesenteric defect and Petersen closure) were recorded.
Results: Time of OR occupation and surgery (incision to trocars removal) were significantly longer in the robot-assisted group (4h53; 3h54-5h44 and 3h00; 2h17-3h54) compared to laparoscopy (3h20; 2h12-4h34 and 1h48; 1h06-2h39). Surgery represented 61 % (52–71) of OR occupation time during robot-assisted RYGBP compared to 53 % (41–62) for laparoscopy. Robotic time represented 49 % (30–68) of total surgery time and 29 % (21–44) of OR occupation time. Robot draping took 11 min (4–16) and robot docking took 11 min (6–26).
We observed an important difference for GJ anastomosis between robotic GJ (54 min; 40–83) and laparoscopy (23 min; 13–40). Robotic JJ (26 min; 15–46) took longer than laparoscopic (16 min; 10–32). Differences in mesenteric closure (robot: 5 min; 2–7; laparoscopy: 6 min; 2–22) and Petersen closure (robot: 4 min; 2–7; laparoscopy: 3 min; 2–5) were not as noticeable.
Conclusion: Robot-assisted RYGBP are longer in time than laparoscopic ones. Real robot time represents about 30 % of surgical time and thus cannot fully account for the increase in OR occupation time. Robot draping has little impact on global time since done while the patient is being prepped.

P367 - Morbid Obesity

Robot-Assisted Bariatric Surgery: Influence of BMI on Trocars Position and Robotic Surgical Time

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Aim: To evaluate the impact of body mass index (BMI) on trocars position and duration of robot use for bariatric surgery.

Methods: Data were prospectively collected for 53 robotic bariatric surgery (*daVinci*® robot) patients with morbid obesity (mean BMI 45 kg/m²; 34–61) between December 2011 and November 2012. Procedures were 45 Roux-en-Y gastric bypass (RYGBP); 18 full robotic gastrojejunal (GJ) and jejunojejunal (JJ) anastomoses; 27 robotic GJ and stapled linear JJ, and 8 sleeve gastrectomies (SG). Trocar position was recorded using a bidimensional coordinate grid (x:A-P; y:1-16), from xyphoid process to pubic symphysis, centered on the navel (coordinate 19). Patients with BMI ≤ 45 were compared to BMI > 45.

Results: For all procedures, camera was inserted on navel's vertical line (x = I), operating robotic arms #1 and #2, respectively to the left (x = L), and right (x = F). Arm #3, used for retraction, and assistant port were located to the far right (x = C) and left (x = O) respectively.

In RYGBP, though x-axis coordinates are identical, y-axis coordinates are higher on abdomen for BMI > 45 patients. In BMI ≤ 45 group, camera was inserted at navel level or slightly above (y = 7 or 8 or 9; 30 % each; 16-19), arm #1 (y = 6; 40 %; L5-L8), and arm #2 (y = 7; 40 %; F5-F8). For BMI > 45 group, trocars were inserted higher toward the xyphoid process than in BMI ≤ 45 group: camera (y = 6; 60 %; 16-19), arm #1 (y = 5; 50 %; L5-L7), and arm #2 (y = 5; 50 %; F5-F7). Plot of trocar position based on patient's height is more scattered than with BMI. Correlation trocars position/BMI is stronger than trocars position/height.

Robotic surgical time varies with the procedure: for full robotic RYGBP, mean 1h45 (1h09-2h24), 1h51 for BMI ≤ 45 (1h09-2h24), 1h36 for BMI > 45 (1h31-1h52); for RYGBP with robotic GJ, mean 1h18 (0h57-2h15), 1h17 for BMI ≤ 45 (1h02-1h50), 1h20 for BMI > 45 (0h57-2h15). For SG, robotic time was 25 min (17–40 min), 27 min for BMI ≤ 45 (20–40 min) and 18 min for BMI > 45 (17–20 min).

Conclusion: No correlation could be identified between robotic time and BMI or height of the patients. BMI appears to influence trocars position, with trocars inserted higher in patients with greater BMI.

P368 - Morbid Obesity

Duodenal Exclusion by Physical Barrier: The Impact on Energy Expenditure and Caloric Intake in an Experimental Model of Obesity

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Aims: We analyze the technique of duodenal exclusion as example of metabolic surgery. At experimental level, this system has proven to emulate the malabsorptive effects of gastrointestinal bypass, following the hypothesis of Rubino and Marescaux. Besides the effects on weight, we analyze changes on daily intake and expenditure energy (EE) measured by indirect calorimetry.

Methods: Sprague-Dawley rats 12 weeks old. Cafeteria diet: 4 weeks, Surgical Intervention / Sham and Sacrifice in the 4 weeks. 4 experimental groups: non obese n = 15 (surgery and sham) and obese by cafeteria diet n = 15 (surgery and sham). Intervention: duodenal exclusion. Daily control of weight, intake, and realization of indirect calorimetry (MM-100 Metabolic Monitor System CWE Inc. U.S.) to determine basal energy expenditure (EE) before and after surgery.

Results: Significant improvement of blood glucose and significant weight loss surgery in both groups. In the non obese animals, there are significant changes in the subgroup intervention with an approximate decrease of 20 % of the caloric consumption at the end of the second week post-intervention. The changes are not maintained during the experiment. Sham group without significant changes. Regarding the obese group, in the intervention group there is a significant decrease in caloric intake at the expense of an increase in feed intake (mean increase 8.5 ± 3 g feed / rat, equivalent to 30 % of the estimated intake of feed in a normal rat) and a decrease in consumption of cafeteria diet (mean decrease of 6.7 ± 2 g dietary cafeteria / rat.). Sham group unchanged. Paradoxically, a decrease in EE was observed in the group of duodenal exclusion more significant in non-obese animals.

Conclusions: In non-obese animals, changes are transient, and no effect was observed at the end of the experiment. In obese animals, a significant decrease of the intake is maintained throughout the experiment. This suggests that, although the surgical technique can influence the EE, intake and qualitative changes of appetite are a potent regulator of thermogenesis. On the other hand, it seems that duodenal exclusion on weight in obese and nonobese animals, normalizes blood glucose, gaining strength the foregut hypothesis.

P369 - Morbid Obesity

Changes in Chemerin, Leptin and Ghrelin Levels After Bariatric Surgery: Roux-En-y Gastric Bypass (RYGB) vs Sleeve Gastrectomy (SG)

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Aims: The increase in fat mass, characterized by alteration of metabolic and endocrine function, leads to increase secretion of various inflammatory adipokines. Chemerin (chemotactic protein derived from adipocytes) has several functions on immunity, differentiation of adipocytes and induction of insulin resistance. Plasma concentrations correlate with body mass index, and are elevated in patients with metabolic syndrome. Relations between Chemerin, morbid obesity and weight loss have been little studied. Ghrelin is a gastrointestinal hormone widely investigated after bariatric surgery procedures although the current results remain unclear. The aim of our study is to determine the levels of Leptin, Ghrelin and Chemerin in morbidly obese patients before and after weight loss due to the action of two different bariatric surgeries: Roux-en-Y Gastric Bypass (RYGB) and Sleeve Gastrectomy (SG).

Methods: In this study, we examined the levels of Ghrelin, Leptin and circulating Chemerin in 30 women with morbid obesity (MO) (BMI > 40 kg/m²) and 60 normal weight control women (BMI < 25 kg/m²). Cases: n = 17 SV / RYGB n = 13). Breakpoints study: at the time of surgery, at 6 and 12 months after surgery.

Results: The preoperative levels of Leptin and Chemerin are significantly higher in the MO as compared to controls, whereas Ghrelin is lower respect to controls. Leptin and Chemerin levels in MO decreased significantly after 6 and 12 months of surgery (p < 0.05). Ghrelin levels increase significantly at 12 months after surgery (p < 0.001). According to the technique used, Leptin levels at 12 months after surgery were significantly higher in the SG group (76.44 (±27.71)) than BPGY group (48.85 (± 23.78)) (p < 0.05). No differences between the two types of surgery on the levels of ghrelin or Chemerin are reported.

Conclusions: Longitudinal changes in Ghrelin levels and Chemerin unrelated to the type of surgery, but with reduced weight after surgery. Postoperative Ghrelin levels are situated at the same levels as the non-obese patients (possible feedback regulation and / or extragastric synthesis). Leptin changes may be due to the strong association with the fat mass, since patients with higher BMIs are those that have undergone a SG.

P370 - Morbid Obesity

Study of Changes in Adipokines Levels After Bariatric Surgery and its Relationship with Clinical and Metabolic Changes

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Aims: Recent studies report the effect of bariatric surgery on glycemic control and the prevention of type-2-diabetes in obese patients. We propose a study into the pathophysiological mechanisms associated to these changes. The objective of this study is to evaluate the preoperative and post-operative serum levels of various adipocytokines and their relationship to changes in metabolic factors after bariatric surgery in morbidly obese women.

Methods: We analyzed circulating levels of the adipocytokines TNF-RI, TNF-RII, visfatin, adiponectin and C-reactive protein (CRP) in 30 morbidly obese women (BMI > 40 kg/m²). Subjects were studied at three time-points: at the moment of bariatric surgery, and after 6 and 12 months.

Results: After surgery, the levels of TNF-RI, TNF-RII, visfatin and CRP were significantly lower than its baseline levels, whereas HMW adiponectin was higher. Fasting glucose, insulin and HOMA2-IR levels were markedly lower postoperatively. HDL-C levels moderately increased, and triglyceride levels sharply decreased. The study of the predictive value of variables indicated that preoperative levels of TNF-RI and visfatin correlated positively with levels of glucose, insulin, HbA1c and HOMA2-IR postoperatively, whereas adiponectin levels correlated negatively. Baseline CRP levels negatively linked to HDL-C and TNF-RII positively to triglyceride.

Conclusions: The preoperative profile with high levels of proinflammatory adipocytokines is linked to smaller improvements in glucose homeostasis and lipid factors. The use of a range of biomarkers may predict the level of metabolic changes following bariatric surgery.

P371 - Morbid Obesity

Otsc - A New Device for Endoscopic Closure of Sleeve Gastrectomy Leak

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Introduction: Sleeve gastrectomy is still increasing in popularity for treatment of morbid obesity. However, notorious leak of the staple line, that occurs in 2.4 % of all operations, poses a significant risk for the patient.

Methods: During a twelve month period all patients with leak from the resection line following laparoscopic sleeve gastrectomy were primarily treated with the Over the Scope Clip (OTSC) (Ovesco, Tübingen, Germany) device. Due to its design it allows for circumferential closure with full thickness bites of tissue.

Results: In 2012 one early and one late leak from the staple line occurred.

The first patient—a 54 year old woman with a BMI of 43—developed upper abdominal pain and fever on the fifth postoperative day. A contrast swallow was unremarkable but CT revealed a 6 × 5 × 4 cm fluid collection in the left subphrenic region and a gapping staple line. The next day the endoscopic intervention was performed under mild sedation. The fistula was visualized and suctioned into the cap, followed by a controlled release of a 12/6e OTSC device.

The second patient—a 36 year old woman with a BMI of 46—presented on the 20th postoperative day with spiking temperature and upper abdominal pain. CT demonstrated a leak in the mid-third of the staple line and a huge abscess anterior to the stomach. The abscess was drained percutaneously under CT guidance. Consecutive gastroscopy confirmed a gastric fistula. The following day an OTSCClip was employed endoscopically in similar manner to the first case under general anaesthesia.

Both patients received postinterventional broad spectrum antibiotics for two weeks. Recovery was unremarkable, inflammatory markers returned to normal levels and no further surgical revision was required. They were discharged in good health four days after intervention.

Discussion: The results of this new endoscopic device for closure of a sleeve leak are very promising.

Endoscopic closure with OTSC should be attempted before complex surgery is considered.

P372 - Morbid Obesity

Effect of Laparoscopic Gastric Plication on Disease Course in Patients with Type 2 Diabetes Mellitus. Our Experience

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Aim: To analyze results of laparoscopic gastric plication (LGP) in patients with type 2 diabetes mellitus (DM2).

Methods: According to literature data about 60 % of patients with obesity have DM2. It's known, bariatric surgery leads to increase of incretins level with recovering of β-cells of Langerhans islets and improvement of insulin production. In addition we have found literature data about complete or partial remission of DM2 after bariatric surgery.

Result: From September 2011 to January 2013 we performed 28 LGP in patients with DM2. There were 8 male and 20 female and age of patients was from 24 to 63 years old. Disease lasts from 7 to 14 years. BMI of patients was from 28 to 45. 9 patients followed the diet, 14 patients received oral hypoglycemic agents, 5 patients had insulin therapy. LGP in all of patients was performed. One patient with BMI 45 had pulmonary embolism, treated by conservative therapy. We noted full recovery of this patient 1 month after surgery and no complications during 18 month of follow-up. Blood glucose and glycosylated haemoglobin before operation was measured. After surgery we measured glucose level every day and Hb A1c every 3 months. One week after surgery normal glucose level we noted in 15 patients. In 12 patients normal glucose level we noted one month after operation. Nine months after operation one patient decreased insulin dose from 45 to 15 IU.

Conclusion: Performance of LGP was effective in 96 % of our patients and can be used for treatment of DM2. This operation is safe, quite simple in execution and cost-effective. The mechanism of the effect of LGP on course of DM2 requires further study.

P373 - Morbid Obesity

Laparoscopic Sleeve Gastrectomy: Experience from a Tertiary Care Teaching Hospital in India

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Background: Obesity is fast becoming a major public health problem in India. Laparoscopic Sleeve Gastrectomy (LSG) has been used as the primary procedure for majority of the patients requiring bariatric surgery at our institution, a tertiary care teaching hospital in India.

Methods: 250 patients underwent LSG from January 2008 to December 2012. Indications for this procedure were morbidly obese [body mass index (BMI) > 40 kg/m²] or severely obese patients (BMI > 35 kg/m²) with co-morbidities. Ten patients with a BMI 30-35 kg/m² with Type II diabetes mellitus, who underwent LSG as a part of a study, are also included in this analysis. Data was collected prospectively and included age, gender, initial body mass index (BMI) and co-morbidities. Follow-up parameters included weight, BMI, excess weight loss (%EWL), impact on co-morbidities and complications.

Results: This series comprised 161 females and 79 males with a mean age of 39.23 years (range, 17–68). Mean pre-operative BMI was 47.6 ± 8.1 kg/m² (range, 30.9–80.37). 76 patients (31.3 %) were super-obese. The mean operating time was 90 min (range, 70–280). All cases were completed laparoscopically. The mean excess weight loss (EWL) at 3, 6 and 12 months was 46.2 ± 26.4 % (n = 180), 61.3 ± 26.5 % (n = 150), 72.9 ± 20.94 % (n = 112) respectively. The %EWL at 2 years was maximum with 76.4 ± 23.2 % (n = 74) and at 3 and 4 years was 68.9 ± 17.7 % (n = 24) and 67.4 ± 14.8 % (n = 14) respectively. The mean post operative BMI at 3, 6 and 12 months was 38.7, 35.4 and 32.4. The mean post-operative BMI in patients who have completed 2, 3 and 4 years was 31.7, 34.2 and 32.6 kg/m² respectively. Type II diabetes mellitus resolved in 89 % and improved in remaining 11 % of the diabetics. Three patients (1.2 %) had a leak from the staple line. All three patients were managed conservatively. Other postoperative complications included one case each of stricture, bleeding requiring re-exploration, deep vein thrombosis and delayed gastro-cutaneous fistula, all of which were managed appropriately. There was one peri-operative mortality.

Conclusion: LSG is a safe and highly effective option for treating the morbidly obese in Indian population.

P374 - Morbid Obesity

Internal Hernias and Angina Abdominis After Laparoscopic Gastric Bypass: The Challenging Management of an Underestimated Problem

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Introduction: Internal hernia represents one of the most common late complications of Roux-en-Y gastric bypass (RYGBP), with an estimated incidence varying from 0.7 % to 3.25 %, reaching 6 % considering only procedures with transmesocolic alimentary loop. Such an incidence only accounts for complicated hernias, while the majority of internal hernias appear as a recurrent episode of postprandial colic pain (angina abdominis). The latter cases are probably the most challenging to diagnose, to treat and to prevent.

Case series: we present a video of four cases of laparoscopic evaluation in patients with recurrent, non-complicated, postprandial abdominal pain (angina abdominis) after RYGBP. All the patients were middle aged females (mean age: 39.5), previously submitted to an antecolic RYGBP; mean EWL was 90.4 % at the time of the intervention. Preoperative study revealed in all cases a partial or complete twist of the mesenteric axis at CT scan. None presented with an acute syndrome (occlusion, leukocytosis, shock) and they were all operated on in a non-urgent setting.

A Petersen non-complicated hernia was detected in three patients, and reduction with stitch fixation was performed, while an adhesion to an intraperitoneal mesh with loop rotation was detected in the last case, and treated by a laparoscopic adhesiolysis.

Postoperative course was uneventful for all the patients (hospital stay: 2.5 days), and abdominal pain resolution was achieved at follow-up.

Conclusions: Laparoscopic exploration yields a sure diagnosis and a safe and effective treatment of non-complicated internal hernias after RYGBP

P375 - Morbid Obesity

Life Threatening Haemorrhage Due to Left Gastric Artery Erosion, 6 Years After Laparoscopic Adjustable Gastric Banding
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Aims: Morbid obesity is a major public health problem. Laparoscopic adjustable gastric banding (LAGB) is one of the most widely used operations performed for its treatment and is generally recognized as safe and effective. However, with growing experience, a number of late complications, notably erosion, have been recognized. Our aim is to present a rare case of life-threatening hemorrhage due to left gastric artery erosion in a patient who had undergone LAGB.

Methods: We present the case of a 58 year old Caucasian female patient admitted to the emergency department with upper gastrointestinal bleeding. The patient reported a LAGB operation for morbid obesity performed 6 years prior to her presentation. An emergency esophagogastroscope was performed, but could not localize the source of bleeding. The patient was haemodynamically unstable and an emergency laparotomy was, thus, performed.

Results: The band was found to have eroded the left gastric artery close to its origin. Bleeding was controlled by ligation of the artery. It was possible to remove the band, which had partially eroded the lesser curvature of the stomach, without perforating the gastric wall. The patient was placed on total parenteral nutrition and was eventually discharged uneventfully 12 days after surgery.

Conclusions: There have been 6 more published cases of delayed severe upper gastrointestinal bleeding after LAGB in the literature. It is imperative that surgeons are aware of this rare, but potentially devastating complication.

P376 - Morbid Obesity

Vitamin B12 Substitution After Gastric Bypass Surgery - Sublingual or Intramuscular?

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Background: Gastric bypass surgery requires a lifelong supplementation of vitamins and micronutrients. Vitamin B12 (Cobalamin) is necessary for the growth and replication of all body cells and the normal functioning of the nervous system. Deficiency of B12 causes anemia and neurologic symptoms. The aim of this study was to determine which way of vitamin B12 supplementation (sublingual or intramuscular) is more effective to prevent deficiency.

Methods: We included 16 patients after gastric bypass surgery (7⁺3 months), 2 male and 14 female.

Nine patients took a total of 500 µg vitamin B12 sublingually every day (Vitamist Spray 4 × 2 puffs) and 7 patients took 1000 µg vitamin B12 intramuscularly bimonthly (Erycytol depot 1 mg ampullae). Laboratory data were evaluated before and 3, 6, 9 and 12 months after surgery. During the postoperative course the patients received a multivitamin mineral supplementation on a daily basis.

Results: Vitamin B12 levels before supplementation in the group with sublingual spray were mean 222[±]55 pmol/l, at 3 months mean 384 + 162 pmol/l, at 6 months mean 319 + 172 pmol/l, at 9 months mean 526 + 395 pmol/l and at 12 months mean 451 + 321 pmol/l. One patient was switched to intramuscular supplementation after 6 months because of non-compliance. Vitamin B12 levels before supplementation in the group with intramuscular injection were mean 216 + 47 pmol/l, at 3 months mean 456 + 281 pmol/l, at 6 months mean 572 + 472 pmol/l, at 9 months mean 414 + 295 pmol/l and at 12 months mean 640 + 560 pmol/l.

Conclusion: Both ways of supplementation prevented Vitamin B12 deficiency effectively. Differences could be seen in compliance of the patients. 78 % of the spray users were unsatisfied with the high frequency of the application, nevertheless 67 % would recommend it. To increase patient's compliance ease of use and patient's convenience are important features to be considered.

Keywords: Gastric bypass, Vitamin B12

P377 - Morbid Obesity

Persistent Dysphagia After Gastric Band Removal: A Word of Caution for Bariatric Surgeons

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Aims: Laparoscopic Adjustable Gastric Banding (LAGB) represents the most frequently used laparoscopic bariatric procedure worldwide; nevertheless, in the mid- and long-term follow-up more than one third of gastric bands are laparoscopically removed, mainly for food intolerance, dysphagia and Gastro-Esophageal Reflux Disease (GERD). In the present study we report two cases of persistent dysphagia after LAGB removal and discuss a previously under-recognized complication arising from a sub-optimal surgical technique.

Methods: A retrospective review of two patients showing persistent dysphagia after LAGB removal was performed.

Results: Case 1 was a 39-year-old woman who underwent LAGB removal in another Hospital due to GERD symptoms despite band deflation and multi-drugs treatment. Afterwards she complained persistent GERD and dysphagia and was referred to our Department. Here, she underwent an upper contrast gastro-intestinal (GI) series, showing a very slow esophago-gastric transit and the persistence of a gastric stricture just below the cardia, with esophageal dilation; an upper endoscopy confirmed the stricture and a 20-mm balloon dilation was performed. Given the persistence of symptoms, the patient underwent a second 20-mm balloon dilation three weeks later, with subsequent symptoms improvement. Case 2 was a 38-year old woman who underwent LAGB removal for food intolerance and hemesia at another Hospital. After band removal she complained persistent dysphagia and emesis and referred to our Department. An upper GI series revealed esophageal dilation with the persistence of a severe stricture below the cardia; the patient underwent an upper endoscopy which confirmed the stricture; she underwent a single 20-mm balloon dilation with nearly complete symptoms improvement.

Conclusions: The two reported patients underline the critical importance of a correct surgical technique when a gastric band has to be removed due to dysphagia, food intolerance or GERD. In these cases, after the band removal is mandatory to carefully check the gastric wall at the band site, where a fibrotic scar can be found. If it is the case, the fibrotic tissue should be incised and separate from the gastric wall for at least 1-1.5 cm in order to avoid the persistence of dysphagic symptoms.

P378 - Morbid Obesity

Gastroesophageal Reflux in Patients Undergoing Laparoscopic Sleeve Gastrectomy. A Two Year Follow Up

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Aim: Gastroesophageal reflux disease (GERD) is highly prevalent in morbidly obese patients and a high body mass index is a risk factor for the development of this comorbidity. We aimed at evaluating the effect of LSG on GERD and upper GI symptoms.

Methods: One hundred twenty four patients were included in the study with preoperative esophagogastroduodenoscopy. All patients undergone LSG for morbid obesity. Patients were evaluated for upper GI symptoms regarding heartburn, dyspepsia, regurgitation, dysphagia (score 4-20) preoperatively and at 1, 3, 6, 12, 18 and 24 months post operatively.

Results: Mean preoperative BMI of the patients was 48.46 ± 0.78 with mean age 39.29 ± 0.9 years. Seventy seven (62.1 %) patients were females and forty seven (37.9 %) were males. Seventy five patients (60.5 %) had gastritis, 36 (29 %) had Helicobacter Pylori that was treated with antibiotics in 31 (25 %) patients. Mild esophagitis was present at 33 (26.6 %) patients, intermediate esophagitis at 15 (12.1 %) and severe at 4 (3.2 %) patients preoperatively. Twenty patients (16.1 %) used systematically PPIs while 10 (8.1 %) used PPIs occasionally. The score has been reduced statistically significant from 6 (median, range 4–17) preoperatively to 5 (median, range 4–10) at 12 months and to 4 (median, range 4–8) at 2 years post operatively (p < 0.001).

Conclusion: Laparoscopic sleeve gastrectomy for morbid obesity relieves the symptoms of GERD two years post operatively.

P379 - Morbid Obesity

Diagnosis of Late Gastrogastric Fistula After Roux-En-Y Gastric Bypass: Experience of a High-Volume Bariatric Centre

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Aims: Late gastrogastric fistula (GGF) are a rare complication following divided gastric bypass procedure (GBP) and not always easy to diagnose on clinical grounds. On the other hand, most radiologists and gastro-enterologists are not specialized in examining patients that underwent bariatric surgery, especially in case of such rare complications.

Methods: Data of all surgical procedures performed for GGF occurring more than 6 months after divided GBP were evaluated between January 2005 and December 2012. Patient characteristics were reviewed; radiologic, endoscopic and intra-operative findings were compared and processed.

Results: Twenty-one patients underwent surgery for GGF after GBP. Most were diagnosed beforehand by upper GI series or endoscopy, but about one quarter (5/21) was found intraoperative. Indications for these operations were refractory ulcer disease in 4 patients and weight-regain in one patient.

Upper GI series were performed in all but one patient; endoscopy in 85.7 % (18/21). Upper GI series had a sensitivity of 80 % for GGF. Preoperative endoscopy was pathologic in all cases, showing marginal ulcers (72.2 %) and less frequently stenosis (22.2 %). On the other hand, the sensitivity of endoscopy for GGF was only 44.4 %

Mean time interval between initial surgery and diagnosis was 30 months (range 6–64 months), while the mean interval between diagnosis and revisional surgery was less than 3 months.

Conclusion: There is not one best diagnostic strategy to rule out GGF. Upper GI series seems to give the best preoperative interpretation of the original construction and can diagnose GGF in the majority of cases. However, a negative radiograph does not rule out GGF.

Endoscopy is a valuable tool to diagnose and assess marginal ulcer disease. Whenever diagnosed they should be treated promptly as we believe they can evolve into late GGF. Unfortunately, GGF are often missed on endoscopy.

We advocate a low threshold for upper GI series in patients with refractory ulcer disease after GBP. Moreover, whenever late GGF is diagnosed, surgery remains the only valid option.

P380 - Morbid Obesity

Management of Late Gastrogastric Fistula After Roux-En-Y Gastric Bypass: Experience of a High-Volume Bariatric Centre

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Aims: Gastrogastric fistula (GGF) after divided gastric bypass procedure (GBP) forms a surgical challenge. Although case studies have reported successful conservative treatment for early GGF, surgery remains the treatment of choice in case of late GGF.

Methods: Data of all surgical procedures performed for GGF after divided GBP between January 2005 and December 2012 were reviewed. A minimum interval of 6 months between primary procedure and diagnosis of GGF was used as cut-off point.

Results: Twenty-one patients underwent surgery for GGF after GBP at our centre. Nineteen patients underwent a laparoscopic Roux-en-Y GBP (90.7 %) with three of these being revisional procedures. One patient underwent open Roux-en-Y GBP; one a laparoscopic mini GBP (performed at another centre).

Preoperative diagnosis was made in 76.2 %. Intraoperative findings showed GGF at the anastomosis at the posterior/posterolateral side of the pouch in 19 out of 21 patients (95.1 %). Surgical procedure was similar in these cases: resection of the gastro-enterostomy and performing a new circular stapled gastro-enterostomy more proximal. Subtotal gastrectomy was performed in 42.1 % (8/19) because of damaged stomach-tissue at the fistula site. All but one procedure were done laparoscopically.

Only two patients, both primarily not operated at our centre, had a proximal fistula because of incomplete transection of the stomach at the angle of His. They both had loss of restriction and weight regain as primary symptom. In these patients a pouch reconstruction with resection of the fistula was performed.

All 21 patients had an uneventful postoperative course.

Conclusion: In case of GGF at the anastomosis, we advocate prompt surgery with resection of the entire gastro-enterostomy containing the fistula site, and constructing a whole new anastomosis. This can be managed laparoscopically whenever feasible. We believe GGF mainly to be a complication of refractory marginal ulceration following GBP. In case of occurrence of a real GGF, the problem will only worsen by increased exposure to gastric acids. In case of a real technical failure of the GBP due to incomplete transection of the stomach, a more tailored approach has to be made.

P381 - Morbid Obesity

The Role of Endoscopy in Patients Who have Undergone Bariatric Surgery

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Aims: Bariatric surgery is a successful intervention for morbid obesity, however a significant proportion of patients have gastrointestinal symptoms requiring a role for upper GI endoscopy (OGD) as a diagnostic and therapeutic tool in these patients. We analyzed the indications and findings of post-operative bariatric surgical patients.

Methods: 710 bariatric cases were performed at St Georges Hospital from April 2010 to December 2012. 372 (52.4 %) were laparoscopic roux-en-Y gastric bypasses, 294 (41.4 %) sleeve gastrectomies, 44 (6.2 %) balloon insertions and 18 (2.54 %) gastric bands. Patients who presented with gastrointestinal symptoms, were referred for OGD. The results and findings were prospectively analysed.

Results: 43 OGDs were performed. Of these patients, 28 previously underwent gastric bypass, five underwent a sleeve gastrectomy and 10 had gastric band insertion. Indications for OGD was abdominal pain in 20 patients, dysphagia in eight patients, dyspepsia in six patients, vomiting in six patients, cessation of weight loss in three patients.

17 of the 43 patients were found to have normal findings, 11 were diagnosed with gastritis and 11 were diagnosed with stomal ulceration. 5 patients were found to have a stricture. Of those who had a gastric band, one patient was discovered to have band erosion and one was discovered to have band migration. Overall; 27 patients received no new treatment, 12 continued on their empirical medical management. Management was changed in 4 patients, 3 receiving endoscopic dilatation of stricture and one had removal of band.

Conclusion: OGD post bariatric upper GI symptoms results in a useful diagnostic assessment, but rarely changes management.

P382 - Morbid Obesity

Treatment of the Failed Gastric Vertical Plication

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Aims: Bariatric procedures are widely accepted as procedures leading to weight reduction and as a treatment of number of diseases. As a number and variety of operations is increasing, the percentage of complications and failure of the operation is significantly growing also. In our presentation we want to show possible reasons of the technique failure and the way we deal with the patients after the failed bariatric surgery-laparoscopic vertical plication.

Methods: In our message we want to show that combination of two basic techniques has a great effect on the weight loss and among others also on diabetes mellitus. We would like to show the most common reasons of the failure of operations we had to deal with and the way we solved them.

Results: In our cohort we will introduce patients with failed gastric plication with no or very little weight loss. This technique we combined with duodeno-ileal bypass. We followed-up a significant weight loss in all our patients. Patients with 2. type of diabetes mellitus reached total remission in very short time

Conclusion: Duodeno-ileal bypass with total gastric vertical plication is a procedure, which fulfils all requirements of restrictively malabsorptive operation. In case of failure of the vertical gastric plication it is easily convertible into the duodeno-ileal bypass.

P383 - Morbid Obesity

Comparison of Direct and Indirect Measurements of Intra Abdominal Pressure in Morbidly Obese Patients Undergoing Laparoscopic Bariatric Surgery

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Objective: to confirm the correlation between intra-abdominal pressure (IAP), gastric pressure (GP) and urinary bladder pressure (UBP) in morbidly obese patients (BMI > 40) at normal and elevated levels of IAP in two positions, supine and 45 degree anti-trendelenburg. In addition, to examine the effect of increase in IAP and change in position on hemodynamic and respiratory parameters in those patients.

Methods and Patients: A prospective controlled clinical study including fourteen morbidly obese patients aged >18 years with BMI >40 who underwent laparoscopic bariatric surgery was conducted.

Results: In supine position; while a direct IAP of 7.8 mmHg was measured, pressure of 10 + 1.2 mmHg and 10 + 1.1 mmHg were measured in the stomach and the bladder, respectively. Increase of IAP to 15 mmHg resulted in increase of the GP and the UBP to 17 + 1.1 and 14.8 + 1.4 mmHg, respectively. Similar results were measured after tilt of 45 degrees anti-trendelenburg position.

In supine position increase in IAP to 15 mmHg, resulted in rise in mean inspiratory pressures (MIP) and peak inspiratory pressures (PIP) from 11 + 0.5 mmHg and 27 + 0.3 mmHg to 12.5 + 0.7 and 31 + 0.6 mmHg ($p < 0.05$)/mmHg, respectively. After tilt of 45° similar increase of IAP resulted in rise of PIP from 24 + 1.1 mmHg to 28 + 1.2 mmHg ($p = 0.05$)

Conclusions: we found that baseline IAP is high in morbid obesity patient and we achieved a good correlation between the direct IAP measured by laparoscopic insufflation route and urinary bladder and gastric measured pressures in morbidly obese patients at normal and elevated levels of IAP. Change of the patients position from supine position to 45° anti-trendelenburg position causes decrease of the mean and peak inspiratory pressures while increasing the tidal volume

P384 - Morbid Obesity

Early Results of a Comparative Study Between Mini-Gastric-Bypass and Roux-En-Y-Gastric-Bypass

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Introduction: The Roux-en-Y-Gastric-Bypass (RYGB) is considered to be the gold standard in the treatment of morbid obesity by many authors. There is however also increasing evidence that the Mini-gastric-bypass (MGB) is a safe and effective operation particularly in super-obese patients. Comparative data concerning the two bypass-methods had been published only from one center so far.

Methods: Therefore, the data of all patients who underwent either of the two procedures as a primary operation for the treatment of morbid obesity in hospital (I) were collected prospectively over the past 15 months and then retrospectively evaluated for perioperative and early postoperative results.

Results: Between October 2011 and December 2012, 36 patients were operated by MGB, while 32 patients underwent RYGB. Both groups were comparable for age, gender distribution and co-morbidities. Mean BMI was higher in the MGB group (52.79 kg/sqm vs. 46.28 kg/sqm). Mean operation time was lower in the MGB group (86 min. vs. 145 min.). The only conversion during the primary procedure occurred in the RYGB group. Early complications occurred in 5 patients of the MGB group and in 6 patients of the RYGB group, resulting in one re-operation in the MGB group and 2 revisions in the RYGB group. Mean hospital stay was similar in the groups. The 30 days mortality was 0 in both groups. So far, no MGB patient had to be converted into a different procedure.

Conclusions: Our initial data confirm that the Mini-gastric-bypass compared with RYGB is a safe and feasible procedure even in super-obese patients and therefore well-established in our decision-algorithm for the treatment of bariatric patients. A prospective randomized trial in our center is planned to evaluate comparative data in the long term.

P385 - Morbid Obesity

Orthodox Religion Belief as a Predictive Value for Operation Success in Laparoscopic Adjustable Gastric Banding Surgery, a Retrospective Cohort Study

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Background/Objective: laparoscopic adjustable gastric band (LAGB) surgery is considered a safe and effective treatment for morbid obesity. The LAGB surgery has a unique set of complications (i.e. slippage, leakage, port infection, port disconnection) that can only be fixed during re-operation. We conducted a retrospective study to evaluate if there is a significant difference in the surgery complication rate between the orthodox population and the general population.

Methods: for a period of 3 months, patients who arrived for a routine checkup in Dr E. Avinoach clinics (specialist LAGB surgeon) after LAGB surgery, were requested to fill up a questionnaire which included three forms—demographics details, LAGB complications evaluation and quality of life evaluation (BAROS—Bariatric Analysis and Reporting Outcome System). For patients that underwent re-operation, details were later gathered from a computer data base in Soroka Medical Center where Dr. Avinoach conducts all of his re-operations.

Results: 272 people participated in this trial. The subject group (orthodox) included 114 people, the comparison group (general population) included 158 people. Several demographics features were significantly different between the groups. The orthodox group included younger (38.2 ± 13.1 vs. 42.5 ± 11.2 , $p < 0.005$), heavier (124.7 ± 20.5 vs. 116.7 ± 19.7 , $p = 0.001$), taller people (1.68 ± 0.08 vs. 1.65 ± 0.08 , $p = 0.01$), with more man (40.4 % vs. 17.7 %, $p < 0.001$) and more married individuals (79.8 % vs. 67.7 %, $p = 0.03$). The BMI (body mass index) of the orthodox group was higher than the general population (43.8 ± 6.1 vs. 42.2 ± 5.7 , $p = 0.03$). Only 12.1 % of the trial's population underwent re-operation, out of which 91 % had slippage. We found a significant difference in the re-operation frequency between the two groups. The orthodox group had less re-operations than the general population group (7 % vs. 15.8 %, $p = 0.02$).

Conclusion: we have proved that the LAGB surgery complication rate is significantly lower among the orthodox population in comparison to the general population. Further research is required in order to characterize the orthodox patients group, and find, among their characteristics, those who lower the appearance of complications. Later on we will be able to implement those characteristics among other groups.

P386 - Morbid Obesity

A Retrospective Study: Operational Results of Re-Implantation of a Lap Gastric Band After Slippage

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Background: There is a profound debate among the bariatric surgeons regarding the surgical method of choice for failed LAGB as a result of slippage or mechanical insufficiency of the band Goal: A retrospective trial of at least two-year follow up of morbid obese patients who experienced repeated LAGB in Dep. Surgery A and examination of the surgical results by these parameters.

Methods: We collected data from 2,471 files of patients who experienced primary LAGB at Department Surgery A between 1996 and 2006. 320 patients had repeated LAGB operation. The data collected includes age, gender, BMI at initial and repeated surgeries, early and late post-operative complications. 139 patients (43.43 %) agreed to participate in the questionnaire. **Results:** Of 320 who experienced repeated LAGB (men to women ratio 1:3.6), 69 (21.6) failed at a mean time of 26.49 months and had to undergo a third operation. In 24 of them, a mechanical band malfunction was the reason of failure.

The questionnaire shows a significant improvement in all co-morbid related parameters from the initial surgery and the end of follow up. For example, mean systolic blood pressure has decreased 16 mm/Hg ($P < 0.01$), triglycerides decreased 39.23 mg/dL ($P = 0.012$) and mean BMI decreased 12.38 kg/m² ($P < 0.01$). 36 % confirmed a general health improvement, 22.7 % have decreased their co-morbid related drug dosages, 62.6 % did not need hospitalization through follow up time and only 2.9 % were hospitalized once as a result of LAGB related complaints. After grading their quality of life before and after the secondary surgery, we found a significant improvement in their social, employment and domestic domains ($P < 0.001$, $P = 0.013$, $P < 0.001$ respectively). Finally, 83.6 % were pleased with their decision of repeating the LAGB surgery and 74 % would even recommend this procedure to their relatives who are in a similar situation.

Conclusion: Laparoscopic re-banding operation for failed gastric banding remains the strategy of choice due to its low morbidity, zero mortality, safety, and efficacy. Furthermore, this procedure proves great efficacy improving obesity related co-morbidities as well as quality of life.

P387 - Morbid Obesity

Laparoscopic Adjustable Gastric Banding and Diabetes Melitus, a Long-Term Follow-Up

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Aims: To evaluate whether Lap gastric banding is a viable solution for patients with DM, in the long-term.

Methods: An historical cohort study, which included a research group that composed of patients who have undergone LAGB between the years 2000–2010 at the, Surgery Dept. A, with a concomitant diagnosis of DM. Patients were followed up for 5–6 years.

Results: The study included 71 patients. In this group the BMI decreased after the procedure without significant statistical differences, between BMI before and after the procedure. HbA1c has also decreased significantly during the study period. No pronounced difference was found in the general amount of post surgical complications in the study group compared to our general population patients who had LGB.

Conclusions: Laparoscopic adjustable gastric band as a way to control DM type II is a long run solution and should be considered as a viable option for diabetic obese patients.

P388 - Morbid Obesity

Failure of the Gastric Vertical Plication - What Can We Do?

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Aims: Bariatric procedures are widely accepted as procedures leading to weight reduction and as a treatment of number of diseases. As a number and variety of operations is increasing, the percentage of complications and failure of the operation is significantly growing also. In our presentation we want to show possible reasons of the technique failure and the way we deal with the patients after the failed bariatric surgery-laparoscopic vertical plication.

Methods: In our message we want to show that combination of two basic techniques has a great effect on the weight loss and among others also on diabetes mellitus. We would like to show the most common reasons of the failure of operations we had to deal with and the way we solved them.

Results: In our cohort we will introduce patients with failed gastric plication with no or very little weight loss. This technique we combined with duodeno-ileal bypass. We followed-up a significant weight loss in all our patients. Patients with 2 type of diabetes mellitus reached total remission in very short time

Conclusion: Duodeno-ileal bypass with total gastric vertical plication is a procedure, which fulfils all requirements of restrictively malabsorptive operation. In case of failure of the vertical gastric plication it is easily convertible into the duodeno-ileal bypass.

P389 - Morbid Obesity

V-loc Suture is an Effective and Safe Method to Close Gastrojejunostomy and Jejunojejunostomy in Gastric By-Pass

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Introduction: The spontaneous perforations of esophagus are complex problems faced by the surgeons and interventional endoscopist. Factors modifying the type of therapy include site and size of the perforation, time interval of detection, expertise and status of the resident esophagus.

This retrospective single-institution study presents a successful treatment strategy for Boerhaave's syndrome.

Material and Methods: During 1995-2012, 22 patients with spontaneous esophageal perforation were treated. Patients were grouped according to time from symptoms to referral (early, <24 h; late, >24 h). In group I (early, n = 14 patients) treatment comprised primary surgical esophageal repair in thirteen cases and endoscopic clipping in one case. In group II (late, n = 8 patients) treatment comprised esophagectomy without primary reconstruction (4 cases) or controlled esophagocutaneous fistula (4 cases). Measures of outcome included age (years), delay to diagnosis (h), severe sepsis on admission, mortality, and hospital and intensive care unit (ICU) stay.

Results: The overall hospital mortality rate was 4,5 % (1/22), being 0 % (0/14) in group I and 12,5 % (1/8) in group II. Patient age (59,3 vs. 62,3 years, P < 0.0001), delay to diagnosis (13,2 vs. 65,4 h, P < 0.0001), severe sepsis on admission (0 vs. 4, P = 0.0256), and ICU stay (3,8 vs. 15 days, P = 0.006) were all greater in group II.

Conclusions: Early diagnosis and carefully selected therapeutic tactics can reduce the mortality rate of Boerhaave's syndrome to an acceptably low level. Methods of organ preservation and minimally invasive techniques can be applied successfully in the treatment.

P390 - Oesophageal and Oesophagogastric Junction Disorder

New Method of Laparoscopic Prosthetic Repair of Giant Hiatal Hernias

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Background: As rates of recurrence and prosthetic strictures following laparoscopic repair of giant hiatal hernias are large, creation of fundamentally new method of hiatoplasty is essential.

The aim of the study was creation and clinical application of new prosthesis and method of its fixation.

Methods: From 2010 to 2012, 24 laparoscopic repairs of giant types II and III hiatal hernias were performed. Mean hiatal surface area was 33.2 cm² (range, 24.6–75.4). Posterior tension-free hiatal repair was performed with a new prosthesis—Rebound HRD-Hiatus hernia (Minnesota Medical Development, Inc.) which was fixed to crura with 3–5 separated sutures. The prosthesis is heart-shaped lightweight polytetrafluorethylene mesh with peripheral nitinol frame. The nitinol frame with memory shape has two key advantages. First, it supports a strong framework of the hiatus, and, therefore, allows to save a principle a real tension-free repair, and prevents migration of the stomach into mediastinum, i.e. recurrence. Second, the prosthesis may be easily inserted through the trocar using a special tube, and expanded to its initial form inside the abdomen.

Results: All procedures were successfully completed. Mean time of fixation of prosthesis was 25 min (range, 15–35). Pain scores were not larger than after standard mesh repair. Mid-term results (mean—15 months, range—6–24) studied by questionnaires, 3D barium study, endoscopic examinations, and 24 h pH testing, showed no cases of recurrence and esophageal erosions or strictures.

Conclusion: New method is safe and provides good anatomical and functional mid-term results, and requires further development and comparison with other techniques.

P391 - Oesophageal and Oesophagogastric Junction Disorder

Laparoscopic Paraesophageal Hernia Repair Using a ‘U’ Shaped Bioabsorbable Mesh with Fibrin Glue Fixation for Crural Closure Reinforcement

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Aims: Recurrence of hiatal hernia is frequent after laparoscopic repair. The use of mesh for hiatoplasty has shown to reduce the rate of recurrence, however complications related to mesh have been reported too. GORE® BIO-A® Tissue reinforcement could be an alternative material to buttress the hiatal closure without the risk of artificial mesh related complications.

Methods: Two patients underwent laparoscopic paraesophageal hiatal hernia repair with Nissen fundoplication using a synthetic bioabsorbable mesh. The mesh is composed of a porous, 3-dimensional web of polyglycolide and trimethylene carbonate (GORE® BioA® Tissue Reinforcement). Fibrin glue (Tisseel™) was applied over the suture closure of the crura, then the “U” shaped mesh was placed over the glue and held in place for a few seconds, and then more fibrin glue was placed over the mesh. After hiatoplasty both patients received a Nissen fundoplication.

Results: The mesh was easily placed through a 10-mm trocar. Fixation of the prosthetic using fibrin glue could be done readily and fixation was almost immediately. Peri- and postoperative period was without complications. Three months after surgery gastroscopy showed and intact wrap and no recurrence of hiatal hernia.

Conclusion: Crural closure reinforcement without any artificial material can be done readily. The device was easy to use and fibrin glue fixation can be done quickly. This type of prosthetic and fixation technique may provide the necessary reinforcement of the hiatal closure without the risk of erosion.

P392 - Oesophageal and Oesophagogastric Junction Disorder

Laparoscopic Heller Myotomy for Achalasia; Our Initial Experience

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Introduction and Aim: Laparoscopic Heller myotomy for achalasia has demonstrated beyond doubt that it's the best way to dealing with this problem. The often cited advantages are better visualization, minimal morbidity and early recovery. These procedures are largely done in tertiary centers. We document our initial experience of this procedure outside of a tertiary centre.

Methods: The records of patients with documented achalasia who underwent laparoscopic Heller myotomy were prospectively collected between JAN 2005 and May 2012. The demographic data, clinical presentation, the investigations, surgical procedure and outcome were looked at.

Results: Fifteen patients were included in the analysis (8 males and 7 females) mean age of 32 years (23–45 years). The presenting symptoms were dysphagia and chest pain predominantly. All patients had gastro copy and barium swallow. Some patients had manometry when available. Laparoscopic Heller myotomy with anti reflux procedure was done in most of them. All patients reported significant improvement in their swallowing except one patient with an anterior dhor who had some discomfort with swallowing but eventually improved. Two perforations were noted (one was a redo patient and the other was due to poor instrumentation) No mortality was reported

Conclusion: Laparoscopic Heller myotomy is feasible and safe as a treatment option for achalasia.

P393 - Oesophageal and Oesophagogastric Junction Disorder

Laparoscopic Repair of Giant Hiatal Hernias

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Aim: Retrospective study of perioperative data, outcome and patient satisfaction in patients undergoing laparoscopic repair of giant hiatal hernias at a Danish high volume centre. Giant hiatal hernias are defined as more than 1/3 of the stomach positioned intrathoracically. Surgical procedure includes mobilization and excision of hernia sac, sutured/mesh reinforced hiatal closure, fundoplication (Nissen, Toupet) and gastropexia.

Method: Review of patient records and patient evaluation forms on all patients operated in the period 2006–2012.

Results: 109 patients underwent laparoscopic repair of giant hiatal hernia including 11 redo-procedures and 11 acute procedures due to incarceration/strangulation. No patients in the inclusion period were scheduled for open hiatal hernia repair. Operation time 171 min, mortality = 1(0.9 %), major morbidity = 3(2.8 %), total morbidity = 6(5.5 %), conversion rate = 0. Discharge within 30 h = 80(74 %), mean LOS = 2.34 days. Readmissions < 30 days = 6. At follow-up 6–12 months full patient satisfaction was reached in 101(92.6 %), no reflux in 100(91.7 %) and no dysphagia in 88(80.8 %).

Conclusion: Laparoscopic repair of giant hiatal hernias is feasible, safe and effective with minimal mortality and morbidity. Approximately 20 % of the patients had some degree of dysphagia; still 92.6 % of the patients were fully satisfied at follow-up.

P394 - Oesophageal and Oesophagogastric Junction Disorder

Treatment of Incarcerated Hiatal Hernias

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Aim: Retrospective study of perioperative data, outcome and patient satisfaction in patients undergoing acute laparoscopic repair of incarcerated/strangulated hiatal hernias at a Danish high volume centre. Acute repair covers patients presenting with lower thoracic pain, vomiting and incapability of swallowing with well-known hiatal hernias or verified by computer tomography.

Surgical procedure includes mobilization and excision of hernia sac, sutured/mesh reinforced hiatal closure, fundoplication (Nissen, Toupet) and gastropexia.

Method: Review of patient records and patient evaluation forms on all patients operated in the period 2006–2012.

Results: 11 patients underwent acute repair of incarcerated hiatal hernia. 9 patients with upside-down stomach, 2 patients with 2/3 of stomach placed intrathoracically. Mean age 66 years (range 23–84 years), operation time 210 min (range 112–300 min). Mean hiatus width 8.8 cm (range 7–11 cm). Mesh reinforced closure in 1/11. Mortality 0, morbidity 0, conversion 0.

6 patients discharged within 30 h, remaining 5 discharged in 2–5 days. Readmission rate 0. Follow-up at 6 months with 100 % patient satisfaction, mild dysphagia in 2/11, no reflux and no symptomatic recurrence.

Conclusion: Conclusions are modest since total number of patients is small. Still, we think laparoscopic repair of incarcerated/strangulated hiatal hernia is feasible, safe and effective with no mortality and no morbidity in this series of high-risk patients.

P395 - Intestinal, Colorectal and Anal Disorders

Hybrid Notes - Single Port Combined Laparoscopic Rectum Resection via Ileostomy with Transvaginal Specimen Retrieval

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Objective: Laparoscopic rectum resection is on the way to become a standard procedure. Further progress in minimal invasive surgery have allowed transvaginal approach for Hybrid NOTES as well as single port procedures to be performed. This didactic video demonstrates a step by step combined Hybrid NOTES—single port laparoscopic low anterior resection via the ileostomy position.

Methods: After open approach via the planned ileostomy position a Single Port system is inserted. These devices allow use of 5 to 25 mm instruments and specimen extraction through an in-build wound protector. A single incision of 3.5 cm length is required. Furthermore, a 12 mm vaginal trocar is brought in after lifting up the uterus. The key steps and potential pitfalls inherent to any colorectal resection are demonstrated, while the specifics of single port surgery are highlighted.

Results: A medial to lateral mobilisation of the colon is performed, identifying the left ureter and the inferior mesenteric artery divided at its origin. The inferior mesenteric vein is taken at the pancreas border. Left flexure and omentum are released and the rectum is mobilized and divided with a linear stapler. The descending colon was divided as well and the specimen was put into a retrieval bag brought in from transvaginal. Specimen extraction through the vagina followed and closure performed transvaginally. The purstring suture and insertion of the anvil is done through the single port system. The bowel is returned into the abdomen and a side-to-end colorectal stapled anastomosis is fashioned. The donuts are checked. A drain is put in via an additional trocar. For completion a diverting ileostomy is performed after removing the port system.

Conclusion: Combined Hybrid transvaginal NOTES—Single port laparoscopic low anterior resection via the ileostomy is a safe and efficient procedure with minimal trauma to the abdominal wall. Patient selection and advanced laparoscopic skills are paramount in order to perform increasingly complex procedures. It is hoped that this video will contribute to a wider and safer practice of laparoscopic surgery.

P396 - Oesophageal and Oesophagogastric Junction Disorder

Outcomes of Laparoscopic Feeding Jejunostomy in Oesophagogastric Cancer

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Aims: Does laparoscopic feeding jejunostomy represent a safe and feasible technique to provide nutritional support for oesophagogastric cancer patients.

Methods: Retrospective review was carried out of consecutive oesophagogastric cancer patients having undergone feeding jejunostomy insertions. Patients were identified through clinical coding and clinical details and outcome data were retrieved by case notes review and the notes were analysed.

Results: 58 patients with oesophagogastric cancer had feeding jejunostomy. There were 35 (60.3 %) patients who had laparoscopic feeding jejunostomy and 23 (39.7 %) had open feeding jejunostomy at the time of curative resections. Of the 35 who had laparoscopic feeding jejunostomy 31 had feeding jejunostomy at time of laparoscopic resection while 4 had feeding jejunostomy at time of staging laparoscopy. There were no intraoperative complications detected in the laparoscopic group with no conversion to open procedure. One patient developed postoperative feeding jejunostomy wound infection. Two patients developed blockage of feeding tube.

Conclusions: Laparoscopic feeding jejunostomy is a feasible procedure that can be attempted at time of staging laparoscopy or at time of curative laparoscopic resection to provide nutritional support for oesophagogastric cancer patients with an acceptable rate of complications.

P397 - Oesophageal and Oesophagogastric Junction Disorder

Our Procedure in Laparoscopic Nissen Fundoplication for GERD Patients

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Introduction: Laparoscopic techniques in anti-reflux surgery for GERD patients are still considered complicated by many surgeons. We have simplified it and established a simple and practical procedure.

Surgical Procedure: Setting

Our 5-trocar setting with patients in the reverse Trendelenburg's position for laparoscopic Nissen fundoplication is as follows. A 5 mm trocar was inserted just below the navel for a laparoscope (A). A 5 mm trocar was inserted in the upper right abdomen for a snake-retractor to pull up lateral segment of the liver, and a holder was used for a snake-retractor. A 5 mm trocar was inserted in the upper right abdomen for operator's right hand. A 5 mm trocar was inserted in the upper left abdomen (B). A 5 mm trocar was inserted in the middle left abdomen (C). The operator is positioned between the patient's legs.

Step 1

Under laparoscopic view, left part of the lesser omentum was cut with preserving the hepatic branch of vagus nerve. The right crus has been dissected free, and the esophagus is being recognized. The soft tissue at the posterior side of the abdominal esophagus was carefully dissected. Then the left crus of the diaphragm was recognized from the right side. In this part of the procedure, laparoscope uses 12 mm trocar (A), the assistant uses 12 mm trocar (B) to pull the stomach to left lower side and the operator's right hand uses 12 mm trocar (C).

Step 2

The branches of left gastroepiploic vessels and the short gastric vessels were divided with LCS. The left crus of the diaphragm was exposed and the window at the posterior side of the abdominal esophagus was widely opened. In this part of the procedure, laparoscope uses 5 mm trocar (A) at the beginning of dividing left gastroepiploic vessels, 5 mm trocar (C) when dividing short gastric vessels and 5 mm trocar (B) at the last part of opening the window at the posterior side of the abdominal esophagus. The assistant uses 5 mm trocar (B-C-A) to pull the stomach.

P398 - Oesophageal and Oesophagogastric Junction Disorder

Therapeutic Algorithm for Surgical Strategy of Boerhaave's Syndrome

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Introduction: The spontaneous perforations of esophagus are complex problems faced by the surgeons and interventional endoscopist. Factors modifying the type of therapy include site and size of the perforation, time interval of detection, expertise and status of the resident esophagus.

This retrospective single-institution study presents a successful treatment strategy for Boerhaave's syndrome.

Material and Methods: During 1995-2012, 22 patients with spontaneous esophageal perforation were treated. Patients were grouped according to time from symptoms to referral (early, <24 h; late, >24 h). In group I (early, n = 14 patients) treatment comprised primary surgical esophageal repair in thirteen cases and endoscopic clipping in one case. In group II (late, n = 8 patients) treatment comprised esophagectomy without primary reconstruction (4 cases) or controlled esophagocutaneous fistula (4 cases). Measures of outcome included age (years), delay to diagnosis (h), severe sepsis on admission, mortality, and hospital and intensive care unit (ICU) stay.

Results: The overall hospital mortality rate was 4.5 % (1/22), being 0 % (0/14) in group I and 12.5 % (1/8) in group II. Patient age (59.3 vs. 62.3 years, P < 0.0001), delay to diagnosis (13.2 vs. 65.4 h, P < 0.0001), severe sepsis on admission (0 vs. 4, P = 0.0256), and ICU stay (3.8 vs. 15 days, P = 0.006) were all greater in group II.

Conclusions: Early diagnosis and carefully selected therapeutic tactics can reduce the mortality rate of Boerhaave's syndrome to an acceptably low level. Methods of organ preservation and minimally invasive techniques can be applied successfully in the treatment.

P399 - Oesophageal and Oesophagogastric Junction Disorder

Laparoscopic Repair of Paraesophageal Hernia

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Laparoscopic repair for paraesophageal hernia is still challenging. We describe our surgical technique for paraesophageal hernia repair and its outcome. Between March 1998 and November 2012, A total of 56 patients with paraesophageal hernia (typeII:1, III:35, IV:20) underwent laparoscopic repair in our hospital. The patients consisted of 16 men and 50 women with a mean age of 74.3 years. Eighteen gastric volvulus (organoaxial: 7, mesenterioaxial: 11) were included. Surgery included reduction of the hernia, closure of the hiatus with or without mesh and fundoplication. The anterior and the posterior main branch and the hepatic branch of the vagus nerve were preserved. Nissen, Toupet, anterior or lateral fundoplication was selected by preoperative symptoms and characteristics of each patient. The form of the fundoplication was evaluated by our newly introduced morphological scores by laparoscopy and endoscopy during surgery. Nissen, Toupet, anterior and lateral fundoplication was performed for 11, 18, 22 and 5 patients and its operation time was 164, 142, 147 and 135 min, respectively. Soft diet started on the first postoperative date (POD) and hospital stay was 9.3 days. Conversion to an open surgery was required for one patient because of the previous open surgery. Dysphagia was observed in five patients, which was relieved within 3 months. Reflux esophagitis was observed in four patients (recurrence: 2). Pleural effusion was observed in five patients, two of which required in two patients. Within a median follow up period of 72 months, symptomatic recurrent hernia was occurred on five patients (8.9 %) and four of them underwent laparoscopic redo surgery.

Laparoscopic repair of paraesophageal hernia is safe and feasible, although the type of fundoplication and the use of mesh are still controversial.

P400 - Oesophageal and Oesophagogastric Junction Disorder

Efficacy and Feasibility of Laparoscopic Nissen Fundoplication in Lung Transplant Recipients

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Background: Lung transplantation is an accepted treatment strategy for end-stage lung disease. Although the immediate surgical outcomes after lung transplantation are good in modern time, survival of lung allograft recipients remains lower than other solid organ transplants. Chronic microaspiration contributes to develop and deteriorate chronic allograft dysfunction with gastroesophageal reflux disease (GERD). GERD is prevalent in end-stage of lung disease and it is even more common in patients after transplantation. We report safety and feasibility of laparoscopic antireflux surgery in patients after bilateral lung transplantation. **Materials and Methods:** From February 2006 to December 2012, 14 patients of 382 who had earlier received lung transplantation at the Oslo University Hospital, Rikshospitalet underwent laparoscopic fundoplication for symptoms of GERD. Efficiency and safety of laparoscopic antireflux procedure and lung function was evaluated.

Results: In all 14 cases laparoscopic Nissen fundoplication was performed, without conversion to open approach. Median operation time was 110 (range 57–22), median blood loss ~0 ml (range 0–30), median postoperative hospital stay in surgical department—1 day (range 1–3). There was only one intraoperative unfavourable incident (minor injury of spleen, which was fixed by application of Tacosil mat without bleeding), no postoperative complications and mortality from the antireflux surgery. Four patients (28.5 %) reported gastrointestinal symptoms after procedure (dysphagia in three cases, both regurgitation and dysphagia in one). In three patients symptoms can be controlled by medication, and one case in patient with regurgitation required redo surgery.

Conclusions: GERD is very common in the lung transplant lung population. Laparoscopic antireflux surgery can be done safely with minimal morbidity and mortality and good short-terms outcomes.

P401 - Oesophageal and Oesophagogastric Junction Disorder

Short-Term Outcomes After Paraesophageal Hernia Repair - Does Biologic Onlay Mesh Affect Clinical Outcomes?

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Aims: The objective of this study is to compare short-term post-operative outcomes between simple suturing of the diaphragmatic crura and repair with onlay biologic mesh during paraesophageal hernia (PEH) repair. **Methods:** Patients who underwent PEH surgery at the Ottawa Hospital between January 2004 and January 2012 were entered into a prospective database. A retrospective chart review of all entered patients was undertaken to ensure validity and completeness of data. Data included demographics, pre-operative comorbidities and symptoms, surgical details, intra-operative complications, and post-operative complications and symptoms. Patients were grouped by type of PEH hernia repair (simple suturing versus biologic mesh onlay). Chi-square/Fisher's exact test and Kruskal-Wallis analysis were used to compare categorical and continuous variables, respectively.

Results: There were 161 PEH repairs performed during the study period (73 Mesh; 88 Suture). Patients in the mesh group were more likely to be female (78 vs. 61%; $p = 0.02$), and have a cardiac history ($p = 0.02$). No significant between-group differences were found for age, BMI, ASA score, history of COPD or asthma ($p > 0.05$).

Pre-operative symptoms (heartburn, regurgitation, chest pain, dysphagia, odynophagia) were similar between groups ($p > 0.05$). No significant differences occurred between groups for admission type (elective, urgent, or emergent), post-operative symptoms (early/late dysphagia, post-prandial bloating, abdominal discomfort, heartburn, regurgitation), intra- or post-operative complications (hemorrhage, visceral perforation, splenic/liver laceration; wound infection, leak, abscess, pulmonary/cardiac complications). Mortality, length of stay, and advancement of diet were similar between groups ($p > 0.05$).

Median follow-up for the mesh and suture group were 179 and 350 days, respectively. Post-operative symptoms were similar between groups ($p > 0.05$).

Approximately 27 % (44/161) of patients had follow-up upper GI series (mesh = 18; suture = 26). Median time to follow-up imaging was 358 and 155 days, for mesh and suture groups, respectively. The suture group trended towards increased radiologic reflux (0 vs. 19 %, $p = 0.07$). No further radiologic differences were identified between groups (recurrence, hiatal hernia, dysmotility, stenosis) ($p > 0.05$).

Conclusions: We found no evidence indicating that biologic onlay mesh during paraesophageal hernia repair improved short-term clinical or radiologic outcomes. Future randomized studies with adequate follow-up are required to further investigate this question.

P402 - Oesophageal and Oesophagogastric Junction Disorder

Laparoscopic Nissen Fundoplication with or Without Prosthetic Materials

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Background: Laparoscopic Nissen fundoplication is an accepted gold standard treatment for gastroesophageal reflux disease (GERD). The aim of this study was examine the results of Laparoscopic Nissen Fundoplication with or without prosthetic mesh operations performed for the treatment of GERD.

Material and method: Sixty patients who operated between March 2007 and July 2012 were prospectively evaluated. Primer crurography performed of the 31 patients and primer crurography with prosthetic mesh used of 29 patients. Endoscopy was performed to all patients preoperatively and postoperatively at 12th months. Demographic features, duration of preoperative symptoms, length of hospital stay, operation times and complications were compared between two groups. The quality of life (GIQLI) test was used for assessment of the patient satisfaction preoperatively and postoperatively at the 6th and 12th months.

Results: Sixty patients with a median age of 42(20–83) years and 26(43 %) of them were women, 34(57 %) of them were male. Preoperative mean duration of symptoms was 21.75 ± 19 months. Esophagitis and/or presence of hiatal hernia were found in all patients preoperatively. There was no difference between two groups according to age, gender and duration of symptoms. Mean length of hospital stay was significantly short in mesh groups (2.93 ± 2.2 vs 4.23 ± 2.6 days). Mean operation time was long in mesh group but not significant (44.95 ± 17.75 vs 36.80 ± 19.25 min). Two perforations were occurred during operation and were repaired at the same time in primer crurography group. Subcutaneous emphysema was occurred in one patient and recovered spontaneously in mesh group. One wrap herniation was seen in a patient who has been operated two times previously for hiatal hernia. The analysis showed that the patients had a low GIQLI preoperatively in comparison with healthy individuals (mean 78.25 ± 19.1 vs. 122.6 points). GIQLI showed an equal improvement and there were no differences in the quality of life in in both groups. All patients' endoscopic findings were normal at first year.

Conclusion: Laparoscopic Nissen fundoplication appears to prevent reflux and its symptoms and create better quality of life at the long term. We believe using prosthetic mesh for repair results in better quality of life without causing an additional complication burden.

P403 - Oesophageal and Oesophagogastric Junction Disorder

Robotic Surgery Reoperation for Failed Heller Myotomy: Is this a Safer Solution?

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Laparoscopic Heller myotomy with antireflux procedure seems the procedure of choice in the treatment of patients with esophageal achalasia. Persistent or recurrent symptoms occur in 10 % to 20 % of patients. Few reports on reoperation after failed Heller myotomy have been published. The aim of this study is to evaluate the efficacy of robotic reoperation after failed Heller myotomy for esophageal achalasia.

Material and Method: From 2008 to 2012, 7 patients underwent robotic reintervention for failed Heller myotomy. Symptoms leading to reoperation included persistent dysphagia in 3 patients, recurrent dysphagia in another 3, and heartburn in one patient.

Results: Mean time from the first to the second operation was 33 months (range 1–130 months). The intervention was completed via a laparoscopic robotic assisted approach in 6 cases and a thoracoscopic robotic assisted approach in one case. Mean operative time was 150 min (range, 120–240 min). Mean postoperative hospital stay was 4 days (range, 3–8 days). There have been no mucosal damage in the course of dissection or myotomy. No major morbidity or mortality occurred. At a mean follow-up of 6 months, reoperation was considered successful in all patients.

Conclusion: Robotic reoperation for failed Heller myotomy is technically challenging particularly in patients where surgery was done several years ago. This approach is safe and is associated with good mid-term results. Probably robotic surgery should be dedicated to complex minimally invasive operations like redo Heller myotomy.

P404 - Oesophageal and Oesophagogastric Junction Disorder

Evaluation the Possibility of Applying Various Techniques in the Treatment of Hiatal Hernia (HH) Using a Minimally Invasive Laparoscopic Approach

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Aim: Minimally invasive antireflux surgery is the preferred approach in the treatment of patients with HH and gastroesophageal reflux disease (GERD). Despite a number of disadvantages, the most common type of antireflux operation is the laparoscopic Nissen fundoplication.

Purpose: To evaluate the effectiveness of various techniques for laparoscopic antireflux operations. **Materials and Methods:** Since 1996 in the clinic of the Ryazan Regional Hospital (Ryazan), Center of Clinical and Experimental Surgery (Moscow), Swiss University Clinic (Moscow) we've performed 424 laparoscopic antireflux operations. Structure of operations: in 38 cases we performed laparoscopic Nissen fundoplication and in 386 cases, that is, the prevailing part, partial posterior wrap (Toupet procedure). All patients preoperatively underwent preoperative research: ultrasound examination of the abdomen, EGD with biopsies of esophageal mucosa, X-ray examination of the esophagus and stomach, esophageal pH monitoring.

Results: We had several intraoperative complications: in one case identified injury of the spleen, perforation of the esophagus, performing partial posterior wrap. In 5 cases we diagnosed pneumothorax performing Nissen fundoplication. Complications occurred during the period of development of technique. There was no conversion. The average time of surgery does not exceed 40 min. In the early postoperative period we diagnosed dysphagia in 25 % of patients who underwent Nissen fundoplication and in 5 % of patients after Toupet procedure.

Conclusion: Toupet procedure associated with the less severe dysphagia in the postoperative period. Choosing a method of laparoscopic fundoplication you have to be sure about the degree of esophageal motility disorders, with a decrease of it, we found that Nissen fundoplication is not advisable.

P405 - Oesophageal and Oesophagogastric Junction Disorder

A Porcine Model of Prosthetic Cruroplasty for Hiatal Hernia Repair: Tips & Tricks

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Aims: Swine are commonly used as models of laparoscopic procedures. Experimental models of laparoscopic hiatal hernia repair, in particular, are being used extensively in order to introduce surgeons to advanced laparoscopic techniques. However, while the debate on the use of prosthetic materials at the oesophageal hiatus continues, there are few published models of prosthetic cruroplasty in swine using laparoscopy. The aim of this presentation is to describe a porcine model of prosthetic cruroplasty, focusing on technical details and tricks essential in successfully utilizing such a model.

Methods: The operation was performed in 11 domestic pigs (26–37 kg bodyweight), using 5 trocars. The phrenoesophageal ligament and crura were dissected free and a posterior cruroplasty was performed. The dimensions of the crura were measured and a piece of biologic (small intestinal submucosa) or synthetic (polyglycolic acid-trimethylene carbonate) material was tailored and fixed to the crural repair.

Two months after surgery the animals were examined by barium swallow and re-operated upon laparoscopically. The crural region was dissected free to evaluate adhesion formation and the region of the diaphragm, esophagus and stomach around the crura was excised en block.

Both operations were recorded in order to analyze the technical aspects of the operation and correlate them with complications.

Results: The operation was completed successfully in all animals. Minor bleeding from the liver and spleen was observed in 5 animals, while gastric perforation occurred in one animal. Two of the animals died, both in the immediate postoperative period. The crural region could accommodate prosthetic material of up to 6 × 8 cm in size. The surgical technique closely mirrored clinical practice, while this model also managed to adequately simulate conditions encountered during re-operation. Operative time decreased from 4 to less than 2 h with standardization of technique.

Conclusions: Laparoscopic prosthetic reinforcement of hiatal closure with long-term survival is technically feasible and safe in a porcine model. There are some potential pitfalls, especially regarding port placement; liver and stomach retraction; and the avoidance of pneumothorax. Operative anatomy and technique closely resemble clinical practice, making this model ideal for training as well as research purposes.

P406 - Oesophageal and Oesophagogastric Junction Disorder

Endoscopic and Endovascular Operations for Prevention of Variceal Bleeding in Patients with Portal Hypertension

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Variceal bleeding as complication of portal hypertension is very common reason of death in patients with liver cirrhosis. Bleeding from esophageal varices is associated with mortality risk in at least 20 % at 6 weeks.

Aim of this study is to explore possibilities of endoscopic and endovascular operations in prevention of bleeding from gastro-esophageal varices in patients with portal hypertension
Method and materials: Prospective study includes 68 patients with portal hypertension, who had 1–3 episodes of bleeding from varices. Majority of patients were men 47 (69.1 %) with mean age was 56 + 3.5 year (range 31–79). The severity of cirrhosis was evaluated with Child-Pugh grade: Child-Pugh A—22 patients, Child-Pugh B—46 patients. Laparoscopic procedure was performed with 4 trocars. Operation includes dissection of abdominal part of the esophagus with suturing of venous vessels, coagulation and dissection of short gastric vessels between the stomach and the spleen, coagulation and clipping of left gastric artery and vena.

We did devascularization simultaneously with Nissen fundoplication in 11 patients with GERD and simultaneously with cholecystectomy in 24 patients.

Results: There was no mortality. Morbidity was 12 %—intraabdominal hematoma was in 5 patients, abscess formation was in 2 patients.

Mean hospital stay was 4.3 + 2.7 days. After 3 months gastroesophagoscopy showed disappearing of varices in 20 patients, decrease of varices size in 18 patients. Endoscopic banding was done in 9 patients 6 month after operation.

During 1–3 years after operation recurrence of variceal bleeding was only in 7 patients.

Conclusion: Laparoscopic devascularization is effective operation which can prevent variceal bleeding in patients with portal hypertension.

P407 - Oesophageal and Oesophagogastric Junction Disorder

Danish Study of 79 Patients Operated for Paraesophageal Hernia 2009–2011

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Background: Various techniques have been performed for laparoscopic repair of paraesophageal hernia (PEH) including crural repair with or without mesh, fundoplication and/or Boerema procedure after dissection of the hernia sac. The aim of this study was to determine the outcome of patients with PEH operated at our center, and if possible to identify the optimal surgical procedure for grade 3–4 paraesophageal hernia.

Method: Retrospective review of all patients operated for PEH at Hvidovre University Hospital from Jan. 2009 to Dec. 2011. 79 patients were identified; all operated by the same surgeon. Operation techniques used; All: total resection of the hernia sac, 23: crural repair and mesh, 47: Boerema procedure after crural repair and mesh, 9: Nissen fundoplication (grade 3 herniation, reflux as main symptom). Two investigators examined all records and conducted a follow-up interview using Gastroesophageal Reflux Disease-Health Related Quality of Life Instrument (GERD-HRQL) and The Short Form 36 Health Survey (SF36).

Results: 79 patients were operated, no conversions performed. 14 % were acute operations, 90 % ASA II–III, mean age 69(44–92) and mean hospital stay after surgery 2 days (1–39). Complete follow-up in 68 cases; mean follow-up time 25 months(11–44). Five had died(2 within 30-days) due to other causes and six were inaccessible. Mortality(30-day): 2.5 %. No major postoperative complications but seven minor(pneumonia etc.). Morbidity: 8.9 %. Only one was reoperated due to recurrence 1 year later. The preoperatively dominant symptoms were epigastric pain, dysphagia and vomiting(86 %), only a minority suffered from reflux symptoms. Postoperatively GERD-HRQL demonstrated good symptom control for over 90 % of the patients and 93 % were satisfied with their present condition. SF36 was comparable with a normal Danish background population. No significant difference was observed between the operations.

Conclusion: Regardless of operation method there was low morbidity(8.9 %) and mortality(2.5 %) and high patient satisfaction with well-controlled symptoms (GERD-HRQL) and quality of life (SF36). The Boerema procedure together with crural repair and mesh is a safe and effective technique and should be considered in the surgical treatment of paraesophageal hernia. However there was only one re-operation due to hernia recurrence during the three year period and longer observation period is needed. Further investigations with prospective multicenter study are needed, before the best operation method can be defined.

P408 - Oesophageal and Oesophagogastric Junction Disorder

Comparison of GERD and Barrett's Esophagus in Patients Underwent Antireflux Surgery

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Introduction: Gastroesophageal reflux disease (GERD) is one of the most common upper gastrointestinal diseases in the western countries. Barrett's esophagus (BE) is a proved precancerosis. It can transform into adenocarcinoma. In order to identify the potential risk factors of Barrett's metaplasia we compared the group of GERD patients with the group of BE patients in our retrospective clinical study. We also analysed the efficiency of laparoscopic antireflux surgery.

Patients and Methods: Between 2001 and 2008 we performed laparoscopic Nissen fundoplication in 176 cases of GERD (Group I) and in 78 cases of BE (Group II). We compared the results of the preoperative anamnestic and demographic data, the functional examinations (pH-metry, manometry and Bilitec) between the two groups. There was no difference in the average age of the patients (53.9 vs. 55.3 year, $p = 0.495$), and the BMI was also similar in both groups (26.9 vs. 27.4, $p = 0.451$). We could not confirm longer symptomatic period in Group II (68.7 vs. 69.0 months, $p = 0.653$). Hiatal hernia was very common in both groups (95.4 vs. 87.5 %); the average size was 3.48 cm in Group I, and 3.73 cm in Group II. ($p = 0.296$). After the antireflux surgery all the patients underwent the same medical examinations and endoscopy. The average follow up time was 13.8 months in Group I and 16.7 months in Group II.

Results: The DeMeester score was higher (18.9 vs. 41.9, $p < 0.001$), and bile reflux was measured more frequently among the patients in Group II. Although the pressures of the lower oesophageal sphincter were lower than normal in both groups, there was no significant difference between in the groups (12.1 vs. 12.6 Hgmm, $p = 0.892$). The postoperative functional follow up confirmed a sphincter pressure increase in the lower esophagus (17.6 and 18.7 Hgmm, $p < 0.001$), and a decrease in acid (DeMeester score 7.7 and 12.7, $p < 0.001$) and biliary reflux in both groups.

Conclusions: More severe acid reflux and more frequent biliary reflux can facilitate the development of BE. Laparoscopic antireflux surgery can effectively decrease the severity and the frequency of acid and bile reflux.

P409 - Oesophageal and Oesophagogastric Junction Disorder

Laparoscopic Cardiomyotomy for the Management of Esophageal Achalasia

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Introduction: Achalasia is a rare primary motility disorder of the esophagus causing progressive dysphagia with consecutive malnutrition, weight loss, foetor ex ore and pulmonary aspiration. In the management of the disease the balloon dilation and botulin toxin injection cause only temporary improvement of the complaints, surgery may offer a more prolonged and considerable relief of symptoms. Surgery has advantage because the first peak of incidence of the disease is in young age, frequently during the twenties and thirties. But according to the literature data the efficacy of surgery is in reverse correlation with the duration and staging of the disease.

Material and method: Between January 1996 and January 2013, 68 patients had undergone surgery. The male/female ratio was 30/38. The median age of female patients was 46.5 y (25–71) while of male patients it proved to be 36.5 y (18–70). As a rule we applied laparoscopic approach, but in 4 cases we performed open surgery because of previous operations and/or considerable comorbidity like common bile duct stones. We performed 6–7 cm long esophago-cardiomyotomy and anterior hemifundoplication (Dor). In two cases conversion was done. There was no operative mortality or severe morbidity in the postoperative period. The patients are followed up by periodical interviews.

Results: The duration of the procedure was 12 ± 18 min. The postoperative manometric studies confirmed the significant decrease of LES resting pressure ($\Delta 17.8 \pm 3.2$ Hgmm) which showed a positive correlation with the symptomatic improvement of the patients. We strongly recommend the early laparoscopic cardiomyotomy for young patients suffering from esophageal achalasia.

P410 - Oesophageal and Oesophagogastric Junction Disorder

Hiatal Mesh Migration. Endoscopic Treatment

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Objective: The use of the mesh in the hiatus for large paraesophageal hiatal hernias or hernias is controversial, mainly for its possible complications: dysphagia by fibrosis, perforation and migration.

We present the migration of a mesh placed in a female patient with symptomatic hernia recurrence and its endoscopic removal.

Clinical Case: A 34 year-old woman with previous Nissen fundoplication 18 months earlier. She returns with persistence of gastroesophageal reflux disease clinic. The barium test shows a relapsed hernia and the endoscopy confirms an grade II reflux esophagitis with metaplasia (Pathological anatomy: Barrett's esophagus without dysplasia). The patient undergoes surgical reduction of the hernia by laparoscopy, new Nissen fundoplication with 2 esophageal points, an extended polypropylene mesh and silicone cover (Surgimesh®) with a esophageal hole placement covering the closure of pillars and several centimeters around the hiatus.

Results: Postoperative course was without complications. She remains asymptomatic and without medication during two and half years after she talks over progressive dysphagia of a week of evolution. Endoscopy shows transverse migration of the mesh at the posterior wall of the gastric esophageal union and section of it with endoscissors is made. After the section of the mesh dysphagia disappears. In two subsequent endoscopic sessions the two flukes are tractioned without getting their extraction. With a dual channel endoscopy that allows pull the mesh by one of the channels and cut it with another, mesh, is completely removed in two fragments. The patient is controlled two years with slight reflux symptoms with antisecretory drugs. Gastroscopy shows small hernia with Barrett's esophagus

Conclusions: The use of a mesh is a useful resource solution for the closure of large defects in the hiatus, but entails a risk of erosion of the esophagus by several factors: the dynamic behavior of the esophagus in the hiatus, the shape and material of the mesh, as well as the technique. The mesh polypropylene, although this covered, it is of comfortable handling for their placement but the risk of esophageal erosion is high. On the other hand, endoscopy is useful because the migration of the mesh can be dealt with without open surgery.

P411 - Oesophageal and Oesophagogastric Junction Disorder

Laparoscopic Revisional Antireflux Surgery is Safe and Feasible When Performed in a High-Volume Centre

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Aims: Around 4 % of the patients undergoing laparoscopic antireflux surgery may require revision surgery. The aim of this study was to evaluate the short-term clinical outcomes after laparoscopic revisional antireflux surgery (LRAS) in a high volume, tertiary referral centre that performed 600 primary antireflux surgeries over five years.

Methods: The study was a retrospective review of all LRAS performed between January 2007 and February 2012. Health-related quality of life (HRQL) was assessed at a median of 6 months post surgery using the gastrointestinal symptom rating scale (GSRS).

Results: The unit performed 30 LRAS (median age 58 years). Recurrent reflux was the most common presenting symptom, wrap migration and extensive adhesions were the most common operative finding. There were no conversions, median operative time 135 mins. and median stay was one day. Only one patient required further redo surgery. Patients also reported good HRQL after surgery.

Conclusions: Laparoscopic revisional antireflux surgery appears to be safe and feasible with favourable HRQL in a high-volume unit with extensive experience in performing complex oesophago-gastric surgery.

P412 - Oesophageal and Oesophagogastric Junction Disorder

Laparoscopic Heller Myotomy and Dor Fundoplication for Esophageal Achalasia

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Introduction: Laparoscopic Heller myotomy with anterior fundoplication is currently the preferred treatment for esophageal achalasia. In this retrospective study, we outline our experience with laparoscopic Heller myotomy and Dor fundoplication.

Patients and Methods: Between 2000 and 2012, 21 patients with the diagnosis of achalasia were treated with laparoscopic Heller myotomy and partial Dor antireflux procedure. The myotomy was performed using the Ligasure Atlas 5 mm or Harmonic scalpel instrument and an anterior partial fundoplication was added. Esophageal cineradiography, manometry and 24 h pH monitoring were repeated postoperatively.

Results: Operative time ranged from 2 h 30' to 3 h 20' with a mean of 2 h and 40'. There was not any perioperative complication and no procedure was converted to open operation. Manometry showed a significant reduction of the resting tone (46–35 to 17–4 mmHg), and patients were free of symptoms at the follow up period, ranging between 6 months and 2 years.

Conclusions: Laparoscopic Heller-Dor operation for achalasia is a safe procedure with good functional outcome.

P413 - Oesophageal and Oesophagogastric Junction Disorder

Warranted Use of Explants for Laparoscopic Correction of Hiatal Hernias

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During the period from 1994 to 2012 the Clinic has accumulated significant experience of laparoscopic intervention for various forms of hiatal hernias in 348 patients (196 females, 152 males) aged from 26 to 79.

Esophageal axial hernias were found in 42 (10 %), cardial hernias in 220 (66 %), and cardiofundal hernias in 86 (24 %) of the patients.

Distant results were obtained for 107 patients (68 females, 29 males) aged from 28 to 74, at 6 months to 12 years after laparoscopic intervention for various hiatal hernias: 30 (28 %) with esophageal axial hernias, 57(53.2 %) with cardial hernias, and 22(20.6 %) with cardiofundal hernias. In 39 % of these cases we performed laparoscopic fundoplication by the Nissen-Rosetti technique, supplemented by Prolene mesh plasty whenever the hernial orifice size was 4.5 cm or more (12 % of cases). For explants we used round-shaped Prolene meshes with an area of 66 to 96 cm² individually carved depending on the hernial orifice area to form a 'window' for the esophagus. The explant was introduced, through a 14 mm trocar, into the abdomen and fixed, by means of a reusable endostapler, with 2–3 staples at each side, to the diaphragm crura and to one another, to form the corresponding esophageal opening.

The distant results of treatment were deemed good in 76.6 %, satisfactory in 16.5 %, and unsatisfactory in 6.9 % of patients. Recurrent HH were found in 6 patients operated on, including 4 for cardiofundal HH (1 Doru, 2 Toupet, 1 Nissen-Rosetti), and 2 for cardial HH (1 Nissen-Rosetti, 1 Toupet). It is noteworthy that there were no recurrences in the group of patients with Prolene mesh diaphragmoplasty.

The performed examination showed that surgical treatment of HH using laparoscopic techniques yields good distant results in 76.6 %, and satisfactory results in 16.5 % of cases.

In our opinion, in cases of cardiofundal and cardial HH complicated by recurrence risk factors, and in cases of recurrent HH, it is expedient to perform laparoscopic fundoplication with diaphragmoplasty, using explants to prevent possible recurrences (unsatisfactory distant results in 6.9 % of cases).

P414 - Oesophageal and Oesophagogastric Junction Disorder

Laparoscopic Nissen-Rossetti Fundoplication in Gastro-Oesophageal Reflux Disease; Experience in 205 Consecutive Patients

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Aim: There are too many studies mentioned that the laparoscopic procedures are as safe as effective as its open counterpart in GERD. This study aimed to evaluate the outcomes of 205 consecutive patients which underwent total fundoplication without division of the short gastric vessels.

Materials and Methods: 205 consecutive patients underwent laparoscopic Nissen-Rossetti fundoplication for GERD between 2005 to 2012. All patients evaluated with esophagogastroscopy and 24 h pH studies preoperatively. Esophageal manometry was used selectively preceding studies were equivocal. The demographic characteristics, symptoms, endoscopy findings, De Meester scores, operative time, hospital stay, complications and outcomes of these patients were evaluated retrospectively. All patients were evaluated with symptom questionnaire, and satisfaction (Visick 1-5) scale postoperatively.

Results: The study population included 108(51.9 %) female and 97(47.3 %) male patients. The mean age was 42 ± 13 years. 205(100 %) patients presented with regurgitation, 124(60.4 %) with heartburn and 41(20 %) presented with respiratory symptoms. Average duration of complaints was 37.3 ± 26.4 months. Endoscopic examination revealed eosophagitis in 122(59.5 %), esophagitis and hiatal hernia in 65(31.7 %) and Barrett's metaplasia in 11(5.3 %) patients. The average Demeester score was 28.7 ± 15.2. The mean duration of surgery was 44.95 ± 17.75 min. Post-operative dysphagia was developed in 17(8.3 %) patients and only 1 patient required secondary intervention. The mean length of hospital was 2.4 ± 1.1 days. The mean follow-up was 45 ± 13.4 months. At a mean follow-up, 68(33.1 %) patients were completely asymptomatic (Visick score 5), 131 patients (64 %) described symptom improvement and were satisfied with their surgeries (Visick score 4), and 6 patients (3 %) failed to describe any change in clinical symptoms (Visick score 3).

Conclusions: Total fundoplication is the most effective barrier and Nissen-Rossetti achieves this goal without dissecting short gastric vessels. Avoiding this manoeuvre results in a significant decrease in bleeding and spleen injury complications. In patients who underwent surgery with diagnosis of GERD routine separation of the short gastric vessels is extending the duration of surgery and increases the risk of bleeding complications and gastric paresis. The study demonstrates that Laparoscopic Nissen-Rossetti fundoplication is easy to apply, has a shorter operation time and better functional results regarding to gas bloating.

P415 - Oesophageal and Oesophagogastric Junction Disorder

Laparoscopic Surgery for the Treatment of Esophageal Achalasia: Ten Years Experience

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Aim: To report the experience of a single center with laparoscopic Heller myotomy with Dor fundoplication (LHM + DF) as a first line surgical treatment for esophageal achalasia.
Methods: Between January 2003 and January 2013 eighty five patients were admitted to our department with the diagnosis of esophageal achalasia.

Results: Of these 85 patients, 78 underwent elective LHM + DF. The remaining 7 patients underwent urgent operation for iatrogenic perforation subsequent to pneumatic dilatation. Heller myotomy with fundal patch was the procedure of choice for these patients and 4 of them were operated with the laparoscopic technique. There were no minor or major complications in patients which LHM + DF was carried out in elective settings. One patient died after laparoscopic repair of perforation after pneumatic dilatation due to leakage and sepsis and one patient died following esophagectomy for end stage disease following 5 years after LHM + DF.

Conclusions: Laparoscopic Heller myotomy with Dor fundoplication for the treatment of achalasia is an effective procedure and may safely be performed in elective settings. Urgent operations for complicated disease or major procedures for recurrent or advanced stage diseases may be associated with higher morbidity and mortality.

P416 - Oesophageal Malignancies

Evaluation of Immediate Inflammatory Response and of the Performance Status After Hybrid Minimally Invasive Esophagectomy - A Case Control Study

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Aims: Minimally invasive esophagectomy represents an alternative to open techniques in order to minimize the surgical trauma with the same oncological outcome. Aim of this study was to explore the effect of hybrid minimally invasive esophagectomy (HMIE) on acute inflammatory response and on the performance status in patients with esophageal cancer.

Methods: A pair-matched case-control study was performed to compare 44 patients who underwent either HMIE or open esophagectomy from 2008 to 2012 in a single institution. Patients were matched by age, sex, tumor stage and localisation and the neoadjuvant treatment. The immediate dynamic of CRP and the performance status, assessed with the Barthel's index, were analysed. Non parametric statistics was performed.

Results: Mean age of the patients was 61 years (range 44–80), male to female ratio was 2.5/1. Of all patients 29.6 % were stage I, 43.2 % stage II and 27.2 % stage III. Localisation of the tumour was in the lower third in 40 cases and in upper third in 4 cases, 75 % of patients had previous chemo-radiotherapy. Statistically significant differences between the HMIE and open groups were: median values of CRP in postoperative day one and three were 66 mg/l (IQR 51.2–83.25) vs. 81.7 mg/l (IQR 72.75–91.17) ($p = 0.001$), respectively 100 mg/l (IQR 69.35–124) vs. 147 mg/l (IQR 111.75–157.75) ($p = 0.005$). Barthel's index in the postoperative day 7, showed an improvement of performance status of the patients after HMIE ($p = 0.043$). There was no difference in duration of intervention 420 (IQR 355–480) vs. 370 (IQR 300–420) min. ($p = 0.07$), blood loss 150 (IQR 100–200) vs. 200 (IQR 150–200) ml. ($p = 0.12$), mean number of abdominal lymph nodes removed 11 vs. 10 ($p = 0.67$) and the complication rate 36.3 % vs. 40.9 %.

Conclusion: HMIE represents an adequate alternative to open techniques and it provides the patient a lower inflammatory response to surgical trauma that directly reflects on an improved performance status of patients.

P417 - Oesophageal Malignancies

Minimally-Invasive Management of Post-Operative Esophago-Jejunal Anastomotic Leak

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Aims: Post-operative esophago-jejunal fistula induces morbidity and mortality after total gastrectomy, and affects the long-term survival rate. Its management is not perfectly established. The aim is to describe the effective use of minimally-invasive procedures in this setting.

Methods: Between 2003 and 2011, 38 patients underwent laparoscopic total gastrectomy and two developed an esophago-jejunal fistula.

Results: The diagnosis was established by a computed tomography scan with contrast ingestion. The absence of complete dehiscence and the vitality of the alimentary loop were checked during laparoscopic exploration, associated with effective drainage. During the endoscopy, dehiscence was assessed and a covered stent and naso-jejunal tube were inserted for enteral feeding. The leaks healed progressively, oral feeding was resumed and the drains removed within 3 weeks. The stent was removed 6 weeks. Three months later, the patients were able to eat without dysphagia.

Conclusions: Early diagnosis allows successful conservative management. The objectives are effective drainage, covering by an endoscopic stent and renutrition. Management by a multidisciplinary team is essential.

P418 - Oesophageal Malignancies

Experience of 32 Cases of Thoracoscopic Esophagectomy for Esophageal Cancer in Prone Position

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Introduction: Thoracoscopic esophagectomy for esophageal cancer in the prone position is an attractive option because it offers superior and broader operational field vision than conventional procedures. Our hospital, which handles around 10 cases annually, began using thoracoscopic esophagectomy for esophageal cancer in 2009. We have used the prone-position technique from the outset and have handled 32 cases thus far. A number of minor improvements have gradually been introduced to the procedure, and we introduced 3D-imaging in August 2011.

Operating Method: The thoracic procedure begins with the patient in a prone position. We insert 4 ports at the 3, 5, 7, 9 intercostal spaces and perform complete thoracoscopic surgery with pneumothorax treatment of 6 mmHg. Upon completion of the thoracic esophagectomy and lymph-node dissection, the patient is placed in the broad-based position. We then dissect the abdominal lymph node and create a "stomach roll", through laparoscopic surgery, using 5 ports inserted into the abdominal wall. We then dissect the cervical lymph node, using a cervical arc incision, and take up the stomach roll through the posterior mediastinum. Lastly, we perform anastomosis between the stomach roll and the cervical esophagus, using hand-sewn end-to-end anastomosis in the neck.

Results: Of the 32 cases handled, 2 were unresectable; the other 30 resectable. The average operation time was 8:43 h. The average volume of operational bleeding was 102 ml and the average number of lymph nodes removed was 43. All patients were able to walk 1 day after the operation; oral intake was possible after three days on average was, and the average hospital stay was 12 days. Although we observed 3 minor anastomotic leakages, 6 cases of recurrent partial nerve paralysis, and 1 aspiration pneumonitis, these symptoms were treated conservatively and successfully, and all patients were transferred to outpatient care, without complications.

Conclusions: Our hospital does not conduct a large number of esophagectomies, but has thus far performed the procedure without incident. We have gained an extremely favourable impression of this procedure. We have the pleasure to submit herewith our report on this procedure, which provides an overview of our experience in 32 cases.

P419 - Oesophageal Malignancies

The Usefulness of the Left Lateral Decubitus Position in the Thoracoscopic Esophagectomy

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In recent years, with the spread of thoracoscopic esophagectomy has also diversified its procedures. There is a prone position and the left lateral decubitus position as a representative, with the presence or absence of pneumothorax. Advantages of the prone position are that it does not require a mastery of the assistant, and a good viewing in dissection of the middle and lower mediastinal lymph nodes. The advantages of the left lateral decubitus position are that the good viewing in dissection of the upper mediastinal lymph nodes as well as open-thoracic surgery is obtained and that it is easy to support unexpected conditions, such as bleeding, and the like. At our institution, in introducing thoracoscopic esophagectomy in May 2012, the first to ensure the safety, we adopt the left lateral decubitus position with pneumothorax which does not require a mastery of assistant. Using 2 monitors reversing, both surgeon and assistant can obtain the eye-hand coordination simultaneously. As carbon dioxide is introduced into the intrathoracic space, we can obtain good surgical view. We show the point of the procedure of thoracoscopic esophagectomy with lymphadenectomy, such as dissection of recurrent nerve lymph nodes, in the left lateral decubitus position with pneumothorax. We performed thoracoscopic esophagectomy for 7 patients with esophageal cancer from May 2012 to January 2013 with no major postoperative or intraoperative complications. Postoperative hospital stay was shorter in the patients treated with thoracoscopic esophagectomy in comparison with those treated with open esophagectomy.

P420 - Oesophageal Malignancies

Oncological Outcomes of Minimally Invasive Esophagectomy

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Aims: Several studies have demonstrated the safety and feasibility of minimally invasive esophagectomy (MIO) in the treatment of patients with resectable esophageal cancer. However, for this technique to gain wide acceptance it has to be demonstrated that it can achieve at least equivalent results in terms of oncological clearance and survival. The current study investigates a cohort of patients who were treated with MIO with special emphasis on oncological outcomes.

Methods: Data was prospectively collected for patients undergoing laparoscopic assisted esophagectomy (LAO). Demographics, postoperative complications, number of harvested lymph nodes, margins of clearance as well as survival and disease recurrence were recorded.

Results: A total of 50 patients were treated with LAO between 2003 and 2012. The median age was 64 and the male to female ratio was 3:1. 47 patients had adenocarcinoma and 3 patients had squamous cell carcinoma. Thirty one patients (62 %) received neoadjuvant chemotherapy. Surgery was performed by two surgeons using a standardised 2-stage technique: laparoscopic mobilisation of the stomach followed by thoracotomy and 2-field lymphadenectomy. 12 patients (24 %) had cardiorespiratory complications and there were no anastomotic leaks. The median lymph node yield was 17 (4–42). Forty one patients (82 %) achieved more than 15 lymph nodes. Three patients (6 %) had positive circumferential margin and 1 patient (2 %) had positive proximal margin. During the follow up period, 8 patients (16 %) had recurrent disease. Overall survival at 1, 2 and 5 years was 88.5, 74 and 54 % respectively (Kaplan-Meier estimate).

Conclusion: This study demonstrates that for the majority of the patients LAO yields adequate number of lymph nodes for histological staging and low rate of positive margins. Overall 1,2 and 5-year survival was favorable compared to published reports. A randomized trial that specifically looks at oncological outcomes are needed to further clarify the role MIO in the treatment of esophageal cancer.

P421 - Oesophageal Malignancies

Laparoscopic Repair of Hiatal Hernias After Esophagectomy

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Background: Patients who underwent minimally invasive (MIE) or open esophagectomy (OE) are at risk to develop postoperative diaphragmatic herniation (PDH). This is a major complication and may appear early or late after esophagectomy with the need for emergency surgery or elective repair. Aim of the study is to report about the technique and outcome of surgical repair of PDH.

Methods: We retrospectively evaluated 154 patients who underwent MIE (n = 74) or open esophagectomy (OE, n = 80) and identified nine patients with PDH and evaluated the technique and outcome of surgical repair. The median time of follow up was 15.9 months (range, 1.34–96.8).

Results: Nine patients (5.8 %) were identified with a PDH, interval until diagnosis was 7.1 months (range, 2 days-93.8) after esophagectomy.

In five patients an elective laparoscopic repair with repositioning of herniated bowel, modified hiatoplasty and colopexy to the ventral abdominal wall were performed without complications. Three patients were referred to an emergency operation. Of these one could be managed with laparoscopic access. In one patient the operation was finished as laparoscopic exploration due to metastatic disease (carcinosis peritonei) involving the hiatus, the abdominal part of the stomach and the herniated colon. Peritoneal recurrence was missed by preoperative imaging.

Median follow up time after herniotomy was 7 months (range 1–37 months). Two patients died 1 and 16 months (progressive cancer disease, pneumonia) after hernia repair. One patient developed a recurrent PDH 8 months after laparoscopic restoration. After hernia repair including anterior colopexy no recurrence has been observed. Overall, 3 patients with PDH suffered cancer recurrence in the meanwhile and received palliative chemotherapy.

Discussion: Laparoscopic repair of PDH usually is safely feasible and is followed by a satisfactory outcome. Due to one case of PDH recurrence, colopexy has been introduced at our institution.

P422 - Paediatric Surgery

Laparoscopic Repair in Children with Inguinal Hernia - Unexpected Findings

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Purpose: Since 1997, 825 children with groin hernia have undergone laparoscopic technique. The medical records were retrospectively evaluated for extract unexpected outcome cases from preoperative diagnosis (i.e. groin hernia).

Materials: The subjects were 825 pediatric patients with inguinal hernias diagnosed preoperatively who underwent laparoscopic surgery during the period from 1997 to date. The ages ranged from 27 days after birth to 14 years old (mean: 3.17). There were 429 males and 396 females. From these laparoscopic findings, cases with unexpected outcomes diagnosed before surgery were investigated.

Results: Internal inguinal hernias were found in five cases (0.6 %). There were six cases (0.7 %) in which the mothers misunderstood the left and right, and two cases (0.4 %) that cured spontaneously. There were seven cases without a hernia sac (0.8 %). One of the seven cases was considered to be a colic appendicitis because of an adhesion between the colic appendix and abdominal wall. Two cases, in which a recurrence had been diagnosed preoperatively, were residual stitch abscess. One case, which had been referred as an incarcerated inguinal hernia and being impossible for any redressement, was abdominal phlegmon. One case, which had been diagnosed as a labial hernia preoperatively because of the presence of a swollen right labium majus, was considered to have the right and left difference within the normal range. And the remaining cases were that the mother had misunderstood the inguinal swelling itself.

Conclusion: There were 20 cases with unexpected outcomes (2.4 %), and laparoscopy was considered very useful for these cases.

P423 - Paediatric Surgery

Laparoscopic Assisted Pull-Through Technique in Hirschsprung Disease

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Introduction: Hirschsprung disease (HD) still remains a serious problem in many pediatric surgery services in Eastern European countries, considering technical problems related to diagnosis and therapy. The incidence of HD is approximately 1/5000 live births. The male-to-female ratio of HD is approximately 4:1, it is 2:1 in longer-segment disease.

Material and Methods: The authors are presenting the case of a 3 years old boy with HD, with history of severe chronic constipation and multiple hospital presentations. The diagnosis was made by barium enema and histopathology of seriated endorectal biopsy samples. Rectum and the distal sigmoid were affected. A laparoscopic assisted pull-through (LATEP) was performed, using a 10 mm optical port in the right upper abdomen, 3 mm port in the left upper abdomen and umbilicus and 5 mm port in the lower left abdomen. After transanal dissection of the rectum the superior rectal vessels were ligated and resected using hem-o-lock clips obtaining enough length of the colon loop for a tension-free coloanal anastomosis.

Results: Postoperative evolution was simple, oral feeding was started the second day after surgery. Three months follow-up with normal daily stooling.

Conclusions: LATEP is the best choice for surgical treatment of HD, even in older child, as a minimally invasive approach, nearly bloodless and infection free. It is effective and low cost due to its short hospital stay.

P424 - Pancreas

Transanal Endoscopic Drainage of Postnecrotic Cyst of the Pancreas

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Aim: The aim of the report was the improvement of methods of drainage of cysts of the pancreas.

Methods: Patient 56 years old, was admitted to the hospital with complaints of pain in the epigastrium, weakness, chills, with heavy sweats. Rounded formation 10 × 8 × 7 cm was palpated in the left upper quadrant of abdomen. We have identified at colonoscopy in descending part of the colon at a distance of 40 cm from the anus a hole in internal fistula as a hearth 1 cm infiltrated mucosa with congested eroded rim and purulent discharge from it, amplifying while palpating the formation. We can nulated fistula by catheter for X-ray contrast studies and entered the contrast agent. After that, we performed a CT scan in which pancreatic cyst with formed 6–5–4 cm thick walls and contrast agent in its cavity was found in the tail of the pancreas. Dabl-pig-tail stent 7fr., was set in the cyst through the fistulous course a nd then from fistulous on stents and besides it there was an active flow of pus in the lumen of the descending part of the colon.

Results: In the postoperative period pain disappeared, overall condition of the patient improved, there was regression of the size of cysts of the pancreas. After 2 weeks CT scan of previously detectable cyst in the pancreas was not defined. After 3 months the stent was removed.

Conclusions: Transanalendoscopicinternal drainagepostnecroticfesteringcystof the tailof the pancreasinto the lumen ofthe descending colonallowed to achievethe elimination ofthe cyst.

P425 - Pancreas

Laparoscopic Excision of a Large Hydatid Cyst of Head of Pancreas

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Aims: the hydatid disease usually affects liver and lung but no body part is immune. The Pancreas is a rare site for hydatid disease and the presentation varies according to location in pancreas. The preoperative diagnosis is difficult and quite often made during surgery. Herein we present a case of large hydatid cyst of pancreas excised laparoscopically.

Methods: A 31 year old Bedouin lady was admitted with history of vague pain and discomfort in right upper abdomen and fullness for last few months after her recent delivery. There was no other significant past medical history. Her general examination was unremarkable. On abdominal examination a vague mass was palpable in right upper quadrant extending to right lumber region. Her liver and kidney function and CBC were normal. The ultrasound and CT scan reported a large cystic swelling arising from the upper pole of right kidney. The cyst was aspirated and 250 ml of clear colorless fluid was drained. She was discharged home but was readmitted after 6 months with similar complains and clinical findings. A MRI scan was done which revealed gall stones, a well-defined unilocular cystic mass of 15 × 10 cm in size in relation to head of pancreas. On Laparoscopy a large cystic mass was seen arising from the head of pancreas. The cyst was aspirated and keeping the possibility of hydatid cyst in mind the cyst cavity was filled with hypertonic saline and left for 20 min and re-aspirated. A cystogram was done which showed no communication with biliary or pancreatic duct. The cyst was incised and endocyst was carefully removed intact in one piece from head of pancreas. Histopathological examination confirmed the Hydatid cyst.

Result: Her post-operative recovery was uneventful and she has been asymptomatic for last 2 years of follow up.

Conclusion: Imaging studies of pancreas can facilitate in the differential diagnosis of hydatid cyst from pseudocyst, cystadenoma and neoplasm of pancreas. Surgery is mainstay of treatment depending on the location. Many surgical procedures are practiced including distal pancreatectomy for cyst in tail of pancreas, excision, pericystectomy, cystogastrostomy, partial pericystectomy, and aspiration in high risk patients with chemoprophylaxis.

P426 - Pancreas

Laparoscopic Gastrojejunostomy for Palliation in Patients with Gastrointestinal Obstruction Secondary to Pancreatic Head Cancer

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Aims: Malignant gastrointestinal obstruction is commonly seen in patients with pancreatic cancer. The conventional approach to the palliation of malignant obstruction has been an open gastrojejunostomy. More recently, laparoscopic gastrojejunostomy has been introduced. There have been no thorough comparisons of laparoscopic gastrojejunostomy with open gastrojejunostomy. The aim of this study was to evaluate the benefit of laparoscopic approach.

Methods: We reviewed the medical records of patients with gastrointestinal obstruction secondary to pancreatic cancer who underwent surgery (open and laparoscopic) from January, 2010 to December, 2012 in our hospital. Patients who underwent prophylactic gastrojejunostomy were excluded from the study. In the laparoscopic gastrojejunostomy, a trocar for scope was inserted just above the umbilicus, and two trocars for surgeon and a trocar for assistant were placed at the right hypochondrium and the left side of abdomen, respectively. The jejunum was routed via an antecolic path. A linear cutter stapler was used to approximate the stomach and the jejunum, then a hole remnant was closed by continuous single layer suture.

Results: Nine patients (5 men and 4 women; the mean age 77 y.o.) underwent open gastrojejunostomy, and 8 patients (8 men; the mean age 66.5 y.o.) underwent laparoscopic gastrojejunostomy. There were no significant differences between the two groups with regard to clinical background. Both procedures were performed successfully in all patients. There were no significant differences in time to starting free oral fluids. The mean length of stay after the procedure was 16 days in the open group, and 10 days in the laparoscopic group. Number of people who received chemotherapy after the surgery was 4 (44.4 %) in the open group, and 6 (75.0 %) in the laparoscopic group. 90-days survival rate was 55.6 % in the open group, and 87.5 % in the laparoscopic group.

Conclusions: Although we could not find significant benefit because of the small study population, we were impressed that patients got better QOL by laparoscopic approach.

P427 - Pancreas

Laparoscopic Distal Pancreatectomy: A Single Center Experience for Standardized Procedure

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Background: Increasing numbers of Laparoscopic pancreatic surgeries (LPS) are being reported. With the approval of the ethical committee of our hospital, we introduced LPS in March 2007. LPS was accepted by the Japanese national insurance in April 2012. Further increase in cases of the LPS is expected from now on.

Object: To report our experience with LPS to introduce a safe procedure and to draw a right conclusion to withdraw in difficult cases.

Results: Indications of LPS in our center are benign, borderline and low-grade malignant tumors. The number of subjects with IPMN, MCN, SCN, LEC and NET were 13, 4, 3, 1 and 3, respectively. We performed 1 laparoscopic-assisted distal pancreatectomy (extra-peritoneal resection), 8 HALS-DP, 1 HALS-SPDP, 12 LAP-DP, and 2 LAP-SPDP. The mean operative time was 342 min, and hemorrhagic volume was 295 ml. No case required transfusion and no case required conversion to open surgery. Notably, 4 cases, those were attempted with LAP-SPDP, were converted to HALS-DP in 3 and LAP-DP in 1 because of severe adhesion between tumor and vessels while maintaining less invasiveness and safety. Postoperative pancreatic fistula (grade B of the ISGPF classification) occurred in 6 (25 %) patients. The mean postoperative number of days taken to initiate oral food intake was 2, and the mean length of the hospital stay was 11 days. No recurrent tumor was observed.

Conclusion: A hand-assisted procedure is safe and efficient especially for initial induction and experience of LPSs. In planning operation, thorough consideration of the technical and anatomical difficulties as well as precise preoperative diagnosis of the tumor will be highly important.

P428 - Pancreas

Laparoscopy Assisted Pancreatic Resection for a Giant Solid Pseudopapillary Tumor: Report of a Case

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Introduction: Solid pseudopapillary tumors (SPTs) of the pancreas are rare neoplasms and predominantly observed in young women. The tumor has a low grade of malignancy and clinically good behavior, although large at the time of diagnosis. Considering these characters, the laparoscopic resection might be an ideal surgical option. We report a giant SPT originating from the pancreatic tail in a young woman, which was successfully resected with laparoscopy assisted pancreatic resection.

Case Presentation: A 17-year-old woman with no symptoms was detected to have a 100 mm multi-cystic tumor in the pancreatic tail by abdominal ultrasonography. Blood investigation and tumor markers (CEA, CA 15-3, CA 19-9, and CA 125) were within normal limits. Abdominal CT showed a large, heterogeneous, well-margined mass in the pancreatic tail, which contained multiple cysts within solid part. On MRI, the cyst showed low in T1WI and high signal intensities on T2WI. On MRCP, it didn't connect with the main pancreatic duct. The possibility of SPT was considered, and a laparoscopic surgery was chosen. We performed a laparoscopy-assisted pancreatic resection. First, laparoscopic procedure was performed to mobilize the spleen, pancreatic tail and body from the retro-peritoneum, using 4-ports technique. After the laparoscopic mobilization, a left subcostal small incision of 7 cm between 2-ports was done. Through the small incision, the splenic vessels were ligated and cut, and the pancreatic body and tail including the tumor was resected with splenectomy. The pancreatic stump was closed by hand sewn technique. The operative time was 360 min and the blood loss was 300 ml. She was discharged on the 15 postoperative day. The pathology report revealed a pancreatic tumor 10 cm in diameter. The tumor contained a yellowish fluid and a thick, stiffened wall, consisting of dense fibrotic tissue with hyaline degeneration, calcifications, regions of ossific metaplasia, and microscopic foci of neoplastic tissue. Then, it was diagnosed the SPT originating from the pancreatic tail.

Conclusions: Laparoscopy-assisted pancreatic resection is a safe and feasible procedure that could become the treatment of choice for patients affected by large SPTs.

P429 - Pancreas

Improvement of the Acute Pancreatitis Nonspecific Diagnosis

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Aims: To evaluate the efficacy of the acute pancreatitis (AP) earlier diagnostic procedures through the blood plasma and pancreatic fluid cytokines content determination.

Methods: Clinical observations were performed on 29 patients with AP or those who were supposed to have AP. These patients were cured in surgical departments of Odessa Municipal Hospitals N9 and N10. tumor necrosis factor-alpha (TNF) and interleukin-1, interleukin-2 and interleukin-6 (IL-1, IL-2 and IL-6) levels were determined in patients' blood plasma and their pancreatic fluid obtained during the diagnostic and/or treating laparoscopic interventions using ELISA method.

Results: The majority of the patients with AP or those who showed the quickest and progressive AP development (25 out of 29, 86.2 %) demonstrated significant both TNF and IL-1 levels increase in blood plasma samples (in 19.5 times and 9 times, correspondently, vs the control data, $p < 0.001$ in both cases). It should be mentioned that 24 out of these 25 patients (96 %) demonstrated AP expressed clinical manifestation within the following 1-3 days.

17 out of 29 AP patients were cured using miniinvasive laparoscopic approach. Interleukin levels were investigated inside the samples of the pancreatic fluid. We found that IL-1, IL-2 and IL-6 pancreatic fluid levels of the well-treated patients with AP did not differ significantly. It should be mentioned the interesting fact of IL-1 and IL-6 level significant increase (in 4 and 18 times, correspondently, vs the control data, $p < 0.001$ in both cases) in pancreatic fluid of patients with AP who have complications. All these patients were treated using traditional surgical methods.

Conclusions: The data obtained showed the principal possibility for AP preclinical diagnosis through the blood plasma cytokines (namely, TNF and IL-1) level evaluation. We showed also that IL-6 level determination inside the pancreatic fluid might have the diagnostic importance (from the 7th day of the disease) from the point of view of possible complications of the disease formation. One can conclude about the principal possibility of nonspecific AP both earliest diagnosis and complications diagnosis that may allow starting the adequate treatment.

P430 - Pancreas

Totally Laparoscopic Pancreaticoduodenectomy: Is There a Learning Curve?

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Background: Laparoscopic pancreaticoduodenectomy (LPDE), being performing around the world, is considered as a technically feasible and safe procedure. Presently, LPDE is an alternative to traditional surgery for patients with tumor of the head of pancreas and periampullary area. At the same time according to the literature data a lot of surgeons stop performing totally laparoscopic pancreaticoduodenectomy (TLPDE) after 5–15 procedures because of the difficulties of learning curve.

Aim: To evaluate the learning curve of totally laparoscopic pancreaticoduodenectomy.

Methods: The data of 48 patients who were planned for LPDE from January 2007 to December 2012 were analyzed. The same surgical team performed all the procedures. 40 patients were underwent TLPDE. For 8 patients procedure was palliative or converted. Patients were divided in two groups. Group A and B (first 20 patients and the second 20 patients respectively). Operative time, intraoperative blood loss and the level of postoperative morbidity were examined.

Results: Among the 48 patients, 40 patients underwent TLPDE. The conversion rate was in the group A—20.8 % (n=5), group B—12.5 % (n=3). Mean operative time of TLPDE for the group A was 547 min and group B was 479 min (minimally—280 min). Mean blood loss was for group A—635 ml, group B—652 ml. Postoperative complication rate was in group A—65 %, group B—45 %. Total postoperative mortality was: group A—10 % (one of the patients died from insufficiency of the pancreatojejunostomy, another one—because of acute heart failure without any surgical complications); group B—0 %. The median operating time in early cases was longer than in the later cases and may represent the learning curve of TLPDE.

Conclusion: The results become significantly better after 20–25 procedures. The most difficult and potentially dangerous for intra and postoperative complications were: dissection along superior mesenteric and portal vein and performing of pancreatojejunal anastomosis. Performing TLPDE by the same team, including nurses, is the very important factor quick learning curve and safety.

P431 - Pancreas

Role for Laparoscopic Surgery in Treatment of Acute Pancreatitis

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Aim: Acute pancreatitis (AP) remains the one of most serious and actual problem of the modern surgery. Laparoscopic surgery is a new and promising treatment modality in the management of patients with acute pancreatitis (AP). Aim of study was the evaluation of our experience with laparoscopic surgery in the management of patients with AP.

Methods: 213 patients with AP were observed, modern diagnostic and treatment technologies were realized (ultrasound-guided fine-needle aspiration, endoscopic retrograde cholangiopancreatography, laparoscopy and traditional operative techniques). Indications for laparoscopy surgical treatment were AP presented with intraabdominal or retroperitoneal exudates and necrosis, detected by ultrasound and/or computer tomography scan, and the presence of acute calculous cholecystitis when 3 to 5 days of conservative treatment did not show clinical improvement.

Results: Conservative therapy and ultrasound-guided fine-needle aspiration and drainage were used in 152(71.3 %) patients with AP. Laparoscopic surgery was started in 101(47.4 %) patients and including: laparoscopic drainage of the intraabdominal exudate and exudate of the lesser sac, cholecystectomy was done in 56 (55.3 %) patients and necrosectomy—in 27 (26.7 %) cases. Laparotomy was necessary in 14 (13.9 %) patients.

Conclusion: Laparoscopic drainage of the abdominal cavity, drainage of the lesser sac, revision of the retroperitoneal compartment and necrosectomy can be safely carried out as an alternative to the conventional surgical approach. Laparoscopy can be initial and sometimes final approach in surgical treatment of AP.

P432 - Pancreas

Laparoscopic Middle Pancreatectomy: Three Cases in Our Hospital

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Introduction: Laparoscopic middle pancreatectomy (MP), which is performed for benign or low malignant potential tumor in pancreatic body, is a complex surgery. We report our procedures and results of three patients who underwent MP for a serous cyst adenoma, a solid-pseudopapillary neoplasm and a pancreatic neuroendocrine tumor.

Technique: Five ports were placed in a semilunar row around the epigastric region. After division of the pancreatic neck, the stump of which was closed using a stapler, the left side, the stump of which requires anastomosis, was divided by HARMONIC. The midline just above the pancreas was opened to 4 cm and the specimen was removed within the plastic bag through this incision. A wound retractor was then loaded with a 5-mm trocar connected through a latex glove at this incision. The jejunal limb was brought in a retrocolic fashion to the left of the middle colic vessels and the blind end was placed near the pancreas remnant. For pancreaticojejunostomy, a modified Kakita method was employed, which is an end-to-side technique with approximation of seromuscular layer of the jejunum and full-thickness pancreas by several interrupted sutures. And a short stent tube was placed and fixed at the stump of the main pancreatic duct with a purse-string suture of the pancreatic parenchyma, and then was inserted into the jejunum through a small orifice without duct-to-mucosal anastomosis.

Results: The mean operative time was 388 min, with mean blood loss of 13 g. Postoperatively, although a pancreatic fistula (Grade B) occurred in one, the patient recovered conservatively. The rest of them had good courses.

Conclusion: MP has higher risk of pancreatic fistula than other types of resection, because two cut ends are created. However, recently, we have obtained comparable results of laparoscopic pancreaticoduodenectomy and distal pancreatectomy using a similar manner. Therefore, we believe that laparoscopic MP is feasible.

P433 - Pancreas

Place of Laparoscopic Treatment of Pancreatic Pseudocyst

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A pancreatic pseudocyst is a collection of fluid around the pancreas which arise as a complication of acute or chronic pancreatitis. It may develop soon after an attack of acute pancreatitis, or present many weeks after recovery from of an attack of acute or chronic pancreatitis.

In most cases, the patient presents with upper abdominal pain, bloating or poor digestion of food. A deep ache with fever might indicate infection of the pseudocyst.

Diagnosis is usually accomplished by ultrasound and CT scanning. Sometimes, endoscopic retrograde cholangiopancreatography (ERCP) is required to evaluate the communication of cyst with the pancreatic duct.

Small asymptomatic cysts do not require treatment and resolve spontaneously. If a pseudocyst is persistent over several weeks with prominent symptoms, treatment of the cyst is required. Interventional therapeutic strategies are occasionally sufficient. These include: endoscopic transpapillary duct drainage, percutaneous catheter drainage, or endoscopic drainage.

The majority of patients are treated by surgery. In the surgical procedure, a connection is created between the pseudocyst and an adjacent intestinal organ to which the cyst is adherent. This connection allows the leaking pancreatic juice to be rerouted into the stomach or intestine through the connection. The type of surgical procedure depends on the location of the cyst. For cysts in the body and tail of the pancreas either a cystjejunostomy or cystgastrostomy is performed. For pseudocysts that occur in the head of the pancreas a cystduodenostomy is usually performed.

The laparoscopic procedure is the preferred surgical technique for treatment of pancreatic pseudocysts. Laparoscopic cystgastrostomy or cystjejunostomy is performed utilizing minimal access techniques, with rapid recovery and early ambulation and discharge from hospital. This review focus on the laparoscopic technique for treatment of pancreatic pseudocyst.

P434 - Pancreas

Laparoscopic Handsewn Cystogastrostomy for Giant Pancreatic Pseudocysts

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Aim: The purpose of this study is to describe method and advantages of laparoscopic hand sewn cystogastrostomy technique in the treatment of giant pancreatic pseudocysts. This technique is safe, effective and also cost effective and can be performed by all general surgeons who are expertise on intracorporeal suturing.

Methods: We performed laparoscopic hand sewn cystogastrostomy for giant pancreatic pseudocysts in five adult patients at Izmir Katip Celebi University, Atatürk Research & Training Hospital, Department of Surgery, between June 2008 and Jan 2013. In this technique we used two additional trocars and camera port to access to the cyst cavity and establish handsewn cystogastrostomy. Both anterior and posterior wall gastrotomies were performed to reach cyst cavity in all patients. 3- to 4-cm cystogastrostomy was performed with 2/0 and 3/0 suture materials following cyst debridement. Once the anastomosis was fashioned through the posterior gastric wall, the gastrotomy hole at the anterior gastric wall was also closed with 3/0 suture materials. No drains were placed.

Results: The laparoscopic hand sewn cystogastrostomy technique was successfully used in all five patients. Mean blood loss was 150 (range 120–200) ml. No patients required conversion to open surgery. Median operative time was 140 (range 110–185) min, and the average cyst diameter was 17 (range 14–25) cm, and the median postoperative hospital stay was 8 (range 5–14) days. One patient had upper GI bleeding, one patient had urinary tract infection and one had transient liver function tests elevation and all of these were managed conservatively during postoperative course.

Conclusion: Laparoscopic hand sewn cystogastrostomy technique is particularly suitable for the patient with debris within the giant pseudocyst. This technique is easy to perform, safe and provides excellent complete decompression of cyst cavity. It minimizes operative costs and success rate is satisfactory in the hands of experienced laparoscopic surgeons.

P435 - Pancreas

Laparoscopic Biopsy of Pancreatic Allograft: Single Center Experience

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Background: Graft biopsy is critical to detect rejection after pancreas transplantation. Percutaneous biopsy (whether computerized tomography scan or ultrasound guided) is unsuccessful 20 % of the time. This study evaluated the feasibility of a laparoscopic procedure in obtaining an adequate pancreatic sample.

Methods: From August 2010 to November 2011, 6 laparoscopic pancreatic allograft biopsies were performed when percutaneous biopsy was not possible.

Results: There were 6 laparoscopic pancreas biopsies performed in 5 patients between 7 w and 150 w (mean 59.8 w) after transplant. Indications for biopsy were hyperglycemia in 5 cases and hyperamylasemia in one case. Laparoscopic approach was performed through the use of 3 trocars. Mean operation time was 52.5 min (std 12.1), and average blood loss was 30.8 ml (std 10.6). We did not register any procedure-related complications during the observation period. Adequate tissue was obtained in 5 of 6 biopsies. In all cases diagnosis of acute or chronic allograft rejection was made.

Conclusions: Laparoscopic pancreatic biopsy is suggested when ultrasound guided biopsy is not possible. This technique is safe, allow visualization of the graft and retrieval of adequate specimen for diagnosis.

P436 - Pancreas

Introduction and Standardization of Laparoscopic Pancreaticoduodenectomy at Community Hospital

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Although laparoscopic pancreaticoduodenectomy (Lap-PD) has been reported as a useful minimally invasive surgery, it is performed only at a small numbers of major medical centers in the world due to its technical difficulty. We report here the introduction and standardization of Lap-PD at our community hospital. As a first step, the procedures around pancreas and reconstruction were performed via a relatively big incision approximately 15 cm. Most of the procedures were followed as open PD. As a next step, the reconstruction was performed via a middle size incision approximately 10 cm. A middle mesenteric approach was applied for the mobilization of duodenojejunal flexure. As a final step so far, only pancreaticojejunal and duodenojejunal anastomoses were performed through a small incision approximately 5 cm. The intracorporeal hepaticojejunal anastomosis was done in this step. We have experienced 11 cases of Lap-PD for last 4 years. We included ampullary tumors, duodenal tumors, distal common bile duct tumors, and pancreas head tumors. Patients with disseminated diseases and locally invasive tumors such as extensive lymphadenopathy and invasion of superior mesenteric vein were excluded. Conversion rate and mortality rate were 0 %. Mean blood loss of the last 6 cases (644 g) was less than that of the first 5 cases (1547 g). Mean operating time of the last 6 cases (507 min) was less than that of the first 5 cases (802 min). Complication rate including grade B pancreatic fistula of the last 6 case was 17 %, whereas that of the first 5 cases was 20 %. Mean hospital stay after surgery was similar between these 2 groups (first: 38 days, last: 40 days). Resected margins were negative in all of the cases. In conclusion, although Lap-PD is a technically challenging and time consuming procedure, it can be safely performed by the step-by-step introduction and standardization even at community hospital.

P437 - Pancreas

Single Port Corporocaudal Pancreatic Resection

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Objectives: Laparoscopic distal pancreatic resection with or without spleen preservation is feasible and safe as it has been demonstrated in different case reports and series. On the other hand, Single port laparoscopic surgery has recently emerged as a method to decrease surgical trauma of the abdominal wall. The objective of this video is to show the use of this new approach in advance laparoscopic surgery, such as distal pancreatectomy, with the same guarantees of conventional laparoscopy.

Materials and Methods: A 39 years old female with a 5 cm tumor of the body of the pancreas is successfully approach by single port. A transverse transumbilical incision is preformed, placing a SILS device. Once the body of the pancreas is exposed, a retropancreatic tunnel is created close to the head of the pancreas, at the level of the portal vein, being assisted by the goldfinger. All the vessels of the espleno-portal axis are exposed, together with the celiac trunk and the splenic artery. Smalls pancreatic veins coming from the espleno-portal axis are resected and the pancreas is dissected free using a purple cartridge reinforced by seamguard. Once the anatomy of the area is completely exposed, the area of resection of the artery and the vein are identified and resected using two white endostaples. The pancreatectomy is completed together with the splenectomy and the specimen is removed through the same transumbilical incision. Surgery last 140 min and the length of the final incision was 3,4 cm.

Results: Patient was discharge from the hospital 3 days after surgery and the histological study showed the presence of an endocrine tumor of the pancreas. The patient is asymptomatic 6 month after surgery.

Conclusions: Distal pancreatic resection using single port approach is feasible and safe when experienced surgeon trained in laparoscopic surgery and single port perform the surgery. This technique should follow the basic principles of laparoscopic corporocaudal resection of the pancreas, being necessary a perfect visualization of the spleno-portal axis and the anatomy of the area, in order to prevent from any potential injury of the vessels.

P438 - Pancreas

Total Laparoscopic Distal Pancreatectomy with En Bloc Celiac Trunk Resection for Treating the Patient with Cancer of the Pancreas Body

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Aim: To show the possibility of total laparoscopic distal pancreatectomy with en bloc celiac trunk resection in a visual way for treating the patient with cancer of the pancreas body with true invasion into the wall of the splenic vein and common hepatic artery.

Patient and Methods: A 66-year-old man with ductal carcinoma of the body of the pancreas with true invasion into the wall of the splenic vein and common hepatic artery near celiac trunk underwent a total laparoscopic distal resection of the pancreas with en bloc resection of the celiac trunk, splenectomy. Five trocars (4–10 mm and 1–12 mm) were used. The organocomplex was mobilized with electrocautery or harmonic scalpel. Liver and gastric blood flow was checked by using laparoscopic clips before the transsection of celiac axes, common hepatic artery and left gastric artery.

Results: The procedure lasted 358 min. Intraoperative blood loss was amounted to 150 ml. Histologists' conclusion- moderately differentiated ductal carcinoma, metastases in one of the four lymph nodes. The patient was discharged from the department of surgery 6 days after the procedure, postoperative period proceeded without complications.

Conclusion: Laparoscopic distal resection of the pancreas with the resection of the celiac trunk is feasible and safe for the patients with the invasion of the tumor in major vessels.

P439 - Physiology, Pathophysiology, Immunology

New Method of the Experimental Adhesions Complex Treatment

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Aims: To evaluate the experimental background for clinical use of the complex antiadhesive pathogenetic scheme of treatment using 'Deltaran' and 'Thioctacid'.

Methods: Experimental trials were performed using male Wistar rats weighting from 220 to 300 grams. Experimental adhesions (EA) were modeled after rats' peritoneum trauma. 'Deltaran' ('Komkon', St-Petersburg, Russia) and 'Thioctacid' (alpha-lipoic acid, 'Pliva', Croatia) were administered i.p. 30 min after EA induction. Rats were divided in the several groups according to the number of the peptides used. 'Deltaran' and 'Thioctacid' were administered separately (groups N1 and N2) and together (group N3). All experimental groups consisted out of 12 animals. 7 days after the EA induction rats were sacrificed and the abdominal cavity was intensively investigated for the adhesions expressions determination. Blood plasma proteolytic activity was measured as the indirect index of adhesions formation.

Results: The rats with EA without treatment showed intensive round-spreading rough adhesions inside all quadrants of the abdominal cavity with the average intensity of 4 points. Adhesions expression were significantly less (vs the rats without treatment, $P < 0.05$) in groups N1 and N2. Few experimental adhesions one could see in the 3rd group rats (vs the rats without treatment $P < 0.01$ and vs rats of groups N1 and N2, $P < 0.05$). 'Deltaran' and 'Thioctacid' administration in rats with EA revealed significant influence on proteolytic enzymes activity. The data of biochemical researches showed significant antiadhesive activity of ['Deltaran' and 'Thioctacid'] complex treatment which prevail over the same of these drugs separate administration ($P < 0.05$).

Conclusions: Hence, the data received are the experimental background for ['Deltaran' and 'Thioctacid'] pharmacological complex clinical antiadhesive effects testing.

P440 - Physiology, Pathophysiology, Immunology

Antiadhesive Effects of Experimental Adhesions Complex Treatment Using Pentoxifylline and Lipoic Acid

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Aims: To evaluate the antiadhesive efficacy of pentoxifylline and lipoic acid complex administration in experimental conditions.

Methods: Experimental trials were performed in chronic conditions on male Wistar rats using the adequate modeling of the adhesions. Experimental adhesions (EA) were modeled after rats' peritoneum trauma. Pentoxifylline (100 mg/kg) and lipoic acid (50 mg/kg) were administered i.p. 30 min after EA induction. 3 days after the EA induction rats were sacrificed and the abdominal cavity was intensively investigated for the adhesions expressions determination. Blood plasma proteolytic activity was measured as the indirect index of adhesions formation.

Results: EA manifestation characterized by functional activity of the proteolytic enzymes increase that followed by cathepsins D, L and B, trypsin, metal-proteinase and carboxypeptidase A and B activities intensification. Pentoxifylline and lipoic acid administration was sufficient for the proteolytic enzymes functional activity normalization. The positive effect was maximal in case of pentoxifylline and lipoic acid combined injections. It appeared 2 h after the EA modeling and lasted throughout 5 days. These data are principal taking into account that pentoxifylline blocks NO-synthase (the key enzyme of NO synthesis) activity which occurs to be most effective in case of combined administration with lipoic acid.

Conclusions: The data obtained show that NO synthesis block though pentoxifylline and lipoic acid combined administration suppresses proteolytic system excessive activity in conditions of EA. Hence, one could see both NO synthesis and the proteolytic system activation pathogenetic importance in conditions of EA. Our results are in favour of pharmacological compounds able to block the NO synthesis clinical testing in patients with excessive adhesions.

P441 - Physiology, Pathophysiology, Immunology

'Tivortin' Antioxidant Efficacy in Conditions of Experimental Hepatic Insufficiency

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Aims: To estimate the antioxidant efficacy of nitric oxide donator 'Tivortin' in experimental conditions of hepatic insufficiency.

Methods: Experimental trials were performed in chronic conditions on male Wistar rats using the adequate hepatic insufficiency model via general bile duct ligating. I.p. 'Tivortin' was used for the hepatic insufficiency experimental treatment. Rats were sacrificed (i.p. Nembutal, 100 mg/kg) 72 h after the experimental trials. Blood plasma and liver parenchyma samples were prepared for the forthcoming biochemical analysis. Malonic dialdehyde (MD), dienic conjugates (DC) levels [as the intermediate products of lipid peroxidation] and superoxide dismutase (SD), catalase, glutathione transferase (GTr) and glutathione peroxidase (GP) activities [as antioxidant enzymes] were evaluated in the prepared blood plasma and hepatic samples.

Results: Blood plasma levels of MD and DC in rats with experimental hepatic insufficiency 6 h after the trials start were significantly higher comparing the same initial data ($P < 0.05$). Indexes of SD, catalase, GTr and GP activity in this time of the experimental trials were lower compare the same initial data ($P < 0.05$). One could observe the same directions of liperoxidative processes intermediate products and antioxidant enzymes activity in rats' liver parenchyma ($P < 0.05$).

The analogous MD and DC levels increase and SD, catalase, GTr and GP activities decrease were observed during 3 days of trials both in blood plasma and liver tissues of rats with hepatic insufficiency. 'Tivortin' use in these conditions resulted in MD and DC blood plasma levels decrease 12 h after trials beginning ($P < 0.05$). 'Tivortin' increased blood SD and catalase activity 24 h, blood GTr and GP—48 h after the trials start ($P < 0.05$). The compound also resulted in both MD and DC levels decrease, and catalase activity increase inside the hepatic parenchyma 24 h after the trials start. It induced hepatic SD, GTr and GP activities increase 48 h after the trials start ($P < 0.05$).

Conclusions: The data received revealed 'Tivortin' antioxidant efficacy in rats' blood plasma and liver parenchyma in conditions of hepatic insufficiency that are in favour of this drug hepatoprotective activity which is worth to be checked in clinical conditions.

P442 - Physiology, Pathophysiology, Immunology

Correlation of Intraabdominal PH and Intensity of Pain After Laparoscopic Cholecystectomy

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Various procedures and interventions can prevent or reduce postoperative shoulder pain after laparoscopic cholecystectomy. The objectives of the study were: to determine the frequency and intensity of pain after laparoscopic cholecystectomy compared to the compared to the use of drainage and in relation to the value of LDH and and pH of the drain content. Prospective research study involved 80 patients randomly selected in whom laparoscopic cholecystectomy was performed. Patients were divided into subgroups, according the parameters which were determined. Patients operated using standard intra-abdominal pressure are divided into two subgroups: 20 patients who were not drained, and 60 patients with a drain placed. The intensity of postoperative pain was evaluated using the VAS scale (VAS-visual analogue scale). The pain level was assessed on the strip length 100 mm where the score ranges from 0 (no pain) to 10 (unbearable pain). In all patients was applied the standard anesthesiological protocol, as well as a standard operative techniques of laparoscopic cholecystectomy with three trocars. The study identified a significantly lower postoperative pain intensity in patients: whose abdomen was drained ($p < 0.05$) and in those who had higher pH of drain content ($p < 0.05$). There was a statistically significant difference between LDH values 12 h postoperatively. This study has shown that laparoscopic cholecystectomy performed with installation of drainage postoperatively, significantly affect the reduction of postoperative pain after laparoscopic cholecystectomy.

P443 - Radiology / Imaging

Endospine (Destandau Design) Guided Intrathecal Catheter Insertion with Programmable Morphine Pump for Intractable Back Pain

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Aim: Continuous intrathecal administration of morphine via an implantable programmable pump might provide an alternative therapy for these cases who failed to conventional oral or transdermal administration of opioids. However, it has some difficulties in performing intrathecal catheter insertion during the procedure, especially in these populations with severe osteoporosis, angulated kyphoscoliosis curve, vertebrae collapse, osteophyte over-growth, narrowing interspinous space and hypertrophic yellow ligament.

Methods: From April 2008 to August 2009, 5 female patients (Age: 75-90 yr, mean 81.8 yr) refractory to conventional opioids medications were used intrathecal analgesic therapy and we administered the visual analog scale for pain assessment. These cases were severe osteoporosis with multiple vertebral fractures. Three of five were received percutaneous vertebroplasty before. Under general anesthesia the part of intrathecal catheters were placed in prone position and subsequently, the reservoir pumps were implanted in the right lateral decubitus position in the same operation.

Results: ENDOSPINE (Destandau design) guided intrathecal catheter insertion with programmable morphine pump was performed uneventfully in all cases. The intrathecal morphine daily doses were 0.1–0.3 mg initially, and 0.26–1.8 mg in the latest OPD visits. Preoperative VAS was 8.2 (8–10) and the postoperative VAS was 1.4 (0–6). Long-term follow-up is mandatory. Two patients expired later. The first one cause of death is pneumonia and respiratory failure and the other is tuberculosis and respiratory failure. The mortality is not related to the operational procedures.

Conclusions: Our results show that intrathecal administration of morphine efficiently relieves the symptoms of pain and improves quality of life. ENDOSPINE (Destandau design) guided intrathecal catheter insertion is clinically feasible, less time-consuming and less radiation exposure to the surgeons.

P444 - Radiology / Imaging

Has the Laparoscopic Era Changed the Interpretation of Radiological Findings? Hour-Glass Stomach Following Two Different Laparoscopic Benign Surgeries

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Aim: Hourglass stomach is classically taught to surgical trainees to describe complicated chronic gastric ulcer with scarring at the mid stomach. Other causes are rare and include syphilis, tuberculosis and caustic ingestion. Given that the incidence of complicated peptic ulcer is decreasing, and contrast studies have largely been superseded by endoscopy, the latter deformity is now rarely described.

We highlight two different cases of “hourglass” stomach presenting to our department in the last year. Neither of these, however, was secondary to the traditional reason described above, but as complications of laparoscopic surgery now commonly performed in the present day.

Method: Two young female patients were emergency admissions with severe epigastric pain and repeated vomiting. The first patient had a background of gastroesophageal reflux disease for which she underwent laparoscopic Nissen fundoplication 4 months previously. The second patient had a background of laparoscopic gastric banding for morbid obesity a year earlier. Imaging in both showed hourglass stomach. Laparoscopy confirmed the diagnosis of a slipped gastric wrap in the first patient and a slipped band in the second. Both were successfully treated laparoscopically by releasing the wrap in the first and removal of the band in the second.

Results: Classically, this radiological finding is attributed to peptic ulcer disease as the most common aetiology. However, improvement in medical therapy for this has significantly reduced the incidence. Additionally, the modern era of minimally invasive surgery has added new differential diagnoses, and whilst we recognise that both of the above complications are previously described and recognised for both procedures, the above reports highlight the need for the awareness of such complications, as they may require urgent intervention to prevent acute complications eg ischaemia/necrosis/perforation

Conclusions: The causation and the interpretation of classically described abnormalities in radiology will change with changes in the incidence of disease and the evolution of minimally invasive surgical treatments and complications thereof.

P445 - Radiology / Imaging

Whirl Sign on CT-Scan: A Sign for Emergency Surgery

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Aims: ‘Whirl Sign’ is a radiological finding described as a swirl of mesenteric soft-tissue and fat attenuation with adjacent loops of bowel surrounding rotated intestinal vessels. A patient with the whirl sign on CT scan is 25 times as likely as a patient without the sign to have Small Bowel Obstruction (SBO) necessitating surgery. The extent of the swirling pattern correlates with the degree of bowel rotation and thus with the severity of vascular impairment. We aim, via this case report, to highlight this uncommon but serious radiological sign to the surgical trainees.

Methods: A 53-year-old male, who had a past surgical history of Hartmann’s Procedure for sigmoid volvulus 3 months earlier, presented with signs and symptoms of SBO. CT scan showed ‘Whirl Sign’ in ileum. Emergency laparotomy revealed gangrenous loops of ileum (1.5 meter length) and more than 400 degrees twist (volvulus) at its mesentery. No obvious adhesive band or internal hernia found. It was thought that the long mesentery, as a degree of congenital abnormality, was the precipitating factor for this ileum volvulus and also for the previous sigmoid volvulus. The gangrenous bowel was resected and double-barrel stoma of small bowel was fashioned at the right iliac fossa. The previous colostomy was left intact in the left iliac fossa.

Results: Patient was discharged home after three weeks of hospital stay, including ICU care post-op. Few weeks later, patient was re-admitted with pulmonary embolus which was treated successfully with thrombolytic agents. Couple of months later, patient was reviewed at clinic and found asymptomatic, well-nourished and managing the stomas well. No plans were made to reverse his stomas due to all above events.

Conclusions: The whirl sign is a radiological representation of underlying bowel ischemia, which can be life threatening. Emergency surgery should be considered in the presence of this sign.

P446 - Robotics, Telesurgery and Virtual Reality

Robotic Lateral Lymph Node Dissection in Patients with Lower Rectal Cancer

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Introduction: While total mesorectal excision with radiotherapy is a standard strategy for lower rectal cancer in European and American countries, lateral lymph node dissection (LLND) has been introduced and shown to reduce the local recurrence rate and improve the survival rate in Japan. Robotic surgery might enable us to overcome the difficulties of conventional laparoscopic procedure for LLND.

Patients & Method: 6 out of 36 patients undergoing robotic LLND are enrolled in this study. Indication of LLND includes the tumor located below the peritoneal reflection and the depth of tumor is clinically T2 or deeper. Preparations included surgical training, certification as a console surgeon, and obtaining institutional review board approval for robotic surgery. Operative techniques: The patient was tilted right side down in a Trendelenburg position. To begin with, 6 ports were placed and patient cart was docked from left caudal side. A medial-to-lateral dissection in dividing the inferior mesenteric artery and vein was performed and sigmoid colon was mobilized from the lateral attachment. After that, port placement was changed from abdominal procedure to pelvic procedure without undocking the patient cart. After total mesorectal excision was carried out, distal side of the tumor was transected. LLND was initially performed from the space between hypogastric nerve and internal iliac artery. Subsequently, the lymph node between internal and external artery was dissected. Finally, end-to-end anastomosis was performed laparoscopically following transanal bowel irrigation.

Results: The whole operating time in patients with LLND and without LLND was 694 and 387 min respectively, that included 563 and 283 min for surgeon console time. The estimated blood loss was 110 and 33 g. There has been no mortality so far, and the median length of postoperative hospital stay was 13 and 9 days respectively.

Conclusions: We herein report our early experience of robotic LLND. The procedure has been safe and feasible, however, we need to shorten the long operative time.

P447 - Robotics, Telesurgery and Virtual Reality

Robotic Excision of Benign Intra-Abdominal Inflammatory Mass with Controversial Preoperative Findings: A Case Report

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Aims: The purpose is to be demonstrated a case of interesting differential diagnosis, initially implying malignancy of the cecum.

Methods: A 62-year-old caucasian male patient (BMI: 32) was admitted to the ER suffering since 2 months from blunt abdominal pain with weight loss and fatigue, reporting hematochezia since two days. Physical examination findings: no blood signs on digital examination, no fever, no abdominal tenderness, palpable mass on the lower right abdominal quadrant. Laboratory findings: anaemia, normal inflammation markers' levels. Abdominal CT showed thickened bowel wall at the cecum and terminal ileum with an area on the cecal wall implying the presence of lumen (either appendix or diverticulum). Colonoscopy showed normal bowel mucosa, up to the last 20 cm of the terminal ileum. The OR was set for robotic cecumectomy as the differential diagnosis included plastron appendicitis, concealed perforation or extra-bowel malignancy. The patient underwent diagnostic laparoscopy and robotic excision of a plastron-like mass surrounding the cecum. The normal-looking appendix was also removed. A sole diverticulum was revealed at the area shown by the CT, approximately 2 cm away from the appendix, covered by the mass. The diverticulum was excised after ligation of its stalk with metal clip.

After uneventful hospital stay of 2 days, the patient was discharged with instructions.

Results: The pathology report confirmed the clinical intraoperative diagnosis of plastron diverticulitis of the cecum without malignancy. There were no histological findings on the co-excised appendix either.

Conclusion: The misleading patients' history and physical examination in combination with rather controversial laboratory tests and imaging don't always preconceive the worst case scenario and the least traumatic surgical approach should be considered first.

P448 - Robotics, Telesurgery and Virtual Reality

Robot Assisted Laparoscopic Surgery in General Surgery

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Aim: Recently, robot assisted laparoscopic surgery has been proposed as an alternative to traditional laparoscopic procedures. The aim of this study was to evaluate the patients operated with robot assisted laparoscopically in our clinic.

Method: Demographic status of patients operated robot assisted laparoscopically between 2010 and 2011, type of performed surgeries, complications were evaluated.

Result: Robot assisted laparoscopic surgery was performed to 58 patients in Umraniye Training and Research Hospital in the same time period. There were 31 female and 27 male patients. The mean age was 57.5 years (range: 25–88). Robot assisted laparoscopic cholecystectomy (n = 5), rectal mobilization (n = 3) for rectal prolapse, abdominoperineal resection (n = 10), total/subtotal gastrectomy (n = 5), right hemicolectomy (n = 1), left hemicolectomy (n = 4), sigmoid resection (n = 8), anterior resection (n = 5), low anterior resection (n = 9), extended low anterior resection (n = 4), thyroidectomy (n = 2) and splenectomy (n = 2) was performed. There were 2 conversions to open surgery. No intraoperative complication occurred, whereas port site hernia (n = 1), numbness in the right arm (n = 3), pressure ulcers (n = 1), pneumothorax (n = 1), urinary bladder dysfunction (n = 1), chylous ascites (n = 2), surgical site infection (n = 3), anastomotic leakage (n = 3) was developed in postoperative period. There were no reoperation and postoperative mortality.

Conclusion: Robot assisted laparoscopic surgery can be performed safely and effectively in many areas of general surgery.

P449 - Robotics, Telesurgery and Virtual Reality

Minimally Invasive Approach in Giant Type III and IV Hiatal Hernias. Is the Robotic Approach Better?

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Surgery is the only available curative treatment for symptomatic large hiatal hernias (type III-IV).

Our intent is to evaluate the results of a single team in giant HH treatment and compare the classic laparoscopic surgery (CLS) approach with the robotic surgery (RS) approach.

Material and Method: Between January 2002 and January 2012, thirty-nine patients underwent minimally invasive repair of a large (type III or IV) hiatal hernia. In 17 patients CLS approach and in 22 patients an RS approach was performed.

All patients were evaluated by medical history, physical examination, barium esophagram, upper endoscopy and esophageal manometry series.

Data were analyzed including operating time, intraoperative blood loss, intra- and post-operative complication, duration of hospital stay after operation and mid term results and follow-up at a minimum one year after surgery.

The postoperative assessment consisted of a barium esophagram on day 2, an office visit at 2 months and 1 year follow up endoscopy and barium esophagram.

Results: The 39 large hernias were divided into 27 type IIIs and 2 type IVs. Mixed hernias constituted 48.75 % of all the hiatal hernias operated on in the given period. 27 patients were women and 12 were men averaging 64 years old (26–80 years old). In RS group has been 3 cases previous operated: 2 cases open for hiatal hernia respectively achalasia and one case laparoscopically for large hiatal hernia.

The total operating time of RS was 140 min range 130–270 min and of the CLS was 170 min range 140–300 min. There have been no blood loss or conversion to laparotomy. In one case a conversion from robotic to laparoscopic surgery was needed due to a robot malfunction.

There have been no differences in hospital stay and number of complication between the two groups. There has been one recurrence in CLS—5.88 % and no recurrence in the RS.

Conclusion: Repair of large hiatus hernia is a technically challenging procedure using a minimally invasive approach. Robotic surgery could offer better results and shorter operating time despite the larger costs.

P450 - Robotics, Telesurgery and Virtual Reality

Robotic Low Anterior Resection by Situs Viscerum Inversus

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Background: The Center of Robotic Surgery performs robotic assisted surgery from 2008 till now. Over this period is a total of 126 interventions and included 123 colorectal cancer cases which resulted in 112 low anterior resections

In the Czech Republic there is an colorectal cancer incidence about 8000/year and rectal cancer amount counts 2000/year. About half of these patients are diagnosed in advanced stages, the others could potentially undergo the surgery. There is about 100 patients with operable rectal cancer in our region. In this case we would like to present a patient with low rectal cancer with situs viscerum inversus. Prevalence of this condition is 1 to 10000 inhabitants, it means that the probability of this combination situs viscerum inversus and rectal cancer is one patient per 10 years in the Czech Republic.

Methods: In this poster we would like to present 64 old female patient with complete situs viscerum inversus in connection with low rectal cancer. After standard presurgical assessment with staging (T3N1M0) patient underwent neoadjuvant treatment with the surgical intervention on the 17th May 2012. The own intervention—low anterior resection was performed on the Da Vinci system with proximal diversion. It was, except for technical issues with robotic system, without complications. Operation time was 190 min. Resection line was negative, circumferential margin was too negative, number of lymphnodes was 21. After surgery there was a minor anastomotic leak solved with antibiotic therapy (Clavien-Dindo II) Hospital stay was 8 days after surgery. Now running following oncological adjuvant therapy.

Results: In this case I would like to point out the differences of technical aspects using miniinvasive robotic surgery by low anterior resection, especially placement of robotic system and operative ports, position of surgical table and use of operative instruments.

Conclusions: The preparation of robotic system and own robotic anterior resection with situs viscerum inversus is well feasible in experienced hands without prolonged surgical time or other complications.

P451 - Robotics, Telesurgery and Virtual Reality

Effect of Robotic Assisted Laparoscopic Surgery on Surgical Stress Response: Systematic Review

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Aim: Surgical stress response is associated with systemic inflammatory syndrome, sepsis, multiorgan dysfunction syndrome. Although the advantages of robotic assisted surgery are well documented, knowledge on the impact of robotic assisted surgery on tissue trauma is quite limited. This systematic review aimed to investigate the effect of robotic assisted laparoscopic surgery on surgical stress response

Methods: PubMed, Scopus, Google Scholar were searched with the search terms “robotic assisted surgery”, “surgical stress”, “surgical stress response”, “oxidative stress”, “neuro-endocrine stress”, “stress response” up to and including January 2013.

Results: One hundred twelve possibly relevant trials were identified and their abstracts were reviewed. Five papers met inclusion criteria including three prospective trials, one case report, and one experimental trial. The first prospective trial concluded that cortisol and IL-6 were lower in laparoscopic assisted distal gastrectomy compared with robot assisted distal gastrectomy. The second trial compared robotic assisted laparoscopic radical prostatectomy (RALP) with open radical prostatectomy (ORP) and after measurement of IL-6, IL-1a, C-reactive protein and lactate, the authors demonstrated that robotic assisted laparoscopic radical prostatectomy induces lower tissue trauma than open radical prostatectomy. The third trial showed differential gene expression in the subset of surgery induced stress response genes between RALP and ORP. The case report concerned a case of polymyalgia rheumatic after RALP. The experimental trial demonstrated that cortisol and substance P were significantly higher with open thoracic approach versus robot assisted thoracoscopic oesophageal surgery.

Conclusion: Current data on the effect of robotic assisted laparoscopic surgery are quite limited. Further research is needed to elucidate the effect of robotic assisted surgery on surgical stress.

P452 - Robotics, Telesurgery and Virtual Reality

Robot - Assisted Laparoscopic Nissen Fundoplication: Initial Experience

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Aim: To report the initial experience with robot-assisted laparoscopic Nissen fundoplication

Methods: Between May 2012 and January 2013 seventeen patients with gastroesophageal reflux disease underwent robot-assisted Nissen fundoplication with Rossetti modification.

Results: Of these 17 operations, 16 were completed with robot-assisted laparoscopic procedure. In one patient, the exposure of the operation field was inadequate with the robotic system and the operation was converted to conventional laparoscopy. There was no complication or mortality in this group of patients. The mean length of stay was 2.7 days and similar with conventional laparoscopy. However, operation times was significantly longer and the robotic system brought additional costs when compared with conventional laparoscopy

Conclusions: Robot-assisted laparoscopic Nissen fundoplication is as safe and feasible as conventional laparoscopy. However, significantly longer operation times and additional costs may preclude the expansion of this technique in routine practice.

P453 - Spleen

SILS Splenectomy Versus Conventional Laparoscopic Splenectomy in Children and Young Adults

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Background: SILS is promising technique for splenectomy especially for children and young adults.

Aim of study was to compare safety and cosmetic results of SILS-splenectomy and conventional laparoscopic splenectomy (LS).

Methods: From 2008 to 2012, 21 laparoscopic splenectomies were performed. There were 9 children aged from 7 to 18 years, and 12 young adults aged from 18 to 27 years. Mean age was 16 years. Mean exclusion criteria were spleen size exceeding 25 cm in length, and age >30 years. Indications were: ITP—9, hereditary spherocytosis—8, splenic cyst—4, malignancy—1. Patients were randomized to LS arm (10 patients) and SILS arm (11 patients). There were no statistically significant differences between arms in preoperative data including spleen size. Standard splenectomy was performed by using 3 trocars. In SILS arm, SILS-port (Covidien) was used (7 patients), or 3 trocars were inserted transumbilically. Procedure was performed using curved instruments, and tourniquet extracted from additional needle hole for retraction of the spleen. The spleen was extracted through umbilical wound. Primary outcome measures were operative time and complications rate. Secondary outcome measures were cosmetic results and hospital stay.

Results: SILS was converted to LS in 2 cases. LS was converted to open procedure in 1 case. Reasons for conversions were large size of spleen. Mean operative time was 87 min (range, 60–120) in LS arm, and 108 min (range, 60–170) in SILS arm ($p < 0.05$). There were no serious postop complications in both groups. Mean hospital stay was 5.5 days (range, 4–7) in LS arm, and 6.2 days (range, 4–9) in SILS arm ($p > 0.05$). 6–12 months post surgery cosmetic results were better in SILS arm.

Conclusion: SILS can be safely used for splenectomy in children and young adults. SILS seems to be better in cosmetic results, but this requires further analysis.

P454 - Spleen

Laparoscopic Splenectomy: Does the Port Number Reduction Influence the Outcome

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Aim: The aim of the present study was to analyze the clinical outcome of laparoscopic splenectomy (LS) according modifying the procedure and reducing the number of trocars used.

Methods: This study consisted of 106 consecutive patients with hematologic diseases referred to our center for elective LS between 1999 and 2012. These patients were retrospectively divided in to three groups according the number of trocars used: group A ($n = 30$; 5 trocars), group B ($n = 35$; 4 trocars), and group C ($n = 41$; 3 trocars). Patient's demographics (age, gender, body mass index), spleen size and weight, perioperative parameters (operative time, estimated blood loss, conversions to open splenectomy and complications), postoperative morbidity and mortality were analyzed. Outcome comparisons between the three groups were performed.

Results: Patients age ranged from 18 to 81 years (mean 47.58 years; SD = 16.6). In total, 73 (68.8 %) patients were female, and 33 (31.2 %) patients were male. Patients demographics did not differ between three groups. A total of 87 (82.1 %) patients presented with benign hematologic disease, whereas 19 (17.9 %) patients had malignant indication for LS. The most frequent indication for LS in all three groups was idiopathic thrombocytopenic purpura.

The spleen length and weight were not significantly different between the three groups. The operative time for LS in group C was shorter although this is not reach statistical significance. When comparing reduced port LS (group C) with groups A and B, there was a significant reduction in conversion rates (7.3 % vs 16.7 %; 28.5 %; $p = 0.048$), intraoperative blood loss (209.5 ml vs 980 ml, and 452.8 ml.; $p < 0.0001$) and intraoperative complications (0 % vs 16.67 % and 11.4 %; $p = 0.033$). Although, there was no significant difference in postoperative morbidity or mortality rates between groups, there was a trend toward lower complication rates due to minimizing the invasiveness of LS (9.7 % vs 16.7 and 20 %; $p = 0.45$).

Conclusions: The use of reduced port LS is superior to conventional LS with regard to safety and efficacy. Reduced port LS should be considered as option to reduce the surgical access trauma in cases of hematologic diseases whenever the spleen is not hugely enlarged.

P455 - Spleen

Ligasure as the Unique Device to Perform Laparoscopic Splenectomy. Lessons from 150 Patients

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Background: Bleeding is the main complication and cause of conversion during laparoscopic splenectomy (LS). We present the advantages of the LigaSure vessel sealing system as the only device to perform LS in adult and pediatric patients added to the semilateral approach for achieving safe vascular control during the entire dissection of the spleen.

Methods: We performed 150 consecutive LS using Ligasure in a 10-year period using LigaSure in two affiliated university hospitals. We employed a right semilateral position technique with dissection of the spleen and vessel sealing using LigaSure. 102 patients had benign hematological Disease and 48 had malignant disease. Median age was 47 ys and median BMI was 23.5

Results: A total of 145 LS were completed with five conversions (3 %) due to hilar bleeding (three cases, 1 of which due to malfunctioning of the device), difficult dissection (one), and massive splenomegaly (one). In all but five patients, blood loss was less than 100 ml. Median operative time was 110 min (in 61 pts a combined operation was performed) No transfusions were needed. There were 14 postoperative complications: portal thrombosis (2 cases), hemoperitoneum (4), surgical wound infection (4), and pleural effusion (4).

Conclusions: The use of LigaSure, and the semilateral position, results in a gain of time and safety in the world largest series herein reported. Furthermore, average intraoperative bleeding is very low.

P456 - Spleen

Laparoscopic Splenectomy in Large Splenomegalies-Technical Particularities

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Laparoscopic splenectomy has been described as a safe and effective technique particularly for treating hematologic diseases, in which the spleen size is normal or only slightly enlarged, while splenomegaly was initially thought to be an absolute contraindication. The improvement of surgical devices has modified this concept. Our surgical experience includes 15 cases of large splenomegaly, in which we tried a laparoscopic approach. The conversion became necessary in 5 cases. The spleen size varied between 15 and 30 cm; the largest spleen which was removed using laparoscopy alone had 20 cm. The main technical challenge was the mobilisation of a large, pathological spleen, while trying to avoid any damage to the splenic capsule. Our option consisted of a primary approach of the splenic artery, near the tail of the pancreas, which was dissected and ligated; thus, the volume of the spleen decreased by 30 % in a few minutes. The main result was a significantly lower blood loss; blood transfusion was necessary in all of the 5 cases which had been converted, but only in 2 out of the 10 cases which were operated using laparoscopy alone. Three patients experienced post-operative complications: one developed an acute pancreatitis, one had a wound infection and the third—a post-operative bleeding. None of these 15 patients deceased. Although laparoscopic splenectomy in large splenomegalies is a technical challenge, we have reasons to believe that with increasing experience the conversion rate might be decreased.

P457 - Spleen

Does the Size and Malignancy Lead to Higher Incidence of Portal Vein Thrombosis After Laparoscopic Splenectomy?

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Aims: Portal vein thrombosis may be a potentially life-threatening complication after splenectomy. Nonspecific and mild onset of symptoms are reason for delay in diagnosis, and the short hospital stay after laparoscopic approach could even contribute to the difficulty of early detection of this condition. Goal of this paper is to assess the impact of diagnosis and spleen size on the incidence of portal vein thrombosis.

Methods: The data were collected prospectively from May 2003 to January 2013. In all patients (N = 42) that underwent laparoscopic splenectomy in Clinical Hospital "Dubrava" Zagreb, Croatia. The impact of diagnosis (benign/malignant) and the spleen size on the incidence of portal vein thrombosis following laparoscopic splenectomy were evaluated. Patients underwent surveillance for portal vein thrombosis using ultrasonography on the 5th postoperative day.

Results: Forty-two patients underwent laparoscopic splenectomy. Majority of patients submitted to laparoscopic splenectomy had benign splenic disease (31 of 42), more than half of them had splenomegaly (24 of 42). Almost all patients with splenic malignancy have splenomegaly (8 of 11). The mean spleen size in splenomegaly patients was 23.88 cm (range 15–31 cm). Portal vein thrombosis occurred in 3 (7.1 %) of 42 patients. All three had ITP and in two cases spleen was normal size. Only in one patient with normal spleen size portal vein thrombosis was symptomatic.

Conclusion: Portal vein thrombosis should be suspected in patients with fever or abdominal pain after splenectomy. Our results on small group of patients, in contrast to general opinion, did not show that the splenomegaly or malignant disease bring higher risk of portal vein thrombosis. The incidence of asymptomatic portal vein thrombosis justifies postoperative ultrasonographic screening.

P458 - Spleen

Laparoscopic Splenectomy for Splenomegaly Using a Homemade Retrieval Bag

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Aim: This study intends to access the feasibility and safety of laparoscopic splenectomy for moderate or massive splenomegaly using a homemade retrieval bag.

Methods: 50 patients underwent laparoscopic splenectomy for massive splenomegaly. A homemade retrieval bag made from the commercial sterile infusion container which costs about US\$ 1-2 per piece was used for spleen retrieval.

Results: In this study there were 31 males and 19 females with mean age of 56 ± 11 years. Laparoscopic splenectomy was successfully completed in 49 of these 50 patients. Overall, mean operative time was 149 ± 31 min (range, 100–252 min). Median estimated blood loss was 189 ± 155 ml (range, 50–920 ml). There were 12 minor complications but no mortality. Time to discharge after surgery ranged from 3 to 9 (mean 4.7 ± 1.7 days). The average splenic weight was 729 ± 74 g (range, 632–930 g).

Conclusions: The cost of our homemade retrieval bag is non-expensive and easy to use, and our preliminary results also indicate that laparoscopic splenectomy is feasible and safe for splenomegaly.

P459 - Spleen

Laparoscopic Splenectomy

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Introduction: Conventional operative techniques are gradually being replaced by minimally invasive surgical methods in the surgery of the spleen. We summarized our 10-year experience we gained after the introduction of laparoscopic splenectomy at the University of Szeged, Department of Surgery.

Material and method: Between 1st January 2002 and 1st December 2011 we performed 54 laparoscopic splenectomies. The data were recorded and analyzed in a retrospective manner.

The patients were divided into three groups according to the spleen weight; group I < 350 g (n = 32), group II between 350 and 1000 g (n = 15) and group III > 1.000 g (n = 7). Specimen was extracted piecemeal via the lateral incision, while in 7 cases the huge specimen was extracted through a 7–8-cm Pfannenstiel incision.

Age, sex, indication, operative time, estimated blood loss, conversion to open surgery, splenic weight, length of hospital stay, time to liquid diet, and morbidity were all recorded.

Results: In cases of laparoscopic procedures average operating time was 133 min (133/118/150). After the learning period, the duration of laparoscopic procedures became shorter (first 5 years: 147 min, second five years: 118 min, p = 0.003), we managed to remove bigger spleens (220 vs. 450 grams, p = 0.063) and the frequency of conversions (n = 4) became lower. The length of hospital stay was 5.2 days (5.17/5.27/5.4), the bowel motility recovery was 2.45 days (2.39/2.8/3). In 7 cases where a Pfannenstiel incision was used for specimen removal the mean operating time was 120 min, and the mean spleen weight was 1125 g.

Conclusion: Our study proves that laparoscopic splenectomy is a safe method with numerous advantages also in the cases of massive splenomegaly. Removal of specimen via a Pfannenstiel is a cosmetically acceptable alternative.

P460 - Spleen

Laparoscopic Splenectomy Using the ‘Tug-Exposure Technique’

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Aim: The purpose of this study is to describe advantages of ‘tug exposure’ technique to get better exposure of the splenic hilum and certain benefits in terms of shortening operation time during laparoscopic splenectomy (LS).

Methods: We performed LS in nine consecutive adult patients by using tug-exposure technique. In this technique we used an umbilical (or cloth) tape to encircle and tug the splenic hilum. Both ends of this string were taken to outside of the abdomen through the skin using suture holder and by pulling gently these ends we provided excellent exposure of splenic hilum. Then splenic hilum was stapled and divided with linear staplers. The operation finished using conventional laparoscopic techniques.

Results: The tug-exposure technique was successfully used in all nine patients. Mean blood loss was 70 (range 20–200) ml. No patients required conversion. Median operative time was 130 (range 100–180) min, and the spleen length was 11 (range 9–17) cm, and the median postoperative hospital stay was 5 (range 3–9) days. One patient had atelectasia and one patient had trocar site hematoma managed conservatively during postoperative course.

Conclusion: The tug-exposure technique is an easy and safe technique to provide excellent splenic hilum exposure during LS. It may reduce the risk of bleeding during hilum dissection and also total operation time. It is cost effective and can be applicable for other laparoscopic solid organ surgeries like nephrectomy etc.

P461 - Technology

Laparoscopic Partial Gastrectomy for Submucosal Tumor (SMT) of the Stomach with Consideration Toward Reduced Port Surgery

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Introduction: We have performed laparoscopic partial gastrectomy on 30 cases. In November 2010, we introduced single-incision laparoscopic surgery and have performed it on 10 cases with a protocol of reduced port surgery (RPS)

Operative Procedures: At the time of introduction of single-incision laparoscopic surgery, we performed operations with three trocars inserted via a 2.5-cm umbilical incision. After the appearance of high-performance thin forceps, however, umbilical incision length was reduced to 1.2 cm. If tumor size was small, an operation was performed with a 12-mm blunt port and a 6-mm metal cannula inserted via the incision, using an inserted thin forceps of 3 mm or less in diameter. The use of a thin forceps enables us to reduce difficulty of the operation by holding triangulation and to improve the cosmetic outcome by minimizing the incision wound. Most tumors in the greater curvature could be resected with a single trocar inserted at the left upper abdominal part. For tumors in the lesser curvature in the vicinity of the esophagus which was highly difficult to resect, however, a 5-mm trocar and a thin forceps in addition to 2 trocars at the umbilical site were used. If tumor size was large, an access device for single incision placed into a 3-cm umbilical incision and another trocar was inserted to the best location for the operation. When a linear stapler was used, a 5 mm-camera was inserted through the 6-mm metal cannula and the linear stapler was inserted through the 12-mm port. Tumor specimens were placed in a plastic bag and additional fiscal incision was minimized as necessary.

Results: The mean operation time was significantly shortened to 105 min (47–159 min) after the introduction of single-incision surgery and RPS from 146 min (63–229 min) before the introduction. No postoperative complication was reported, post operative hospital stay was 7 to 13 days, and a surgical scar was inconspicuous.

Discussion: RPS for SMTs based on single-incision surgery with the surgical strategy in which an optimal access procedure and an optimal device were selected according to the size and the location of SMT was useful and cost-effective.

P463 - Technology

Routine Cholangiography During Rigid-Hybrid Transvaginal Natural Orifice Transluminal Endoscopic Cholecystectomy

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Objective: Transvaginal rigid-hybrid transluminal endoscopic cholecystectomy (tvCCE) became a routine procedure in some laparoscopic departments over the last years. Yet, intraoperative cholangiography is an important adjunct to cholecystectomy, its feasibility and safety in tvCCE has not been demonstrated so far.

Methods: Consecutive patients undergoing tvCCE between April and October 2012 were included in this study. An intraoperative cholangiogram was obtained routinely in all patients. Patient's characteristics, operation, feasibility and duration of cholangiography and the postoperative course were recorded prospectively.

Results: In 32 out of 33 patients (97 %) intraoperative cholangiography could be successfully performed. The mean duration of cholangiography was 6 min (range 2–10). In 3 patients (9 %) common bile duct stones were detected. Laparoscopic bile duct revision without conversion was successful in two of those patients. One patient needed postoperative ERCP. One operation was converted to 4-port laparoscopic cholecystectomy. One additional 2–12 mm port was required in 11 patients (33 %). In another 3 patients (9 %) two additional 5 mm ports were used. There were 3 (9 %) intraoperative and one (3 %) postoperative minor complications.

Conclusion: Intraoperative cholangiography during tvCCE is feasible, safe and easy to perform. Need for intraoperative cholangiography does no longer represent a contraindication for tvCCE.

P464 - Technology

Safe Use of a First Entry, Non-bladed, Laparoscopic Port System. With Direct Visualization, Using an Angled Laparoscope

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Aims: To assess the safety and outcomes following the use of a unique first entry laparoscopic port system that allows direct insufflation during placement.

Methods: Consecutive laparoscopic procedures performed by a single surgeon, were included for prospective analysis. A 11 mm Kii Fios First Entry System (Applied Medical, CA, USA) was placed under direct vision using a 10 mm 30° angled laparoscope. The laparoscope position was adjusted to allow direct visualization of the obturator tip. Insufflation was achieved immediately on penetration of the peritoneal cavity. Port sites were closed at the end of the procedure with a subcuticular suture only. Any laparoscopic procedures that required port site extension for specimen retrieval were accessed using an open Hasson technique and were therefore excluded from analysis.

Results: The non-bladed port system was used for first entry in 563 laparoscopic procedures over a four-year period. Bariatric procedures accounted for 379 (67 %). The remainder was for fundoplication, incisional hernia repair or staging laparoscopy. Ninety-one (16 %) were revision procedures, following previous abdominal surgery.

There were no incidences of port site bleeding or post-operative hernia observed during the study period. One small bowel visceral injury (0.18 %) was observed in a patient following multiple previous abdominal surgery. This was identified immediately and sutured primarily without further complication.

Conclusions: A non-bladed, optical port can be used safely with an angled laparoscope for first port entry. With complication rates equal to open port placement, previous surgery should not exclude optical first port use.

P465 - Thoracoscopic Surgery

Verification Strategy for Our Lobe-Specific Unidirectional Stapling for Video-Assisted Thoracic Surgery Lobectomy

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Aims: More and more lung cancer surgeries are performed using video-assisted thoracic surgery (VATS), and now exceed 50 % of lobectomies for primary lung cancer in Japan. The lobe-specific unidirectional stapling (LSUS) strategy reported by Park IK, was designed to standardize stapling technique for VATS lobectomy. An appropriate LSUS strategy may reduce the risk of vessel injury, bronchial fistula the operation time of procrastinating. We retrospectively review our experience of VATS lobectomies for lung cancer in order to verify of our LSUS strategy.

Methods: From November 2010 to December 2012, 39 patients underwent intended curative VATS lobectomy for primary lung cancer in our institute. 16 patients that were resected with our LSUS strategy using flexible endostaplers were reviewed. The patients consisted of 8 male and 8 female, with a median age of 75 years (49–85). All target structures were stapled through a lobe-specific port which we recognize as safe to pass through. In both upper and right middle lobectomies, a utility thoracotomy (4–9 cm) is made on the anterior axillary line and the posterior port, under the angulus inferior scapulae, which became the stapler port for their pulmonary vein, artery and bronchus. On the contrary, a utility thoracotomy is made on the posterior axillary line and the anterior port, at the 5th intercostal space on the anterior axillary line, which became the stapler port in both lower lobectomies.

Results: The types of surgery were 4 in right upper lobectomy, 2 in left upper lobectomy, 1 middle lobectomy, 7 in right lower lobectomy, 1 left lower lobectomy, and 1 bilobectomy for right upper and middle lobe. The 5 patients with pathological stages IIIA had hilar lymph nodes positive. The stapler could be passed through easily and the anvil of the stapler could be gently inserted behind the vessels and bronchus without either excessive pushing against them or vessel injury in all cases during stapling using our LSUS strategy. No perioperative deaths occurred and complications appeared in 3 patients (19 %) but were not related to stapling techniques.

Conclusion: Our LSUS strategy is feasible for VATS lobectomy for lung cancer.

P466 - Thoracoscopic Surgery

A Novel Fluorescence Technique for Identification of the Pulmonary Segments by Using the Photodynamic Diagnosis Endoscope System

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Aim: The identification of the intersegmental plane is essential for a successful anatomic pulmonary segmentectomy. Photodynamic diagnosis is a technique that has been proposed to enhance tumor detection and resection. We modified this technique to identify pulmonary segments by using the photodynamic diagnosis endoscope system. In the present study, we examine this technique in *in vivo* porcine lungs.

Methods: The photodynamic diagnosis endoscope system consisted of the D-Light system as the excitation light source and a TRICAM camera as the fluorescence sensing endoscope (Karl Storz GmbH & Co, Tuttlingen, Germany). Vitamin B2 was used as the fluorescence substance. 6 pigs underwent general anesthesia and cranial segmentectomy of cranial lobe in right lung. After identification of the segmental bronchus, the fluorescent substance was injected by a bronchoscopy. The fluorescent segment was observed using the photodynamic diagnosis endoscope system, and the identified intersegmental plane was cut by an electric cautery. The operative data collected were the success rate of accurately identifying the pulmonary segments. The duration and light intensity of fluorescence of the target segment were recorded to provide an objective measurement of success. The same parameters were also measured for the adjacent segment.

Results: In all procedures, it was possible to identify the target segment by its yellow-green fluorescence. The success rate of accurately identifying pulmonary segments was 100 %. The light intensity of the target fluorescent segments was 209.8 ± 12.8 just after injection, 214.6 ± 10.1 after 15 min, 219.0 ± 9.8 after 30 min, and 223.4 ± 9.4 after 1 h. For the adjacent nonfluorescent segments, the measured light intensity was 59.1 ± 9.6 , 62.2 ± 10.3 , 63.7 ± 9.4 , and 66.5 ± 9.7 in each time. At every measurement from injection until 1 h later, the light intensity of the target fluorescent segments was significantly stronger than that from the adjacent nonfluorescent segments. No perioperative death and complications were encountered. No unexpected injuries of the major segmental bronchi and vessels occurred. The amount of bleeding and air-leakage from the transected intersegmental plane was little.

Conclusion: This fluorescence technique involving vitamin B2 and the photodynamic diagnosis endoscope system allowed the accurate and safe identification of the pulmonary segment in *in vivo* porcine lung.

P467 - Thoracoscopic Surgery

Welding of the Lung Parenchyma in the Morphological Diagnosis of Disseminated Processes in the Lungs

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Aim: Diagnostic errors in patients with lung dissemination is about 75–80 %, and adequate specialized assistance to them is usually 1.5–2 years after the onset of the first signs of the disease, which affects the effectiveness of treatment and prognosis. In this case a partial apical resection of the lung becomes standard diagnostic procedure for the differential diagnosis of disseminated processes.

Methods: We studied 57 patients from 2008 to 2012 with disseminated processes in the lung parenchyma. For morphological verification of diagnosis we performed partial apical pulmonary resection. Analysis of the traditional manual suture showed a significant increasing of the operation time and the necessity to strengthen the seam line of argon-enhanced cold plasma electrocoagulation. To this end, we made superficial impact on the pulmonary parenchyma with the help of the device 'ECONT 0701'. As a result we observed that argon-enhanced cold plasma electrocoagulation not provide complete sealing of the lung resection margins. Using of ultrasonic scalpel has significantly reduced the duration of surgical procedure, but this method is very expensive. Welding seam, which we performed with a welding hardware system 'EK 300 M-1', not only reduced the operation time but did not require additional aerostasis. In our experience we can conclude that in the optimal formation of a single suture line of pulmonary parenchyma was in case of using the automatic mode at 50 % welding power mode. The best results of forming a weld in a few areas of suturing was in cases using of semi-automatic mode at 60 % welding power mode. Presented welding modes also characterized with better antibacterial and antimycobacterial effect than other suture techniques. Clinical analysis showed decreasing of pleural exudation volume of down to 10 % compared with the typical hardware and reduce seam terms exudation. Thus, one can estimate the adequacy and clinical efficiency of a biological welding.

Conclusion: We suggest using a welding system for the performing of partial apical pulmonary resection for differential diagnosis in patients with dissemination of unknown etiology.

P468 - Thoracoscopic Surgery

Video-Thoracoscopic Treatment of the Spinal Nerve Sheath Tumours

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Aim: Video-thoracoscopic (VATS) removal of the spinal nerve sheath tumours is effective and simple method compared to open thoracotomy.

Methods: Between 2011 and 2012 we have operated three patients with Schwannoma of the spinal nerve. Operation was performed at two acts. At a first act neurosurgeons performed hemi-laminectomy and divided tumour of the nerve and dura. At the second act patient was positioned at lateral position with selective ventilation. Three ports were positioned depending of tumour position and camera (10 mm, 30°) was introduced. Tumour was completely removed by harmonic scalpel and one thoracic drain placed.

Results: All the patients were males at age of 58.66 and 67 years. Tumours were right-sided at two and left-sided at one patient. All tumours were Eden 3 type. Duration of VATS procedure was 24–35 min. Thoracic drains were removed on the 2nd postoperative day. One patients had a pneumonia successfully treated.

Conclusions: VATS removal of spinal nerve sheath tumours is simple and operation is shortened. Patients are recovering faster to normal activity with less postoperative pain and better cosmetic effect.

P469 - Thoracoscopic Surgery

Video-Thoracoscopic Lobectomy at Patients with Non-small Lung Cancer: First Croatian Experiences

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Aims: Video-assisted thoracoscopic (VATS) lobectomy at patients with non-small lung cancer (NSCLC) is still not a routinely performed at a majority of thoracic surgery departments, mostly because of steep learning curve. The aim of this study is to show a feasibility of VATS lobectomy at small volume centers.

Methods: Between 2009 and 2012 we have planed VATS lobectomy at 22 patients with stage I NSCLC. All the patients were operated by anterior approach. Utility incision (4–6 cm length) was positioned at 4th intercostal space and two port incisions were at 6th intercostal space at anterior and posterior axillary lines. Camera (10 mm, 30°) was introduced through port at 6th intercostal space at anterior line. Lobar artery, vein and bronch were separately divided and stapled. Lobar fissure was the last divided by stapler (no fissure touching). Systemic mediastinal lymphadenectomy was done by harmonic scalpel at all the patients. Specimens were removed within the bag. When conversion was necessary utility incision was lengthened to 10 cm, rib retractor used and visualisation achieved combining incision and monitor (hybrid VATS).

Results: VATS lobectomy was done at 12 (54.6 %) and conversion at 10 (45.4) patients mostly due to uncertain identification of anatomical structures. At all the patients one thoracic drain was placed. Average duration of VATS lobectomy was 184 min (164–218). Average duration of the drainage was 4.1 (3–8) day and hospitalisation 7.2 (5–12) days. There was not perioperative mortality and prolonged air leak at two patients was treated by prolonged drainage. Average number of removed mediastinal nodes was 16 and two patients were up-staged because of positive nodes.

Conclusions: Despite the obvious advantages of VATS lobectomy, its introduction at small volume centers is difficult due to very steep learning curve

P470 - Thoracoscopic Surgery

VATs with Spontaneous Breathing Laryngeal Mask Anesthesia for Management of Pleural Disease in Patients with Poor Cardio-Pulmonary Function

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Purpose: Double-lumen intubation or endotracheal tube with bronchial blocker use for one-lung ventilation is considered mandatory for general anesthesia of thoracic surgery. The risk is high especially for patients with poor cardio-pulmonary function. To avoid tracheal intubation related risks, nonintubated thoracoscopic surgery under thoracic epidural anesthesia is introduced in recent days. However, for old age patient with spinal deformity, the technique of epidural anesthesia is difficult and time-consuming. The serious potential risks related to epidural hematoma or spinal cord injury also increases in this population. Due to above reasons, we apply spontaneous breathing laryngeal mask anesthesia for patients with poor cardio-pulmonary function receiving thoracoscopic surgery and evaluate its feasibility and safety.

Methods: From March 2010 through March 2011, 7 poor cardio-pulmonary functional patients (APACHE: 8(5–16), ASA: III, Comorbidity: 2(0–4), Age: 74(55–80)) with pleural disease were managed by video-assisted thoracoscopic operations under spontaneous breathing laryngeal mask anesthesia without muscle relaxant usage. All procedures were performed with the patient in the lateral decubitus position.

Results: Collapse of the operative lung and visual field for operation were satisfactory. No patient required conversion to intubated one-lung ventilation, and no patient needs conversion to thoracotomy. No intraoperative complications or laryngeal mask displacements occurred. Our mean operation time is 70 min (range, 50–145 min). During the entire procedure for all patients, values of arterial oxygen saturation, and peak end-tidal carbon dioxide tension resulted excellent: lowest SpO₂: 98(96–99) %, peak EtCO₂: 38(27–51) mmHg. Only one patient required intensive care unit stay (only 1 day) after operation for her previous sepsis, poor renal function and anemia. No postoperative complications occurred. Besides, post operative side effect such as sore throat and vomiting requiring medication were not complained in our 7 patients.

Conclusion: Thoracoscopic surgery with spontaneous breathing laryngeal mask anesthesia for patients with poor cardio-pulmonary function is safe and feasible. Avoidance of intubation in these patients can have less anesthetic risk and decrease intubation-associated discomfort post operation. This kind of anesthesia is quicker than thoracic epidural anesthesia and avoids the risks of epidural hematoma or spinal cord injury.

P471 - Thoracoscopic Surgery

Feasibility of Pressurized Intrathoracic Aerosol Chemotherapy (PITAC) in the Human Patient

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Background: The feasibility of Pressurized Intraperitoneal Aerosol Chemotherapy (PIPAC) has been recently demonstrated in the human patient. The first applications have delivered promising results, including regression of peritoneal carcinomatosis nodules on the small bowel and ascites control. We now performed the first application of therapeutic pressurized chemotherapy aerosol within the pleural cavity.

Methods: A 74 y.o. female patient suffering peritoneal and pleural carcinomatosis of ovarian origin was admitted with symptomatic ascites and bilateral pleural effusion. We first performed combined PIPAC application in the abdomen and PITAC in the right thorax, by applying cisplatin 7.5 mg/m² and doxorubicin 1.5 mg/m² body surface at a pressure of 12 mmHg for 30 min at a temperature of 37 °C. After 4 weeks, PITAC was performed on the left side. For the procedures, a double-lumen tube was inserted and the ipsilateral lung excluded. A three-trocar technique was used and remote-controlled aerosol nebulisation was performed in analogy to our PIPAC standard operating procedures.

Results: It was possible to apply the same intrathoracic CO₂ pressure as during PIPAC (12 mmHg) without significant intraoperative problems. During the procedure, the patient needed low-dose catecholamines. FiO₂ was 50 %, Peak ventilation pressure was 18 mbar with a PEEP of 5 mmHg. Some hypercarbia developed with an etCO₂ of 37 mmHg at the end of the procedure. After 2 months follow-up, no significant pleural effusion was detected anymore.

Conclusion: PITAC is feasible in the human patient. No cardiovascular collapse nor any signs of tension pneumothorax were observed. PITAC can induce regression of pleural effusion. Further studies on the therapeutic effects (symptoms & outcome) of PIPAC on pleural effusion of ovarian origin and pleura mesothelioma are needed.

P473 - Thoracoscopic Surgery

Videothoracoscopy Role in the Early Diagnosis of XDR

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With the increase in the world's MDR TB patients, the problem of early diagnosis of TB and detection of drug resistance is particularly important.

A study was conducted 145 patients with pleural effusion of unknown etiology treated in 2011-2012. For morphological verification of diagnosis with a biopsy performed video thoracoscopy modified sections of the pleura. Biopsies were studied morphologically, cytologically and microbiologically. General video thoracoscopy diagnostic value in the diagnosis of pleural effusion was 97 %. Histological examination of biopsy specimens obtained indicates a significant proportion of tuberculosis among the causes of pleural effusion, which was 74 %. Identifying TB etiologii pleural effusion was 100 %. Microbiological studies obtained at video thoracoscopy pleural biopsies allowed to test drug sensitivity and identify extensive drug resistance TB in 12 % of the subjects. Thus 12 % of patients that do not emit mycobacteria could individualize chemotherapy regimen in terms up to 2.5 months.

I believe that the conduct of microbiological studies of pleural biopsy is appropriate. A drug test sensitivity necessary for early detection of extensive drug resistance TB.

P474 - Thoracoscopic Surgery

Needlescopic Thoracic Sympathectomy (NTS): Our Experience

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Aims: Thoracoscopic surgery has made a significant impact on the accessibility and safety of "cervical" sympathectomy. Advances in instrumentation allows most sympathectomies through 2-mm needlescopic ports. We review a series of NTS and evaluate the effectiveness, safety and evolution of the technique.

Methods: Between 1996 and 2012, 83 patients underwent thoracic sympathectomy (for facial blushing/hyperhidrosis, axillary/palmar hyperhidrosis and other indications). NTS was performed in the supine position, with double lumen intubation, using two mini thoracoports. A 2-mm camera port was inserted into the 3rd intercostal space in the anterior axillary line. The operating port was inserted into the 2nd intercostal space in the mid-clavicular line. Sympathectomy was achieved by electrocautery scissors. The parietal pleura over each related rib lateral to the sympathetic chain was divided for 2–3 cm to ensure that all Kuntz nerves were cut. Umbilical vein catheter (3Fr) was inserted to drain the remaining CO₂ under water and was usually removed after satisfactory chest X-ray.

Results: 162 thoracic sympathectomies were performed in 83 patients, mostly females (69 %). The mean age was 34 (range 14–74 yrs). Only two 2 mm ports were used in 84 % (n = 136). Standard 5 mm ports were used on 26 occasions for better visibility, access or to allow 5 mm instruments. The mean operative time was 39 (range 20–75 min). A few significant complications were encountered: haemothorax (intercostal port) requiring a second thoracoscopy within 2 h (1-case) and transient Horner's syndrome (2-cases) resolving spontaneously within 2 months. Failure of symptom resolution occurred in one patient with facial blushing and two with facial and scalp sweating. Troublesome compensatory sweating was encountered in 4 patients.

Conclusions: In spite of the slightly reduced visibility, the use of 2-mm instrumentation in NTS is safe. It enhances patient satisfaction, minimising incision-related morbidities and improving cosmesis.

P475 - Training

Simulated Colonoscopy Training: Responsiveness of Surgery Interns

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Aim: This study aimed to evaluate the responsiveness of surgery interns to simulated colonoscopy training.

Methods: Interns defined as postgraduate year 1 surgery residents without previous exposure to colonoscopy underwent simulated colonoscopy training at a single institution using a 13 mm colonoscope in synthetic colorectal anatomy trays with tattoos in a hybrid simulator. After baseline and mentored training sessions final testing was performed with 5 predetermined proficiency criteria. Content-valid measures defined by the extent of their departure from clinical reality were evaluated by 2 blinded raters. Responsiveness was defined as change in performance over time and was assessed by comparing baseline testing with unmentored final testing.

Results: For 1 year, 12 interns performed 48 colonoscopies. Eight participants were male with a mean age of 26.83 and 80 % were right hand dominant. Overall procedure time (24:46 vs. 20:54 min; p = 0.03), passing splenic flexure (20:33 vs. 10:45 min; p = 0.007), passing hepatic flexure (23:31 vs. 12:45 min; p = 0.003), reaching cecum (23:38 vs. 13:26 min; p = 0.008) times improved significantly. Rates of inability to navigate the scope (75 % vs. 8.3 %; p = 0.023), incomplete colonoscopy (100 % vs. 33.3 %; p = 0.042), and too fast scope withdrawal (16.7 % vs. 8.3 %; p = 0.052) improved significantly. Tattoo identification time (9:16 vs. 12:25; p = 0.50) and the rate of colon perforation (8.3 % vs. 8.3 %; p = 0.023) remained unchanged. Inter-rater reliability was 1.0 for all measures.

Conclusions: Simulated colonoscopy training impacted responsiveness of surgery interns with decreased procedure time and increased rates of complete colonoscopy with appropriate scope withdrawal.

P476 - Training

Intensive Laparoscopic Training in Pigs - 13 Years of Experience in Pius Branzeu Center for Laparoscopic Surgery from Timisoara, Romania

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Aims: To assess the effectiveness of intensive laparoscopic training on pigs during 10 years of training.

Method: Between 2000 and 2012, 28 intensive (3 days) and 8 advanced (2 days) laparoscopic courses (gastric, biliary, colo-rectal and bariatric) on live tissue were organized, with 391 participants coming from 14 countries. This poster presents the effectiveness of the training of the 260 surgeons who followed the 3 days laparoscopy skills courses. At the beginning of the first day, during the training and at the end of each day the acquirement of the skills participants were evaluated. Three groups were studied: the first group with no experience in laparoscopic surgery; the second group with less than 15 laparoscopic cholecystectomy and the third group with more than 15 laparoscopic cholecystectomy.

Results: The first group had a lot of difficulty and were able to acquire only less than 30 % of the taught techniques, the second group performed better and acquired 63 % of the taught techniques and the third group performed very well acquiring 96 % of the taught techniques.

Conclusion: Surgeons with no previous laparoscopic surgery experience take little benefit from these courses. They need to acquire basic skills on trainer boxes or on virtual reality simulators before the training on pigs. Surgeons with little experience in laparoscopic surgery acquire easier skills, but the best benefit is taken by surgeons with some laparoscopic surgery experience.

P477 - Training

Impact of Seniority on Operative Time in Laparoscopic Cholecystectomy, Initial Experience of Surgical Department of Developing Countries

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Introduction: Resident participation in laparoscopic cholecystectomy (LC) is the first step of laparoscopic training but seems to increase the time of operation. This time cost in training programs is not well defined especially in developing countries. We performed the aim of this study was to compare and determine the effect of seniority on the operative performance of laparoscopic cholecystectomy.

Patients and Methods: We underwent a retrospective study of all consecutive laparoscopic cholecystectomy for gallbladder lithiasis performed over two academic years in our Moroccan training program.

We compared operations performed by junior (PGY 4-5) or senior (PGY 6) residents and attending surgeons, assisted by junior residents, none of whom had fellowship training in advanced laparoscopy.

All data concerning Demographics (ASA, ECOG score, body mass index and indications), surgeons, operative time (from skin incision to closure), conversion rate, and operative complications (clavien-Dindo classification) were recorded and analysed. ANOVA, Student's t-test, and χ^2 tests were used as appropriate with statistical significance attributed to $P < 0.05$.

Results: One hundred thirty eight LC were performed. No differences were found on univariate analysis between groups in demographics or diagnosis category. The overall rate of operative complications or conversions and hospital stay were not significantly different between the 3 groups. However Mean Operative times were longer for junior ($n = 27$): 115 ± 24 min; than senior ($n = 37$): 77 ± 35 min than seniors ($n = 66$): 55 ± 17 min ($P < 0.001$).

Conclusion: Laparoscopic cholecystectomy performed by Residents is safe and feasible, however seniority influences operative time but not complications rate. This information may improve surgical educating programs in developing countries to assess the importance of early initiation to laparoscopic skills to reduce the time cost.

P478 - Urology

Multiple Organ Retraction During Urological Laparoscopic Surgery

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Purpose: During laparoscopic surgery, as in open surgery, exposure is critical. We describe our surgical technique that provides intra-abdominal multiple organ retraction in order to obtain a stable surgical field and adequate exposure.

Materials and Methods: Flex Arm Surgical Holders is an adjustable, spring-loaded articulating instrument holder. The device offers the flexibility of the attachment of multiple arms (up to three) on the same rod, which can rotate 360° to aid in positioning. This device permits multiple laparoscopic instruments to be held simultaneously. We utilized this device for multiple organ retraction during urological laparoscopic surgery (laparoscopic radical prostatectomy, $n = 5$; laparoscopic radical nephrectomy, $n = 3$; laparoscopic partial nephrectomy, $n = 2$; laparoscopic pyeloplasty, $n = 2$).

Results: We achieved significant improvements in the efficiency of retraction of the liver, kidney, colon, and prostate during urological laparoscopic surgery. Our method maintains a constant surgical field through the proper retractor position and the proper amount of isometric force for optimal exposure.

Conclusions: With this device, instrument migration due to muscle fatigue and organ injury as a result of excessive force are all substantially reduced. We believe that this technique may be helpful not only in urological laparoscopic surgery, but also in laparoscopic approaches in other departments.

P479 - Urology

Initial Experience in the Laparoscopic Treatment of Total Utero-Vaginal Prolapse

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Between Jan 2011 and Jan 2013 in the Surgery-Urology Clinic of Pelican Hospital we had 160 female patients examined with pelvic floor defects. Out of the 160 examined patients we had 26 patients with utero-vaginal prolapse of varying degrees. A number of 11 patients were diagnosed with 3rd degree genital utero-vaginal prolapse. One patient was excluded from surgery by other pathologies and 10 patients were admitted for surgery. We operated laparoscopically in all 10 cases proceeding to colposacropepy with polypropylene mesh. In one case the patient had a lot adhesions in the pelvis following a previous surgery and we had to convert. In the other 9 cases the surgery was finalised laparoscopically. The mean operation duration of the surgery was 3 h and 10 min, ranging from 6 h for the first case to 2 h and 35 min for the last case. Out of the 10 cases we operated only one patient exhibited postop urinary effort incontinence and it was necessary to perform a suburethral mesh banding using the TOT method.

P480 - Urology

An Analysis of Selected Vital Function Parameters in Patients Undergoing Anesthesia for Laparoscopic and Open Prostatectomy

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Aims: Laparoscopic prostatectomy is not yet a standard in treatment of selected cases of prostate cancer however the results are promising. Present study reveals the systemic response for laparoscopic and open prostatectomy.

Material and Methods: Eighty patients with prostate cancer limited to the gland were qualified for radical prostatectomy, 47(59 %) were operated by laparoscopy(LAP), 33(41 %) open way(OPEN) by experienced urologists. Entry data as age, ASA score, BMI comorbidity rates were comparable in both groups. During procedures patients were continuously monitored (pulse, mean arterial pressure, body temperature, oxygen saturation, respiration rate, carbon dioxide end tidal pressure-EtCO₂, fluid resuscitation, operation time, blood loss, average room temperature). Parameters were measured before insufflation (predominantly 15 mmHg), after insufflation, and every 30' of LAP operation to the moment of desufflation, and at intubation, first skin incision and every 30' of OPEN operation to the moment of tube removal.

Results: Pulse, MAP were similarly increasing during both types of procedures and became around normal at the end, patient body temperature changes were minimal and insignificant ($p = 0.19$) in both groups, operation room temperatures were comparable. EtCO₂ was significantly higher in LAP group (mean 37.5 versus 28.9 mmHg, $p < 0.005$), given fluid rate was smaller in LAP group (mean 2267 ml \pm 531 ml LAP versus 2676 \pm 566 ml OPEN, $p = 0.001$). Operation time was comparable (194 \pm 36 min. LAP, versus 201 \pm 32 min OPEN $p = 0.37$). Blood loss was significantly lower in LAP group $p = 0.0035$

Conclusion: laparoscopic prostatectomy although highly demanding for anesthesiologist because of excess of CO₂, offers some advantages as less fluid administered and significantly lower blood loss.

P481 - Urology

Initial Experience with Laparoscopic Nephrectomy in a Secondary Greek Hospital During Economic Crisis

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Aims: Laparoscopic nephrectomy is a feasible and safe technique mainly performed in specialized and often in private centers. Florina General Hospital covers the medical needs of 30000 patients per year; no ICU is available, while the whole area is characterized by the poorest climate conditions in Greece. Transport in the nearest central hospital for patients and relatives is now further aggravated by the current economic crisis. We report our initial experience with laparoscopic nephrectomy emphasizing in the advantage for the interested population.

Materials-Methods: Eight transperitoneal laparoscopic nephrectomies were performed from January 2012 to December 2012. The patients included 5 males and 3 females. The mean age was 69.75 ranging from 48 years to 77 years. Right sided nephrectomies were performed in 6 cases. The indications for nephrectomy included stones (1), non-functional kidney (2), renal cancer (5).

Results: The mean operating time was 149, 5 min (range 110–160). The mean hospital stay was 4.25 days (range 2–7 days). Conversion to open nephrectomy was required in 1 case due to poor vision. Complications were seen in two patients (wound infection). No mortality was seen and no intrabdominal injuries occurred.

Conclusion: Our series data, although based on limited number and experience, are partially in accordance with others from specialized centers. Considering the fact that new technologies such as laparoscopic and robotic surgery are a strong point of attraction for patients and relatives, our data as well as the future scheduled operations for 2013, indicate that small hospitals may not refuse this kind of operation offering large advantage in the local population in terms of economy and high quality health care.

P482 - Vascular Surgery

Videolaparoscopic Arteries Ligation in the Treatment of Type II Endoleak After Endovascular Repair of Abdominal Aortic Aneurism

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Aim: Many reports are in literature about the laparoscopic ligation of the Inferior Mesenteric Artery for the treatment of type II endoleaks after EVAR (Endovascular Aneurism Repair). Transcatheter embolization of lumbar and hipogastric arteries is a safe and effective endoleak's treatment but sometimes is not technically possible. The purpose of this study was to evaluate the possibility of videolaparoscopic treatment of type II endoleaks after abdominal aortic aneurism endovascular repair in patients not suitable for transcatheter embolization.

Methods: In the last 18 months 2 patients with type II endoleak were treated. The first endoleak was supplied by right hipogastric artery and the second by a right lumbar artery, after endovascular repair of infrarenal and iliac aneurysms. Intravascular transfemoral embolization was not possible because of concomitant stump closure of right iliac aneurism and femoral cross-over. The C.T. study showed the origin of endoleak in one case from the right hipogastric artery and the other case from a right lumbar artery. Open ligation of these arteries was the only established therapy. Videolaparoscopic ligations of hipogastric and lumbar arteries with metal clips were performed; in order to achieve a minimally invasive treatment.

Results: Aneurism growth was arrested in both patients, as documented on CT scan (weeks after treatment), with complete exclusion of the sacs and no signs of recurrence endoleaks. No complications occurred and the patients were discharged the day after the procedure.

Conclusion: Videolaparoscopic ligation of the arteries supplying the endoleaks may be considered a safe, sure and effective alternative to embolization of hipogastric and lumbar artery, when not technically possible. This technique permit to avoid laparotomic surgery in these patients

P483 - Vascular Surgery

Subfascial Endoscopic Perforator Surgery (SEPS) in Treatment of Advanced Chronic Venous Insufficiency-Our Experience

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Aim of this study was to evaluate the efficiency and safety of SEPS procedure in patients with advanced chronic venous insufficiency (CVI), to report our long-term experience with this procedure.

Methods: A total of 168 patients (98 women and 70 men)-192 lower limbs, with a mean age of 56.2 years (range 34.1–80.5), were operated on from November 2002 to December 2012. All the patients presented the clinical symptoms grade IV chronic venous insufficiency with painful, heavy lower limbs, 56 patients presented an cutaneous ulcer with medium size 5.8 cm, that was active at the moment of the intervention, 112 patients presented skin changes without ulceration. 48 patients had previous operation (saphenectomy). The incompetent perforating veins were marked with ECHO-Doppler in all patients. 36 patients absolved phlebography.

Results: There were no intra operative complications. Follow up began 7 days after the intervention and then continue every 2 months. We observe dyesthesia, oedema, pain and recidivation. Post operatively 7 patients had minor calf paresthesia, 3 patients had allergic dermatitis. In 9 cases were dyesthesia in area of incision, in 5 cases haematoma in sub-fascial space. The medium number of divided perforators was 4(2–8), if it was necessary, we continued by saphenectomy. The active ulcer disappeared in 45 patients from 3 weeks to 5 months. In all patients disappeared or improved pain, oedema. Patients with skin changes had certain reduction of their manifestation.

Conclusion: According our 10 year experience short and long-term results are good and post surgical complications are few. The subfascial endoscopic perforator surgery seems to be careful, feasible and effective method, only a little prolonging operating time, with good postoperative course.

P484 - Vascular Surgery

Aortic Replacement Combining Laparoscopic and Endoluminal Techniques: A Preliminary Study in Porcine Model

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Objectives: Currently the treatment of aortic pathologies is feasible through two types of minimally invasive procedures: laparoscopy and endovascular techniques. The aim of this study was to determine the feasibility of the placement of an aortic prosthesis combining both types of techniques attempting to reduce the aortic occlusion times and eliminate the possible migration of the prosthesis and the blood leakage appearance.

Material and Methods: We performed a preoperative image study in 5 female pigs (40–45 kg) combining percutaneous ultrasonography (B-mode ultrasound, power Doppler and duplex Doppler), digital subtraction angiography (DSA), intravascular ultrasound (IVUS) and CT-scan. Five aortic substitutions were made in the infrarenal aorta by interposition of an ePTFE prosthesis with self-fixing system and monitoring by ultrasound, angiography, IVUS and CT-scan at 7, 15, 30 and 60 days after surgery.

Results: The aortic replacement using laparoscopic and endoluminal approaches was successfully performed in all animals. No major complications were encountered and the conversion to open surgery was not necessary in any case. Mean operative time was 132 ± 10.30 min from the start of pneumoperitoneum until the closure of the abdominal wall incisions. Aortic dissection time was 41.28 ± 3.56 min. The no-flow time was 38.11 ± 1.27 min. The mean time for the placement of the prosthesis was 36.57 ± 3.42 min. Ultrasound studies showed no alterations in vascular flow in the aorta. The CT-scan and angiographic results showed a high permeability. However, in two cases we observed intimal hyperplasia previously to aortic stenosis.

Conclusions: The aortic replacement technique using hybrid approach simplifies the aortic surgery through minimally invasive approaches. This study shows the feasibility of this technique but it is necessary a learning curve with a high degree of compatibility of laparoscopic and endoluminal teams. Further studies are necessary in experimental models in order to reduce occlusion time and postoperative complications.

P485 - Emergency Surgery

Laparoscopic Management of a Perforated Gallbladder

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The role of laparoscopy in the management of the patient with an acute abdomen has not been fully established.

We present a video of an 80 year old gentleman presenting with an acute abdomen, who had a perforated gallbladder with bilious peritonitis successfully managed with laparoscopic methods.

At admission the patient's abdomen was tender & distended, but he remained haemodynamically stable. A CT was organised which showed free fluid in the right upper quadrant and running down the right para-colic gutter. The gallbladder was inflamed, but there were also diverticulae noted around the hepatic flexure. Since the CT scan was not diagnostic, laparoscopy was performed in the first instance. Free bilious fluid was seen in all 4 quadrants of the abdomen. A right upper quadrant phlegmon was carefully opened, and perforation of the gallbladder was identified. Laparoscopic ultrasound was used to confirm anatomy, and the gallbladder was safely dissected laparoscopically. After cholecystectomy, lavage and irrigation was performed with close attention paid to washing all recesses in the abdomen. The patient made a full and uncomplicated recovery from this operation.

This case highlights the benefits offered by laparoscopy in both diagnosis and also treatment of an elderly patient with an acute abdomen. Where safe, we would advocate a laparoscopy-first approach in all such emergency cases. Once anatomy has been safely identified, the source of peritonitis can often be treated with laparoscopic techniques. The presence of substantial bilious peritonitis need not indicate the need for immediate conversion to open surgery. Surgeons must not disregard the need for thorough wash-out of all compartments of the abdomen in such cases, and fastidious attention to detail is recommended here to avoid post-operative complications.

P486 - Gastroduodenal Diseases

The Benefit of a Robot-Assisted Gastrectomy in Terms of Pylorus Preserving Gastrectomy for Early Gastric Cancer

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Purpose: Function preserving gastrectomy in early gastric cancer has developed. Robot surgery has theoretical advantages, such as increased degrees of freedom of instruments and 3-dimensional view. This study was to see whether a robot assisted pylorus preserving gastrectomy (RAPPG) shows real benefit over laparoscopy assisted pylorus preserving gastrectomy (LAPPG) in terms of short term surgical outcomes or not.

Methods: We conducted single center-based case-control study. The study included 16 patients underwent RAPPG, and 24 patients underwent LAPPG at the National Cancer Center, Korea between Feb 2012 and Dec 2012. No patient in given period was excluded in analysis. Clinicopathologic data, operation related data, postoperative morbidity and pathologic data were analyzed by Student t-test and Chi-square test.

Results: Age of patients was 51.7 + 10.3 in RAPPG and 57.5 + 13.1 in LAPPG. ($p = 0.126$) BMI (kg/m^2) was 24.1 + 2.9 in RAPPG and 24.1 + 3.1 in LAPPG. ($p = 0.945$) Postoperative hospital stays were 6.5 + 1.2 in RAPPG and 6.5 + 2.0 in LAPPG. ($p > 0.999$) Operating time was 222.2 + 21.9 in RAPPG and 239.0 + 62.7 in LAPPG. ($p = 0.238$) Number of dissected lymph nodes was 33.9 + 10.4 in RAPPG and 28.0 + 9.5 in LAPPG. ($p = 0.083$) Regarding postoperative complications, there were 1 patients (7.1 %) in RAPPG and 4 patients (16.7 %) in LAPPG ($p = 0.631$). Stasis occurred in 3 patients (18.8 %) after RAPPG and in 6 patients (25.0 %) after LAPPG. ($p = 0.717$) Differences of hemoglobin level between preoperative and immediate postoperative day were similar in both groups. ($0.9 + 0.8$ vs $0.9 + 0.7$, $p = 0.824$) Conversion rate to distal or total gastrectomy was 5.9 % (1/17) in RAPPG and 11.1 % (3/27) in LAPPG ($p \geq 0.999$).

Conclusion: RAPPG was comparable to LAPPG regarding surgical and oncologic outcomes. We might need more cases to show the benefit of robotic surgery in pylorus preserving gastrectomy.

P487 - Intestinal, Colorectal and Anal Disorders

Perforated Jejunal Diverticulum. Laparoscopic Management

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Aims: Diverticulae can occur anywhere along the digestive tract, but are most common in the colon. The incidence of diverticulae in the small bowel ranges from 1.1 and 2.3 % of total intestinal diverticulae. Asymptomatic in 60–70 % of cases and cause symptoms or surgical complications in 10–19 %. We present a patient with complicated jejunal diverticulum managed totally by laparoscopy.

Methods: 75 years old male with a history of colonic diverticulosis with diverticulitis episodes history by entering new episode of rectal bleeding. On the 4th day of admission, the patient presents abdominal pain of sudden onset associated with peritoneal irritation, suspecting complications of diverticular disease. On CT shows pneumoperitoneum secondary to transverse colon microperforation in the context of diverticular disease versus large jejunal diverticulum microperforation. The patient was placed in a supine position with the legs spread open in a 30° reverse Trendelenburg position. Exploratory laparoscopy is performed observing peritonitis secondary to a large perforated jejunal diverticulum, performing laparoscopic diverticulectomy using a linear stapler and abdominal cavity drainage.

Results: The patient had good postoperative recovery with drains removal on the 6th day after surgery and was discharged at seventh day. The histopathology report revealed a jejunal diverticulum perforation in the wall.

Discussion: The value of laparoscopy in patients with acute abdomen is known since the 50s, but has been in the last decade when it has begun to be used in surgery as a diagnostic method, and in the majority of cases, also therapeutic. Most authors advocate economic intestinal resection in cases of perforated jejunal diverticulitis. In our case due to the large size of the diverticulum was feasible to implement diverticulum resection without intestinal resection.

P488 - Intestinal, Colorectal and Anal Disorders

Laparoscopic 'No Touch' Intersphincteric Rectal Resection: Three Step Technique

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Intersphincteric resection (ISR) allows sphincter-saving surgery even in low rectal cancer. Described laparoscopic ISR have a potential disadvantage of inability to apply « no-touch » principle. We present new three-step technique (position-change approach) that allows performing oncologically adequate total mesorectal excision (TME) with intersphincteric resection even in anatomically narrow pelvis.

Surgical Technique: The surgical procedure is comprised of three stages. The first step of surgery is a laparoscopic trans-abdominal procedure with trocars placed as for typical low anterior resection. Paraaortic lymph node dissection at the root of inferior mesenteric artery is performed with ultrasonic scalpel and high ligation below left colic artery is done with LigaSure. The second step is transanal intersphincteric dissection. Lone Star retractor is placed into the anal canal, circular incision is performed 1 cm below tumour edge, lumen is closed with purse-string suture and the space between internal and external sphincters is developed up to puborectalis muscle (superior edge of anal canal). The lower part of mesorectum is also mobilized from below. Dissection stops at the middle of prostate in men, and middle vagina in women. The third step is abdominal TME performed with complete preservation of pelvic autonomic nerves until joining the perineal dissection plane. With low rectum already mobilized transanally, laparoscopic TME becomes easier to perform, excessive traction is not needed. The rectum with tumor and sigmoid are pulled through the anal canal and the colon is transected above the tumour. Splenic flexure mobilization is done rarely if colon length is not enough. Coloanal anastomosis between the colon, external sphincter, and the anoderm is performed with interrupted sutures. Finally, a pelvic drain is placed laparoscopically, and a protective colostomy is created in a port site. **Conclusion:** This approach allows to perform sphincter-saving surgery with no-touch principle. Therefore, laparoscopic ISR may be optimal strategy in the treatment of non-advanced selected ultralow rectal cancer.

P489 - Intestinal, Colorectal and Anal Disorders

A New Therapy for Non Healing Perineal Sinus After Removal of Ileal Pouch-Anal Anastomosis

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Restorative proctocolectomy with creation of ileal pouch for the treatment of Ulcerative colitis is established and safe procedure. The most common complication is pouchitis. In this article we describe a case of severe pouchitis which required removal of the pouch, complicated with chronic pelvic abscess formation treated with absolute alcohol.

Keywords: Pouch, Cuffitis, Removal, Abscess, Alcohol

P491 - Pancreas

Laparoscopic Transgastric Gastrocystostomy for Pancreatic Pseudocyst

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Aims: Pancreatic pseudocyst is a common complication of acute pancreatitis. Drainage is the treatment of choice if not resolved at 6 weeks of its establishment. Although the percutaneous and endoscopic access is gaining adepts, surgical access remains the 'gold standard' for best results. When the surgeon has enough experience, the laparoscopic approach is ideal. We present a laparoscopic transgastric cystogastrostomy

Methods: The patient is under general anesthesia and placed in the supine and subjected to a 15 to 30° reverse Trendelenburg position with legs apart. The surgeon placed between the legs and the assistants left and right of the patient. We used the four trocars technique. Details of laparoscopic approach is presented step by step in this video.

Results: Male patient 45 years old, developed a pancreatic pseudocyst 12 cm in diameter after enolic severe pancreatitis. Three months later, is operated and was given a laparoscopic transgastric cystogastrostomy. Total operating time was 55 min. No postoperative complications presented. He was discharged from the hospital on postoperative day 5. We describe the imaging appearance at 3 months after surgery. After half a year of follow-up no recurrence of pseudocyst was observed.

Discussion: Until the development of laparoscopic method, the only surgical type of treatment was a drainage of pseudocyst into the stomach or intestine by the open surgery. In a recent years, a new procedures of laparoscopic treatment of pseudocysts pancreatic were published. Despite of the small number of cases it is legible that this certain method of operative treatment has clear benefits for the patient

P490 - Morbid Obesity

The Role of Single Incision Laparoscopic Surgery (SILS) in Bariatric Surgery

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Introduction: Single-incision laparoscopic surgery (SILS) has the potential advantages of reduced postoperative pain and reduced port-site complications. In this article, we present our first experiences with SILS gastric banding (LGB) and laparoscopic sleeve gastrectomy (LSG) in the UAE in comparison to the international results.

Methods: Since May 2009, 73 carefully selected patients (Average body mass index 41.2, between 38.5 and 47.5 kg/m² with peripheral obesity) underwent LGB in 18 patients and LSG in 55 patients using this single incision technique. The same surgeon performed all surgical interventions. For all patients, the same perioperative protocol and operative techniques were implemented.

Results: Three LGB and one LSG were converted to standard laparoscopy. Three LSG needed additional 5 mm port. Mean operative time was 110 (95-165) min for LGB and 180 (70-350) min for LSG. The mean postoperative pain score was 06/10. 2 patients were totally pain free, 6 h after LGB. There were no postoperative complications after LGB. After LSG, there were two wound healing problems, two intraabdominal bleedings and three leaks from the stapler line at the level of oesophageo-gastric junction. All patients were very pleased with the cosmetic outcome.

Conclusion: Single incision laparoscopic surgery is feasible, allowing for scarless abdominal operations. This early experience suggests that outcomes are comparable to standard laparoscopic surgery but with improved cosmesis, however, long term results are awaited to confirm these findings. A new learning curve to reduce the timing of operation and the rate of postoperative complications is needed even for those surgeons who are performing advanced minimal access surgical procedures.

P492 - Pancreas

Laparoscopic Distal Pancreatectomy with Spleen Preservation for the Treatment of Neuroendocrine Tumor

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Aims: Minimally invasive pancreatic surgery, is still not considered standard procedure. Laparoscopic distal resection of pancreas is much more feasible due to lack of intestinal anastomoses. We present our approach to laparoscopic management of a body pancreatic tumor resection with spleen preservation

Methods: We described a 43-year-old woman who underwent laparoscopic distal pancreatectomy preserving the spleen and splenic vessels for the treatment of a neuroendocrine tumor in the pancreatic body. The patient experienced an important weight loss, one year diarrhea with an acute metabolic decompensation, received diagnosis of neuroendocrine tumor and referred for laparoscopic surgery. The patient was placed in a supine position with the legs spread open in a 30° reverse Trendelenburg position. Surgeon placed between the legs and the assistants left and right of the patient. Five ports were used to complete all the procedure and an enlargement of one of the ports was done to remove the specimen. Laparoscopic resection details are discussed in detail in the presented video.

Results: After surgery diarrhea disappeared. No major intraoperative bleeding. The patient had an uneventful recovery and was discharged on the fifth postoperative day with a drain due to a small pancreatic fistula, removing the drain a week after. Final pathological evaluation revealed a 42 × 30 mm well differentiated endocrine tumor with uncertain biological behaviour (Cytokeratin, CD 56 and Synaptophysin positive). Resection margins not affected

Discussion: This video demonstrates the feasibility and the steps involved in performing an adequate laparoscopic pancreatic resection in an endocrine tumor with all the potential benefits offered by the spleen preservation.

P493 - Spleen

Single Incision Laparoscopic Distal Pancreatectomy for Gastric Varices

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Splenic vein thrombosis is one of the complications of chronic pancreatitis, and hemorrhage due to gastric varices as a result of splenic vein thrombosis is rare. We report a rare case of the splenic thrombosis following single incision laparoscopic distal pancreatectomy (SILDP) in a 60-year-old man. He was admitted to our hospital because of the tarry stool. Upper gastrointestinal endoscopy showed fundal varices and computed tomography (CT) showed the thrombus in the splenic vein. The patient was successfully treated with SILDP. We performed SILDP because of adhesion due to the previous surgery (right hemicolectomy) and the postoperative complications such as anastomotic leakage and ileus. Postoperative CT showed the disappearance of thrombus in the splenic vein and the follow-up upper gastrointestinal endoscopy showed improvement of gastric varices. Pathologic finding of the tail of the pancreas showed chronic pancreatitis.

P494 - Emergency Surgery

Modified Mini-Laparoscopic Appendectomy: A Nonvisible-Scar Surgical Alternative

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Aims: Laparoscopic appendectomy via the three-trocar technique is widely used for appendectomy. Nowadays, new costly and complex techniques as the single incision laparoscopic (SILS) and natural orifice surgery (NOTES) have been developed to face the increasing concern about body image. This video demonstrates the mini-laparoscopic approach for acute appendicitis in one patient of our initial prospective case series.

Methods: Between October and December 2012, patients <40 year old, with a body mass index < 30 kg/m², and with suspected early phase of acute appendicitis were enrolled. All operations were performed by the same surgical team. Three ports were used: a 12 mm intraumbilical port, a 5 mm suprapubic port, and a 2.3 mm port placed in the right iliac fossa. The position of the surgical team was modified according with the standard laparoscopic appendectomy. The operator was positioned in the patient left, in a cephalic position, the first assistant stayed at the operator left, and the scrub nurse facing them. The screen was placed on the right side but at the patient-right-upper quadrant. Always preserving an optimal laparoscopic triangulation, the 5 mm/30° laparoscope was placed in the 5 mm suprapubic trocar. Demographics, clinical, and surgical characteristics were recorded.

Results: A total of 7 patients with a mean age of 25 ± 6 years underwent this approach. The mean duration of the operation was 50 ± 10 min. Total incision surface was in all cases of 19.3 mm. Right parietocolic visualization since the suprapubic port was better than at the standard periumbilical one, and mesoappendix dissection was also facilitated since this optical position. The operation was completed successfully in all patients, and conversion to either standard laparoscopic or open surgery was not required. All patients experience oral intake reintroduction after 12 h and were discharged after 42 h of the surgery without any complication. The appearance of the abdominal scars was excellent in all the patients at 10 days after surgery.

Conclusions: Modified mini-laparoscopic appendectomy was feasible and safe in this initial experience, and could represent a reproducible alternative to standard and advanced minimal invasive techniques. The view provided via the suprapubic position makes access to and dissection of the appendix easier.

P495 - Endocrine Surgery

The Role of Video-Assisted Parathyroidectomy in Treatment of Patients with Primary Hyperparathyroidism

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To introduce minimally invasive operations in patients with primary hyperparathyroidism (pHPT), we have chosen minimally invasive video-assisted parathyroidectomy (MIVAP), introduced by P. Miccoli in 1997, because this operation combines the advantages of endoscopic and open surgery: small trauma, the use of endoscope and instruments for open thyroid surgery, the possibility to perform bilateral neck exploration.

Aims: To analyze results of conventional and MIVAP in treatment of patients with pHPT. **Methods:** In 2010-2012 we have operated 32 patients with pHPT, of which 27 were women, middle age of patients was 58.2 ± 12.1 years. We divided all patients into two groups: I—11 patients who underwent MIVAP, II—21 patients, who were operated with conventional operation. Selection criteria for group I were: diagnosis of single adenoma based on preoperative localization studies (ultrasonography, sestamibi scintigraphy, or both), no previous neck surgery or concomitant thyroid diseases.

Results: Duration of surgical intervention was significantly lower in the first group (48.3 ± 10.2 min vs 95.1 ± 14.6 min, $p < 0.05$). Length of incision was shorter in patients of first group (2.5 ± 0.2 cm vs 5.9 ± 1.1 cm, $p < 0.05$). We didn't perform conversion. Efficiency of MIVAP was confirmed with intraoperative frozen section analysis. In one patient (4.8 %) of second group developed transient paresis of recurrent laryngeal nerve. In 2 patients (9.5 %) of second group transient symptomatic postoperative hypocalcemia was observed.

Conclusion: MIVAP in carefully selected patients (34.3 %) is an effective minimally invasive method of surgical treatment of patients with pHPT, which reduces the time of surgery, the incidence of postoperative complications and has good cosmetic effect.

P496 - Liver and Biliary Tract Surgery

Warmed, Humidified Carbon Dioxide Insufflation vs. Standard Carbon Dioxide in Laparoscopic Cholecystectomy

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Aim: Patients undergoing warmed, humidified carbon dioxide (CO₂) insufflation for laparoscopic cholecystectomy (LC) will have less postoperative pain than patients undergoing laparoscopic cholecystectomy with standard CO₂ insufflation.

Patients and Methods: This is prospective, randomized, double-blinded, controlled trial. 148 patients (w = 103, m = 45) scheduled for elective LC were randomized into either receiving heated humidified carbon dioxide or standard gas. Intraoperative core temperature was measured. The perioperative management was identically for both groups. Postoperative pain intensity was assessed using a visual analogue pain scale (VAS), and the amount of analgesic consumption was recorded. The postoperative pain management was also standardized and equal for both groups.

Results: The study is closed now; the complete results are still in evaluation and will be presented at the 21st International Congress of the European Association for Endoscopic Surgery.

Preliminary results show, that patients operated with non-heated gas feel more pain at the day of operation and the first postoperative day.

Conclusion: Our study should reveal the positive effect of heated and humidified carbon dioxide gas on patients with regard to postoperative pain after laparoscopic cholecystectomy.

P497 - Oesophageal and Oesophago gastric Junction Disorder

Is There a Need for Pyloroplasty in Laparoscopic Oesophagectomy

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Aims: The aim of this study is to evaluate the outcomes of laparoscopic oesophagectomy without performing pyloroplasty.

Methods: Retrospective review was carried out on 35 consecutive oesophago gastric cancer patients having undergone laparoscopic oesophagectomy without pyloroplasty. The outcomes were measured in terms of developing postoperative delayed gastric/conduit emptying or evidence of pyloric stenosis. The interventions undertaken to resolve the problem were also recorded.

Results: 5/35 (14.3 %) of laparoscopic oesophagectomy without pyloroplasty developed postoperative gastric delayed emptying with endoscopic evidence of pyloric stenosis. 4/5 (80 %) patients were managed conservatively with endoscopic dilatation. One (20 %) patient needed laparoscopic pyloroplasty.

Conclusions: Laparoscopic oesophagectomy without pyloroplasty is safe and feasible with low incidence of delayed gastric emptying. Most cases where delayed gastric emptying can be managed by endoscopic dilatation.

P498 - Pancreas

Laparoscopic Radical Antegrade Modular Pancreatosplenectomy Procedure for Cancer of the Body and Tail of the Pancreas

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Background: Laparoscopic extended lymph node dissection for pancreatic body and tail cancer is difficult to perform. Especially it is absolutely necessary to obtain negative surgical margin even in the minimally invasive surgery.

Objective: We hypothesize that to obtain negative surgical margin certainly in minimally invasive surgery, "radical antegrade modular pancreatosplenectomy procedure" is very effective. So we report our experience with laparoscopic distal pancreatectomy with left adrenalectomy for a patient with advanced pancreatic tail cancer which is suspicious for invasion to the retroperitoneum.

Methods: At first the lesser sac is entered and the short gastric vessels are dissected. And then, the neck of the pancreas is elevated off the superior mesenteric and portal veins. The neck of the pancreas is divided by using the linear stapling device. Lymphadenectomy around the common hepatic artery is performed, the splenic artery and vein are ligated and divided close to its origin, and lymphadenectomy around the celiac artery are performed. In laparoscopic approach, it is very difficult to dissect around the SMA because plexus nerves around there are very thick. So previously the left renal vein is exposed, and then the adrenal vein is divided at its union with the renal vein and the dissection proceeds posterior to the adrenal and then more laterally behind Gerota's fascia directly onto the surface of the kidney. In laparoscopic surgery the plane is dissected more easily and safely in an excellent view than open surgery. After the plane is dissected near to the diaphragm as possible, the left side of the aorta is exposed. And then the plane of dissection proceeds vertically in the sagittal plane, exposing the left side of the aorta up to the level of the celiac artery and the SMA. After retroperitoneal dissection, dissection around the celiac artery and SMA is more easily and safely because effective countertraction is obtained.

Conclusions: Radical antegrade modular pancreatosplenectomy procedure could enable us to perform radical lymphadenectomy and obtain negative surgical margin for the cancer of the body and tale of the pancreas much more easily and safely in an excellent view even in the minimally invasive surgery.

P499 - Pancreas

Laparoscopic Approach to Treatment Pancreatic Insulinoma

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Aims: Our intention is to show one of the approach for treatment of pancreatic insulinoma, which we implemented in our laparoscopic list of laparoscopic procedures. Although this procedures are very difficult for surgeon, these are very acceptable for patient because of many benefits of this kind of operation.

Methods: We have one case report of patient with next characteristic. Patient 51 years old with hypoglycemic syndrome 1 mmol/l, BMI 35,9, high concentrate: glucoses, insulin, C-peptide. CT show to us tumor on upper margin of pancreas body, size—23 × 20 mm. We operated patient with laparoscopic approach. Operation performed with 4 trocars.

Results: We had next characteristic of operation: Number of trocars is 4, obesity patient, difficult formation of operating space, bleeding in small surface, difficult moving the laparoscopic instruments. Operation time is 150 min, postoperative stay 2 days, with minimal consumption of analgetics.

Conclusion: This approach reserved only for well diagnosed benign insulinoma on the surface of the pancreas, and for surgeon with high experience in laparoscopic surgery without chance to damage pancreatic duct. In these select patients, it is best choice for the patients because less traumatic approach, less stay of hospital, analgetic consumption and better functional and cosmetics result.

P500 - Urology

Laparoscopic Port Economy - Technical Solutions

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Introduction and Objectives: During laparoscopic surgery, tissue traction is often needed to improve exposure and facilitate the procedure. Typically, additional ports are placed and ancillary instruments are used for this purpose. In this video we describe techniques that avoid placement of additional ports without compromising on the quality of dissection and tissue exposure.

Material and Methods: Exhibits:

Traction of prostate during wide prostate resection.

Traction of lower pole of a kidney during LESS nephrectomy.

3. Control of spleen using Endograb™ for renal hilar vessel dissection during nephrectomy

4. Expansion of the visual field with Endograb™ for distal ureterectomy with bladder cuff during laparoscopic nephroureterectomy

5. Liver control during right-sided renal surgery with several techniques, including Endolift™.

Conclusion: In urologic laparoscopic surgery several technical adjustments allow for safe and efficient traction without placement of additional ports.

P501 - Amazing Technologies

Transumbilical Multi-mini Port Clipless Cholecystectomy Without Using Triport

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Transumbilical multi-mini port clipless laparoscopic cholecystectomy is a novel laparoscopic surgical technique for cholecystectomy utilizing only a transumbilical incision, which eliminates any visible abdominal scars and improves cosmesis. This pilot study was conducted to assess the safety, feasibility, and short-term outcomes of transumbilical multimini port clipless laparoscopic cholecystectomy using conventional laparoscopic equipment. Transumbilical multi-mini port buying a Harmonic scalpel, it is economical for patients in poor countries that cannot afford the expensive triport. Fifteen clipless cholecystectomy without using the triport technique takes about 55 min less time. After the initial expense of patients (14 females average age 40 years and 1 male age 45 years) underwent laparoscopic cholecystectomy. To reduce the triport technique, so this single-port technique is feasible for performing routine laparoscopic procedures.

The duration of surgery was 55 ± 20 min. Blood loss, patient recovery, and outcomes were comparable to those of using cost, an innovative technique was used in which 3 small incisions were made along the edge of the umbilicus in a 'J' fashion.

P502 - Amazing Technologies

Transumbilical Clipless Laparoscopic Cholecystectomy Using Puppeteer Technique

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This is a pilot study of 15 cases to assess the safety, feasibility, and short-term outcomes of trans umbilical clip less laparoscopic cholecystectomy using single operating port. Sutures are used for retraction of the gallbladder—a technique known as the 'puppeteer technique', Puppeteer stings act similar to the traditional three ports. The Harmonic scalpel is not only a safe and effective instrument but also a reliable substitute for clips because it provides complete hemobiliary stasis. Due to puppeteer movement the visibility and trifurcation was brilliant and retraction is done easily at the junction of cystic duct & CBD. This methods gives the clarity and safety of conventional four port technique and at the same time gives cosmetic result of scar-less surgery

P503 - Amazing Technologies

The Reliability of Radiological and Endoscopic Investigation in Diagnosis of Colorectal Cancer

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Background: Imaging modalities to diagnose colorectal cancer (CRC) include double contrast barium enema (DCBE), CT colonography (CTC), flexible sigmoidoscopy and colonoscopy. Failure of diagnosis following these investigations can lead to increased disease burden and worse treatment outcome. The aim of this study is to determine the sensitivity of colorectal imaging in the detection of CRC.

Methods: A prospectively maintained colorectal cancer database was used to perform a retrospective review of all new colorectal cancer cases between January 2010 and April 2012. The investigation of these patients was compared to previous investigations within 12 months. An examination that was negative for cancer with no immediate follow up was defined as a missed cancer. The missed diagnosis rates were compared between the different imaging modalities

Results: 449 patients were diagnosed with colorectal cancer (277 male, 172 female). The mean age at diagnosis was 70 years (37.4–90.6). 85 (18.9 %) cases were investigated following an emergency presentation and 45 (10 %) were from population screening. CT was the most common method of investigation (44.5 %), followed by flexible sigmoidoscopy (24.1 %), colonoscopy (16.3 %) and DCBE (14 %). The overall missed cancer rate was 2.67 % (12/449 patients). The rates of missed cancer by investigation were 2 % (4/200) in CTC, 1.85 % (2/108) in flexible sigmoidoscopy, 4.11 % (3/73) in colonoscopy and 4.76 % (3/63) in DCBE.

Conclusions: Our results compare favourably to those previously reported. However, there is an incidence of missed diagnosis with all modalities. Patients should be counselled to include missed diagnosis when being investigated for possible CRC. Patients with persistent symptoms should be considered for re-investigation.

P504 - Amazing Technologies

Single Incision Laparoscopic Surgery with Homemade Glove Port: Tips and Tricks

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Background: Single incision laparoscopic surgery (SILS) is a novel technique and provide excellent cosmesis.

Aim: Single Incision Laparoscopic Surgery with Homemade Glove Port is easy in experienced laparoscopic surgeons. Our homemade glove port is easy to use and cost-effective than the other homemade gloveport.

Project description: We presented an easy, feasible and cost-effective method for single incision laparoscopic surgery.

Method: We performed 41 SILS procedure From January 2012 to January 2013. In this technique, we used one powder free glove (left or right), one 3/0 polypropylene suture, two cable ties instead of wound retractor which is used other homemade glove port techniques. Outcome measures included need for conversion, operative time, length of hospitalization, cosmetic outcome, and complications.

Results: There were 31 cholecystectomies, 4 appendectomies, 4 inguinal hernias, and 2 umbilical hernias with a median operative time of 45, 25, 65 and 29 min, respectively. Mean hospital stay was 1.2 days for cholecystectomy, 1.2 days for appendectomy, 1 day for transabdominal preperitoneal hernia repair, and 1 day for umbilical hernia repair. All umbilical scar was well. There were no perioperative port-related or surgical complications. Only one patients convert to normal laparoscopy than open surgery in cholecystectomy group.

P505 - Amazing Technologies

Robotic Complex ‘Da Vinci’ in Pancreatic Surgery

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Materials and Methods: in abdominal department of Surgery Institution Named for A.V. Vishnevskiy 110 robot-assisted operation were done since 2009. Among them were 19 pancreatic interventions: 13 distal resections, 3 resections of the pancreas head, two middle pancreas resections, one pylorus-saving pancreaticoduodenal resection.

In 11 cases cystic tumors of pancreas were found (4 mucinous tumors, 1 serous cystadenoma, 1 Intraductal Papillary Mucinous Neoplasm, 5 solid pseudopapillary tumors). Five patients underwent surgery for neuroendocrine tumors. Ductal adenocarcinoma was diagnosed in 3 cases.

Results: The most optimal application points of robotic technologies in pancreatic surgery could be distal (especially in case of spleen saving) and middle resections also saving resections of pancreas head. Until now it is more reasonable to provide different pancreaticoenteroanastomosis in the end of the surgery using laparoscopic and minilaparotomic techniques. We believe that it doesn't harder the post operation period and leads to reduction of the operation time. Due to the great manipulation advantages of the robotic instruments and possibilities of 3D imaging pancreatic surgery is provided with more safety and accuracy in comparison with traditional laparoscopic technique. There were no complications found during the operations. All of the interventions were done without or with small blood loss (50–100 ml). Medium duration of postoperative period was 11 days.

Conclusions: Robotic complex usage offers the opportunity to provide high quality volume image, precise mobilization, decrease of the intraoperative injury and blood loss, comfort position of the surgeon during the pancreatic operations.

P506 - Amazing Technologies

Innovative Educational Method for Laparoscopy: Online Real-Time Live Surgery Symposium

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Objectives: To find educational methods to deliver up-to-date surgical information and techniques in a faster and more cost-effective way to all surgeons across the world than offline symposium on internet base.

Method: The title of symposium and schedule are determined and 4–5 surgeons are arranged to participate as an online panel. On the day of symposium, panels access to specially designed teleconferencing system which is already connected with laparoscopic camera and operation room, and then have discussions each other with an operator watching operation in terms of techniques and recent information regarding the operation. The operation and discussions are broadcasted to the audiences over internet in real-time. The audiences can watch the symposium on PC or smart phone as well as can ask the questions about the operation or leave comments using chatting tool which is also specially designed for the symposium. The symposium itself is recorded and provided VOD form in web site for the surgeons who missed the symposium or want to watch again.

Results: The first online real-time live surgery symposium was held on Feb. 23, 2012, and 7 more symposiums have been done ever since. Each symposium managed different surgical subjects which were colorectal cancer, stomach cancer, appendicitis, cholecystitis and hernia. The first symposium did not draw much attention, which just brought less than 100 audiences, because of lack of public acts and recognition. However, as the symposium went on, it was widely recognized and the number of audiences was increased gradually in every symposium. Especially, the fourth symposium with the title of laparoscopic gastrectomy was watched by more than 500 audiences.

Conclusion: I believe online real-time live surgery symposium could be one of the very effective alternatives that will play a leading role in the education and diffusion of laparoscopic surgery in the near future.

P507 - Amazing Technologies

On the Road of Less: Results After Five Years' Experience and More than 300 Cholecystectomies

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Background: LESS (Laparoendoscopic Single-Site Surgery) is a relatively new approach to perform minimally invasive surgeries. Its main goal is to cause less metabolic and inflammatory reaction in patients, allowing a faster return to regular daily activities, with better cosmetic results. The literature is deficient in long-term studies, with large series and experiences, using this surgical approach. This study presents the results collected during five years' experience and more than 300 LESS cholecystectomies.

Methods: Between 2008 and 2012, 312 LESS cholecystectomies were performed by the same surgical group. All patients had symptomatic cholelithiasis. The SITRACC—Single Trocar Access (Edlo Company, Brazil), which is a LESS multichannel platform with special curved and articulated instruments, was used. Conversion rate and its main causes, operative time, operative and post-operative complications were studied. The medium post-operative follow-up was 1.7 years.

Results: The average operative time was 38 min. Nine cases were converted to conventional laparoscopy and 11 cases needed an additional port to perform this procedure safely. About the post-operative complications, one case needed reoperation by conventional laparoscopy due to bleeding of the cystic artery few minutes after the procedure. Four trocar site hernia were found, and one retained choledocholithiasis needed endoscopic management.

Discussion: The LESS approach needs larger series, as well as comparative studies between this new approach and conventional laparoscopy surgery. The literature is quite deficient in order to answer several important questions about LESS procedures, such as trocar site hernia rate and recovery time.

Conclusions: The LESS cholecystectomy is feasible and safe. The operative time, after passed the learning curve, reaches values similar to those procedures made by conventional laparoscopic surgery. New studies are needed, using larger series, to compare this still new approach to the conventional endoscopic surgery procedures, especially concerning the operative trauma, metabolic response and hernia trocar rate.

P508 - Amazing Technologies

Pure Transgastric Notes in Adnexal Procedures: The First Human Case Report

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Background and Aim: Natural orifice transluminal endoscopy surgery (NOTES) is an innovative procedure that represents a further evolution of minimally invasive surgery. To our knowledge, pure transgastric NOTES for adnexal procedures has not been reported in human being, though some were carried out in animal experiments. Here we report the first clinical application of pure transgastric NOTES for adnexal diseases and evaluate its feasibility and safety.

Project Description: On December 15, 2012, a 36-year-old female patient presented with vaginal bleeding 20 days and left lower abdominal pain 3 days. Her last menses was 10 weeks before this visit. She has no history of abdominal surgery. The serum beta-human chorionic gonadotropin (β -hCG) was 547.23 mIU/ml (normal less than 5 mIU/ml). Transvaginal ultrasonography confirmed the diagnosis with left fallopian tubal ectopic pregnancy and right simple ovarian cyst. A pure transgastric NOTES procedure was performed after approved by the hospital ethical committee. The operation process including: (1) creation of gastric access by using PEG-like gastrotomy technique; (2) establishing pneumoperitoneum with laparoscopic insufflator: a 8Fr abdominal flexible drainage catheter was placed on right lower abdomen and connected to a laparoscopic insufflator; (3) detection of uterus and bilateral adnexa: a superficial endometriosis lesion was occasionally found on the right ovarian surface. The ectopic pregnancy mass and ovarian cyst were observed; (4) Cystotomy of the ovarian cyst with Hook knife; (5) electrical cautery of the superficial endometriosis lesion with Coagrasper; (6) salpingostomy and dissection of the ectopic pregnancy lesion from the tubal wall with Hook knife and IT knife without laparoscopic assistance; (7) removal of the lesion and observation of no remnant; (8) closure of the gastric incision with endoclips and nylon loops.

Preliminary results: The patient did well postoperatively without any complications. There was no evidence of intraabdominal infection or bleeding. Oral intake was resumed 72 h after the operation. Serum β -hCG returned to normal 3 day after operation. The histological examination confirmed the presence of chorionic villus in the specimen. Follow-up endoscopy on the 5th postoperative day showed well healing of the gastric incision.

P509 - Amazing Technologies

Oxidative Stress Markers in Laparoscopic Versus Open Appendectomy for Uncomplicated Acute Appendicitis: A Double-Blind Randomized Study

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Acute appendicitis is known as the most common causes of urgent surgery due to acute abdominal pain. Advantages and disadvantages of open appendectomy (OA) versus laparoscopic appendectomy (LA) is still remains an area of active research. Oxidative stress is the condition defined as an imbalance in the cells between oxidants formed by various processes and the antioxidative mechanisms, and abdominal surgery is associated with the generation of oxidative stress. The goal of this prospective trial was to compare oxidative stress in patients who underwent LA and OA for uncomplicated appendicitis by analyzing the levels of serum markers of oxidative stress and inflammation. One hundred patients with uncomplicated acute appendicitis were randomly assigned to LA or OA. Levels of pre-operative and postoperative leukocyte, C-reactive protein, Vascular Endothelial Growth Factor (VEGF), Vascular Endothelial Growth Factor Receptor Antagonist -1 (Flt-1), Total Anti-oxidant status (TAS), Total oxidative stress (TOS) and oxidative stress index (OSI) were measured, and the demographic parameters of the patients were denoted. Oxidative stress markers were found lower in LA group. This study provides evidence that laparoscopic surgery for uncomplicated acute appendicitis is associated with significantly lower oxidative stress compared to open surgery.

P510 - Amazing Technologies

Laparoscopic Spleen-Preserving Distal Pancreatectomy: A Single Institution Experiences of 45 Cases

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Background: Spleen preservation during laparoscopic distal pancreatectomy has been proposed as a means to reduce the risk of postsplenectomy sepsis, hematologic and immunologic disorders.

Aim: To evaluate the feasibility and safety of Laparoscopic spleen-preserving distal pancreatectomy. Project description: Two alternative techniques; sparing of the splenic artery and vein, or splenic preservation with sacrifice of the splenic artery and vein (Warshaw procedure) were compared.

Preliminary results 28 patients underwent splenic vessel preservation (SVP group), and 17 patients underwent splenic vessel divided but short gastric and left gastroepiploic vessels conservation (WT group). The mean operative time, mean blood loss, mean postoperative hospital stay and the rate of overall postoperative complications did not differ between the two groups. The tumor size was significantly greater in the WT group than SVP group (3.92 cm vs 2.59 cm; $p = 0.007$).

P511 - Amazing Technologies

Definition of the Best Individual Pressure Maintenance in Artificial Pneumoperitoneum Laparoscopic Surgery

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Background: Artificial pneumoperitoneum.

Aim: establish an individual pattern of maintenance pressure of the artificial pneumoperitoneum.

Project Description: prospective clinical study with patients submitted to videolaparoscopy. We measured the distance between the inferior extremity of the xiphoid appendix to the upper edge of the pubis, and assessed the values of the intratracheal pressure, the intraperitoneal pressure and the volume of carbon gas insufflated during the creation of the artificial pneumoperitoneum. The data was collected in many moments during the confection of pneumoperitoneum.

Preliminary Results: The measurements of the xiphopubic distance showed a direct relation with the intraperitoneal pressures. The adequate maintenance pressure of the pneumoperitoneum for videolaparoscopic surgery will be the one measured by the insufflator when it is obtained an increase of 8 % in the xiphopubic measurement measured when the patient is anesthetized and in the absence of pneumoperitoneum.

P512 - Amazing Technologies

The Sterilization Method for Laparoscopic Instruments in Developing Country

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The disposable cover for video scope of laparoscope and its cable is available, but not enough for all patients. The purpose of this study is to know whether our sterilization method increase infection rate such as hepatitis B & C or HIV.

Submerging video scope and its cable, light source cable, cautery wire in Cidex liquid and sprayed by ethyl alcohol 96 % used in our hospitals.

The post operative blood test of hepatitis B & C or HIV for (76 patients) who received laparoscopic operation. The post operative blood reexamination is carried out.

All of cases of preoperative negative HB, HC, and HIV were negative results postoperatively.

If this procedure is practiced in many developing countries, better to accept this fact as a reality and to accumulate more results like our research for the decision to accept this procedure clinically or not.

P513 - Amazing Technologies

Robot-Assisted Live Donor Nephrectomy - The Rotterdam Experience

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Background: Laparoscopic donor nephrectomy has become the gold standard for live donor nephrectomy (LDN). We expanded our surgical armamentarium with the da Vinci Surgical System (DVSS) to evaluate the multiple technical advantages during LDN in order to maximize donor safety.

Aim: The aim of this project is to evaluate the feasibility and donor safety of the DVSS during LDN.

Project Description: Donors were eligible for DVSS, provided they had a BMI under 26, a left-sided nephrectomy was indicated and preoperative imaging revealed no multiple vascular anatomy. Two robot arms are used: a Fenestrated Bipolar Forceps and a Harmonic ACE Curved Shears (HACS).

Preliminary Results: Thirty-eight donors have been operated. The HACS was switched to a Permanent Cautery Hook after eight LDN to maximize surgical precision. Results show an intermediate learning curve in operation time, with no significant difference in warm ischemia time compared to laparoscopy ($p = 0.19$) and no conversions.

P515 - Amazing Technologies

Comparison of Tissue Response to Flat and Stepped Design Linear Stapler Cartridges

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Background: Linear staplers apply uniform compression to tissue, with potential for high shear stress especially in thick/dense tissue, possibly resulting in tissue damage. A stepped cartridge design could reduce shear stress and improve device performance.

Aim: This study examined stapler cartridge design effects on tissue deformation and correlated observations to a soft tissue FEA model.

Project Description: Tissue was compressed utilizing commercially available staplers, fixed (in place) in 10 % buffered formalin and prepared for standard histopathological assessment. Acute tissue response was subsequently compared to the FEA model (utilizing the same anvil and cartridge profiles).

Preliminary Results: Differences between acute tissue response to compression by flat and stepped stapler cartridges were revealed; flat cartridges produced more uniform tissue response although this distribution may not be ideal. Tissue deformation observed via histology and FEA modeling suggests that high stress concentrations present at the edges of the stapler could negatively impact tissues.

P514 - Amazing Technologies

Laparoscopic Anterior Ramps for Left-Sided Pancreatic Cancer: Technical Feasibility and Short-Term Results

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Background: Laparoscopic distal pancreatectomy with splenectomy is regarded as a safe and effective treatment for benign and borderline malignant pancreatic lesions, but debate still remains its application for left-side pancreatic cancer.

Aim: To evaluate the feasibility and safety of laparoscopic radical distal pancreatectomy with splenectomy for left-side pancreatic cancer.

Project Description: 20 patients treat with RAMPS procedure were collected in a prospective database in Peking Union Medical College Hospital. Patient's demography, intra-operative variables and postoperative complications were evaluated.

Preliminary Results: 5 patients with left-side pancreatic cancer underwent laparoscopic RAMPS, mean operative time and blood loss during operation were 235 ± 65 and 238.1 ± 70.5 respectively, mean tumor size was 3.5 ± 0.8 , node harvest was 14 ± 3 , one patient suffered from R1 resection and four patients suffered from R0 resection. There was no significant difference from data of open RAMPS, Laparoscopic anterior RAMPS is feasible in selected patients with left-sided pancreatic cancer.

P516 - Amazing Technologies

Transanal Single-Port Video Assisted Endosurgery a Feasibility Study of a New Single-Port Access

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Singe port laparoscopic techniques are transferred for transanal access and hybrid techniques are in evolution.

Here we present the clinical application of a new transanal single port for video assisted excision of rectal tumors.

Three non selected patients eligible for TEM were offered a procedure performed via a disposable single port (Triport) anchored to the anal canal with the aid of a circular anal dilator. Pneumorectum was established, followed by trasanal excision of rectal lesions, with the use of a laparoscope and ordinary laparoscopic instruments.

Three patients, aged 45–72 years old underwent transanal excision of rectal lesions. The average distance from the anal verge was 6,3 cm and the mean tumor diameter confirmed by pathology was 4.35 cm. Pneumorectum was maintained well through the whole procedures that were lasted in average 81 min.

The transanal video-assisted excisions of rectal pathologies with the aid of this single port and anal dilator is feasible and effective. It exhibits important advantages over TEM.

P517 - Amazing Technologies

Selection of Laparoscopic Surgical Strategy for Proximal Gastric Cancer

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Background: The selection of surgical strategy for patients with proximal gastric cancer is controversial.

Aim: The study aims to investigate the surgical outcome of the three most commonly used operative procedures and determine an optimal laparoscopic surgical approach for proximal gastric cancer.

Project Description: Between May 2009 and October 2012, a total of 70 patients underwent LAG for proximal gastric cancer by the same surgeon. Of these, 23 underwent LAPG, 34 underwent LATG-RY and 13 underwent LATG-OrvilTM. We reviewed their records from our prospectively collected proximal gastric cancer database. The patient characteristics, clinico and pathologic outcomes were compared among the three groups.

Preliminary Results: LATG-OrvilTM may be an optimal laparoscopic surgical approach for proximal gastric cancer with sufficient lymph node dissection, satisfactory early recovery, and acceptable morbidity.

P518 - Amazing Technologies

Multiorgan Female Pelvic Prolapse: A New Laparoscopic Approach and Results P.O.P.S. + S.T.A.R.R.

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Background: Many women who underwent traditional surgery for pelvic organ prolapse had a relapse.

Aim: To demonstrate the surgical treatment validity and the post-operative complication decrease

Project Description: 73 women who underwent P.O.P.S. + S.T.A.R.R. treatment, follow-up one year

Preliminary Results: we observed an important reduction or a completely disappearance about pre-operative signs and symptoms. We are aware that the proposed technique, if taken into account by urogynecologists, will raise several arguments and will raise many doubts and perplexities. For this reason we wanted to develop a follow-up sufficiently long and many case studies with data to support our claims. The results were excellent in patients with multiorgan pelvic prolapse, especially with the vagina walls elongated and that retain a good trophism.

P520 - Amazing Technologies

TEP Inguinal Hernia Repair, Comparison Between Postoperative Pain Using Glue or Protack Fixation Device For Mesh Fixation

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Background: While performing laparoscopic TEP inguinal hernia repair in our hospital, polypropylene mesh (Braun optilene Mesh) was usually fixed with Covidien protack fixation device. In our research, we have decided to fix one part of used meshes with Hystoacryl Braun glue.

Aim: We wanted to know whether there was a difference in post-operative pain in patients with bilateral inguinal hernia TEP repair which was made bilaterally having on one side polypropylene mesh fixed with Covidien protack fixation device, and on the other side with Hystoacryl Braun glue.

Project Description: In the period from May 2012 to February 2013, 30 patients with bilateral inguinal hernia underwent surgery as described above.

Preliminary Results: There is a significant statistically difference in postoperative pain first and second postoperative day.

P521 - Amazing Technologies

Transanal Endoluminal Total Mesorectal Resection (TETMR) by Transanal Endoscopic Microsurgery (TEM) for the Treatment of Low Rectal Cancer

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Background: TETMR is a sphincter preserving technique combining transanal TME with TEM instrumentation and laparoscopy.

Methods: Transanal TME is achieved with a modified TEM rectoscope. Splenic flexure mobilization and vascular control are performed by laparoscopy, followed by colo-anal anastomosis and ileostomy.

Preliminary Results: TETMR by TEM was performed in eight patients (5 males, 3 females, median age 66 years) with mean tumor distance from anal verge 2.9 cm. Mean operative time was 450 min. Seven patients underwent neoadjuvant radiochemotherapy (nRCT) and one patient (T3N0) received adjuvant RCT. No intraoperative complication occurred. Postoperative complications were anastomotic leakage (3) and urinary incontinence (1). Mean hospital stay was 16.6 days. Mortality was nil. Final staging was pT3N1 (1), pT3N0 (1), pT2N0 (4), pT0N0 (2). Late complications included anastomotic stenosis (2) and recto-vaginal fistula (1) treated by stent.

Conclusions: TETMR by TEM is a safe and effective approach. Adequate experience in TEM is mandatory.

P522 - Amazing Technologies

The Application of Laparoscopy in Cases with Abdominal Surgery History Cases

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Background, Aim: To summarize the application of laparoscopy in the abdominal operation and evaluate the feasibility and short-term effect of laparoscopy in secondary abdominal surgery.

Project Description: The clinical data of thirty-five cases underwent laparoscopy from December 2002 to July 2009 were analyzed in the study. Fifteen cases having the history of cesarean section were operated colorectal cancer radical correction with laparoscopy.

Preliminary Results: The secondary surgery was performed successfully in all cases with the aid of laparoscopy. The average operation period was 140 min. The mean amount of bleeding less than 50 ml. The first anal exsufflation time ranged from 24 h to 72 h with an average value of 38 h. The pathologic results of the edge of neoplasms in all cases are negative. There was no operative complication such as junction leak occurred in any cases.

P524 - Amazing Technologies

Laparoscopic Bile Duct Exploration Using Cholangioscope Patent No.DE102007047334A1

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Background: Laparoscopic bile duct exploration (LBDE) is still practiced sporadically because of lack of dedicated LBDE Set.

Aims: LBDE is the method of choice in cases of: 1-After the failure of endoscopic method, 2-Patients with gastric bypass, 3-Hepatic lithiasis, 4-Cystic duct lithiasis. The purpose of this paper is to show that Cholangioscope as a crucial component of the Set has a decisive role in the routine clinical application and LBDE expansion. Project description: The first LBDE the author performed the January 30th 1993 using a flexible fiberscope. It turned out that this was a very complicated procedure. From 1996 through 2010 were designed and manufactured four generations of Cholangioscope which is modular instrument consisting of a flexible fiberscope (FF) and Rigid Telescopic Introducer (RTI).

Preliminary results: From January 1993 to March 2013 was successfully performed 764 LBDE. The Cholangioscope significantly shortens the duration of the procedure.

P523 - Amazing Technologies

Effects of Long Term Bed Rest on the Coagulation System as a Model for Post Surgical Immobilization

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It is generally believed that bed-rest shifts the haemostatic system towards hypercoagulability. Therefore, bed-rested and immobilized patients are commonly treated with anticoagulants. Pro-coagulatory changes in bed-rested and immobilized patients are commonly known and treated with anticoagulants to prevent hyperclotting, it is still unclear which exact endothelial and haemostatic effects occur during bed-rest.

To examine whether long-term bed-rest leads to coagulatory changes, we performed haemostatic profiling prior, during and 2 days after bed-rest of 21 days.

The blood samples were collected from 12 healthy male subjects undergoing 21 days of strict bed-rest. We recorded thrombin formation, clot development curves and markers of thrombin formation and fibrinolysis.

We have reason to believe that this study confirms our results from an earlier study, that in healthy subjects bed-rest does not cause hypercoagulability.

The results can be useful for patients confined for long term periods in bed such as after surgical operations.

P526 - Amazing Technologies

Surgical Skills Acquisition and Retention Using Virtual Reality

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Background: In the ever-escalating procedural complexity in the era of minimal invasive surgery embracing new technology for training is a necessity not a luxury.

Aim: We objectively investigated the efficacy of surgical VR training and retention of skills using a validated curriculum with expert performance as benchmark for proficiency

Methods: 30 novices were randomly recruited and trained toward FLC on a Lap Mentor, Symbionix. The novices were retested 1 year later to investigate the retention of skills

Results: Time taken to finish FLC decreased from 9:57 to 7:10 min in MTST of 30:04 min. NOM improved from 551 to 363, TPL improved from 1368–807 cm in 3.4 trials One year later. We investigated the retention of skills 90 % stayed within time proficiency, 80 % within economy of movement and 60 % remained within TPL proficiency.

Conclusion VR provides individualized training and the skills acquired are maintained irrespective to training.

P527 - Amazing Technologies

Hybrid Approach in Surgery of Colorectal Tumors

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We operated using SILS-port for tumors of the rectum 18 patients. We have implemented a combination of two endoscopic approaches simultaneously. Surgical technique presented the simultaneous mobilization of the rectum by transanal access using SILS-port and standard laparoscopic access from the abdominal cavity. We have created three operations, including 2 in colorectal cancer and 1 case of diffuse polyposis colon.

The mean operative time of 180 min. Postoperative complications were observed. The advantages of the hybrid access: good visualization of the operative field, minimal blood loss, minimal postoperative pain.

P528 - Amazing Technologies

New Technique Using Combined Instrument vs Conventional Multi-Instrument Technique in Single-Port Laparoscopic Hysterectomy

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Study of the effect of the combined instrument (bipolar and monopolar) for the duration of the operation.

Active implementation of technique of Single Incision Laparoscopy Surgery (SILS) is constantly setting new challenges for surgeons. One of them—the reduction in the duration of surgery.

All 32 patients underwent hysterectomy through a single incision laparoscopic approach. We used two techniques: conventional technique with multiple instruments (17 patients) and the technique using a tool that combines the monopolar and bipolar energy in one (15 patients). As a result of the study, we found that the use of the combined instrument significantly by 20 % reduces the duration of surgery, intraoperative blood loss does not increase, does not increase the number of complications and postoperative hospital stay.

P529 - Amazing Technologies

Endoscopic Surgery Telementoring 'A Simple Solution'

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Background: Telementoring is an important tool for on job training allowing a junior laparoscopic surgeon to perform surgeries with distant control and interaction with an experienced surgeon. This technique is very suitable for remote areas with inequity of expertise

Aim: To introduce a simple way of, web based, tele mentoring for endoscopic surgeons
Project description: Developing an E-learning website with a connection port for online telementoring of live surgery 'audio-video' allowing interaction between surgeons without the need of any complicated hardware interface and no limitation of bandwidth

Preliminary results: The website has been already activated and test phase of broadcasting already accomplished. The next phase will be pressure test followed by launching of the first version

P530 - Amazing Technologies

Clinical Outcome of Synthetic Glue vs Taks Fixation of the Mesh During Laparoscopic Repair of Inguinal Hernia

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Background: Atraumatic mesh fixation with synthetic glue may reduce chronic pain after laparoscopic repair of inguinal hernia.

Aim: to compare clinical outcome of synthetic glue vs taks fixation of the mesh

Project Description: Between 2006 to 2012, 62 patients underwent laparoscopic repair of inguinal hernia. Patients have been divided in two groups according to mesh fixation technique: titanium taks (group A = 35 pts) and synthetic glue (group B = 27 pts) respectively. Clinical outcome have been evaluated in terms of intra- and post-operative complications, post-operative pain (measured with a visual analog score—VAS) and recurrence rate.

Preliminary Results: No significant difference have been registered in terms of complications and recurrence rate. Mean follow-up was 24 months. Post-operative VAS score was significantly lower in group B than in group A. 6 months after surgery pain persisted in 4 patients of group A.

P531 - Amazing Technologies

Use of Transanal Minimal Invasive Surgery (TAMIS) Approach for Endoscopic Transanal Resection of Tumour (Etart) in Rectum
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Background: Trans-anal minimal invasive surgery (TAMIS), an innovative modality facilitates the excision of rectal lesions not otherwise amenable to standard transanal excision.

Aims: Authors successfully advanced TAMIS approach to the next level by performing endoscopic transanal resection of tumour (ETART) in the rectum.

Technique Description: Instead of using standard ETART instruments, authors employed TAMIS approach for ETART in 83 years male with obstructing rectal cancer. Multiple access port (GelPort®) was used. One port was utilized for camera access and remaining two ports were used for resectoscope, suction irrigation and various other maneuvers. The procedure involved removing small chunks of tumour tissue with each sweeping movement of resectoscope under vision.

Preliminary Results: Each quadrant of the tumour region was removed without rectal perforation and uncontrolled bleeding until adequate luminal patency was achieved. Use of TAMIS approach for ETART has potential advantages of avoiding contaminant fluid spillage, easy access, improved visualization.

P534 - Different Endoscopic Approaches

Successful Endoscopic Removal of Swallowed and Penetrated Pin from the Antrum Using Endoscopic Retrieval Net
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Introduction: Swallowed foreign bodies are mostly pass through the gastrointestinal tract uneventfully. Accidental ingestion of pins or needles are more common in Turkish population due to the use of headscarf among women. Herein we report a case of ingested pin that penetrated the full thickness of the gastric wall in the prepyloric region.

Case Report: A 25-year old female was admitted to emergency service for accidental swallowing a pin. The initial examination revealed normal abdominal findings. Plain x-ray confirmed existence of a pin in upper abdomen. The patient who omitted serial control examinations; was admitted with epigastric pain after four days. Repeated plain x-ray revealed a pin still in its first position. Hereby we decided to perform gastroscopy. We detected the needle is stuck in the gastric wall at the prepyloric region approximately 1.5–2 cm in depth. Inflammation and hyperemia was observed around the pin. We thought that endoscopic retrieval net is safer than the other instruments to catch and remove the pin. And we utilized it for this procedure. Control endoscopy was performed one week later and observed that inflammation had regressed.

Discussion: The most common causes of foreign body ingestion are accidental swallowing of objects. The abdomen should be examined for clinical evidences of peritonitis. Although the majority of foreign bodies pass harmlessly through the gastrointestinal tract and conservative management is generally recommended. 10 to 20 % of them will require nonoperative intervention such as endoscopy, and approximately 1 % of them will require surgery. Endoscopic approaches are generally less invasive than surgical intervention to remove ingested foreign bodies. However, extreme caution is required when the foreign body is sharp, as it is easy to injure the wall of the gastrointestinal tract.

Conclusion: In conclusion, an ingested foreign body infrequently causes severe problems, however complications such as perforation and migration should be always keep in mind. We think that using endoscopic removal net is a safe and easy way to remove the sharp objects such as pins and needles.

P533 - Amazing Technologies

The Clinical Application of Radical Laparoscopic Right Hemicolectomy for Colon Cancer: How Do We Do It?

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Background, Aim: To explore the method, the feasibility and safety of radical laparoscopic right hemicolectomy for colon cancer.

Project Description: The study was done on clinical data and follow-up of 87 cases treated with laparoscopic assisted right hemicolectomy from December 2006 to June 2009. How we do it: Step 1. Sealing ICV at origin Step 2. Dissecting right to SMV Step 3. Extending Toldt's space Step 4. Sealing RCV, MCV Step 5. Dividing gastro-colic ligament Step 6. Lateral mobilization Step 7. Ablating, anatomizing and exploring Preliminary results The mean operation time, blood loss, assisted incision length, the mean resuming time of bowel function, the total number of lymph nodes harvested, postoperative hospital stay were (142 ± 35)min, (93 ± 45)mL, (5.3 ± 1.5)cm, (42.5 ± 5.6)h, (18.6 ± 6.4), (8.5 ± 3.3)d, respectively. The percentage of assisted incision infection is 4.5 % (4/87), there were no other postoperative complication. 5 of 87 patients were loss to followup, the other patients were followed up for 2 to 32 months.

P535 - Gastroduodenal Diseases

Laparoscopic Gastric Resection for a Heterotopic Pancreatic Cyst: Report of a Case

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Aims: heterotopia of pancreatic tissue is a common developmental anomaly, affecting predominantly the gastrointestinal tract. Although heterotopic pancreas rarely causes symptoms, diseases of normal pancreatic tissue may occur in heterotopic sites. Owing to the rarity of the disease and not-specific presentation, diagnosis and treatment of these conditions can be very challenging.

Methods and Results: The case of a symptomatic cyst arising from the posterior gastric wall in a 40-year-old man is presented. The patient presented to our Institution with a history of left upper quadrant abdominal pain, uncorrelated to mealtimes. The physical examination was negative. Barium X-rays, CT and MNR scan were performed revealing a 6 cm-cyst of the posterior gastric wall not-communicating with the lumen of the stomach, suspected to be a duplication gastric cyst. EUS confirmed the report of CT scan whereas FNAB showed rare squamous cells and histiocytes consistent with serum cyst. The patient underwent laparoscopic gastric wedge resection. The post-operative course was uneventful and the patient was discharged in post-operative day 4. Pathology report of the specimen described a cyst of the gastric wall lined by ductal pancreatic epithelium. At 1 month follow up the patient reported complete resolution of preoperative symptoms.

Conclusions: This case shows how pancreatic cyst could arise in heterotopic pancreatic tissue therefore this disease should be included in the differential diagnosis of the cystic lesions of the stomach. Ectopic pancreatic cyst related-symptoms could be successfully treated by surgical resection of the cyst.

P536 - Intestinal, Colorectal and Anal Disorders

Ischaemic Colitis - Is Laparoscopic Approach Feasible?

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Ischaemic colitis is the most common form of gastrointestinal injury. It accounts for 50–60 % of hospital admissions. It is predominant in elderly patients and approximately 90 % of cases occur in patients who are older than 60 years. Fulminant pancolitis is rare, occurring in only 1 % of cases. In majority of cases signs and symptoms resolve within 48 h and complete endoscopic resolution occurs within two weeks. Laparotomy, segmental or total colectomy is established treatment for fulminant ischemic colitis.

We present a case of fulminant idiopathic colitis and massive rectal bleed in a young 50 year old patient treated by emergency laparoscopic panproctocolectomy.

P538 - Intestinal, Colorectal and Anal Disorders

Laparoscopic Reversal of Hartmann Procedure. Technical Considerations and Experience

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Introduction: The Laparoscopic reversal of Hartmann procedure is proving to be a procedure that can be achieved and safe, and provides undeniable advantages over open surgery, as in the patient recovery and improving the stay.

However it is not a simple procedure, it is need a wide experience in laparoscopic colorectal surgery, and the standardization of the technique is essential.

We present our experience and the more important technical aspects in this type of surgery. **Method:** Between 2005 and 2012 were operated 10 patients (6 females ad 4 males) those who previously had undergone emergency Hartmann surgery.

The operating time was of 130 min (110–180) and there were no remarkable intraoperative complications. In none of this cases was necessary to use open surgery.

Regard to the surgical technique, we use two 5 mm ports, an optical 10 mm port and one of 12 mm. We initiated the procedure by doing the meticulous adhesiolysis until identified and mobilize the rectum stump. We perform an intracorporeal anastomosis with circular stapler introducing the anvil through the colostomy that finally was mobilized and reintroduced in the abdominal cavity. In 3 cases was needed the splenic angle mobilization.

Results: It was initiated feeding and patient mobilization before 24 h of the surgery and all were discharged between the 4th and the 7th day of post operating without any important complications. There was no anastomotic dehiscence in our cases and the degree of satisfaction of all patients was very high.

Conclusion: The reversal of Hartmann procedure, often is more complicated than original surgery, due to the large number of adhesions. The laparoscopy in these patients can be very difficult because of this motive, but this also helps in the correct dissection of the structures and the perfect visualization and mobilization of the rectal stump.

We believe that with an adequate training, the advantages of this procedure in the ostomized patients, were more notorious in the intestinal transit recovery, post operating pain, decreasing the incidence of infection on surgical wound, the appearance of incisional hernia and average time of stay.

P537 - Clinical Practice and Evaluation

Single-Incision Laparoscopic Appendectomy vs Conventional Laparoscopic Appendectomy

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Aim: In 2009, Single incision laparoscopic appendectomy(SILA) was introduced in our hospital. The objective of this study is to compare the results of SILA and conventional LA(CLA) performed for appendicitis using a retrospective analysis.

Methods: In the period from 1 January 2009 to 31 December 2012, 369 patients were operated on by the authors, 103 of them by the SILS technique. In these cases, we excluded cases that do not match the indication of SILA. The indications for SILA were as follows: ①abscess(-); ②perforation(-); ③dense adhesion(-); ④previous major abdominal surgery(-); ⑤intestinal dilatation(-). Moreover, the cases that were required drain insertion and with resected at the same time in other organ were excluded. As a result, we selected 119 cases as CLA group and 94 cases as SILA group. In 94 SILA cases, first half of 47 cases were defined as early SILA group and second half of 47 cases were defined as late SILA group.

Result: There were no significant between group differences in gender, BMI, age, WBC, CRP, and Body temperature before operation. The mean operative time of CLA group was 51 ± 24 min, early SILA group was 68 ± 25 min and late SILA group was 53 ± 23 min. Mean operating time was significantly longer in early SILA group. There was no significant difference in bleeding volume among the groups (5.6 ml vs 6.6 ml vs 3.1 ml). An abscess in the surgical wound was observed in three patients in early SILA group. We don't have wound infection after exchanging access platform in late SILA group.

Conclusion: Although early SILA group have wound infection and taking more operating time compare with CLA group, there were no complication and operating outcomes were same in late SILA group compare to CLA group. This study demonstrated that SILA for uncomplicated appendicitis is feasible and safe and can result in good surgical results, with similar postoperative outcomes of CLA.

P539 - Gastroduodenal Diseases

Single Port Intra-gastric Surgery for Resection of Pre-Pyloric Gastrointestinal Stromal Tumor

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Introduction: Single port laparoscopic surgery is becoming an alternative to conventional laparoscopic procedures, as a new approach where all the standard ports are gathered in just one multichannel dock through only one incision. Laparoscopic intra-gastric surgery (LIGS) helps us to remove benign gastric lesions and GIST tumors placed in the posterior wall of the stomach and close to the esophagogastric junction or the gastro-duodenal junction that, in other case, requires major gastrectomy. Single port intra-gastric surgery allows just one incision at the anterior gastric wall instead of the multiple punctures needed in conventional LIGS and no especial trocars are needed, with a perfect seal of gastrotomy due to special characteristics of TriPort plus.

Material and Methods: We reported a case of A 62-year-old male with a clinical history of rectorrhagia. Colonoscopy showed no abnormalities. Gastroscopy revealed a prepyloric gastric submucosal tumor. Endosonography confirmed the presence of a 3 × 3cm submucosal tumor close to pylorus, with a biopsy with needle puncture aspiration suggesting a benign or low grade stromal tumor (GIST). Intra-gastric single-port excision of tumor was performed. Patient was discharged home 24 h after surgery. Histological examination of the surgical specimen confirmed the presence of a 2 × 2 cm GIST with tumor free margins.

Conclusion: With the current experience gathered on single port access surgery in our group, we think there are no technical restrictions compared with conventional laparoscopic surgery to remove this type of lesions, and single port intra-gastric surgery using TriPort plus device presents some advantages regarding conventional LIGS.

P540 - Liver and Biliary Tract Surgery

Effect of Surgical Team Experience on Laparoscopic Cholecystectomy Outcomes

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Aims: Laparoscopic cholecystectomy (LC) is the gold standard procedure in management of cholelithiasis. The experience of surgical team may effect the outcomes of LC. We aimed to evaluate our results in term of surgical team and the outcomes of surgical procedures.

Methods: In this study, we prospectively investigated the patients whom underwent elective LC for chronic cholecystitis between January 2009–June 2012 in a single teaching hospital. All the operations performed by the same team who had performed at least 100 laparoscopic cholecystectomies previously. We used four trocar technique without intraoperative cholangiography. The patient's demographic status, rate of conversion, morbidity and mortality, hospitalization time, complications and pathology results were evaluated.

Results: A total of 705 patients were included into the study. There were 564 (80 %) female and 141 (20 %) male (female/male ratio: 4) patients. The mean age was 49 (range 17–83) and the mean hospitalization time was 1.2 days (range 1–8). The conversion rate was 2.4 % (n:17). Bile duct injury occurred in one patient which was strasberg type d and managed with primary suture peroperatively. Biliary leakage from the bed was detected in one patient and was ceased spontaneously. Bleeding were detected from epigastric port site in two patients and from liver bed in two patients and were managed conservatively. Percutaneous drainage performed in two patients because of subdiafragmatic infection. Overall major complication and morbidity due to operation was seen in eight patients (1.1 %). No operative mortality was seen. Postoperative pancreatitis occurred in two patients. Postoperative ERCP performed only in one patient (0.1 %) because of a retained bile duct stone. Reoperation wasn't necessary in any case.

Conclusion: It's observed that the outcomes of the laparoscopic cholecystectomy in term of the rate of conversion, complications, morbidity and retained bile duct stone were favorable when LC was performed by selected and experienced surgical team.

P541 - Emergency Surgery

Duodenal Perforation Due to a Foreign Body. 'Back Door' Pancreatic Access by Laparoscopic Approach

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Introduction: Ingestion of gastrointestinal foreign bodies is frequently associated to delayed diagnosis of complications and timely treatment. Duodenal perforations can develop abscess in rare locations simulating cholecistitis or pancreatitis.

We present a case of a retroduodenal abscess secondary to a duodenal perforation due to a foreign body and a successfully retropancreatic access by laparoscopic approach.

Case Report: A 52 years old male affected by an abdominal mid-epigastric pain over the last 72 h and fever. Based on the patient history and physical examination in emergency room department a false diagnosis of cholecistitis was initially adopted. A TC scanner confirmed a foreign body on the back of the pancreatic head and duodenum, air bubble outside and a 8 cm retropancreatic abscess. A emergency Laparoscopic approach was practised to remove the abscess and the foreign body.

Methods: Patient was positioned in left lateral decubitus supinus. Three ports were placed in the left hipocondrium (5 mm), paraumbilicus (10 mm) and hipogastrium (5 mm). First step was the aperture of the colo-liver ligament. Colonic liver flexure was descended and the second and third duodenal portion exposed. A roma dissection was performed in the medial and posterior duodenal wall just adjacent to the ampulla of Vater. Abscess and a 5 cm chicken bone were both successfully removed using this "Back door" access by laparoscopic approach without any evidence of bowel perforation or fistula. A drainage was introduced into the retropancreatic cavity. Patient had a success recovery and was discharged in 7 days.

Conclusions: We believe that this "Back door" laparoscopic approach in atypical locations in paraduodenal abscess can help to an adequate exposition of this anatomic area, and contribute, when it is possible, to a faster recovery and to reduce the morbidity secondary to a conventional laparotomy.

P542 - Abdominal Cavity and Abdominal Wall

Endoscopic Approach in Rectus Diastasis with Umbilical Hernia Associated. Advantages of a New Minimally Invasive Technique

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The problem arises in those patients with a symptomatic umbilical hernia and diastasis recti above or below the umbilicus. If only the hernia is corrected with the use of prosthetic or reinforcement, we will be closing on a tissue defect anatomically weak due to alba line is damaged. The probability of hernia recurrence will increase, and we will have poor aesthetic outcome. Conventional surgery involves making an incision along the entire length of the fracture gap, with the resulting increase the probability of wound infection and aesthetic deterioration involved.

Its possible to solve both problems with minimally invasive approach.

Material and Methods: Between October 2011 and April 2012 were included in the study patients between 20 and 60 years who had symptomatic umbilical hernia larger than 2 cm ring associated diastasis recti without excess skin of the abdomen. 13 patients were included in the study. 10 mm Incision is made midline above the pubic bone and the suprapubic space is opened. Introducing BTT 10 mm trocar for optics and under direct vision, two 5 mm trocars are placed, one on each side of the trocar BTT separated by about 5 cm. The supraaponeurotic space is opened by freeing the adhesions using cautery. When the umbilical level is achieved, the umbilical sac is reduced and it's reintroduced to the intraabdominal compartment. The mesh is introduced and anchored to the edge of the defect using 2 stitches. The aponeurosis plication is achieved with the use of continuous knotless suture No. 0 nonabsorbable. After this step, subcutaneous suction drain is placed through one of the trocars of 5 mm.

Results: The average operative time was 90 min. The Seroma was the main complication in 80 % of the patients. All cases solved at 7 postoperative days. Thoracic Emphysema was observed in one patient, solved after 24 h with no treatment. Aesthetic outcomes were very high in all of the patients. No others complications were seen at 6 months follow-up.

Conclusions: Minimally invasive surgery in rectus diastasis with umbilical hernia associated, is factible, with high cosmetics results. Seroma is the main complication without medium or long term consequences.

P543 - Abdominal Cavity and Abdominal Wall

Advantages of Single Port Surgery in Multirecurrence Ventral Hernia

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Introduction: Single port access in abdominal wall surgery is a good alternative in selected patients. It has advantages regarding conventional laparoscopic approach.

We present 53 year old man with previous open umbilical and incisional hernia surgery 10 and 3 years ago. A new 8 × 4 cm incisional subumbilical ventral hernia is diagnosed in the physical examination, ant it's confirmed with CT scan

Material and Methods: Patient stands in supine position with arms close to the body. Surgeon and assistant stand in the left of the patient.

A 1.5–2 cm incision is made midline between inferior rib and anterosuperior iliac spine in left vacium. Once the peritoneum is incised, the Triport plus device is placed.

Two 5 mm grasper and 5 mm 30° optic are used to perform the surgery in order to diminish as much as possible conflict between the instruments. The adhesions are freed by blunt dissection using in the left hand an angulated grasper, pulling down the adhesion. When the real size of the defect is measured, the mesh is introduced through the device easily by removing the head of the triport plus. By this way, the mesh doesn't stay in contact with the skin avoiding the possibility of mesh infection.

The mesh (PTFE-c) is placed trying to overlap 5 cm the defect and is fixed using a double crown technique. The last step is close the fascial defect (1-1.5 cm size) with only one suture.

Conclusions: Single port ventral hernia repair is factible and reproducible in incisional ventral hernia surgery. Defects bigger than 13 cm size or close to bones edges, should be treated by conventional laparoscopic approach

P544 - Intestinal, Colorectal and Anal Disorders

Laparoscopic Approach in Rectocele Iii with Cistocele Associated: Rectovaginal Wall Prosthetic Reinforcement and Colposacropexy

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45 years old woman presents obstructive defecation and mass protrusion through the vagina, with urinary incontinence. After physical examination and dynamic MRI, a Rectocele III with Cistocele associated is diagnosed. The patient undergo laparoscopic surgery because of the symptoms. One 10 mm trocar at umbilical position and two 5 mm trocar in left and right vacio.

The first step is opening the pelvic peritoneum both sides of the rectum. The rectovaginal space is opened distally. The anus elevators are seen and that is the distal margin of the dissection. The anterior face of the vagina is dissected in order to create enough space to fix the mesh on it, and pull up the vagina with the bladder.

One 6 × 12 cm PTFE-c mesh is anchored to anus elevator in front of the rectum, distally, and to promontory proximally. This mesh is in charge of rectovaginal wall reinforcement.

Other 4 × 10 cm PTFE-c mes is fixed to the anterior surface of the vagina distally, and to the promontory proximally using helicoidal sutures. This mesh pull up the vagina and the bladder, solving the cistocele.

The last step is closing the peritoneum previously opened using a continuous suture.

Conclusions: Laparoscopic surgery is an excellent approach to solve this problem. It provides perfect visual field, improving the identification of the anatomical landmarks. Laparoscopic surgery should be the gold standard in pelvic floor disorders.

P545 - Gynaecology

Robotic Surgery for Challenging Adnexal Masses

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Background: Adnexal masses present a diagnostic dilemma; the differential diagnosis is extensive, and most masses are benign. However, without histopathologic tissue diagnosis, a definitive diagnosis is generally precluded. Robotic-assisted laparoscopic surgery (RALS) could evolve as an important surgical approach in the field of adnexal surgery.

Purpose: To present our experience with robotic procedures on challenging adnexal masses, including ovarian and non-ovarian, benign and malignant pelvic pathology.

Case Series: Challenging robotic cases are presented including an ovarian cyst with severe adhesions to the pelvis, a case of severe rectovaginal endometriosis, an unknown retroperitoneal cystic mass underneath the body of the uterus and a malignant ovarian cyst. Finally, in one case, a large cyst that appeared to be 'ovarian' in origin from the ultrasound scan, proved out to be a typical splenic cyst. All cases were treated successfully and followed an uneventful recovery.

Conclusions: Robotic surgery significantly improves dexterity and allows the surgeon to operate delicately into deep narrow spaces with great precision. With improved technology and increased surgical skill, minimally invasive surgery is feasible and safe in managing adnexal pathology.

P546 - Oesophageal and Oesophagogastric Junction Disorder

Robotic Hiatal Hernia Repair and Nissen Fundoplication for Large Paraesophageal Hernias and Redo Cases

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Introduction: Laparoscopic hiatal hernia repair and fundoplication is the method of choice for repair of hiatal hernias and treatment of gastroesophageal reflux. Robotic-assisted laparoscopic surgery (RALS) is evolving as an important surgical approach in the field of gastroesophageal procedures.

Aim: To present our techniques, and assess the benefits of RALS in fundoplication procedures.

Study Design: Since September of 2006, 84 patients with hiatal hernias and/or reflux have been operated in our clinic with the use of the robotic system da Vinci. 6 of these cases presented with large, complicated paraesophageal hernias. Our technique includes: opening of the hepatogastric ligament, recognition of the right crus of the diaphragm and dissection around the esophagus. Then dissection of the hernial sac is performed with recognition and protection of the anterior and posterior branches of the vagus nerves in all stages of the procedure. After reduction of the hiatal hernia, mobilization of the superior part of the gastric fundus takes place, with ligation and division of the short gastric vessels. Suturing of the diaphragmatic crurae follows with interrupted non-absorbable material. Our preferred technique of fundoplication is Nissen modified by DeMeester. **Results:** There were no conversions to open surgery. We were able to make a successful repair to a 64-year old patient who underwent two failed previous procedures. In one case, duration of the operation was significantly increased due to a small splenic capsule tear that was controlled with the aid of the robotic system. There was no need for transfusion. There was one case of post-operative gastroparesis in a 92 y/o patient. Another patient presented with the wrap migrated to the thorax after a motor-vehicle accident. In both cases the patients where re-operated successfully.

Conclusions: Robotic hiatal hernia repair and treatment of GERD provides comparable objective and subjective results and duration of the operation and length of stay in comparison with the laparoscopic techniques. It seems to provide advantages in the case of very large paraesophageal hernia and in redo cases but further research is needed to prove a significant difference from conventional laparoscopy.

P547 - Intestinal, Colorectal and Anal Disorders

Robotic Colorectal Procedures: Our Experience with Abdominoperineal Resection

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Introduction: Although APR has currently been restricted to a small proportion of patients with low rectal cancer, recent propositions to excise the rectum performing a wider perineal and a proper pelvic floor resection have renewed interest on this procedure. Robotic-assisted laparoscopic surgery (RALS) is evolving as an important surgical approach in the field of colorectal surgery.

Aim: To present our technique, and assess the benefits of RALS.

Study Design: A series of 79 consecutive colorectal RALS procedures were performed between September 2006 and December 2012, including 21 low anterior resections (LAR), 19 sigmoidectomies, 10 Right Colectomies, 7 Colostomy takedown procedures, 7 transversectomies, 5 abdominoperineal resections (APR), 4 rectopexies, 4 left colectomies, 1 segmental colectomy and 1 total colectomy. Our technique for APR involves a robotic abdominal and an open perineal phase. Our preferred method is a medial-to-lateral approach with early identification and high ligation of the inferior mesenteric vessels with care to identify and preserve both ureters. We move in an avascular plane for the presacral dissection and with care to preserve the autonomic nerves of mesorectum. The dissection continues through the Waldeyer's fascia, lateral stalks, and Denonvillier's fascia, exposing the entire posterior wall of the vagina or the prostate in the end. The perineal portion of the procedure involves dissection of the perianal skin and soft tissue and detachment of the lower rectum from its attachments to the muscular wall of the pelvis.

Results: five cases of robotic APR were performed. Mean patient age was 52.2 years old and mean operating time 325 min. Mean estimated blood loss was 400 mL. There were no conversions to open surgery. There was no perforation of the specimens. Circumferential margins were negative in all cases. Mean hospital stay was 6 days. There were no perineal wound infections.

Conclusions: Robotic APR provides comparable results concerning operating room times and length of stay. It may prove superior to conventional laparoscopy in complex cases such as in previously irradiated pelvis or in cases of recurrent anal cancer. Further randomized trials are expected to show a significant difference between the two approaches.

P548 - Oesophageal Malignancies

Total Thoraco-Laparoscopic Oesophagectomy in Supine Position: A New Technique

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Introduction: Traditionally the laparoscopic and thoracoscopic phases were performed in supine and left lateral decubitus positions respectively. We introduce a novel variant where both these phases were performed on a supine patient and share our experience.

Surgical Technique: After intubation with a double lumen endotracheal tube the patient was placed in Lloyd Davis position. Camera port was inserted midway between the xiphisternum and umbilicus. A 5 mm port site at the epigastrium was used for placement of Nathanson liver retractor. Operating 12 and 5 mm ports were placed an inch below costal margin along the mid-clavicular line in the left and right hypochondrium respectively. An assistant 5 mm port was placed in the left anterior axillary line, at horizontal level to the umbilicus.

Modified thoracoscopic oesophageal dissection was carried out in the same position using four 12 mm ports. First optical camera port was inserted in the right 5th intercostal space in the mid-axillary line. Oesophageal mobilization and en-bloc subcarinal lymphadenectomy was done using Harmonic scalpel®(Ethicon). The oesophagus is divided at the level of carina using an endostapler.

The specimen was delivered into the peritoneal cavity and retrieved through the midline minilaparotomy created by extending the camera port site incision. Gastric conduit was done using Echelon™Flex endostapler. End-to-side oesophago-gastric anastomosis was done using The DST Series™ EEA™ OrVi™ 25 mm device. The minilaparotomy site was used to support the shaft of the stapler.

Conclusion: Total thoraco-laparoscopic supine oesophagectomy is a new approach wherein the total operating time, blood loss and post operative complications may be comparable to the prone thoracoscopic phase.

P549 - Clinical Practice and Evaluation

Results of Laparoscopic Procedures for Ulcerative Colitis

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Introduction: Ulcerative colitis (UC) is chronic inflammatory disease of the large bowel, and almost benign disease, and predominantly affecting younger adults. Despite significant improvements in medical management of inflammatory bowel disease, 20 to 30 % of UC patients require surgical intervention. Laparoscopic surgery for colorectal disease has been shown to improve postoperative healing compared with open surgery, and also have cosmetic advantage. Laparoscopic restorative proctocolectomy for those patients are thought more suitable procedure than open. Since 2004 we had started to indicate restorative laparoscopic associated proctocolectomy for Ulcerative colitis, now we report our result of this procedure.

Aims: We confirmed our conventional procedure and results to improve our operation procedure.

Method: From 2004 to 2012, 21 cases of UC patients require surgical intervention. Exclude toxic megacolon and panperitonitis cases, in seventeen cases of which, we did laparoscopy associated restorative proctocolectomy and ileal pouch anal anastomosis (LAP-IPAA). Four were accompanied with cancer. LAP-IPAA was performed with using 5 ports of tractors. We start at right side colon to remove, then transverse and left side to rectum were dissected. After complete of abdominal procedure to remove large bowel, mucosectomy of rectum was done as a trans anal procedure. Whole large bowel was removed from ileostomy site from abdominal cavity. Then IPAA was performed.

Results: The median operation time, blood loss, and postoperative hospital stay are 570 min, 300 ml and 24 days. Fifteen-ileostomy closure was done. One patient died of the progression of cancer, which recurred. One patient required another operation for permanent ileostomy due to pouch failure. Although the most frequent complication after LAP-IPAA was bowel obstruction, but no surgical treatment was needed.

Conclusions: Results from our experience, although LAP-IPAA was taking a longer operation time and much bleeding as a laparoscopic surgery, these require the refinement of procedure, it seems feasible technique.

P550 - Intestinal, Colorectal and Anal Disorders

Single-Incision Laparoscopic Surgery for Small Bowel Pathologies

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Introduction: Aside from obstruction, small bowel pathologies are uncommon gastrointestinal indications for surgical interventions. Due to the rich vasculature, resections—if necessary—are limited to segmental resections of the affected region. Therefore, a laparoscopic approach seems ideal, if technically amendable. We report our experience with a single-incision technique.

Methods: Between 06/2012 and 01/2013, four patients underwent a single-incision laparoscopic (SIL) procedure for small bowel pathologies. All procedures were performed using a 10 mm camera, one articulated and one straight grasper, allowing for examination of the whole small intestine. If necessary, segmental resection was easily possible using a recappable SIL port.

Results: Patients age was 61.58 ± 21.80 years, BMI was 29.88 ± 10.90 . Three (75 %) of patients had a history of multiple previous abdominal surgeries. Indication for surgery was small bowel obstruction (1), tumor (1), bleeding (1), angiodysplasia (1) and intestinal pseudoobstruction (1, for full thickness biopsy retrieval). Mean operation time was 96.25 ± 32.28 min. Mean fascial incision size was 4.33 ± 0.91 cm. In one patient (obstruction by phytobezoar), the procedure was started as standard laparoscopy and a SIL port was introduced to allow for enterotomy and retrieval of the bezoar. In two patients (50 %), a small bowel resection reanastomosis was performed (mean resection length 10 cm). The postoperative course was remarkable for one intraabdominal bleeding from the mesentery (20 %), requiring surgical revision.

Conclusion: Due to the mobility of the small intestine, localized lesions are usually well accessible by laparoscopy. The use of recappable SIL-ports allows for segmental resection without the use of additional incisions.

P551 - Gastroduodenal Diseases

Totally Laparoscopic Excision of Duodenal Duplication Cyst

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A 34-years-old woman presented with exacerbating intermittent upper abdominal pain, accompanied by nausea and occasional postprandial vomit. There was no history of jaundice, weight loss, pancreatitis, or diarrhea. Hematochemical analysis were normal.

Abdominal ultrasound showed an anechoic mesogastric lesion laterally to the head of the pancreas. CT scan revealed a hypodense, non-enhancing cystic lesion measuring 56×31 mm, located in the second portion of the duodenum under the uncinate process of the pancreas. These findings were confirmed by abdominal magnetic resonance.

The patient underwent esofagogastroduodenoscopy and endoscopic ultrasonography those revealed a well-defined anechoic mass originating from the medial wall of the second portion of the duodenum.

A totally laparoscopic excision cystic mass was performed. Duodenotomy did not resulted necessary and no communication between the cyst and the duodenal lumen was found.

Histopathological examination of the excised lesion confirmed the diagnosis of duodenal duplication with internal lining of gastrointestinal epithelium and smooth muscle, without evidence of dysplasia or malignancy.

The patient was discharged on the seventh postoperative day without any complication.

The naso gastric tube was removed the day after.

P552 - Training

Are We Utilising All Available Online Resources to Improve Laparoscopic Training?

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Aims: To analyse the acceptability and feasibility of Video feedback provision through video hosting website YouTube®, in order to improve learning outcomes in laparoscopic training centres.

Methods: Twenty international surgeons performed a laparoscopic enterotomy closure task with video recording during intermediate laparoscopic skills course. Video and paper feedbacks were created. An email was sent to each trainee with a file attachment as PF and an online reference of VF, uploaded on YouTube®. Candidates completed Likert scale survey.

Results: 80 % candidates strongly agreed to the training approach and assessment process. 90 % strongly agreed to VF as a method of choice for error identification and correction through better understanding as compared to 10 % agreeing to PF ($p < 0.001$). 20/20 (100 %) candidates strongly agreed to YouTube® as a method of feedback provision.

Conclusions: Video feedback (VF) method is strongly favoured among international surgical trainees when provided through YouTube® for laparoscopic task performance during a training course. The demand of laparoscopic surgical training is growing internationally. Video feedback of any laparoscopic task learnt during a course can be provided through YouTube®. It provides a source for continuous learning and facilities like geographical analysis could be a valuable resource for estimating the international influence of a training centre.

P553 - Oesophageal Malignancies

laparoscopic Resection of the Oesophagus - Our Experience

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Background: In recent years there has been a great development in both detection and treatment of oesophageal cancer worldwide. In Poland, the issue is still a major concern as the prevalence reaches 1300 new cases annually. Unfortunately, only half of the patients is likely to have surgery, the other half is mostly non-operational due to the severity of the disease. In this study we would like to present a case of a patient with a low-grade early stage oesophageal cancer who was operated laparoscopically.

Methods: 72-year-old male patient with a BMI of 27.07 kg/m² was qualified for laparoscopic transhiatal oesophagectomy in the Department of General and Vascular Surgery, Ceynowa Hospital in Wejherowo, Poland. Preoperative diagnostics revealed Barrett's oesophagus, specimen taken for histological examination showed the presence of adenocarcinoma cells. Comorbidities: hypertension.

Results: Laparoscopic transhiatal resection of the oesophagus was performed. Neoesophagus was placed in the posterior mediastinum and cervical anastomosis was obtained by laparotomy. Time of the operation was 95 min, there were no intraoperative complications. The standard pre-operative preparation: assessment of nutritional status, antibiotic prophylaxis and thromboembolic prophylaxis was implemented. In the fourth postoperative day the anastomosis leak test was performed and in the fifth oral fluids were administered, in the 9th day after surgery the patient was discharged home. Patient recovers well and does not report complaints.

Conclusions: Operation should be assessed as technically demanding, reserved only for advanced surgeons. Nevertheless, at an early stage of cancer, performed using minimally invasive techniques is both safe and feasible.