The 14th Asia-Pacific Congress of Endoscopic and Laparoscopic Surgeons of Asia

MIS United: The One World

NOVEMBER 21 - 23, 2019

CHIANG MAI, THAILAND
Dear Colleagues,

On behalf of the organizing committee, it is my great pleasure to invite you to the annual scientific meeting of Endoscopic and Laparoscopic Surgeons of Asia, ELSA 2019, which will be held at the Shangri-La Hotel in Chiang Mai, Thailand from November 21 to November 23, 2019. The theme of this year’s meeting is MIS United; The One World. Through your participation you will have the opportunity to share insight into the research and development of advanced techniques in Minimally Invasive Surgery technology. With international collaboration we hope to maximize the benefit of MIS. Please join us in this endeavor.

The goal of ELSA 2019 is to bring together an international multidisciplinary team of MIS from our brotherhood society SAGES and EAES to present and exchange recent breakthrough ideas and techniques related to MIS and to collaborate in the near future.

In addition to benefiting from the excellent academic program, we are excited for you to visit Thailand's northern capital, Chiang Mai, crowned the best city in Asia and top 10 best cities in the world! Known as the ‘Rose of the North’ it hasn’t lost its traditional charm amongst its cosmopolitan inhabitants and modern infrastructure. You will get to discover natural perfection in its landscapes, equanimity of temples and awe-inspiring animals during your visit.

We are excited for this year’s meeting of international surgeons and look forward to the sharing of new innovations and procedures from all specialties representing the greatest surgeons from around the world. Please join us this November 21 to 23 in Chiang Mai, Thailand.

Cheers,

Suthep Udomsawaengsup
MD., FACS, FRCST

Congress President ELSA 2019
WELCOME MESSAGE
From President of ELSA

Dear Colleagues and Friends,
On behalf of the Executive Committee and the Board of Governors of the Endoscopic and Laparoscopic Surgeons of Asia, it is with great pride and honor that I invite and welcome all of you to the Asia Pacific ELSA Congress 2019 on November 21st to the 23rd. This will be held at the Shangri-La hotel in the beautiful northern city of Chiang Mai, Thailand.

This year’s congress promises an outstanding clinical education and several hands-on training opportunities for surgeons, surgery residents, nurses, and allied medical workers who are interested in the field of minimally invasive surgery. The highlight of this endeavor is the collaboration of ELSA with the Society of American Gastrointestinal and Endoscopic Surgeons (SAGES) and the European Association for Endoscopic Surgery (EAES) as we move onwards in MIS, UNITED as “ONE WORLD”.

Together with the Local organizing Committee headed by the congress president Prof. Suthep Udomsawaengsup, I wish to welcome you all personally to this breathtaking city as we bask in the sights and sounds of the heart of Thailand.

Mabuhay!

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Oral presentation
Abdominal wall and Hernia

Tips for Single-port Totally Extraperitoneal Preperitoneal hernia repair by the glove method

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Background: Eighty percent of single-port (SP) laparoscopic surgery were for benign diseases, such as cholecystectomy, appendectomy, and inguinal hernioplasty in my institution. In particular, SP inguinal hernioplasty is increasing and comprised 59% of the total number of SP laparoscopic surgery in the last 2 years. SP-TEP comprises approximately 90% of SP-inguinal hernioplasty and is now my standard procedure for inguinal hernioplasty. I introduce some tips for SP-TEP by the glove method.

Methods: An 1.5cm incision is made below of umbilicus. According to the trans-rectal method, I divide the space between muscle and the posterior fascia is exposed. The Alexis wound retractor is then inserted. After inserting the wound retractor, the surgical glove is attached and 2 low-profile laparoscopic 5mm ports and one 12mm port are inserted through the holes of the surgical glove with cut fingertips. The preperitoneal space is dissected and the pelvis confirmed. The dissection is further advanced laterally toward the hernia. The sac, the inferior epigastric vessels, spermatic cord and testicular vessels must all be detected. After dissection of the myopectineal orifice, ProGrip self-fixating mesh (15×10 cm) is introduced through the 12-mm port and correctly expanded to fully cover the myopectineal orifice.

Discussion: The problems of single-port laparoscopic surgery are the loss of triangulation and the potential for instrument conflicts. TEP does not require triangulation because in conventional TEP the ports are positioned linearly. In addition, the glove method allows greater freedom of movement for all instruments in all directions compared to conventional methods, the ports are not fixed to the abdominal wall but in my method as the incision is 1.5cm, the port itself acts as a fulcrum for the instruments.

Conclusion: TEP is the method of choice for single-port laparoscopic surgery and the glove method may alleviate some of the disadvantages of single-port laparoscopic surgery.
Tumescent transabdominal preperitoneal repair for inguinal hernias

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**Background:** In laparoscopic transabdominal preperitoneal inguinal hernia repair (TAPP), has less an early postoperative pain, earlier return to usual activities and less chronic pain are superior compared to open mesh repair. However, TAPP procedure has have problems to have a longer operative time and is considered technically difficult with and a longer learning curve.

**Methods:** Tokumura et. al devised a method called Tumescent TAPP is the operative method devised by Tokumurato overcome these drawbacks of TAPP procedure. In this procedure involves performing TAPP after injecting a large amount of diluted tumescent analgesics and epinephrine as well as and carbon dioxide (CO2) gas is injected into the preperitoneal space, at the beginning of the procedure to facilitate subsequent dissection of preperitoneal space. Using tumescent TAPP method, it was we found it easier to confirm the inguinal anatomy and dissect the preperitoneal layer and inguinal floor, space with minimal blood loss bleeding. We use a 15x 10cm mesh is inserted and we fixed the mesh using non-absorbable tackers.

**Results:** We performed tumescent TAPP to in 400 patients. The mean operating time is 61 minutes for unilateral lesion and on one side and 92 minutes on for bilateral side. All the procedures were performed without major complications and no We have not experienced a recurrence within the observation period.

**Conclusion:** TWe conduct a presentation of tumescent TAPP procedure is safe and easy way to perform TAPP procedure for inguinal hernia.
Laparoscopic Hiatal Hernia Repair: outcome and experience

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Objective: To examine the safety and efficiency of the laparoscopic hiatal hernia repair (LHHR) with mesh.

Methods: We retrospectively reviewed LHHR from July 2012 to July 2017. The primary outcome was the efficiency of this procedure, and this was evaluated by the control of the gastroesophageal reflux, hiatal hernia related symptoms and the recurrence rate of hiatal hernia. The secondary outcome was the safety of the procedure, and this was evaluated by the incidence of complications.

Results: A total of 51 patients who underwent LHHR during this period. The Dor fundoplication was performed at the same time if not contraindicated. The average operation time was 100±19.6 mins, the average blood loss was 28±15.4 ml, and average hospital stay was 2ds. The gastroesophageal related symptoms and hiatal hernia related symptoms were significantly improved. The patients returned to normal diet within four weeks after operation. The follow up was on average 32months, and no recurrence or mesh related complications were identified.

Conclusions: LHHR with mesh is a safe and efficient procedure, and is able to reduce the recurrence compare to the suture repair.
Obturator hernia: A laparoscopic intra-abdominal approach

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Introduction: The obturator hernia is a rare pelvic hernia that often resulted into the small intestine incarcerated. This type of hernia account for 0.5-1.4% of all hernia. Because these patients had unspecific symptoms, they are often delayed diagnosed. These patients with delayed diagnosis often need intestinal resection and have a high mortality rate. Repair of the hernia is considered a challenge for most surgeons. Because the defect was usually too deep and the definite repair was difficult. Under the trans-abdominal laparoscopy, we had the wider visual filed and working space for managing the condition. The recent reports also have suggested that laparoscopic repair may be feasible for incarcerated obturator hernias

Method: We reported four cases who was diagnosed with obturator hernia at emergent room. They had been to the ER for the symptoms of the bowel obstruction including the distended abdomen and the vomiting. The diagnosis was confirmed by the abdominal CT. Emergent operation was arranged. The trans-abdominal laparoscopy was used. We pulled back the incarcerated small intestine and checked the condition of the incarcerated intestine. Two of the four cases had bowel injury and mini-laparotomy was made for resection of the intestine. All the defect of the peritoneum was closed by a continued two-layer suture. We used the A long-term absorbable (about 1-2 years) monofilament suture.

Result: These four cases all discharged and no complication were noticed. During the follow-up after half year, there was no evident recurrence.

Conclusion: The laparoscopic intra-abdominal approach of the obturator hernia was a safe way to manage the problem. There was small wound and less post-operative pain. No evident recurrence was observed during the clinics follow-up.
Transabdominal preperitoneal (TAPP) laparoscopic approach for incarcerated inguinal hernia repair: report of 73 cases

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Objective: To investigate the efficacy, key technical points and complication management of the transabdominal preperitoneal (TAPP) approach for incarcerated inguinal hernia repair.

Methods: Seventy-three patients with incarcerated inguinal hernias underwent TAPP surgery in our department between Jan 2010 and Dec 2015. A retrospective review was performed by analyzing the perioperative data from these patients.

Results: The operation was successfully completed in all 73 patients. Operation time was 54.0 ± 18.8 min (range, 35-100 min). Length of stay was 3.9 ± 1.1 d (range, 3-9 d). There was 1 case of incisional infection, 32 cases of seroma, and 3 cases of postoperative pain during follow-up. All patients recovered after the appropriate treatment. No recurrence or fistula was observed.

Conclusions: The TAPP approach represents a safe and effective technique for incarcerated inguinal hernia repair because of its potential in assessment of hernia content and decreasing incisional infection rate. However, it requires experienced surgeons to ensure safety with special attention paid to the key technical points as well as complication management.
Totally endoscopic sublay (TES) repair for midline ventral hernia: surgical technique and preliminary results

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**Background:** Rives-Stoppa operation is a proven technique for ventral hernia repair, however it requires a large midline incision, which pose the problems of massive trauma, postoperative pain and wound infection. Researchers have tried to achieve this retromuscular repair by minimally invasive approach. Recently we also develop our novel approach--Totally Endoscopic Sublay repair (TES). The procedure will be described in detail and the safety and efficacy evaluated.

**Method:** During July 2017 and February 2018, sixteen consecutive cases of primary and secondary epigastric midline ventral hernias were repaired using the TES procedure. A large mesh should be placed in the retrorectus position using this minimally invasive procedure. The indications for this procedure include umbilical, epigastric and incisional hernia equal in length to the rectus diastasis.

**Result:** All operations were successful without open conversion. The mean operation time was 111 min (76 ~ 205min), postoperative pain was mild and the mean VAS was 2.6 on first postoperative day. The average postoperative stay in hospital was 3.1 days (2 ~ 5days). 2 cases experienced postoperative seroma but without adverse effect on the final outcome and no recurrences during the follow-up period of 1 to 7 months.

**Conclusions:** TES procedure is safe, practical and minimally invasive requiring no specific device and highly reproducible. Besides there is no need for expensive anti-adhesion mesh and fixation tacker which make it more cost effective. TES is a good technique for the surgical treatment of midline ventral hernia.
Cost Effectiveness and Financial Implications in Laparoscopic Ventral hernia repair: Experience from a Developing Country

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Introduction: Ventral and Incisional hernia have a recurrence rate of 25–49% and more than 50% for recurrent hernias. As an alternative, laparoscopic techniques offer the potential benefits. Minimal access surgery has revolutionized hernia treatment, most of primary or recurrent hernias are performed laparoscopic. Our study is focused on the outcomes and financial implications in performing LVHR.

Methods: 577 consecutive patients who underwent LVHR between 2011 to 2017, Including 232 primary repairs, 188 recurrent hernias and 157 Incisional hernias.

Results: N=577, Male=260 & Female=317. Mean BMI of 34 kg/m2. N=11 conversions to open operation. Average defect size 63.5 cm², Mesh size 38.1X50.8 cm² & Operating time average 90-180 min. Over all hospital stay 1.53+0.62 (p=0.005), Use of analgesics 2.07+0.77 doses (p=0.005), Early return to work 7.13+2.66 days, mean post-operative pain score 2.99+1.32 (p=0.005) was significantly less than conventional open repair in all three groups. The follow-up response of the patients in each of the subgroups was outstanding regarding pain score and early return to their work place. Mean post-operative pain score in 3 groups was 3.45+1.23, 2.31+1.01, 1.01+0.45 (primary repair), 4.34+1.78, 3.32+1.21, 2.01+0.98 (recurrent hernia), 4.01+2.34, 3.54+1.78, 2.98+1.20(incisional hernia) after 8,12 and 24 hours respectively. Financial implications include price of implant average PKR=40000-55000, Fixation Device PKR=10000-20000.Financial benefits on average hospital stay PKR=5000-10000, Analgesics PKR=3000-7000, Post-operative follow up PKR=2500-5000 (Amount saved by patients)

Conclusion: Despite being higher costs of implants used in laparoscopic repair, financial implications were still better than open repairs in terms of less hospital stay, enhanced recovery, early return to work and minimal use of post-operative medications (analgesics). In developing county like Pakistan its financial implications are still being under trails to make it a cost-effective procedure in terms of implants used and their prices.
Combined preincisional periportal and preperitoneal infiltration with bupivacaine in pain relief after laparoscopic hernia surgery

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**Background:** It is well known that the intensity of postoperative pain following laparoscopy is less compared to open surgical technique. However, it still requires pain relief methods to achieve the new era of the enhanced recovery after surgery (ERAS) (www.erasassociation.org) protocols. We have criticized the term ERAS and replaced it by enhanced recovery after anesthesia (ERAA) which we have published recently.[1] We have designed the ERAA ladder which summarizes all aspects of ERAS protocol including the background, preoperative, intraoperative as well as postoperative management [Figure 1]. In terms of pain modality, intraoperatively, we avoided opioids and replaced it by dexmedetomidine (4 mcg/ml) infusion at a rate of 0.5 mcg/kg/h. In the postoperative period, we avoided well opioids and replaced it with multimodal analgesia (MMA) including nonsteroidal anti-inflammatory drugs and paracetamol beside a rescue dose of intravenous (IV) tramadol if required. Furthermore, regional anesthesia in open surgical techniques such as thoracic epidural analgesia can be recommended. IV lidocaine infusion can also be used in either laparoscopic or open surgical techniques. Continuous wound infiltration of local anesthetic is weekly recommended in open abdominal surgery technique. Transversus abdominis plane (TAP) block is strongly recommended in laparoscopic abdominal surgery. The TAP block is purely a somatic blockade; it has no visceral pain relief effect. It is considered basically an integral part of many MMA strategies to optimize the postoperative pain management following lower abdominal surgeries. The analgesic effect of TAP block is limited to the afferent sensory nerves of the anterolateral abdominal wall. The pattern of sensory distribution after TAP block depends on the volume of local anesthetic as well as the number and sites of injection.
Ventral laparoscopic percutaneous repair of ventral and excision of the sac (VLPCRVH) technique

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Background: A recurrent Hernia is defined as “The breakdown of a hernia repair or the bulge returns at or near the site of the prior hernia” (1) department of surgery of Cleveland Clinic Foundation has studied the Recurrence after laparoscopic ventral hernia repair where out of 100 repairs, 9 patients developed recurrence, (2) with many associated factors that were involved in many studies, we will mention them bellow individually in this literature review and compare them with our center in which we carry out VLPCRVH for ventral hernias with no recurrence for 2 years follow up.

Methods: The unique suitable technique in the repair of ventral hernia is still controversial, the rates of recurrence & seroma in laparoscopic mesh repair is diminishing the merits of minimally invasive surgery, therefore we adopt combination laparoscopic mesh repair combined with a small incision through sac excision and simple stitch technique of the defect and mesh introducing. Therefore, we have 78 patients, 8 patients have been repaired primarily and the rest of the patients have been repaired with VLPCRVH.

Results: No wound infection, most of the cases are done by day surgery, with four seromas, no patients have encounter chronic pain as well

Discussion: No deference was found in regard to the approach used in the repair either by open or laparoscopy, BMI and size of mesh did not predict the recurrence rates, which is similar to our patients results while in relation to the type of mesh, it was found that its related to the recurrence rates, while at our center no statically significance relation was found.

Conclusion: VLPCRVH seems to be suitable, however, this a two years study, longer follow up is needed in addition to prospective comparison study.
Surgical outcomes of the standard and advanced laparoscopic percutaneous extraperitoneal closure procedures for adult inguinal hernias that do not involve peeling the inguinal floor and using mesh, or plugs.

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**Introduction:** Transabdominal pre-peritoneal (TAPP) repair is the first choice for adult inguinal hernias in this hernia center. However, laparoscopic percutaneous extraperitoneal closure (LPEC) or advanced LPEC, which does not peel the inguinal floor and does not use mesh or plugs, is carried out occasionally according to the size or form of the hernia orifice.

**Purpose:** This study describes the LPEC and advanced LPEC procedures without artificial materials and no peel the inguinal floor for indirect inguinal hernia in adults, and its surgical outcomes.

**Materials and Methods:** A total of 592 patients (male 541, female 51) with indirect inguinal hernias between 16 and 96 years of age treated from 2013 to June 2019 were studied. Of them, 122 males (age 16-96 years) and 17 females (age 16-75 years) underwent the LPEC. The advanced LPEC (LPEC with ilio-pubic tract repair) was performed in 23 males (age 21-91 years).

**Results:** They have been followed from 4 months to 6 years after surgery. Only 3 (age 40, 29 and 81 years) of 122 males who underwent LPEC recurred within 2 years. In these patients, the outer edge of the hernia orifice was unclear and showed a so-called "slip-like" form. In such cases, advanced LPEC is needed to reinforce the lateral and posterior walls of the hernia orifice by adding a U-shaped stitch between the aponeurosis arch of the transverse abdominal muscle and the ilio-pubic tract.

**Conclusion:** Although TAPP and totally extraperitoneal (TEP) procedure peel widely the cavities of Bogros and Retzius and using mesh, these are considered to be minimally invasive herniorrhaphy. LPEC or advanced LPEC which do not peel the inguinal floor and no using artificial materials are even less invasive than the TAPP and TEP repairs, and they can prevent recurrence according to the size or form of the hernia orifice.

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Introduction: Almost one third of patients developed incisional hernia after a major abdominal surgery, with more than 40 percent had recurrence three years post-surgery (Poulose et al., 2012). Laparoscopic ventral hernia repair (LVHR) has recently been favored over open technique because of less intraoperative blood loss, less chronic post-operative pain, faster return to baseline activity and greater cosmesis with dependence on surgical expertise (Eker et al., 2013). However, complications may develop, though rare, but similar to both techniques. Infections and recurrence are most commonly encountered complications. Treatment of infected mesh following LVHR often requires invasive mesh removal and abdominal wall reconstruction. Although there are reported cases of successful treatment of mesh infections using systemic antibiotics combined with local antibiotic infusion, the absence of well-designed trials evaluating its effectiveness limits its application in practice (Alston et al., 2013).

Background: We reported a case of a 71-year-old male who developed large incisional hernia after laparotomy due to penetrating bowel injury. Patient underwent extended totally extraperitoneal technique (e-TEP) plus transversus abdominis muscle release (TAR) and was discharged two days post-surgery apparently well. One-week post-surgery, patient consulted at the outpatient with no significant findings. Twelve days post-surgery, the patient noticed periumbilical erythema which progressed to necrosis and purulent discharge five days after. The patient was admitted and underwent emergency debridement, intraoperatively showing mesh infection.

Methods: Conservative management was done through broad-spectrum antibiotics, flushing with Daikin’s solution, and wet-dry dressing. After completing recommended antibiotic treatment, patient was eventually discharged with instructions on daily wound care.

Results and Conclusion: Seven weeks post-debridement, granulation tissue completely covered the mesh with subsequent dermal closure. With this, conservative management of post-operative mesh infection can be a safe and cost-effective alternative option, relieving the patient from a more invasive procedure.
Elective Incisional Hernia Repair – lower risk of postoperative wound infection with laparoscopic versus open repair

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**Introduction:** The advantage of laparoscopic over open repair of incisional hernias (IH) in the elective setting is still controversial. Our study aims to compare the postoperative outcomes between laparoscopic and open elective IH repair in an Asian population.

**Methods:** A retrospective study was conducted in an acute and general hospital in Singapore between 2010-2015. Patients who underwent elective IH repair were included. Five patients with ischemic bowel, class III and above contamination were excluded. Patient demographics, comorbidities, operative details and postoperative outcomes were collected from the hospital’s electronic medical record system. Postoperative outcomes within a year such as recurrence, pain, infection, hematoma, seroma formation were compared between the laparoscopic and open groups.

**Results:** There were 221 eligible subjects. Majority of subjects were elderly Chinese females who were overweight. There were no significant differences in demographics and comorbidities. Open repair was performed in 49.4% of subjects while 50.6% underwent laparoscopic repair. Mean operation time for open repair was 116 minutes (116 ± 60.6) and 139 minutes (136 ± 64.1) for laparoscopic repair (p=0.079). Mean hernia size defect in open repair group was 61.6cm² as compared to 60.0cm² in the laparoscopic repair group (p=0.576). Within a year post open repair, 7.0% of subjects had postoperative wound infection as compared to 1.1% in the laparoscopic group (p=0.004). Post-operative pain, recurrence, hematoma/seroma formation were comparable.

**Conclusion:** Elective laparoscopic IH repair has comparable outcomes with open repair and may offer the advantage of reduced postoperative wound infection rates.
Application of videolaparoscopy in emergency surgery in children

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A modern trend in the development of surgery is to reduce the invasiveness of surgical interventions. Since the beginning of 2018, 173 patients with acute surgical diseases of the abdominal cavity have been treated in the department of emergency and purulent surgery of the 2-Clinic of SamMI. Of these, there were 121 children with acute appendicitis, 51 with acute intestinal obstruction. Of the total number of patients, video laparoscopic surgeries were performed in 21 patients operated on an emergency basis. Of these, laparoscopic appendectomy was performed in 11 patients, in 3 patients with appendicular peritonitis. Diagnostic laparoscopy was performed in 8 patients with acute adhesive intestinal obstruction with separation of adhesions and restoration of intestinal passage. Two patients with gastrointestinal bleeding phenomena, during radioisotope scanning, revealed Meckel's diverticulum, which was subsequently removed laparoscopically. No complications after these operations were noted.

Thus, the use of laparoscopy in emergency surgery in children is not only justified, but also advisable due to the maximum diagnostic capabilities, completeness of the therapeutic effect and good treatment results.
Validation of Difficulty Scoring System of Laparoscopic Liver Resection for Hepatolithiasis

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**Background:** We previously developed a modified difficulty scoring system (DSS-IHD) of laparoscopic liver resection (LLR) for patients with intrahepatic duct (IHD) stone. We validated DSS-IHD in patients who underwent LLR for hepatolithiasis.

**Methods:** DSS-IHD was based on the extent of liver resection (2 ~ 4), stone location (1 ~ 5), atrophy of liver parenchyma (0 ~ 1), ductal stricture < 1 cm from the bifurcation (0 ~ 1), and combined choledochoscopic examination for remnant IHD (0 ~ 1).

**Results:** The DSS-IHD ranged from 3 to 12 and divided to 3-level groups of low group (score 3 ~5; n = 26), intermediate group (6 ~ 8; n = 72), and high group (9 ~ 12; n = 23). The mean operation time (187.4 ± 80.2 vs. 348.8 ± 147.6 vs. 367.8 ± 141.1; P < 0.001) and the mean blood loss (354.2 ± 301.3 vs. 849.4 ± 968.4 vs. 1083.0 ± 955.2; P = 0.004) were significantly different among groups. The mean hospital stay was also marginally different among groups (7.6 ± 3.5 vs. 13.4 ± 11.6 vs. 13.2 ± 11.2; P = 0.054). When we simply divided patients by right and left LLR, there were significant differences in DSS-IHD (8.9 ± 2.0 vs. 6.5 ± 1.6; P < 0.001), operation time (472.4 ± 185.3 vs. 289.7 ± 124.5; P <0.001) and blood loss (1810.5 ± 1269.7 vs. 596.8 ± 656.1; P = 0.001) between right and left LLR group.

**Conclusions:** The surgical difficulty varies among patients undergoing LLR for IHD stones. The DSS-IHD predicts well the surgical difficulties of LLR for patients with IHD stones.
How to Prevent Bile Duct Injury during Laparoscopic Cholecystectomy—Our strategies, and Development of a Prevention System Using Artificial Intelligence—

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As laparoscopic cholecystectomy (LC) has become more widely performed, bile duct injury (BDI) is known to occur in a certain proportion of cases, and the prognoses of patients who suffer BDI in particular have been poor. BDI during LC occurs for two main reasons, namely, misidentification by the surgeon and surgical difficulty due to severe inflammation. We have been implementing the following preventive measures:

Prevention of misidentification: We check for anomalous bile ducts before surgery using preoperative imaging. We identify anatomical landmarks, such as Rouvière’s sulcus, the bottom of the segment 4, common bile duct, and cystic duct; these identifications are performed by surgical team members. We achieve critical view of safety (CVS) and evaluate the CVS score. We perform timeout before clipping and cutting of the cystic duct and artery.

Minimization of the degree of BDI due to severely inflamed gallbladder: We evaluate surgical difficulty at the beginning of the operation by identifying fibrosis, scarring, edema, easy bleeding of the gallbladder, and intraabdominal findings, such as visceral fat or liver cirrhosis. We follow the standardized safe steps in LC for acute cholecystitis (Tokyo Guideline 2018). We maintain the plane of dissection within the gallbladder surface throughout LC. We do not use the fundus-first approach, when possible. We consider intraoperative cholangiography to reduce the extent of the BDI. If the anatomical structure remains difficult to identify, we consider bail-out procedures. As a result of these preventive measures, there have been no experiences of BDI due to misidentification, and only one minor BDI due to a difficult gallbladder has been occurred. In that case, the injury was repaired laparoscopically during the operation. We are further developing a safe system to reduce misidentification using artificial intelligence technologies.
Comparisons of surgical and long-term outcomes between open and laparoscopic distal pancreatectomy in patients with pancreatic ductal adenocarcinoma

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**Background:** Safety and feasibility of laparoscopic distal pancreatectomy (LDP) in regards to the pancreatic adenocarcinoma (PDAC) were not well-known. This study was to investigate the demographic and pathologic characteristics, and to compare the survival outcomes and recurrence patterns between patients who underwent LDP and open distal pancreatectomy (ODP).

**Methods:** This was a retrospective study with prospectively collected medical data. Between 2005 and 2018, patients who underwent distal pancreatectomy due to pancreatic adenocarcinoma were enrolled. Patients who underwent combined other organ resection, open biopsy, or remnant total pancreatectomy were excluded. Clinical and pathologic variables, and recurrence patterns were investigated, and survival outcomes were calculated with Kaplan-Meier method.

**Results:** Total 287 patients were enrolled. ODPs and LDPs were performed in 245 patients (85.4%) and 42 patients (14.6%), respectively. Operation time was shorter (133 vs. 178 min, P=0.001), estimated blood loss was less (245 vs. 366 mL, P=0.15), and the duration of postoperative hospital stay was shorter (11.4 vs. 16.3 days, P=0.001) in LDP than ODP group. Clinically relevant postoperative pancreatic fistula occurred comparably between two groups (9.5 vs. 11.0%, P=0.802). Tumor size (3.2 vs. 3.5cm, P=0.151), number of harvested lymph nodes (12.2 vs. 14.0, P=0.241), overall American Joint Committee on Cancer staging, and overall recurrence rates (47.2 vs. 55.4%, P=0.465) were comparable between LDP and ODP group. Of patients who obtained R0 resection status and did not have distant metastasis preoperatively, 5-year overall survival rates were comparable between LDP and ODP group (29.2 vs. 28.9%, P=0.292).

**Conclusion:** LDP has better perioperative outcomes compared with ODP, and shows similar pathologic, survival outcomes, and recurrence patterns in PDAC patients. To overcome the shortcomings of retrospective study, large-scale randomized controlled trial for evaluating the safety and feasibility of LDP would be needed.
Laparoscopic right hepatectomy with portal thrombectomy in a patient with hepatoma concomitant with portal vein thrombus after percutaneous transhepatic portal vein embolization

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**Background:** To reduce risk of postoperative liver failure due to an insufficient volume of functional liver, percutaneous transhepatic portal vein embolization (PTPE) can be performed prior to major hepatectomy. However, extension of portal vein thrombus to remnant liver can cause fatal liver failure.

**Methods:** The patient was a 66-year-old man who had a hepatoma located near bifurcation of anterior and posterior Glissons. PTPE was induced because of insufficient future liver remnant volume (23.7%). 36 days after PTPE, 40.8% future liver remnant was obtained and laparoscopic right hepatectomy was performed. Preoperative CT scan revealed portal vein thrombus extended to portal trunk, therefore, portal thrombectomy was planned in the manner we described previously (Surg Endosc 2014).

**Results:** The patient was placed in the left hemilateral position, and 4 laparoscopic trocars were positioned. The right Glisson and the right hepatic vein was dissected and liver hanging tape was attached. Hepatic parenchymal transection was started along the ischemic demarcation line under inflow occlusion by using clamp clash method. After hepatic parenchymal transection was completed, the right hepatic vein was divided, and the right Glisson was maneuvered individually. The right hepatic artery and right hepatic duct were divided. The intraoperative ultrasonography revealed portal vein thrombus near the portal trunk. After portal trunk and left portal vein were clamped, right portal vein was divided. The thrombus in the portal vein was retrieved and the stump of the right portal vein was closed with running sutures. The total operative time was 424 minutes, and blood loss was 60g. The patient was discharged on the 12th postoperative day without any adverse events.

**Conclusions:** Laparoscopic lobectomy with portal thrombectomy for hepatoma concomitant with portal vein thrombus after PTPE is a safe and feasible procedure in selected patients, when performed by surgeons with expertise in hepatic surgery and minimally invasive techniques.

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OBJECTIVE: To explore the laparoscopic treatment of hepatic hydatid cyst at tertiary care teaching hospital

PATIENTS AND METHODS: The cross-sectional case series study of five year (June 2013 – May 2018) was conducted in department of surgery LUMHS Jamshoro. All the patients having age ≥18 year of age, either gender, underwent laparoscopic surgery for hepatic hydatid cysts were included in the study while the exclusion criteria for laparoscopic intervention included intraparenchymal location of the cyst, more than 3 cysts and cysts with calcified walls. The diagnosis of the hydatid cyst was based on history, physical examination, ultrasound, CT scan and serological tests. The clinicopathologic features, operative time, conversion to laparotomy, morbidity, mortality and recurrence were reviewed. The frequency and percentage was calculated for categorical variables and mean ±SD was calculated for numerical variables.

RESULTS: During five year study period, total one hundred patients underwent laparoscopic surgery for hepatic hydatid cysts with means age 49.74±895 (SD). The symptoms observed were pain in 92%, fever in 90%, nausea / vomiting in 85% patients, the palpable mass in 78% and jaundice in 72%. Regarding the number of cysts, single cysts in 70%, two cyst in 20% and three cysts in 10% patient population while the location of cysts documented as right lobe of liver 75%, left lobe of liver 20% and 5% exists in both lobes. Regarding the complications and outcomes the anaphylactic shock was observed in 5.0%, port site infection 11%, bile leakage 11%, peritonitis 9.0%, conversion 3%, recurrence 5.0%, hernia formation 3.0 %.

CONCLUSION: It has been concluded that laparoscopy of hepatic hydatid cysts is a safe and best treatment in specific population and is a simple technique with potentially reduced risk of complications & recurrence.
Risk factors of occult distant metastases in patients with pancreatic ductal adenocarcinoma

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**Objectives:** Contrast enhanced multidetector computed tomography (MDCT) is used to evaluate local extension, invasion of adjacent vascular structures and surgical resectability in patients with pancreatic ductal adenocarcinoma (PDAC). However, the findings for the identification of occult distant metastases are not sufficient. Staging laparoscopy (SL) has been shown to identify small peritoneal or liver metastases not seen in the preoperative imagings. Here, we report the risk factors for distant metastases on SL in patients with potentially resectable PDAC.

**Methods:** A total of 112 patients with PDAC, who preoperatively received MDCT and underwent SL from May 2005 to May 2019, were enrolled in this study. Patient characteristics and preoperative MDCT findings (tumor size and location, local extension or vessel invasion of the tumor) were retrospectively collected from the patient charts. Univariate and multivariate analyses were performed to identify risk factors of occult distant metastases.

**Results:** Among the 112 patients, occult distant metastases were found in 11 patients (9.8%), with small liver metastases recognized in four patients, peritoneal metastases in 6, and both in 1 during SL. There were no significant differences in patient characteristics between patients with and without occult distant metastases. In the univariate analyses, MDCT findings of portal invasion, retroperitoneum invasion, plexus infiltration, and tumor size (≥28 mm) were significant risk factors for occult distant metastases. In the multivariate analysis, the tumor size was the only independent risk factor for patients with potentially resectable PDAC.

**Conclusions:** The tumor size of PDAC is a risk factor for occult distant metastases. It is not easy to predict unresectable cases preoperatively, and SL may be beneficial for patients with potentially resectable PDAC.
Gasless versus Conventional Laparoscopic Cholecystectomy.

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**Introduction:** Gasless laparoscopy using abdominal wall-lifting (AWL) method has been developed in an attempt to avoid the adverse effects of carbon dioxide pneumoperitoneum that may occur in conventional laparoscopy. However, lifting has been criticized for its poor operative space, complexity of instruments and technical challenge. The aim of this study was to find out any difference in peri-operative outcomes between gasless (GLC) and conventional laparoscopic cholecystectomy (CLC).

**Methods:** Eighty patients with American Society of Anesthesiologists physical status 1, 2 and 3 were randomly allocated to CLC (40 patients) or GLC (40 patients). Completion rate, perioperative complications, and operation time were recorded. Intra operative hemodynamic changes i.e. EtCO2, Heart rate and mean arterial pressure were recorded at 0, 30 min and end of the procedure. Post-operative pain score and post-operative hospital stay were also assessed.

: One case from CLC and two from GLC were converted to open cholecystectomy because of dense pericholecystic adhesions. Although GLC required a longer operation time (P=0.009) in compared to CLC, no significant perioperative complications were noted for the patients of either group. Significant reduction in end tidal carbon dioxide level throughout the procedure in GLC (P=0.014) in compared to CLC group, however no significant hemodynamic changes in heart rate and mean arterial pressure between the two groups. Post-operative pain score and post-operative hospital stay were also similar in both groups.

**Conclusions:** The gasless with AWL approach avoids increase in EtCO2 level associated with conventional laparoscopic surgery and may avoid the adverse effects of carbon dioxide. Although the technique required a longer operation time, no major complications were resulted from GLC method. Therefore, the technique is a feasible, safe and effective alternative to conventional LC. Moreover, it probably costs less and is therefore, more useful in developing countries.
Laparoscopy Distal Pancreatectomy for Insulinoma

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Insulinomas are benign neuroendocrine tumors which is the most common of the pancreatic islet cell tumors, yet they remain a rarity. The incidence are 1-4 cases in one million patients a year. 60% are woman with a median age at presentation of 47 years. 90% are solitary and 10% multiple. More than 90% are benign adenomas and about 5%-6% of cases are malignant, and 5%-8% are associated with multiple endocrine neoplasm (MEN type I). Most insulinoma are 1-3 cm in size. Hyperinsulinism causes severe hypoglycemia and leads convulsion, depression and coma. Initial operation is curative in 88%, and long-term survival is normal. Recurrence rates of 7% (sporadic) and 21% (MEN type I) have been reported at 20 years. Clinical manifestation related with endogenous hyperinsulinism: autonomic (less specific) like sweat, worried, tremble, nausea, hungry palpitation and tingling. The more specific neuroglycopenic are confusion, changes of behavior, dizzy, headache, and weakness. The classic diagnostic criteria (Whipple's triad): hypoglycemic symptoms, fasting hypoglycemic (< 45 mg/dL) and reversal of changes with glucose. The treatment is surgical, except in advanced metastatic disease, where streptozotocin is helpful. Enucleation is performed for solitary insulinoma, and pancreas resection is performed for multiple insulinomas. Sometimes ultrasonography intra operative is useful to determine the insulinoma location. The surgical can be done by laparotomy or laparoscopic surgery. The benefit of laparoscopic surgery are small incisions, less pain, faster mobilization, short hospitalization and better cosmetic. In the other side, laparoscopic pancreatectomy should be done by experience surgeon with availability of supporting instruments.
A case of laparoscopic Spiegel lobe resection for hepatic angiomyolipoma

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Introduction: Hepatic Angiomyolipoma (AML) is a relatively rare tumor and it is difficult to distinguish from other hepatic tumors by imaging before surgery. And Spiegel lobe resection is technically difficult because of its anatomical location. We experienced a case of hepatic AML in Spiegel lobe successfully resected by laparoscopy.

Case presentation: A 51-year-old female visited our hospital because of epigastric pain. CT scan showed about 30mm enhanced mass in early phase in Spigel lobe. The mass presented low signal in T1 and high signal in T2 on MRI. We couldn’t made definitive diagnosis, so we performed operation for diagnosis and treatment.

Surgical procedures: The patient was placed in the lithotomy and head high position, and we started operation with 5 ports. After mobilization of the lateral section, the Arantius duct was divided with clip. To mobilize Spiegel lobe, the inferior vena cava ligament and the short hepatic veins were divided with clips and LigaSure from caudal to cranial side. Subsequently, resection of the Glisonnian pedicles and liver parenchymal were performed with intermittent Pringle maneuver used. Liver parenchymal resection was performed using a Cavitron ultrasonic aspirator (CUSA) and harmonic scalpel. The operating time was 163 min and the bleeding was 30ml.

Postoperative course: She was discharged 7 days after operation. Histopathologically, the tumor was composed of spindle cells, blood vessels and adipose cells. Immunohistological study showed HMB-45, MelanA and aSMA were positive. The tumor diagnosed as hepatic AML.

Conclusion: We reported a case of hepatic AML in Spiegel lobe diagnosed and treated with laparoscopic surgery. Laparoscopic approach had good view from caudal side, so it was safe and useful for mobilization and resection of the Spiegel lobe.
The clinical relevance of postoperative drain fluid amylase and drain position in open and laparoscopic distal pancreatectomy

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Introduction: The definition of postoperative pancreatic fistula (POPF) by the international study group for pancreatic surgery (ISGPS) is based on the drain fluid amylase (DFA) level. However, for this definition, the drains need to be well positioned around the pancreatic anastomosis or stump. The aim of this study is to evaluate the incidence and clinical impact of drain malposition after open and laparoscopic distal pancreatectomy (DP).

Methods: A retrospective study was performed by reviewing the medical records of 334 patients who received open or laparoscopic DP at Seoul National University Bundang Hospital, between June, 2004 and December, 2018. Patients with no measured DFA or postoperative CT were excluded from the study. Demographic data and perioperative data including DFA and the drain positions identified with CT were analyzed.

Results: Of the 334 patients, 181 (54.2%) had a high DFA, and 153 (45.8%) had a low DFA at postoperative day 3. Drains were malpositioned in 79 (23.7%) patients with no significant difference between open and laparoscopic DP. The low DFA group had significantly more malpositioned drains than the high DFA group (37.3% vs 12.2%), Percutaneous or endoscopic drainage for amylase-rich intraabdominal fluid collection was performed in 31 patients (12.2%) with well positioned drains and in 28 patients (35.4%) with malpositioned drains. The final incidence of clinically relevant POPF (CR-POPF) was 18.8% in the high DFA group and 19.0% in the low DFA group, with no statistical significance. Patients with malpositioned drains experienced a significantly higher incidence of CR-POPF than patients with well positioned drains (38.0% vs. 12.9%).

Conclusions: Even patients with low DFA can develop CR-POPF with similar frequency as patients with high DFA. This suggests that the ISGPS definition of POPF based on DFA levels is limited in DP due to frequent malposition or malfunction of the drains.
A surgical approach to prevent postoperative pancreatic fistula in laparoscopic distal pancreatectomy

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**Introduction:** Postoperative pancreatic fistula (POPF) is the most frequent surgical complication after distal pancreatectomy (DP). We present our standardized procedure that has provided good results in terms of POPF.

**Patients and Methods:** Twenty-five patients underwent laparoscopic DP at the current institution from November 2018. The amylase level in the drainage fluid was assessed, and the incidence of POPF was evaluated according to the ISGPF definition.

**Surgical procedures:** A linear stapler was used for all pancreatic transections. The splenic vein was divided simultaneously with the parenchyma when the pancreas was divided at the body or tail, while they were divided separately when the pancreas was divided at the neck. The jaws of the stapler were advanced, avoiding folding and tucking of the pancreas from the caudal side, and then, closed gently. To confirm the flattened pancreas, the jaws were opened once before being tightened. The jaws were completely tightened by gradually compressing the pancreatic parenchyma, squeezing the liquid and melted fat tissues from the pancreatic parenchyma. The stapler was slowly applied (1 cm/min), and the transection was completed. For a thicker pancreas, initially, only the caudal part of the pancreas was gently grasped with the stapler. The jaws were then pulled back to confirm the flattened pancreas and were advanced again as much as possible to compress the wider part. This procedure was repeated until the caudal edge of the pancreas reached the innermost section of the jaws, and the jaws were completely tightened as described before. If the fibrotic capsule was destroyed along the staple line, the pancreas was transected on the side of the pancreatic head again.

**Results:** Regarding POPF, biochemical leak was noted in 11 patients while no cases of grade B or C POPF were encountered.

**Conclusion:** Our standardized procedure is safe and useful to prevent POPF.
Indocyanine green fluorescence imaging use in laparoscopic complete excision of choledochal cysts.

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**Introduction:** Complete excision of choledochal cysts (CC) is regarded as inevitable due to its malignant potential. Laparoscopic choledochal cyst excision (LCCE) is feasible, but technically demanding with a considerable difficulty due to the higher hemorrhagic potential of the engorged epicholedochal plexus, difficult CC dissection owing to adhesion and inflammation and potential risk of portal vein (PV) injury because of its distortion caused by the mass effect of CC. The application of indocyanine green fluorescence (ICGF) application in LCCE is further discussed in this report. Method: This report includes a retrospective review of three adult patients with CC who underwent LCCE with ICGF imaging from November 2016 to August 2019.

**Result:** The mean age was 25.67 years. Two patients had Type-I CC, and one patient had Type-IV CC (Todani's classification). All patients presented with abdomen pain associated with jaundice and/or cholangitis. LCCE was successful in all patients with estimated blood loss less than 100 ml. The median operation time and post-operative stay were 424 minutes and 8 days respectively. Minor bilioenteric anastomosis leak occurred in the Type-IV CC case. Pathologic examination was accorded in choledochal cysts without evidence of malignancy.

**Discussion:** During cyst dissection, the fluorescence venography could identify the location of distorted PV. While at the following cholangiography phase, the demarcation of the brightening CC and the dim PV could be clearly seen to avoid vessel injury, even with significant pericystic adhesion and inflammation. The fluorescence cholangiography could also delineate the exact pancreaticobiliary junction to guide the level of the cyst excision.

**Conclusion:** ICGF imaging can provide additional anatomic enhancement in the surgical treatment of CC. Yet, it is a relatively new technology, and it may be difficult to demonstrate a statistically significant clinical difference with their use.
Real-word Evidence and Preliminary Experience of Laparoscopic Radical Resection of Hilar Cholangiocarcinoma: 32 Consecutive Patients in a Single Center

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**Introduction** The use of minimally invasive surgery has become widely accepted in Hepatobiliary surgery, even in patients with malignancy. However, performing laparoscopic resection for the treatment of hilar cholangiocarcinoma (HC) is still not universally accepted as an alternative approach to open surgery, and only a limited number of such procedures have been reported due to the difficulty of performing oncologic resection and the lack of consensus regarding the adequacy of this approach.

**Methods** Data of 32 consecutive patients who underwent laparoscopic resection of HC at a single institution between May 2013 and June 2019 was retrospectively reviewed and analysed.

**Results** The number of Bismuth type II, IIIa, IIIb and IV patients is 2 (6.2%), 3(9.4%), 7(21.8%), 20(62.5%) respectively. Among them, 29 patients underwent pure laparoscopic surgery and 3 patients were converted to laparotomy. The operation time was (404.3±62.8) minutes. The mean estimated blood loss (EBL) was 650 mL (range = 470–1400 mL). An average of four lymph nodes (range = 1–11) were retrieved. The median tumor size was 3.0 cm. 26 patients had a negative margin (R0), 5 patients was diagnosed with high-grade dysplasia on the proximal resection margin (R1), 1 patients just underwent palliative operation (R2). Overall and major (Clavien–Dindo grades III–V) complication rates were 53.1% and 6.3%, respectively. The median length of stay (LOS) was 25 days (range = 19–34 days). All patients had been followed up for 3 to 60 months postoperatively until June 2019, five our patients died.

**Conclusion** Laparoscopic resection of HC, which performed by a rich-experienced surgeon, seem feasible and safe in the short term. Larger series with longer follow-up are needed to assess if there are any long-term disadvantages or advantages to laparoscopic resection of HC.
Outcome of Critical View of Safety Dissection in Laparoscopic Cholecystectomy

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**Introduction:** Bile duct injury (BDI) is the most serious iatrogenic complication in Laparoscopic Cholecystectomy (LC). The incidence of BDI is 0.2-.4%. The most common cause of serious BDI is misidentification. A method of identification of cystic structures was first introduced by Steven Strasburg in USA in 1992. Three criteria are needed to achieve Critical View of safety (CVS). 1. Calotte’s triangle was cleared of fat and fibrous tissue, 2. Lower third of the gall bladder (GB) is dissected off the the cystic plate. 3. Two and only two structures are seen entering the GB which are cystic duct and cystic artery. We wanted to see the safety of CVS technique as sole method of dissection in laparoscopic cholecystectomy.

**Methods:** 1062 cases were operated from January 2013 to January 2018 in a period of five years. All cases were operated with CVS dissection method only. Cases included acute cholecystitis, mucocele, empyema, chronic cholecystitis and simple cholelithiasis. Conventional 4 ports were used. Hook diathermy, blunt dissection, teasing tissue with Maryland forceps and gauze dissection were used to achieve CVS.

**Results:** There was only one case of cystic duct stump leak requiring drainage and CBD stenting. Average operating time was 42 minutes and range being 13 to 80 minutes. Out of these 1062 cases in 934(82%) cases all 3 criteria of CVS were achieved. All 3 criteria could not be achieved in remaining 128(12%) cases. There was no death in our series.

**Conclusion:** To prove that CVS dissection method prevents bile duct injury requires randomized trial involving a large number of sample. Low rate of complication of this technique probably makes the surgeon feel more secure both with inflamed and uninflamed anatomy. Excellent outcome of our study forecasts that CVS method will be the gold standard technique in the dissection of the gallbladder in LC.
Successful experience of laparoscopic distal pancreatectomy in pancreatic disease

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Introduction: Expanding technology leading the indication of laparoscopic surgery to pancreas. We initiate laparoscopic distal pancreatectomy with spleen resection (LDPSR) since 2013. To assess the feasibility and safety of LDPSR, we report our experience.

Method and material: Past 9 years, we have done 10 LDPSR in 10 patient. Seven cases were male, and the other 3 were female, and median ages were 73 years old. The indication of surgery including 8 cases of neoplasm, and 2 cases of lesion which related to alcoholic pancreatitis. All cases were performed distal pancreatectomy by laparoscopic technique except one with hand-assisted laparoscopic surgery (HALS). Pancreatic resection has been performed by SigniaTM stapling system using tristaple, recently with reinforce system.

Results: All cases successfully performed by laparoscopy and no open conversion was observed. Operation time was ranged from 205 to 432 minutes (median 306 minutes). Amount of blood loss ranged from 50 to 1340 ml (median 185 ml). No complication including pancreatic fistula developed during and after surgery, and all patient discharged within 10 days after surgery.

Conclusion: Our experience show LDPSR seemed to be feasible and safe. Further studies are required to elucidate its real impact, since we had not been initiated the technique in cases with pancreatic cancer.
Critical appraisal of the learning curve of minimally-invasive hepatectomy: contemporary experience with the first 200 cases of a “self-taught” early adopter in a teaching institution during IDEAL stage 3

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Introduction: A recent study analyzing the experience of fellowship-trained early adopting surgeons during stage 3 of the IDEAL paradigm demonstrated that the learning curve (LC) of minimally-invasive hepatectomy can be shortened compared to the long steep LC of pioneering surgeons during IDEAL stage 2. In this study, we aimed to critically appraise the contemporary learning experience with MIH of a “self-taught” early adopter during stage 3 of the IDEAL paradigm.

Methods: Review of the first 200 consecutive patients who underwent MIH over an 88-month period since 2011 by a single surgeon who had no prior training in MIH. All cases were performed without an external proctor. Only cases whereby the surgeon was the principal operator was included. Cases experienced as a supervisor or assistant were excluded. The cohort was divided into 4 equal groups of 50 patients. Risk-adjusted cumulative sum (RA-CUSUM) analysis of the LC was performed.

Results: 190(95%) underwent totally MIH and there were 13(6.5%) open conversions. There were 55(27.5%) major resections and 94(47.0%) were graded as high/expert difficulty according to the Iwate criteria. Comparison across the 4 groups demonstrated a significant trend towards increased adoption of totally MIH, higher ASA score patients, increased multifocal tumors, increased performance of traditional major hepatectomies and decreased blood loss. RA-CUSUM analysis demonstrated the LC in terms of blood loss, blood transfusion rate, open conversion rate, operation time and postoperative length of stay to be 65 cases. Subset analysis demonstrated the LC for MIH of Iwate low/intermediate difficulty and of Iwate high/expert difficulty to be 35 and 30 cases, respectively.

Conclusion: MIH of all difficulty levels is feasible and can be safely adopted today even by surgeons with no prior formal training. The LC of the “self-taught” early adopter is about 65 cases.
Comparison of laparoscopic versus open distal pancreatectomy with concurrent organ resection for pancreatic ductal adenocarcinoma

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**Background:** Since laparoscopic surgery is being preferred over open surgery on left sided pancreatic cancer patients, in case of concurrent organ resection combined surgery, surgeons tend to hesitate to perform laparoscopic approach. So we conducted this study to compare the surgical outcomes of laparoscopic distal pancreatectomy (LDP) and open distal pancreatectomy (ODP) with additional organ resection.

**Methods:** 60 patients who underwent laparoscopic or open distal pancreatectomy with concurrent organ resection for pancreatic cancer between 2010 and 2017 in Asan medical center were reviewed and analyzed retrospectively.

**Results:** There were 41 patients in ODP group and 19 patients in LDP group respectively. Patient demographics showed no statistical difference between groups. Surgical quality related variables including operation time (ODP: 253 minutes, LDP: 242 minutes, p=0.542), number of total harvested lymph nodes (ODP: 16.5, LDP: 11.6, p=0.077) and R0 resection margin (ODP: 73.2%, LDP: 84.2%, p=0.515) were comparable between groups. However, in terms of postoperative hospital stay, LDP group showed shorter length of stay (ODP: 16.4days, LDP: 10.5days, p<0.001). Median overall survival (ODP: 17.0months, LDP: 30.2months, p=0.105) and disease free survival (ODP: 8.7months, LDP: 10.0 months, p=0.139) showed no statistical difference and postoperative pancreatic fistula rates (LDP: 0%, ODP: 7.3%, p=0.545) were comparable between 2 groups.

**Conclusion:** Even with additional organ resection, LDP group showed safe and comparable surgical outcomes with shorter hospital stay.
Outcomes of laparoscopic cholecystectomy with common bile duct exploration (LC with LCBDE) by chopstick technique in the patients with choledocholithiasis

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**Introductions:** Several techniques in laparoscopic cholecystectomy with common bile duct exploration (LC with LCBDE) procedure were proposed worldwide, and the special instruments may be required in some technique. The chopstick technique is the technique mainly used in Minimally Invasive Surgery Unit, Faculty of Medicine Siriraj Hospital, that the necessary laparoscopic instruments, such as Maryland dissector, endo-bowel clamps, are only needed.

**Methods:** We analyzed the outcomes from the patients with gallstone (GS) with common bile duct stone (CBDS) who underwent LCBDE from January 2012 to April 2019. All patients were operated with a standard 4-port incision. Transcholedochal approach was used in all cases, then CBDS was extracted by chopstick technique first. Completion of CBDS removal was proved by intraoperative choledochoscopy, and choledochotomy was closed with intracorporeal interrupted absorbable sutures. The completeness of stone removal, the conversion rate, the operative time, the length of hospital stay, and other outcomes was also interpreted.

**Results:** All 32 patients underwent CBDE, that 90.6% by laparoscopic approach and 9.4% by robotic approach. The most common indication was large impacted CBDS in 68.8% of cases. The number of preoperative ERCP episodes was 2.4 times. Average preoperative CBD diameter was 15.2 mm, and maximal CBDS size was 16.3 mm. The mean operative time of LCBDE was 195.1 minutes, and estimated blood loss was 110 mL. The immediate CBDS clearance rate was 96.9%. The mean length of hospital stay was 7.7 days. Conversion rate to open surgery was 28.1%, which the most common cause was tight intraabdominal adhesion (15.6%). The postoperative bile leakage was 12.5%, and 15.6% of patients need further postoperative ERCP.

**Conclusions:** The chopstick technique for LCBDE is the reasonable alternative for CBDS management in the secondary hospital or hospital in the rural area with comparable surgical outcomes.
Clinical value and pitfalls of fluorescent cholangiography during single-incision laparoscopic cholecystectomy for the patients with the infraportal type of the right posterior bile duct

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Background: Reports about clinical value of fluorescent cholangiography using indocyanine green (ICG) during single-incision laparoscopic cholecystectomy (SILC) were increasing. We report clinical value and pitfalls of fluorescent cholangiography during SILC for the patients with the infraportal type of the right posterior bile duct.

Methods: Our SILC procedure utilized the SILS-Port with an additional 5-mm forceps through the umbilical incision. Before SILC, 1 mL of ICG (2.5 mg) was administrated by intravenous injection. For fluorescent cholangiography, ICG fluorescent laparoscope system was used.

Results: We performed fluorescent cholangiography during SILC in 13 patients with the infraportal type of the right posterior bile duct. All procedures were completed successfully. The interval from the injection of ICG to the first obtained fluorescent cholangiography before the dissection of Calot’s triangle ranged from 40 to 60 minutes. Before the dissection of Calot’s triangle, fluorescent cholangiography could identify the infraportal type of the right posterior bile duct in 4 patients (31%). After the dissection of Calot’s triangle, fluorescent cholangiography could identify the infraportal type of the right posterior bile duct in 6 patients (46%). The patients whose infraportal type of the right posterior bile duct could not be identified under fluorescent cholangiography had preoperative cholecystitis and/or obesity (body mass index > 25 kg/m2).

Conclusions: Fluorescent cholangiography for the patients without preoperative cholecystitis nor obesity can identify the infraportal type of the right posterior bile duct. The thick fat tissue due to cholecystitis and/or obesity interrupt identification of the infraportal type of the right posterior bile duct under fluorescent cholangiography.
Preoperative Prediction of Difficult Laparoscopic Cholecystectomy and Its Management: Our Experience

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AIMS & OBJECTIVES: Preoperative prediction of difficult laparoscopic cholecystectomy using clinicoradiological parameters, to correlate these parameters with intraoperative severity and to identify the methods to overcome the technical difficulties experienced during surgical exploration in difficult laparoscopic cholecystectomy.

METHODS: A 5 years prospective study of difficult laparoscopic cholecystectomy was done. Preoperative parameters considered were age, gender, previous attacks of biliary colic, abdominal scars, BMI, palpable gallbladder while radiological parameters included were gallbladder wall thickness, presence of pericholecystic collection and presence of impacted calculi. Intraoperative findings of adhesions around the gallbladder, presence of distended or contracted gallbladder, access to upper abdomen, presence of bile/ pus outside gallbladder and time taken to demonstrate the critical view of safety were used to confirm difficult laparoscopic cholecystectomy.

RESULTS: A total of 322 patients underwent laparoscopic cholecystectomy over 5 years of which 51 cases were found to have difficult laparoscopic cholecystectomy based on preoperative parameters and 45 cases were confirmed to be difficult laparoscopic cholecystectomy based on intraoperative findings. 4 out of the 271 patients who were labelled as easy laparoscopic cholecystectomy had intraoperative difficulty. Preoperative scoring system had a Sensitivity of 91.84% and Specificity of 97.8%. Positive Predictive Value of this scoring method was 88.24%. Conversion rate from laparoscopic to open cholecystectomy was 0%.

CONCLUSION: Preoperative scoring system can be utilized to predict the chances of conversion from laparoscopic to open cholecystectomy and high risk patients can be informed beforehand. It also allows senior surgeons to be present in the operation theatre and allows for prediction of possible complications that may occur in these subset of patients.
Initial experiences of laparoscopic pancreaticoduodenectomy

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**Background:** In Japan, laparoscopic pancreaticoduodenectomy has been an insurance treatment since April 2016, however the number of operations is still small due to the complexity of the procedure. The aim of this study was to investigate the short-term clinical outcomes of laparoscopic pancreaticoduodenectomy.

**Methods:** We performed a retrospective review of the operative outcomes of 12 patients who underwent laparoscopic pancreaticoduodenectomy at our institution from April 2016 to August 2019. The short-term outcomes were assessed.

**Results:** Of 12 patients, 8 patients underwent laparoscopy-assisted procedure, and 4 patients underwent pure laparoscopic procedure. Concomitant tumor enucleations of remnant pancreas were performed in 2 patients. The overall median surgical time was 550 minutes (range, 435–800 minutes), and the volume of blood loss was 85 mL (11–554 mL) with no blood transfusion. There was no conversion to open pancreaticoduodenectomy. Complications, grade IIIa pancreatic leakage according to the Clavien-Dindo classification, were noted in 3 patients with no mortality.

**Conclusion:** We found that the laparoscopic pancreaticoduodenectomy could be successfully performed with good operative outcomes. Thus, we believe that this technique is safe and feasible.
Laparoscopic surgery for congenital biliary dilatation in adults

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**Background:** Congenital biliary dilatation in adult is almost caused by the pancreaticobiliary maljunction. Because the incidence for concurrent biliary tract cancer is high, the extrahepatic bile duct resection encompassing the gallbladder is recommended. The aim of this study was to evaluate the outcomes of laparoscopic surgery for congenital biliary dilatation in adults at our institution.

**Methods:** We performed a retrospective review of the operative outcomes of 8 adult patients who underwent laparoscopic surgery for congenital biliary dilatation at our institution. The short-term and long-term outcomes were assessed.

**Results:** The overall median surgical time was 403.0±82.0 minutes, the volume of blood loss was 33±35 mL, and the length of postoperative hospital stay was 15.0±7.8 days. Conversions to mini-laparotomy was occurred in 3 patients (37.5%) due to the difficulty of biliary reconstruction. The distribution of postoperative morbidity was as follows: grade II in 2 patients and grade IIIa in 2 patients, with no mortality. Regarding long-term outcomes, 3 complications occurred, including 2 cholangitis, and 1 biliary stenosis. No patients developed biliary cancer.

**Conclusion:** Laparoscopic surgery of congenital biliary dilatation in adults is technically difficult; however, our results demonstrate the safety and feasibility of this technique.
Comparison of Surgical Outcomes of Robotic and Laparoscopic Pancreateicojejunostomy after Pancreatoduodenectomy in Patient with a Soft Pancreas: Multi-Institutional Study

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Objective(s) A soft pancreas remains a potent risk factor of postoperative pancreatic fistula following pancreaticoduodenectomy (PD). Recently, minimally invasive PDs have been gradually expanding its application. This study aims to evaluate the effect of anastomotic technique of robotic versus laparoscopic pancreateicojejunostomy (PJ) on postoperative pancreatic fistula formation among patients with soft pancreas in multi-institutional database.

Methods From January 2014 to January 2019, 147 patients with soft pancreas and small pancreatic duct less than 3 mm diameter, who underwent minimally invasive PD for periampullary pathologies, were identified. Surgical outcomes of 97 patients who underwent laparoscopic PJ and 50 patients who underwent robotic PJ were compared.

Results General demographics were comparable between laparoscopic and robotic group, except patients with higher ASA score were more included in laparoscopic group. Majority of indications were common bile duct cancer and ampullary cancer in both laparoscopic and robotic group (61.8 % vs. 60 %, p=0.166). All patients underwent duct-to-mucosa anastomosis for pancreateicojejunostomy. Mean pancreatic duct size was also comparable (1.98±0.69 vs. 2.08±0.96, p=0.475) Mean operative time and estimated blood loss were similar. Total postoperative pancreatic fistula rate (57.7 % vs. 46.0 %) and Clinically significant fistula rates higher than grade B (11.3 % vs. 14.0 %) were not statistically different (p=0.279). Delayed gastric emptying was more often in laparoscopic group (7.2 % vs. 0 %, p=0.239) without statistical significance. Total postoperative complications (30.9 % vs. 38.0 %) and severe complications higher than grade III (4.1 % vs. 18.0 %) were more frequent in robotic group (p=0.024). Length of hospital stay was comparable.

Conclusion Our study showed similar postoperative pancreatic fistula rate in both surgical modality. However, robotic approach demonstrated higher postoperative complication rate.
Robotic Limited Local Resection of Duodenal Juxta-Ampullary Neoplasms

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Objective(s) The unique and complex nature of the anatomical location of duodenal juxta-ampullary neoplasms makes determining the appropriate surgical strategy for them challenging. For the benign or borderline malignant tumors, endoscopic submucosal resection is considered to have a risk of perforation of the duodenum or idiopathic injury of ampulla of Vater, bile duct, or pancreatic duct. For these neoplasms, which are considered as overtreatment by pancreaticoduodenectomy, robot surgical system can help to perform safe local resection of duodenal juxta-ampullary lesions.

Methods Between December 2014 and December 2018, seven patients who underwent robotic local resections for duodenal juxta-ampullary tumors were reviewed. Tumor locations were localized using preoperative endoscopic clipping, which was identified by intraoperative laparoscopic ultrasonography. All patients underwent robotic local resection and primary closure of duodenum.

Results There were four male and three female patients. The mean age was 59.1 years (range 39-76) and the mean BMI was 24.8 (range 24.8-31.2). The total mean operation time was 125.0±16.3 min and estimated mean blood loss was 51.4±37.2 ml. All patients were successfully completed robotic local resection of duodenum preserving ampulla of Vater. The mean tumor size was 1.5 cm (range 0.9-2.5). Final pathologic diagnosis included gastrointestinal stromal tumor in three patients, neuroendocrine tumor in two patients, and high grade dysplasia in two patients. The median postoperative hospital stay was 6.1 days (range 4-7). There were no postoperative complications and no recurrence during a mean follow-up period of 17.6 months (range 3-50).

Conclusion With accurate preoperative diagnosis and careful selection of patient, local resection of duodenum for juxta-ampullary benign or borderline tumors may be an attractive treatment option. Robot surgical system helps meticulous management of these tumors preserving ampullary structures.
Recurrence of common bile duct stones following laparoscopic common bile duct exploration: A multicenter study

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Introduction Recurrence of primary common bile duct stone (CBDS) occurs after laparoscopic common bile duct exploration (LCBDE). This study aimed to investigate risk factors for the recurrence of primary stones after LCBDE.

Methods Patients who underwent LCBDE between January 2001 and December 2018 in 4 teaching hospitals of South Korea were included. Operation, fluoroscopy, and ERCP records were investigated retrospectively, and the primary outcome was recurrence of CBDS. Multivariate logistical regression was performed to identify independent risk factors for recurrence of CBDS.

Results The study included 230 patients, 31 of whom had recurrence. In univariate analysis, CBDS size (>9 mm) (p=0.003), multiple stones (≥2) (p=0.031), stone size (≥1.5 cm) (p=0.041), CBD diameter (≥12 mm) (p=0.005), CBD dilatation (≥10 mm) (p=0.02), prior history of laparoscopic cholecystectomy (LC) (p=0.002) were associated with recurrence. After multivariable logistic regression, CBDS size (>9 mm) (adjusted odds ratio [AOR] 4.28, 95% confidence interval [CI] 1.40-13.07, p=0.011), CBD dilatation (≥10 mm) (AOR 5.85, 95% CI 1.69-20.34, p=0.005), and prior history of LC (AOR 3.50, 95% CI 1.31-9.35, p=0.013) were associated with recurrence.

Conclusions Stone size, CBD dilatation, and prior history of LC were risk factors for recurrence of CBDS, and this warrants close monitoring after operation.
CBD Stone Management Data From A High Volume Center: Minimizing Complication, Optimising Outcome.

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INTRODUCTION Management of CBD stones has seen a major paradigm shift from open surgery to minimally invasive techniques for clearance. Here we present data on management of CBD stones at a high volume centre over a period of 6 years.

METHODS A retrospective study of case records of all patients treated for common bile duct stones and its complications from Jan 2012 to Dec 2017 at our institute was undertaken. Patient symptomatology, imaging findings were noted. Various methods of treatment, both endoscopic and surgical, and their complications were detailed.

RESULTS 932 patients were treated for common bile duct (CBD) stones and their complications over a period of 72 months EUS was performed on all patients with suspected CBD stones. Detection of CBD stones on EUS was followed by therapeutic ERCP same day. During ERCP, NBD tube was placed for patients fit for surgery while CBD stent was placed for remaining. Both CBD stent and NBD were placed for selected patients. NBD patients underwent surgery the next day & were discharged after 1-2 days. 989 ERCP were performed for CBD stones (including repeat ERCP sessions). Surgical intervention was done in 790 patients – 657 laparoscopic cholecystectomies (LC) within 48 hours, 35 interval cholecystectomies, 77 laparoscopic CBD explorations, 12 open explorations, 9 choledochal cyst excisions. CBD explorations were combined with T-tube/ primary closure/ enteric diversion. ERCP success rate was 90.7% (897 success with 92 failures). ERCP complication rate was 3% with 1 mortality. Surgical morbidity was minimal with only 1 mortality.

CONCLUSION Strategic selection of endoscopic & surgical interventions & their timing can effectively manage choledocholithiasis, minimizing hospital stay, complications and near zero mortality.
Background: Pure laparoscopic donor hepatectomy (PLDH) has become increasingly accepted in the minimally invasive surgery era. However, the outcomes of pure laparoscopic donor left hepatectomy (PLDLH) are relatively less known than left lateral sectionectomy or right hepatectomy. The present study aimed to report the experience and outcomes of PLDLH including the middle hepatic vein and to compare them with conventional donor left hepatectomy (CDLH).

Methods: The medical records of live liver donors between January 2010 and January 2018 at Seoul National University Hospital were retrospectively reviewed. Donors who underwent left hepatectomy including the middle hepatic vein were included. To minimize selection bias, donors who underwent CDLH after the initiation of PLDH program were excluded. Subsequently, there were 18 donors who underwent CDLH and 8 who underwent PLDLH.

Results: The warm ischemic time (4 minutes [interquartile range (IQR) 2-7] vs. 11 minutes [IQR 10-16]; P=0.001) was longer in the PLDLH group compared with CDLH group. The total operation time (265 minutes [IQR 255-308] vs. 333 minutes [IQR 281-376]; P=0.090) and time to remove the liver (182 minutes [IQR 172-205] vs. 245 minutes [IQR 196-276]; P=0.081) were also longer in PLDLH but not statistically significant. The length of postoperative hospital stay was significantly shorter in the PLDLH group (9 days [IQR 8-10] vs. 7 days [IQR 7-8]; P=0.006). There was no postoperative complication in PLDLH group. The rate of complications in recipients was similar in both groups.

Conclusion: PLDLH including the middle hepatic vein appears to be safe and feasible. Further analysis including long-term outcome is needed.
Comparison between PTGBD and upfront surgery in patients with moderate-to-severe cholecystitis

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**Introduction:** Cholecystectomy, including laparoscopic cholecystectomy, is standard treatment in acute cholecystitis. And Percutaneous transhepatic gallbladder drainage (PTGBD) is one treatment option for patients with moderate to severe acute cholecystitis. The purpose of this study is to compare the clinical outcome of early surgery group and PTGBD group in moderate-to-severe acute cholecystitis.

**Method:** From 2014 to 2017, a total of 837 patients who underwent surgical resection with moderate-to-severe acute cholecystitis at Samsung Medical Center, Seoul National University Boramae Medical Center, Ilsan Paik Hospital, and Ajou University Hospital were analyzed retrospectively. The patients with grade II, III according to Tokyo Guideline 2013 and underwent PTGBD insertion before surgery were included. The 1:1 propensity score matching (PSM) was implemented as a statistical method.

**Result:** Patients who underwent PTGBD before surgery were old age, had more preoperative septic condition, co-morbidity and poor performance status. And PTGBD group had longer hospital day (HD), need more ICU care than early operation group. PTGBD group’s postoperative HD was shorter than early operation patients’. After PSM, there was no different of biliary complication and postoperative HD between PTGBD group and early operation group.

**Conclusion:** In most cases of Grade II, III cholecystitis, early surgery was safe. Therefore, it is better to consider early operation in Grade II, III cholecystitis.
Laparoscopic cholecystectomy in patients with left sided gallbladder using an Indocyanine Green (ICG) Fluorescence Cholangiography

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**Background:** Left-sided gallbladder is a relatively rare anatomical variation that is frequently associated with a biliary system anomaly. In patients with LSGB, LC is associated with a higher incidence of bile duct injury (4.4%), necessitating the establishment of a safe surgical approach in these patients. Here, we describe a case of left-sided gallbladder with cirrhotic liver treated by using an ICG fluorescence cholangiography during laparoscopic cholecystectomy.

**Case presentation:** An 62-year-old man with gallbladder adenomyoma was admitted to our hospital. Computed tomography demonstrated that the gallbladder was centrally dislocated and left-sided gallbladder with right-sided ligamentum teres. A laparoscopic cholecystectomy was performed. The round ligament was attached to the right side of the gallbladder, and the left-sided gallbladder was diagnosed by intraoperative findings (fig. 1). The patient was discharged 2 days after surgery without postoperative complications.

**Conclusions:** ICG fluorescence cholangiography should be used in cases of left-sided gallbladder during laparoscopic cholecystectomy. An assessment of the extra- and intrahepatic biliary system is essential to avoid biliary injury in cases of left-sided gallbladder.
Laparoscopic Distal Pancreatectomy with Splenic Preservation: Experiences in One Center.

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**Background:** Splenic preservation has been advocated in patients undergoing laparoscopic distal pancreatectomy for benign or low-grade malignant lesions because of its hematological and immunological advantages. Laparoscopic distal pancreatectomy with splenic preservation is technically more difficult than with splenectomy.

**Aims:** To evaluate the short-term outcomes of laparoscopic distal pancreatectomy with splenic preservation.

**Methods:** Retrospective study.

**Results:** From January 2015 to January 2019, a total of 15 laparoscopic distal pancreatectomies with planned splenic preservation were performed. There were 10 cases successful with splenic preservation (Warshaw’s technique in 2 cases, splenic vessel preservation in 8 cases), 5 cases changed to unplanned splenectomy due to adhesive chronic pancreatitis. As compared to laparoscopic distal pancreatectomy with splenectomy, there were no significant difference in the operating time (218 vs 240 min, p=0.202), conversion to open (9.1% vs 6.7%, p=1), hospital stay (7.6 vs 8 days, p=0.552), pancreatic fistula (10% vs 21.4%, p=0.615), mortality (0% in both groups).

**Conclusions:** Laparoscopic distal pancreatectomy with splenic preservation is a feasible, safe and effective surgery. Risk factor for unplanned splenectomy might be adhesive chronic pancreatitis.
Early detection of imaginerary dissection line using an Indocyanine green (ICG) fluorescence cholangiography during laparoscopic cholecystectomy

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Background/Purpose: Bile duct injuries are the most dismal complication in cholecystectomy. The Critical View of Safety (CVS) has been shown to be a good way to obtain the secure anatomical identification. We try to get an early detection of imaginary dissection line (fig.1) using an ICG fluorescence cholangiography during laparoscopic cholecystectomy.

Methods: Thirty patients underwent laparoscopic cholecystectomy using ICG cholangiography. Thirty patient were grouped into two groups, with one group underwent needlescopic grasper assisted single incision laparoscopic cholecystectomy (nSLIC) (6 patients) and another group underwent Three port laparoscopic cholecystectomy (TPLC) (26 patients). Basic information about the patient and diagnosis was collected.

Result: ICG cholangiography group was consisted of 9 male (28.6%) and 21 female (71.4%), TPLC group was consisted of 7 male (29.2%) and 17 female (70.8%) (p = 1.0) and nSILC group was consisted of 2 male (33.3%) and 4 female (66.7%). The average age of nSILC group was 47.8 ± 10.7 years old, and TPLC group was 51.9 ± 11.7 years old (p = 0.363). CVS time of TPLC group was shorter than nSILC group (nSILC: 22.3 ± 14.1 min, TPLC: 11.5 ± 4.8 min, p = 0.060), major procedure time (skin incision to GB removal from liver bed) of TPLC group was shorter than nSILC group (nSILC group: 31.5 ± 19.5 min, TPLC: 18.3 ± 6.7 min, p = 0.009). Total operation time (skin to skin) of TPLC was shorter than nSILC group (nSILC: 63.7 ± 18.6 min, TPLC: 41.6 ± 14.7 min, p = 0.007). Imaginary dissection line obtaining rate showed all patients in two groups (6/6 vs 24/24).

Conclusion: ICG fluorescence cholangiography may get an imaginary and confirmatory dissection line during laparoscopic cholecystectomy. It might be helpful to prevent bile duct injury during laparoscopic cholecystectomy. This result was thought that the number of performed cases were small.
Successful management of aberrant right hepatic duct during laparoscopic cholecystectomy

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**Background** Anatomic variants of the biliary tree present challenges to surgical management during laparoscopic cholecystectomy and affect perioperative outcomes. An aberrant right hepatic duct connecting into the cystic duct is a practically important variation because of the susceptibility to serious postoperative refractory bile leakage. We report a successful case of laparoscopic cholecystectomy in the aberrant right hepatic duct of a patient diagnosed with chronic cystitis.

**Case presentation** A 49-year-old man was referred to our department for treatment of chronic cholecystitis. Magnetic resonance cholangiopancreatography indicated that the cystic duct branched from the common bile duct and an aberrant bile duct connected to the cystic duct. Intraoperative cholangiography revealed that the bile duct was not confluent to the major right branch of the intrahepatic bile duct and drained a narrow area. Preoperative magnetic resonance cholangiopancreatography had diagnostic value. Furthermore, intraoperative cholangiography with the Critical View of Safety method was paramount to achieving safe cholecystectomy based on confirmation of the biliary anatomy and the drainage area of the aberrant right hepatic duct.

**Conclusion** We encountered a rare but clinically significant case of laparoscopic cholecystectomy. This case suggests that precise understanding of the anatomy and drainage area of the aberrant right hepatic duct preoperatively and intraoperatively can lead to safe cholecystectomy.
Totally Laparoscopic Pancreaticoduodenectomy: Surgical and Oncologic Outcomes.

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**Background:** totally laparoscopic pancreaticoduodenectomy is considered as a safe and effective procedure. The aim of this investigation is to evaluate surgical and oncologic outcomes of totally laparoscopic pancreaticoduodenectomy at a single center.

**Method:** case series

**Result:** there were 41 cases performed totally laparoscopic pancreaticoduodenectomy at University Medical Center at Ho Chi Minh city, Vietnam during a period of 2 years from 06/2017 to 06/2019. The operating time ranged from 7 hours to 10 hours in the first year and from 5.5 hours to 7 hours in the second year. There were 3 conversions accounting for 7.3%. No blood transfusion was needed. Blood loss was 155 ± 90 ml. Based on ISGPF 2016, POPF rate was 7.3%. Biliary fistula happened in 1 case. Re-operation and percutaneous were required in 1 case and 2 cases, respectively. The hospital stay ranged from 7 to 10 days in no morbidity group. The maximum and average lengths of hospital stay were 21 days and 11 days, respectively. R0 rate reached at 100%. Retrieved lymph nodes was 8 – 18 with 12 lymph nodes in average.

**Conclusion:** totally laparoscopic pancreaticoduodenectomy is safe and effective in terms of surgical and oncologic outcomes in well-selected patients.
Early Experience of Solo Surgeon Laparoscopic PPPD with Articulated Scope Holding Arm System: the feasibility and safety of short term surgical outcomes

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**Background** Surgeons performing Laparoscopic PPPD usually requires two or three surgical assistants. However, those who perform the solo surgeon laparoscopic PPPD (SSLPD) simply need a scrub nurse because a passive camera holder can hold camera stably instead of surgical assistants. In this study, we investigate the feasibility and safety of the SSLPD with articulated scope holding arm system.

**Methods** From April, 2017 to July, 2019, 11 patients underwent minimal invasive PPPD in our hospital. Among them, 9 patients underwent SSLPD and 1 patient underwent robotic single port plus 2 ports hybrid PPPD and 1 robotic single port plus 2 ports PPPD. The above 9 patients underwent SSLPD using passive camera holder (UNITRAC®, Carl-Braun-Straße 1, 34212 Melsungen, Hessen, Germany) which facilitate single-handed repositioning. And 1 patient underwent SSLPD using robotic single site surgical system (the da Vinci Xi® Surgical System (Intuitive Surgical®, Sunnyvale, CA)). Viewing by using a device such as Grasper was achieved by pulling and fixing Grasper using a towel click.

**Results** 5 patients were female and the rest were male. 5 patients were diagnosed ampulla of vater cancer, two were pancreatic cancer, one was common bile duct cancer, one was duodenal cancer and one had mucinous non-neoplastic cyst. And the mean operation time was 644 minutes and the mean estimated blood loss was 863ml and mean length of hospital stay was 13.2 days. There was no major complication except one patient developed postoperative bleeding but recovered after conservative treatment.

**Conclusion** The SSLPD procedure using passive camera holder is feasible and safety method though operation time takes a little longer. If more clinical experience is to be built, this method will be safer and more efficient in performing minimally invasive PPPD or PD for patients with periampullary cancer.
Iatrogenic bile duct injury during laparoscopic cholecystectomy. Is it preventable?

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Laparoscopic Cholecystectomy has widespread acceptance in early 1990’s. LC is the “Gold Standard” for symptomatic or complicated GB stones. Approximately 750,000 LCs are performed each year in the USA. Over all incidence of Bile duct injury is 0.3%. Only 25-33% of injuries are recognized intraoperatively. Survey administered to 4100 participating surgeons from American College of Surgeons where 44% (n=1,412) completed the survey reported 37.7% being primary surgeon for a BDI and 12.9% had more than one injury. Factors contributing to bile duct injuries include inflammation in the Calot’s triangle, short cystic duct, excessive cephalad retraction on the gallbladder fundus, insufficient or excessive lateral retraction of the gallbladder infundibulum, use of an end-viewing scope, excessive use of cautery, physician inexperience and aberrant biliary anatomy. Preventive measures for iatrogenic bile duct injury include attention to operative details, insufficient close or deep plane, Strasberg critical view of safety, appropriate Handling of Gallbladder, careful use of diathermy and recognition of Biliary and Vascular Anomalies.LC is a common surgical procedure but BDI are infrequent and among the leading sources of malpractice claims against surgeons worldwide. Between 34% and 49% of surgeons are expected to cause such an injury during their career. Proper surgical training to perform LC is essential. Awareness and preventative methods are of clinical importance to surgeons. BDI increase mortality and morbidity, reduce long-term survival, reduced quality of life and increase cost.
Pure laparoscopic living donor hepatectomy : single-center experience on 300 patients

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**Introduction:** Minimally invasive operation has been widely used for hepatobiliary operation. The aim of this study was to determine safety and feasibility of pure laparoscopic living donor hepatectomy (PLDH).

**Method:** From November 2015 to April 2019, 300 cases of adult PLDH were performed in Seoul National University Hospital. Patients were divided into three subgroups from the first operation to 300th case: group 1 (case 1st-100th), group 2 (case 101st-200th), group 3 (case 201st-300th). We reviewed retrospectively and analyzed outcomes of safety and feasibility.

**Results:** Surgical procedures were included Right hemihepatectomy (n=262), extended right hemihepatectomy (n=26), left hemihepatectomy (n=6), left lateral sectionectomy (n=4) and extended left hemihepatectomy (n=2). Operative time (group 1: 323.02±62.20 min, group 2: 253.25±53.39 min, group 3: 237.54±74.12 min) and blood loss (group 1: 423.10±202.18cc, group 2: 200.15±194.26cc, group 3: 181.87±145.11cc) were gradually decreased (p<0.05). And hospital stay days tend to be decreased (group 1: 8.08±2.05 days, group 2: 7.11±2.82 days, group 3: 6.87±1.67 days, p<0.05).

**Conclusion:** Pure laparoscopic living donor hepatectomy is feasible and safe even for donors who have anatomical variation.
Outcomes of laparoscopic liver resection in Rajavithi Hospital

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Background: Laparoscopic surgery is widespread expeditiously with an increasing tendency both in terms of the number of surgery and the type of surgery. Laparoscopic surgery provides smaller surgical wounds and less pain after surgery, as well as less time for hospitalization after surgery. Therefore, laparoscopic surgery techniques have also been applied in surgery for liver disease patients. During the last 5 years, Rajavithi Hospital received approximately 80-100 liver surgery patients annually. Most of them entered the open abdominal surgery, which was found to have complications after surgery, such as a long recovery period at the hospital, lung atelectasis after surgery, etc. Thus, laparoscopic hepatectomy has been applied more to reduce the complications that occur after surgery.

Objectives: To study outcomes of laparoscopic hepatectomy in patients at Rajavithi Hospital, and to compare the effects of laparoscopic hepatectomy in patients with cirrhosis and non-cirrhosis.

Materials and Methods: Research design is retrospective study from the data in January 2013 - November 2018 by examining the results of laparoscopic surgery in patients with liver mass at Rajavithi Hospital. The studied data include general information of patients and surgical results, which can be assessed from 2 phases, namely results in the operating room and results after the surgery.

Results: 114 patients underwent laparoscopic hepatectomy, divided into 44 patients for major operations, accounted for 38.4%, and 70 patients for minor operations, accounted for 61.4%. There was an average amount of blood loss during surgery (Intraoperative blood loss) at 600 milliliters, with an average operative time of 285 minutes, average hospital stay of 8 days. 53 percent of the patients had postoperative complications, which was post hepatectomy liver failure (9.6%), pleural effusion (4.4), sepsis (3.5) and 1 patient died after surgery.

Conclusion: Laparoscopic hepatectomy is a safe treatment option for patients who are necessary to receive liver surgery.
Incidence of unplanned repeat endoscopic retrograde cholangiopancreatography: a prospective single center study

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Endoscopic retrograde cholangiopancreatography (ERCP) is the most common therapeutic procedure used to treat benign biliary disease and malignant biliary disease. Unfortunately, patients often require more than one ERCP to these disorders and it is difficult to counsel patients on the likelihood of this possibility, given the lack of available data. We set out to establish how often repeat ERCPs were required for benign biliary and malignant indications and look for pre procedure clinical indicators that might pose an increased risk of needing multiple ERCPs.

Methods: In this trial, a total of 147 ERCP procedures performed in 88 patients at the endoscopy department of our hospital between 2017 -2018, were Prospectively evaluated. The age, gender, complaints, pre-procedure diagnosis, and the final diagnosis were assessed. Data were analyzed to define the incidence of repeat within range 2-3 months of an index ERCP done for benign and malignant condition. Chi-square test was used to statistically analyze the results. The level of significance was set at p<0.05. Type of stent and number of stents were evaluated using univariate and multivariate logistic regression to define risk factors for requiring unplanned repeat ERCP.

Results: In a total of 147 ERCP procedures performed in 88 patients were performed between 2017-2018 and were included in the analysis. 130 underwent their ERCP for benign biliary indications, and of those 4 (3%) required an repeat ERCP and 17 underwent their ERCP for malignant condition and of those 4 (23.5%) required an repeat ERCP. The most common indication that resulted in repeat ERCPs were CBDS (2.3%) for benign condition and malignant obstruction at distal CBD (23.5%) for malignant condition Multivariate logistic regression analysis for risk factors for unplanned repeat ERCP include: Type of stent and number of stent were not associated with significant risk for repeat ERCP.
Reduction of thermal damage during laparoscopic hepatic parenchymal transection contribute to prevent the postoperative bile leakage

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**Background:** The development of energy devices with coagulation technology has opened the doors for laparoscopic liver resection (LLR). However, the thermal effects can lead to postoperative complications like biliary tract stenosis or bile leakage.

**Methods:** We employ the clamp clash method under inflow occlusion for parenchymal transection. Previously, hepatic parenchyma was clashed by activated bipolar forceps, BiClamp (high coagulation method: HCM). Although this method enabled superior hemostasis, deep and diffuse thermal damage often occurred at the cut surface. The energy device was changed to ultrasonic laparoscopic coagulating shears (LCS). The hepatic parenchyma was clashed in a non-active state (low coagulation method: LCM). Therefore, small vessels were recognized clearly among the raw parenchyma and could be resected without switching to another device.

**Results:** From June 2014 to May 2018, 166 cases of pure LLR were performed in our hospital. There was no difference in the clinical characteristics between HCM group (n=74) and LCM group (n=92) except for repeat hepatectomy ratio. As for operative variables of HCM and LCM group, the median operative duration was 271 and 188 minutes, the median amount of bleeding was 80 and 50 ml, and the median post-operative hospital stay was 8 and 7 days, postoperative complications over grade 3 according to the Clavien-Dindo classification were 5 (3 bile leakage) and 4 (0 bile leakage) cases, respectively. The laboratory data after LLR revealed that LCM represented lower elevation level of transaminase, total bilirubin, white blood cell and C-reactive protein than HCM. The fluid collection at cut surface, which may be the potential bile leakage, was checked using CT scan 1 month after LLR. The development of large fluid collection over 3cm in diameter was significantly decreased in LCM group.

**Conclusions:** Reduction of thermal damage during laparoscopic hepatic parenchymal transection may contribute to prevent the postoperative bile leakage.
Laparoscopic Treatment with Hydatid Cyst

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According to the WHO, the incidence of persons with hydatid cyst in endemic areas is more than 50 per 100,000 population per year. Hydatid cyst of the liver (HCL) occurs at any age, but most patients are probably infected during childhood. Methods. From 2017 to 2019, we performed 81 procedures with HCL. The patients had cysts only in the liver. The patients were divided into two groups: the main group (21 - laparoscopic procedure) and a control group (60 - open surgery). We also used intraoperative US evaluation of the liver and the HCL. Albendazole was administered before (1 course) and after (2–4 courses) surgery in all children (10 mg/kg per day, administered twice daily). The parasitic hydatid cysts were located mostly in the right liver lobe in both the main and control groups (90.4 and 80.0%, respectively). Results. Hospital stays were significantly longer in patients in the control group. Operation time was significantly shorter for the main group. In conclusion, our experience has shown that the laparoscopic technique is an effective surgical treatment for HCL. Compared with open surgery, the duration of the surgical effects decreased and the number of postoperative complications was markedly reduced.
Comparison of the oncological outcomes of open versus laparoscopic surgery for T1-T2 gallbladder cancer: A propensity score-matched analysis

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Background: Although several studies have focused on laparoscopic treatment for T1 gallbladder cancer (GBC), few have investigated the differences in the oncologic outcomes of laparoscopic and conventional open surgery for T1 and T2 GBC. The purpose of this study was to assess the role of laparoscopic surgery in T1-2 GBC patients.

Methods: Data on 114 patients with T1-2 GBC who underwent surgical resection between January 1999 and December 2017, were retrieved from a retrospective database. Eligible patients were classified into ‘laparoscopic’ and ‘open’ groups. Propensity score matching was used in a 1:1 ratio. The effect of surgery type on surgical outcomes and oncologic outcomes was investigated.

Results: Twenty-one patients each were included in the open and laparoscopic surgery groups after propensity score matching. The median follow-up duration was 70 and 26 months for the open and laparoscopic group, respectively. The operative time (310.2 ± 83.2 vs. 214.5 ± 138.6 min, P=0.01) and length of postoperative hospital stay (14.4 ± 5.8 vs. 8.3 ± 5.7 days, P=0.001) were significantly shorter in the laparoscopic group. The 3-year overall (88% vs. 90%, P=0.683) and disease-free (78.9% vs. 65%, P= 0.451) survival rates were similar between both groups.

Conclusions: Using propensity score matching, we found that laparoscopic surgery for T1-T2 GBC yielded similar long-term oncological outcomes, with the achievement of favorable short-term outcomes, compared to open surgery. Laparoscopic treatment should be considered for patients with T1-T2 GBC.
Risk factors and the time of occurrence on the development of CBD stones after LC

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**Background.** The development of common bile duct (CBD) stones after laparoscopic cholecystectomy (LC) could be a stressful event for surgeon and patients. The purpose of this study was to investigate the risk factors and the time of occurrence on the development of CBD stones which are detected a certain period after LC in patients who have no history of CBD stone before operation.

**Methods.** A total 1,938 patients who received LC for benign gallbladder lesion were retrospectively analyzed. The patients were categorized into two groups according to the development of CBD stones at least 6 months later after LC (case group, control group). The risk factors and the time of occurrence on the development of CBD stones after LC were evaluated.

**Results.** In univariate analysis, significant factors for the development of CBD stones were found in old age, mild/moderate/severe acute cholecystitis, the presence of periampullary diverticulum and smaller size of gall stone. By multivariate analysis, body mass index (OR 0.0862, 95% CI, 0.747 – 0.995, p=0.042), non-smoking (OR 0.190, 95% CI, 0.040 – 0.909, p=0.038), moderate acute cholecystitis (OR 6.875, 95% CI, 2.232 – 21.176, p=0.001), the presence of periampullary diverticulum (OR 6.955, 95% CI, 2.665 – 18.150, p<0.001) and smaller size of gall stone (OR 0.192, 95% CI, 0.046 – 0.808, p=0.024) were independent factors that could predict development of CBD stones at least 6 months later after LC. The cutoff value for the smaller size of GB stones was 0.65cm and 38.5% were developed within 10.7 months after LC.

**Conclusion.** Surgeon could preoperatively mention the possibility of CBD stone to the patients who have these risk factors and should carefully follow up, particularly until 1 year after LC.
A comparative study of laparoscopic versus open pancreaticoduodenectomy for ampulla of Vater carcinoma: a propensity score-matched analysis on 359 consecutive cases

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**Background:** Several studies have compared laparoscopic pancreaticoduodenectomy (LPD) and open pancreaticoduodenectomy (OPD) in patients with periampullary carcinoma; however, only a few studies have made such comparison on patients with ampulla of Vater cancer (AVC). We compared the perioperative and oncologic outcomes between LPD and OPD in patients with AVC by using propensity score-matched analysis.

**Methods:** Data from patients who underwent LPD or OPD due to AVC at a single high-volume center between August 2011 and December 2017 were retrospectively reviewed. Demographics, surgical variables, and postoperative and oncologic outcomes were compared between the LPD and the OPD groups.

**Results:** A total of 359 patients underwent PD due to AVC during the study period (76 LPD, 283 OPD). After propensity score matching, the LPD group showed significantly longer operation time than did the OPD group (400.2 vs. 344.6 minutes, P < 0.001). Nevertheless, the LPD group had fewer number of pain killer administration (8.3 vs. 11.1, P < 0.049), fewer Grade II or more severe postoperative complications (15.9% vs. 34.8%, P = 0.012), and shorter postoperative hospital stay (13.7 vs. 17.3 days, P = 0.048) compared with the OPD group. There was no significant difference in recurrence-free and overall survival between the two groups (P = 0.754 and 0.768, respectively).

**Conclusions:** Compared with OPD, LPD for AVC had comparative oncologic outcomes with less pain, less postoperative morbidity, and shorter hospital stay. LPD may serve as a promising alternative to OPD in patients with AVC.
Oncologic outcomes of laparoscopic versus open pancreatectomy for intraductal papillary mucinous neoplasm with high-risk stigmata and worrisome features

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Introduction: Laparoscopic pancreatectomy is being performed widely for intraductal papillary mucinous neoplasm (IPMN). However, there have been a few reports on specific oncologic outcomes for IPMN of laparoscopic pancreatectomy in comparison with open pancreatectomy. The aim of this study is to compare the postoperative and survival outcomes of open and laparoscopic surgery for IPMN.

Methods: This retrospective study includes 147 patients who underwent laparoscopic (n=87) or open pancreatectomy (n=59) between February 2004 and April 2019. The presence of high-risk stigmata and worrisome features, as described by the 2017 international consensus guidelines, were analyzed. Clinicopathologic characteristics and perioperative outcomes were compared between both groups.

Results: There were 43 patients with high-risk stigmata and 83 patients with worrisome features. There were no significant differences in demographics, postoperative complications, operation time, estimated blood loss, or resection margins. Pancreateicoduodenectomy was more frequently performed in the open group. The laparoscopic group had less postoperative transfusion (OR: 3.35, 5.7% vs. 16.9%, p=0.049) and shorter postoperative hospital stay (12.4days vs. 18.0days, p<0.05) than the open surgery. The median number of harvested lymph nodes (8.0 vs. 17.0, p<0.05) were lower in the laparoscopic group than in the open group. Overall survival rate was higher in the laparoscopic group than in the open group (96.6% vs. 79.7%, p<0.05). Also, in the malignant (high grade dysplasia and invasive) IPMN (n=102), it was 100% for laparoscopic group and 85.0% for open group (p=0.081). The overall survival rate was 96.0% and 83.3% for laparoscopic and open group in IPMN with high-risk stigmata (p=0.491), which was 95.8% and 85.7% in IPMN with worrisome features (p=0.245).

Conclusions: This study showed that laparoscopic surgery has oncological safety for the patients of malignant IPMN.
A comparison of minimal invasive versus open distal pancreatectomy for pancreatic ductal adenocarcinoma in single institution: propensity score matching analysis

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Introduction: Because of concerns about adequate oncological outcomes and perioperative complications, minimally invasive distal pancreatectomy (MIDP) for pancreatic ductal adenocarcinoma (PDAC) still has limitation of generalizability. Aim of this study was to evaluate the perioperative outcome and oncologic outcome of MIDP compared with open distal pancreatectomy (ODP) for PDAC. Methods: We retrospectively reviewed 363 patients undergoing MIDP and ODP for PDAC from January 2011 to December 2017. We collected demographic, perioperative outcome, pathology, and overall and disease-free survival data and compared MIDP and ODP. After propensity score matching (PSM), we also analyze perioperative and oncologic outcomes.

Result: We compared 184 MIDP patients with 179 ODP patients. MIDP and ODP patients differed for neoadjuvant chemotherapy (1.6% vs 14.0%, p<0.001) and concurrent vessel resection (2.1% vs 18.4%, p<0.001). MIDP had shorter operation time (210 vs 236 min, p<0.001) and hospital stay (8 vs 11 days, p<0.001) than ODP. Other perioperative outcomes were the same. Pathologic outcome was not different between MIDP and ODP except lymphovascular invasion (39.7% vs 53.6%, p=0.009) and harvested lymph node (14.0 vs 16.0, p=0.037). MIDP had better overall (32.6 vs 25.0 months, p=0.023) and disease-free survival (13.3 vs 10.4 months, p=0.020). With PSM, MIDP also showed shorter operation time, hospital stay, comparable survival with ODP (HR=1.20, p=0.256) and better overall survival in inverse probability of treatment weight analysis (HR=1.43, p<0.001).

Conclusion: MIDP has advantage of perioperative outcomes and shows the possibility of better oncologic outcome for resectable PDAC
Randomized control trial on open versus laparoscopic common bile duct exploration in management of common bile duct stones

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Introduction: Choledocholithiasis is a common problem in surgical practice. This study aimed to compare the outcomes of open common bile duct exploration (OCBDE) versus laparoscopic common bile duct exploration (LCBDE) in management of common bile duct stones (CBDS).

Methods: This was hospital based, interventional, open label randomized prospective study. It included 80 patients with CBDS, randomized into two groups, operated from December 2016 to May 2018 at Defence Services General Hospitals (1000 Bedded), Myanmar.

Results: The mean duration of OCBDE was 108 ± 33.6 minutes and that of LCBDE was 120.8 ± 35.9 minutes. Success rate for stone removal was 97.5% in OCBDE group and 92.5% in LCBDE group (p = 0.305). Conversion rate in LCBDE to open surgery was 5%. Primary closure was carried out in 27 patients, T-tube drain in 40 patients and internal drain by choledocho-duodenostomy was done in 13 patients. Intraoperative complications of port site haematoma occurred in 2 patients of LCBDE and excessive bleeding occurred in one patient of OCBDE. Post-operative complications occurred in 8 patients of OCBDE (20%) and 6 patients of LCBDE (15%) (p=0.305). There was no mortality case in both groups. Mean post-operative VAS pain scores were significantly reduced in LCBDE group than OCBDE group (p < 0.001). Mean value for total number of rescue analgesia was significantly lower in LCBDE group than OCBDE group (0.9 ± 0.78 vs 3.1 ± 0.67) (p < 0.001). Mean duration of hospital stay in LCBDE (5.7 ± 2.15 days) was shorter than that of OCBDE (9.1 ± 2.36 days) (p < 0.001). Likert’s score for patients’ satisfaction is significantly higher in LCBDE group (p < 0.001).

Conclusions: LCBDE has comparable outcome with OCBDE in stone clearance and complication rates with reduced post-operative pain, analgesic requirement, shorter hospital stay and better patient satisfaction.
Upper Gastroenterology disease

Problems and pitfalls in laparoscopic treatment of upside-down stomach

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Introduction: Laparoscopic surgery of upside-down stomach (UDS) is in some cases associated with technical difficulties.

Methods: Between January 2010 and March 2018 46 patients were treated laparoscopically because of symptomatic UDS. Symptoms occurring were anaemia in 21 (45.7%) patients, pain or chest pressure in 17 (38.6%) patients, 17 (37%) patients experienced dysphagia, and reflux was mentioned by 6 (13.0%) patients. All patients, except one, were prospectively investigated. Mean duration of follow-up was 24 months. The grade of intraoperative difficulties (I to IV) was assessed as: I. - ideal cases (i.e. easy to operate, no problems) – 1 (2.2%) patient; II. - not quite ideal cases (some minor difficulties may occur) – 32 (69.6%) patients; III. - problematic cases (difficult to operate, some operative techniques are considerably more difficult than others) – 11 (23.9%) patients; and IV. - very difficult cases (every operative step is difficult) – 2 (4.3%) patients.

Results: There was no mortality and no conversion to open procedure. One patient had to be reoperated because of a intraoperatively not recognised gastric perforation. 7 (16.3%) patients developed symptomatic recurrences and were reoperated. In 5 (10.9%) multimorbid cases the extent of operation was reduced for reposition and gastropexy. The follow up examination revealed no special complaints from these patients. In 2 (4.3%) cases it was not possible to mobilise the gastroesophageal junction under the diaphragm. In these patients we accepted the transformation of hiatal hernia from type III into type I and did not perform Collis gastroplasty. One of these patients developed heartburn and regurgitation, all other patients were without special complaints.

Conclusion: A laparoscopic hiatoplasty with primary hiatal closure and anterior hemifundoplication by upside down stomach is associated with a few major complications and achieves a good symptomatic outcome for the vast majority of individuals despite of relatively high recurrence rates.
Effectiveness of intra-operative endoscopy for localization in gastrectomy for stomach cancer; comparing preoperative endoscopic clipping & intra operative ICG injection

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**Introductions:** Knowing the intraoperative location of tumor is very important for determining proper resection margin and choosing anastomosis method in gastrectomy for gastric cancer. This study aimed to introduce intraoperative endoscopy to identify that tumor visually without tactile sensation and compare other methods.

**Methods:** Patients with early gastric cancer (EGC) who received Totally laparoscopic distal gastrectomy (TLDG) from January 2015 to May 2019 were included. Among them, patients with tumor located at antrum were excluded. The patients were categorized into Group A (Intra-operative endoscopy, n=35), B (pre-operative clipping, n=42), C (Pre-operative ICG injection, n=24) and D(no procedure, n=352) based on if they underwent procedure for localization or not. For evaluating superiority of accuracy and effectiveness among the groups, postoperative outcomes were compared.

**Results:** Compared with D, Only Group B showed shorter distance from tumor to proximal resection margin (dis PRM) statistically. (dis PRM of Group B vs. Group D :1.9cm vs. 2.8cm, P value=0.017) Meanwhile, Group A did not present statistically difference in dis PRM, but shorter than other groups in fluctuation of dis PRM. (dis PRM of Group A vs. B vs. C vs D: 2.5[1.4-3.5]cm vs. 1.9[0.7-3.7]cm vs. 3.5[1.4-4.7]cm vs. 2.8[1.6-4.4]cm) Moreover, Group A showed not only shorter operation time but also individually less variation of operation time.

**Conclusions:** The method of localization by intraoperative endoscopy is superior for accuracy and sensitivity than other methods in case of TLDG, which is less sensitive to tactile. Not only does it show time effective but it is also cost effective due to the absence of additional procedure compared to other methods.
Endoscopic management of massive upper gastrointestinal bleeding from the jejunal diverticulum by the hemoclips: A case report.

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**Introduction:** Jejunal diverticulum is a rare condition with an incidence of 0.4-4.6%. Most of the patients are asymptomatic but there was complicated by diverticulitis with or without perforation, bowel obstruction and bleeding. The author reported endoscopic management in an unusual case that presented with massive upper gastrointestinal bleeding.

**Method:** A 52 years old male presented with hematemesis, hematochezia and hypovolemic shock. Endoscopy was performed after initial resuscitation and cannot identify the bleeding source. CT angiogram was done after the re-bleeding, which demonstrated of contrast leakage in the proximal jejunal diverticulum. Enteroscopy was performed and showed the bleeding point from jejunal diverticulum. Endoscopic clips (Hemoclips) were applied to the ulcer and sentinel clot at a base of diverticulum in an attempt of bleeding control.

**Result:** The post intervention period was uneventful and the patient was discharged from the hospital on the fourth operative days. Neither recurrent of bleeding nor diverticulitis was occurred during two years of following period.

**Conclusion:** Enteroscopy for application of the endoscopic clips is a safe and effective treatment tool for the treatment of bleeding jejunal diverticulum.
Laparoscopic and Endoscopic Cooperative Surgery for Stomach Submucosal Tumors: A Case Series Study.

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Background: Laparoscopic wedge resections are increasingly utilized to treat gastric submucosal tumors. However, laparoscopic wedge resection is not applicable for tumors located near the gastric inlet, or outlet, or posterior wall and requires resection of relatively large sections of normal gastric wall, particularly if laparoscopic linear staplers are used.

Methods: From Jan 2018 to May 2019, among 52 patients with gastric submucosal tumor were admitted, 5 consecutive patients underwent laparoscopic and endoscopic cooperative surgery (LECS) for resection of gastric SMTs. The procedure was performed under general anesthesia. The mucosal and submucosal layers around the tumor were circumferentially dissected by endoscopic submucosal dissection. Subsequently, the seromuscular layer involving three-fourths of the line of the incision around the tumor was laparoscopically dissected. The submucosal tumor was then exteriorized to the abdominal cavity and dissected with ultrasound devices and closed with barded sutures.

Results: In all cases, the LECS procedure was successful in dissecting the gastric SMTs. The tumors were in the upper third of the stomach in one cases, in the middle third in three cases, and in the lower third in one cases. The mean operating time was 127.0 ± 38 minutes, and the mean intraoperative blood loss was 20.2 ± 6.4 ml. The postoperative course was uneventful in all cases. Conclusions We demonstrated the feasibility and satisfactory surgical outcomes after LECS for gastric SMT. With LECS, relatively small sections of normal gastric wall are resected without postoperative morbidity or mortality.

Conclusion: The LECS is safe and beneficial technique for resection of SMTs, even for those tumors located near the gastric inlet or outlet.

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Introduction

The working space in the upper mediastinum is limited and lymphadenectomy along the left recurrent laryngeal nerve is difficult and anastomosis by a circular stapler in the narrow neck field is also difficult in VATS-E. We report our technique of the lymphadenectomy along the left recurrent laryngeal nerve and safe anastomosis.

Methods

(1) Patients One hundred forty five patients (27 in left lateral and 118 in prone position), with esophageal carcinomas underwent VATS-E, respectively.

(2) Methods

i) VATS-E in prone position Esophagectomy is performed in prone position with 5 ports those are used at the intercostal space (ICS) and pneumothorax by maintaining CO₂ insufflation. ii) Lymphadenectomy around left recurrent laryngeal nerve. Working space at the left upper mediastinal area for lymphadenectomy around the recurrent laryngeal nerve is limited in prone position. To obtain the space the residual esophagus is stripped in the reverse direction and retracted toward the neck after the stomach tube is removed through the nose. iii) Anastomosis. At first the circular stapler is introduced into the gastric conduit and joined to an anvil, and close a little. And then a joined anvil is placed into the proximal esophagus and secured by means of a pursestring suture. The gastric conduit opening is closed by a linear stapler, and the anastomosis is completed.

Results

1. The rate of permanent and transient recurrent laryngeal nerve paralysis were 2.7% and 21%, respectively. 2. The rate of anastomotic leak and postoperative pneumonia was 3.9% and 2.9%,

Conclusions

1. Lymphadenectomy along the left recurrent laryngeal nerve after esophageal stripping is available in prone position of VATS-E. 2. Our anastomotic technique is safer than the usual method of circular stapler.
Quality of Life after Laparoscopic Sentinel Node Navigation Surgery in Early Gastric Cancer: A single center cohort study

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**Purpose:** This single-center cohort study was initiated to investigate the quality of life of patients after laparoscopic sentinel node navigation surgery (SNNS) compared to conventional laparoscopy assisted distal gastrectomy (LADG) in early gastric cancer patients.

**Methods:** Patients who were recruited for laparoscopic SNNS surgery between July 2010 and April 2013 was assessed for their QOL. The control group was gathered retrospectively, consisting of patients who underwent conventional LADG with radical lymphadenectomy during the same period. QOL questionnaire was taken serially from preoperative week 1 until 12 months postoperatively (1, 3, 6, and 12 months) using Korean version of the European Organization for Research and Treatment of Cancer (EORTC) QOL questionnaire-core (QLQ-C30) and gastric cancer-specific questionnaire (STO22).

**Results:** A total of 78 eligible patients were identified from the gastric cancer database of SNUBH and was classified into the control group (LADG group) and 80 patients were assorted to the comparison group (SNNS group). Overall, postoperative QOL scores were less likely to deteriorate in the SNNS group than in the LADG group compared with preoperative scores. In the QLQ-C30, postoperative QOL scores were significantly better in the SNNS group than in the LADG group in global health status and all functioning scales except role function. The increase in the scores on postoperative fatigue, insomnia, and diarrhea scores was significantly less in the SNNS group than in the LADG group. In the QLQ-STO22, the increase in the scores on postoperative dysphagia, eating restriction, anxiety, and body image disturbance was also significantly less in the SNNS group than in the LADG group.

**Conclusions:** Our results indicate that postoperative QOL in laparoscopic gastrectomy combined with SNNS is superior to conventional laparoscopic distal gastrectomy in patients with stage I gastric cancer.
Endoscopic-assisted laparoscopic wedge resection for small gastric gastrointestinal stromal tumor (<2cm)

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**Introductions** Along with the advanced and widespread image examination, the incidental cases of gastrointestinal stromal tumor (GIST) are increasing and the size of tumor are getting smaller. NCCN and ESMO guidelines suggest us GIST of stomach \( \geq 2 \text{cm} \) was needed to accept surgery and tumor < 2 cm should be followed up by endoscopic ultrasonography (EUS). However, the patients who has GIST < 2 cm are suffered from not only every time EUS but also the potential malignant tumor. Thus, we will arrange tumor excision if the patients of GIST < 2 cm strongly demand.

**Methods** Since 2013 to 2018 in our hospital (Kaohsiung Veterans General Hospital), we collect 57 patients of gastric GIST who was performed laparoscopic wedge resection. In these 57 cases, there are 16 patients of gastric GIST < 2 cm who accepted endoscopic-assisted laparoscopic wedge resection and we analysis their hospital records during operation.

**Results** We review these 16 cases, there are no post-op complication or tumor recurrent. Besides, 3 high mitotic rate cases are the result of serendipity that indicated the potential malignancy of GIST < 2 cm.

**Conclusions** To sum up, we consider to arranged endoscopic-assisted wedge resection of stomach if patients has GIST of stomach < 2 cm and want to remove it.
Tips and Tricks in Laparoscopic Enterolysis; Experience Learned from 28 Patients.

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Aims: To present the effective technique in laparoscopic enterolysis.

Methods: Between 2016 and 2018, 28 patients underwent laparoscopic operation for acute abdomen involving intestine adhesion were included in the study. The operative procedures are as follows: Choosing the first trocar away from the scar by open method. Subxyphoid midline incision could be a good choice because it is easier to enter into peritoneum and identify visceral adhesion such as liver or stomach. Once the pneumoperitoneum is created, the trocar (LAGIS; MEDTRONIC) is inserted. Restoring the anatomy. Adhesion causes anatomic distortion. Changing laparoscope to another port if the clear view is unable to obtain. The 3-D image system (MedicalTek) is electively used. Taking down the adhesive omentum. Identifying the cecum, then searching for the transition point and adhesion zone from the collapsed distal ileal loop to the proximal site. Using gauze or grasping the mesentery to manipulate bowel loops atraumatically. Adhesiolysis by cold-scissor. Minimally laparotomy with extracorporeal resection and anastomosis of ischemia. Drainage is inserted.

Results: 16 men and 12 women underwent the surgery. The average age is 61 years old. The mean operation time and hospital stay is 160 minutes and 7 days. Morbidity is minor. One patient died due to underlying disease. None have abdominal compartment syndrome.

Conclusions: Laparoscopic treatment for adhesive bowel obstruction is still under debate. A successful laparoscopic enterolysis is based on the concept of laparotomy, such as by early intervention, achieving full inspection of intestine, safely manipulating bowel loops and releasing the transition zone. In our series, we change laparoscope from one port site to another if we cannot have the clear view. Large size gauze is used to manipulate bowel loops. The goal is to restore the alimentary function. The presenting techniques might be helpful for the further study.
A POEM FOR ACHALASIA

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Traditionally endoscopic pneumatic dilation and laparoscopic Heller myotomy have been the standard first-line treatment for achalasia. Recurrent or persistent dysphagia after a Heller myotomy occurs in up to 10-15% of patients. Current surgical options for these patients include revisional Heller myotomy or esophagectomy. Both have significant associated morbidity. Per-oral endoscopic myotomy (POEM) has been introduced as a novel therapeutic approach for the primary treatment of achalasia. It’s a relative new procedure and more than 20 cases have been performed in our centre. The POEM was performed on patient under general anaesthesia in endoscopic suite. Prior to the procedure the OGDS is performed to ensure no residual food particle in the oesophagus. During POEM procedure, the cardio-oesophageal junction (COJ) was identified. The POEM was performed at a length of 10 cm myotomy extending from 7-8 cm proximal to the GE junction to 2-3 cm into the cardia of the stomach. A submucosal tunnel was made at posterior esophagus 2-3cm above the intent length of myotomy prior to myotomy. The tunnel subsequently closed with haemoclips after completion of myotomy. Endoscopic examination at the conclusion of the procedure was performed to evaluate for injury or perforation, as well as for adequacy of the myotomy in improving passage of the endoscope into the stomach. Patient was admitted following the procedure. A gastrograffin swallow study was performed on post-operative day 1. Per oral endoscopic myotomy is safe and effective for treatment of esophageal achalasia. With increased experience of the entire team, case efficiency improved.
Various Laparoscopic Approaches In The Management of Gastric Submucosal Tumors

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Introduction Gastric submucosal tumors include leiomyomas, Schwannomas, and gastrointestinal stromal tumors (GISTs). Presented here are 3 cases of gastric submucosal tumors who underwent different laparoscopic approaches in the resection of the lesions.

Case Reports A 42-year-old female consulted because of epigastric pain associated with hematemesis. Endoscopy revealed a 2 cm submucosal mass at the mid body. CT scan showed a 3 cm mass along the greater curvature. The patient underwent endoscopically-assisted laparoscopic wedge resection of the tumor. The patient's post-operative course was unremarkable. There was no evidence of bleeding, anatomic leak, and infection.

A 33-year-old female consulted because of epigastric pain of 3 months' duration. The patient was anemic with a hemoglobin of 41 g/dl. A submucosal mass just below the gastro-esophageal junction was seen on endoscopy. Endoscopic ultrasound showed a 3.3 x 1.9 cm hypoechoic lesion which seemed to be arising from the muscularis propria. On CT scan, a 5 x 3 x 3 cm intraluminal polypoid-like mass in the gastric fundus was seen. The patient underwent laparoscopic transgastric resection of the tumor. The patient's post-operative course was unremarkable.

A 64-year-old female consulted because of an incidental finding of epigastric mass on CT scan. Patient had no abdominal symptoms such as pain, vomiting, or loss of appetite. CT scan described the mass as exophytic, arising from the lesser curvature of the stomach, and measuring 5.6 x 4.6 x 4.6 cm. The patient underwent Combination of Laparoscopic and Endoscopic Approaches to Neoplasia with Non-Exposure Technique (CLEAN-NET). The patient's post-operative course was unremarkable.

Conclusion Laparoscopic resection of gastric submucosal tumors is safe and effective. It has several benefits as compared to open surgery. The addition of intraoperative endoscopy aids in determining the location and extent of the lesion and in preventing injury and dysfunction.
Efficacy and complication of POEM for treatment of achalasia in rajavithi hospital

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**Background:** Achalasia is an esophageal disorder characterized by abnormalities of peristalsis. The choice of treatment at present remains palliative. And the common operation is laparoscopic heller myotomy. The recently developed treatment of achalasia is POEM, which combine benefits of endoscopic procedure and efficacy of surgical myotomy. However the efficacy and complication of POEM still need to evaluated and understood.

**Method:** From March 2556 to December 2561, 75 patients underwent POEM in a single tertiary referral center. Pre and postoperative symptoms were record using Eckardt score. Esophagogastroduodenoscopy, High-resolution manometry, Time barium swallowing were performed before POEM. Complication after POEM were record. Then the time of follow up patients is 3, 6, 9, 12 months after procedure. Eckardt score and heartburn symptoms were used to evaluate the effect of procedure.

**Result:** POEM was successfully completed for all patients. The mean time was 127 mins and the mean total length of myotomy was 10.5 cm. No significant complication occurred. The length of hospital stay was 7 days. A mean follow up of 11 month (3-12 months) was available 67 patients. The Eckardt score were all significant reduce after POEM and heartburn symptom

**Conclusion:** POEM is good option in a first line therapy for achalasia symptoms and recurrent symptoms is still low
LAPAROSCOPIC (TRANS-ABDOMINAL) REPAIRING OF DISTAL ESOPHAGEAL PERFORATION WITH GOOD SUCCESS AT THE SAMITIVEJ SUKHUMVIT HOSPITAL, BANGKOK

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Perforation of distal esophagus is a serious emergency condition which could lead to severe infection of mediastinum, sepsis and following death definitely in the past. Conventional treatments of opened repairing and triple ostomies of diverting esophagostomy, decompressing gastrostomy and feeding jejunostomy could help saved the patients of this condition, but the morbidity and mortality were still high. In our recent experiences of such critical emergency conditions, we have used laparoscopic approach, instead of opened surgery, with good results and no mortality. There were three different cases during one year period in our Hospital; a female with immediately detected perforation after endoscopic dilatation for achalasia by an experienced endoscopist, and two males with spontaneous esophageal perforation after vomiting (Boerhaave's syndrome). All of them had transabdominal laparoscopic repairing of the perforation at distal esophagus with interrupted stitches, irrigation and cleansing of contamination in the mediastinum, placing of large drainage catheters in the mediastinum, retaining of nasogastric tubes, unilateral or bilateral intercostal drainages. Post-operatively they were taken care in the intensive care unit. Fortunately all of them had recovered gradually and could have food orally at last and left from hospital finally. We would like to share our experiences of this transabdominal laparoscopic approach which provided good outcomes and no mortality. The patients did not have any large incisional wounds, which were likely to add more chance of morbidity and mortality, so their could recovered sooner. Other important factors for better outcomes were 1) early diagnosis and repairing as soon as possible. 2) prompt broard-spectrum antibiotics 3) cleansing and clearing of contamination to mediastinum as much as possible. 4) providing adequate drainage. 5) intensive respiratory care. 6) total parenteral nutrition.
Colorectal Disease

Propensity-score-matched analysis of short- and long-term outcomes in patients with an ileocolic artery crossing anterior vs posterior to the superior mesenteric vein during curative resection for right-sided colon cancer.

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Background: Colorectal cancer is one of the most common malignant diseases worldwide. However, laparoscopic lymph node dissection is technically demanding and time-consuming in right-sided colon cancer surgery because of variable vessel anatomy. We evaluated whether the ileocolic artery (ICA) crossing anterior to the superior mesenteric vein (SMV) was associated with better intraoperative parameters and survival compared with the ICA crossing posterior to the SMV, following laparoscopic curative resection for right-sided colon cancer.

Methods: This was a propensity-score-matched retrospective study including data for 540 patients with right-sided colon cancer undergoing laparoscopic curative resection (299 with the ICA crossing anterior to the SMV (group A) and 241 with the ICA crossing posterior to the SMV (group B). We compared propensity-matched scores between the two groups to evaluate surgical and oncological outcomes.

Results: We found no significant difference in 5-year overall survival rates between groups for any disease stage (0–III). However, 5-year disease-free survival (DFS) rates did differ significantly between groups (p=0.011), especially in patients with stage III disease (p=0.011). We then performed univariate and multivariate analyses to determine the associations between DFS and ICA location and tumor-node-metastasis (TNM) stage. ICA location and TNM stage had a poor association with DFS on univariate analysis: ICA hazard ratio (HR): 2.08, 95% confidence interval (CI): 1.11–4.08, p=0.022 and TNM stage HR: 3.55, CI: 1.51–8.42, p=0.003; and on multivariate analysis: ICA HR: 2.04, CI: 1.09–3.99, p=0.0237 and TNM stage HR: 4.27, CI: 2.33–8.02, p<0.001.

Conclusions: Our results showed that an ICA crossing posterior to the SMV was associated with worse DFS compared with an ICA crossing anterior to the SMV. We recommend careful laparoscopic technique in patients with an ICA crossing posterior to the SMV, during lymph node resection in right-sided colon cancer surgery.
Laparoscopic assisted right hemicolectomy with bottom-to-up approach for right side colon cancer.

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**Introduction:** In our department, we have performed “Laparoscopic assisted right hemicolectomy with bottom-to-up approach (BU-rHC)” in order to improve safety and accuracy of surgical trunk (ST) dissection.

**Operative procedure:** After insertion of 5 ports, the duodenal (DU) descending and horizontal leg were identified. At the DU horizontal leg, incision was made at the posterior lobe of small intestinal mesenteric membrane and the pancreatic head (PH) and the DU were exposed as much as possible. It may intrude into the ascending mesocolon at the right side of the DU, so it is necessary to intentionally switch to a deeper layer that is front of the Gerota's fascia and to continue exfoliation of the right hemicolon. Since it had been separated between PH and superior mesenteric blood vessels, it is possible to sufficiently dissect the tissue around the ileocolic artery and vein and ST dissection can be performed without damaging the PH. After dissecting at the root of accessory right colic vein, middle colon vein and artery right branch, detach the omentum and transverse mesocolon. Finally, the midline wound was extended to 3-5 cm, the tumor was brought outside the body, and a functional end-to-end anastomosis was performed.

**Result:** BU-rHC had been performed in 100 cases between 2015/09 and 2019/03. The median operation time, intraoperative bleeding and postoperative oral intake resumes/ initial fart/ defecation / postoperative hospitalization were 198.0 min, 10 ml, and 3/2/3/8 days. 11 cases (4 cases of hyperextension of tumor, 5 cases of adhesion, 1 case of blood flow failure at anastomotic site, 1 case of obesity) transfer to open surgery. Postoperative complications (Clavien-Dindo Grade 3 or more) were observed in 3 cases (adherent ileus, paralytic ileus, hematochezia).

**Conclusion:** BU-rHC was thought to be safe and accurate for ST dissection.
Development of an Assessment tool for Laparoscopic Sigmoidectomy using the Delphi Method: The ASLAC Project

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Background: Laparoscopic colorectal surgery (LCS) is considered an advanced minimally invasive procedure. Tools to assess surgeons’ skills in laparoscopic surgery, such as laparoscopic inguinal hernia repair and laparoscopic gastric bypass surgery, have been developed. However, no standardized training system has yet been established for the procedures of LCS. If a reliable assessment tool for the assessment of trainees in LCS were made available, it would be useful for establishing an educational system for LCS training. Trainee surgeons would then be able to learn the critical steps and important points of LCS procedures using this assessment tool. We therefore launched the “Development of an Assessment tool for Laparoscopic Colectomy” (ASLAC) project to develop a reliable tool for assessing laparoscopic sigmoidectomy.

Methods: We developed tools for assessing laparoscopic sigmoidectomy. Our study was conducted in two steps: a cognitive task analysis (CTA) and the Delphi method (first and second round). Consensus was defined in advance using Cronbach’s alpha $\geq 0.8$ according to a global Delphi consensus study on defining and measuring the quality of surgical training. Subtasks for which 70% of experts cited a value of $\geq 4$ (agree or strongly agree) were used as new tools. Ten expert surgeons were recruited as participants for the Delphi method.

Results: The mean post-graduation period of expert surgeons was 26 years (range, 19-32 years). The median number of LCS cases performed by the experts was 700 (range 219-2700). The developed scale was consisted of 35 items. Cronbach’s alpha of the 1st round was calculated to be 0.85 and 0.81 in 2nd round. Of these 10 experts, all experts (100%) answered the first and second round.

Conclusions: In the present study, we used CTA and the Delphi method to develop a new scale to evaluate trainee surgeons’ skills in performing laparoscopic sigmoidectomy.
Management of Sigmoid Colon Gallstone Ileus Patients with Previous Colorectal Resection

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Case report: A 82 years old lady with history of total mesorectal excision followed by radiotherapy in 2007. She has an emergency admission to surgical ward for intestinal obstruction. CT scan was arranged and noted prominent small bowel and large bowel until sigmoid colon where there was a gallstone lodged. There was also concomitant CBD stone leading to dilated biliary tree. Aerobilia noted with a cholecystoenteric fistula identified. Colonoscopy under CO2 insufflation was performed. Gallstone was identified behind a smooth stricture 10 cm from anal verge. Attempted mechanical crushing of stone but failed. Decided to proceed to laser lithotripsy. Stone was fragmented and intestinal obstruction subsided. Later the lady proceed to ERCP for CBD stone removal and no adverse event noted. Literature review - Sigmoid colon gallstone ileus is a rare complication from gallstones. Literature search only found around 40 reports on such cases. Most these patients are managed with operation with high morbidity and mortality. However, with the increasing popularity and expansion of endoscopic treatment. Few reports of endoscopic lithotripsy in colon has been published using basket or electrohydraulic lithotripsy with much lower complications rates compared with operation.

Conclusion We demonstrated laser lithotripsy is feasible and safe to relieve obstruction in patients with sigmoid colon gallstone ileus. Endoscopic lithotripsy should be employed as first line treatment of such condition if there is no contraindication especially for patients with high operative risks.
Stepwise Improvement of Surgical Quality in Robotic Lateral Pelvic Node Dissection: Lessons from 100 Consecutive Patients with Locally Advanced Rectal Cancer

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Background: Lateral pelvic lymph node dissection (LPND) is a challenging procedure due to its technical difficulties and higher incidence of surgical morbidity. Owing to its technical difficulties, lateral pelvic lymph nodes (LPNs) may not be dissected completely and thus be remained in the narrow pelvis. Therefore, a steep learning curve is anticipated in doing LPND. However, no study has been conducted about the surgical acquisition of this complex procedure. We aimed to evaluate the learning process in performing robotic total mesorectal excision (TME) with LPND for patients with locally advanced rectal cancer.

Methods: This study included 100 patients with rectal cancer who underwent robotic TME with LPND between 2011 and 2017. A cumulative sum analysis and moving average were performed on the basis of the number of unilateral retrieved LPNs for evaluating the learning curve.

Results: The number of retrieved LPNs steadily increased. The cumulative sum model suggested that the learning curve was divided into 4 phases based on 3 cut-off points as follows: learning I (33 patients), learning II (19 patients), consolidation (30 patients), and master (18 patients). At the beginning of the consolidation phase, we adopted fluorescence-imaging and at the beginning of the master phase, we redefined standardization of the technique. The unilateral number of retrieved LPNs was significantly greater in the master phase than in the other phases (12.8 vs. 4.9, 8.2, and 10.4, P<0.001). Urinary problems were more frequently observed in the learning phase I than in the master phase (39.4% vs. 16.7%, P=0.034). During the median follow-up of 44.2 months, local recurrence in the pelvic sidewall occurred in 4 patients in learning phase I and in 1 patient in learning phase II.

Conclusion: The completeness of LPND has increased after adopting the standardized surgical technique and new imaging system, and accumulation of surgeon’s experience. Further study is warranted to determine the oncologic result following each phase.
Ureteral injury was suspected during laparoscopic left hemicolectomy for descending colon cancer with left sided renal hypoplasia

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We report a case of laparoscopic left hemicolectomy with sufficient lymphadenectomy for a patient with descending colon cancer and left sided renal hypoplasia. A 66-year-old Japanese man referred to our hospital for bloody stools. Lower gastrointestinal endoscopy revealed a tumor of 15mm seized in the descending colon. Preoperative CT examination demonstrated there is no distant metastasis. Therefore we performed laparoscopic left colectomy with D3 lymphadenectomy. The root of the inferior mesenteric artery and the left colon artery was divided safely. While we were operating, the left ureter was not confirmed and we suspected a ureteral injury and consulted a urologist. But the right ureter was not be identified by conversion to laparotomy and confirmed stricture by cystoscope. During the operation, abdominal contrast enhanced CT was performed and the right kidney was hypoplasia. The patient’s postoperative course was good. The ureteral injury is one of the serious complications with laparoscopic surgery. The urinary aplasia occurs in 1:500-1000 individuals. We recognized the importance of comprehend the renal urinary tract system and respond calmly and quickly in unexpected situations.
Underwater endoscopic mucosal resection is a safe and effective method for curative resection of rectal neuroendocrine tumors

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**Background and Aims:** For rectal neuroendocrine tumors (NETs) with size $\leq 10$ mm, endoscopic resection is the first choice of treatment. However, because rectal NETs usually invade the submucosal layer, achieving R0 resection is difficult. Endoscopic submucosal dissection (ESD) has a high R0 resection rate, and underwater endoscopic mucosal resection (UEMR) was recently introduced to secure a negative resection margin [A1] easily and safely. The aim of this study was to evaluate the efficacy and safety of UEMR vs ESD for rectal NETs $\leq 10$ mm in size.

**Methods:** This retrospective observational study enrolled 115 patients with rectal NETs sized $\leq 10$ mm who underwent ESD or UEMR between January 2015 and July 2019 at the National Cancer Center, Korea. The differences in R0 resection rate, adverse event [A2] rate, and procedure time between the ESD and UEMR groups were evaluated.

**Results:** Of the included 115 patients, 36 underwent UEMR and 79 underwent ESD. R0 resection rate was not different between the UEMR and ESD groups (UEMR vs ESD, 86.1% vs 86.1%, p=0.996). Procedure time was significantly shorter with UEMR (UEMR vs ESD, 5.8 ± 2.9 vs 26.6 ±13.4 minutes, p< 0.001). Two patients (2.5%, 2/79) and none experienced adverse events in the ESD and UEMR groups, respectively; however, this difference was not statistically significant.

**Conclusion:** Considering that UEMR is an easy and simple technique, it can be a promising safe and effective treatment approach for small rectal NETs.
Feasibility of intraoperative ICG angiography in laparoscopic low anterior resection

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Introductions Anastomotic leakage (AL) is a big problem, especially for post-rectal surgery. Leakage is associated with the tension and blood flow of organs. Indocyanine green fluorescence imaging (ICG-FI) has been used for objective evaluation of blood flow. The aim of this study was to evaluate the effect of ICG-FI on the AL rates in laparoscopic low anterior resection (LAR) for lower rectal cancer.

Methods Data for all 114 patients who underwent LAR for lower rectal cancer at a single institution between 2012 and 2018 were retrieved from the database. ICG evaluation was used in 21 cases (ICG group) and in the other cases (unused group) the blood flow of the anastomotic site was evaluated by the surgeon’s subjectivity. ICG was injected intravenously and blood flow was evaluated before transecting colon.

Results There was no significant characteristic difference between ICG and unused group except for gender. The AL rate was 8 \% in ICG group and 5.6\% in unused group. Time to fluoresce of ICG group was analyzed but there was no significant difference between cases which occurred leakage or not. The transecting site of the colon was changed to the better site in 3 cases after ICG evaluation.

Discussion In our study, there was no superiority of ICG group in the point of decreasing the anastomotic leakage, which might be because of the small number of cases. But ICG-FI can prove the secure perfusion at the anastomotic site, which helps the detailed investigation for the cause of leakage.

Conclusion ICG-FI evaluation is useful not only for evaluating the perfusion to potentially reduce the leakage, but also the detailed investigation for the cause of leakage.
**Total mesorectal excision: The initial experience in Vietnam**

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**Background:** By giving the enhances visualization of the surgical planes in the mid- and low mesorectum, transanal total mesorectal excision (TaTME) allows surgeon to get more careful dissection compared to conventional TME. Available data from cohort studies suggest that TaTME is a feasible and safe technique. The aim of this study was to prospectively evaluate the short-term outcomes of TaTME.

Methods: 56 patients with mid and low rectal cancer who underwent TaTME in 108 Millitary Central Hospital from July 2017 to December 2018 were included in this study. The data of preoperative staging, tumor’s location, operative morbidity, macropic quality of mesorectal specimen, circumferential resection margin, anal sphincter function were collected. The method popularized by Quirke, Kirwan’s classification was used to assess to quality of mesorectal specimen, the sphincter function respectively. Patients were followed in the outpatient clinic 2 week after the surgery and then every 3 months in the first year. Statistical analysis was performed using SPSS 20.0.

**Results:** Preoperative staging: cT2: 8.9%, cT3: 71.4%, cT4a: 8.9%; cTx: 10.7%. The mean age: 65.45±11.18 years, the mean BMI:20.5±2.6kg/m2. The mean operative time: 147.8±22.2 mins. Operative morbidity rate: 28.6%, no operative mortality. The quality of mesorectal specimen: complete: 80.4%, nearly complete: 16.1%. The circumferential resection margin (CRM) negative rate: 94.6%; The mean harvested lymph nodes: 8.24±3.17; Postoperative staging: pT0: 5.4%, pT1: 3.6%, pT2: 26.8%, pT3: 55.4%, pT4a: 8.9%; pN0: 66.1%, pN1: 23.2%, pN2: 10.7%. The mean follow-up time was 10.0±3.9 months, one patient (1.8%) developed local recurrence and distant metastasis simultaneously, disease-free survival and overall survival rates: 98.2% and 100% respectively. The sphincteric function at 12 months postoperation: Kirwan I: 58.5%, Kirwan II: 41.2%.

**Conclusion:** The TaTME technique is safe and feasible with acceptable results, especially in the quality of mesorectal specimen and sphincter function.
Short- and long-term outcomes of laparoscopic versus open palliative resection for stage IV colorectal cancer

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**Background:** Issues surroundings the safety and efficacy of palliative laparoscopic resections for stage IV colorectal cancer have not been explicitly examined. We compare perioperative outcomes with a contemporaneous group of patients who underwent conventional open procedures.

**Methods:** We retrospectively reviewed data from laparoscopic resections performed in patients for symptomatic stage IV colorectal cancer between. Data regarding patient demographics, perioperative morbidity and mortality, intraoperative blood loss, operative time, length of postoperative hospital stay, and time from surgery to chemotherapy were assessed.

**Results:** A total of 51 patients were identified and of these patients, 11 (21%) underwent palliative laparoscopic resections and 40 (78%) underwent conventional open resection for stage IV colorectal cancer. In comparing laparoscopic to conventional procedures, the length of postoperative hospital stay in the laparoscopic resection group was significantly shorter than that in the open resection group (median, 17 vs. 20d, P<0.05). Significant differences were present between the 2 groups when following features were compared: leukocyte on day 1 (median, 7.87 vs. 8.70009/L) and day 3 (median, 6.40 vs. 7.8009/L), albumin level on day 7 (median, 38.0 vs. 29.8 g/L), and C-reactive protein level on day 7 (median, 0.6 vs. 2.8 mg/dL). There were no significance differences between the 2 groups in intraoperative blood loss (median, 105 vs. 155 mL), operative time (median, 271.5 vs. 187.5 min), time to intake of solid food (median, 4 vs. 4 d), the rate of postoperative complications, perioperative mortality, or a duration from surgery to chemotherapy (median, 22 vs. 28 d).

**Conclusions:** Palliative laparoscopic resection is a safe and feasible option with acceptable morbidity and mortality in patients with stage IV colorectal cancer. Importantly, in this group of difficult-to-treat patients, our results compare favorably with those from previously published reports on open procedures.
A case of huge rectal gastrointestinal stromal tumor resected by laparoscopic intersphincteric resection assisted by transanal minimally invasive surgery

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**Background:** Gastrointestinal stromal tumors (GISTs) of the rectum are rarely found, and radical surgery such as abdominoperineal resection would be necessary for large rectal GIST. When intersphincteric resection (ISR) is carried out laparoscopically, it can be performed as minimally invasive surgery with preservation of the anus. However, there are cases where laparoscopic ISR is difficult due to the tumor size, the location, et al. Here we report a case of huge rectal GIST resected by laparoscopic ISR assisted by transanal minimally invasive surgery (TAMIS).

**Case presentation:** The patient is a 77-year-old man who was found to have a huge pelvic tumor by abdominal ultrasonography of the comprehensive medical examination. Colonoscopy showed a large submucosal tumor at the rectum, whose pathological result was GIST. CeCT and MRI revealed the tumor size to be 73mm, located at the anterior wall of the rectum, and invasion to the left seminal vesicle and the prostate was suspected. After administration of imatinib mesylate at 400mg/day for 6 months, the tumor size was reduced from 73mm to 50mm, and a slight distance between the tumor and the left seminal vesicle was emerged. Thus the operation was planned.

**Operative method:** The operation was started laparoscopically with 5 ports. The tumor was located at the anterior wall of the rectum, occupying the narrow space of the pelvis. Dissection of the tumor from the anterior organs with keeping it membraned, as is recommended by the guideline, was thought to be histologically possible, but technically difficult by laparoscopic approach. Thus, TAMIS approach was added to create a guide for the appropriate dissection line, resulted in the completion of ISR.

**Conclusion:** Laparoscopic ISR assisted with TAMIS was successfully performed for a huge rectal GIST. We recommend ISR with a combination of laparoscopic and TAMIS approach for locally advanced rectal GIST.
Interval Single-incision Laparoscopic Appendectomy Versus Emergency Single-incision Laparoscopic Appendectomy: A Retrospective Study

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Aim: Interval single-incision laparoscopic appendectomy (ISLA) for perforated appendicitis with periappendiceal abscess after initial nonoperative management to improve inflammation and abscess is a feasible and safe procedure. However, there are only a few reports have been published. we report our experience with this procedure.

Methods: We retrospectively reviewed of 234 patients treated by single-incision laparoscopic appendectomy from March 2015 to July 2019 in Konyang university hospital. The safety and feasibility of ISLA and its perioperative outcomes were investigated.

Results: 22 patients were treated with initial conservative treatment, followed by ISLA after three months and 208 patients were treated by emergency single-incision laparoscopic appendectomy (ESLA), respectively. There was no case converted to open or added additional trocar in both groups. Compared to ESLA group, ISLA group had significantly old age and higher ASA score but there were no differences in sex, body mass index (BMI), smoking history and previous abdominal operation history in demographic characteristics. In perioperative outcomes, there was no difference in mean operating time (53.18±20.39 (ISLA) vs. 48.17±18.10 (ESLA); p=0.224), length of postoperative stay (2.09±0.53 (ISLA) vs. 2.32±0.97 (ESLA); p=0.273), and hemovac drain insertion (0% (ISLA) vs. 4.3% (ESLA); p=1.000), postoperative complication(0% (ISLA) vs. 9.1% (ESLA); p=0.229).

Conclusion: Conservative management followed by ISLA is safe and feasible for treatment of perforated appendicitis with periappendiceal abscess compared to ESLA, although ISLA requires two separated hospitalizations.
Stabilization and surgical results of procedures in single port laparoscopic ileocecal resection by young surgeon

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Introductions: In our hospital, single port laparoscopic surgery is selected as an surgical procedure for colonectomy. However, a certain experience is necessary to improve the operability of forceps in a single port laparoscopic operation. Safety and surgical results in young surgeons are still debatable. We examined 29 cases of single port laparoscopic ileocecal resection (D3 dissection) in young surgeons.

Methods: The period is one year and nine months from July 2017 to April 2019, and the surgeon is a gastroenterological surgeon (presenter) who is in the ninth year after graduation.

Results: The patient background was total of 29 cases of 16 cases of ascending colon cancer, 9 cases of cecum cancer, 3 cases of appendiceal tumor, and 1 case of malignant lymphoma, with male and female ratio of 9:20, an average age of 73 (92-50 years old), and an average BMI of 21.2 (14.7-27.7). Average of the total operation time was 159 minutes (82-277 minutes), intraoperative hemorrhage was 26ml (5-150ml), and the number of days of postoperative discharge was 9.6 days (7-18 days). Postoperative complications were only one case of surface surgical site infection. Comparing the initial 10 cases with the last 10 cases, the operation time was significantly reduced, and there was no significant difference in the number of days discharged from the hospital. The operation time was shortened with each case in both the total operation time, the inner approach time, and the outside approach time.

Conclusions: Single port laparoscopic ileocecal resection can be safely performed by young surgeons, and it is thought that the reduction of surgical time can be obtained by stabilizing the surgical procedure.
Our established method of Laparoscopic right hemicolectomy～The operator is as firm as a rock～

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Introductions: In the laparoscopic right hemicolectomy for the right-sided colon cancer, the lymph node dissection based on the colorectal cancer handling rules is important. However, there are many different types in dominant blood vessels of the right-sided colon, a stylized reasonable dissection procedure, which assumes that diversity has been required. Surgical procedures: The patient is set at the lithotomy position, and the operator stands inter-leg, the assistant stands left-side, and the scopist stands left caudal of the patient. Two 12 mm ports are inserted above the navel and upper pubic bone, and three 5 mm ports are inserted at the left and right lower abdomen and left middle abdomen, and the scope is inserted through the suprapubic port. Surgical Trunk dissection is carried out with the inferior approach, and the mobilization of the right colon from the hepatic flexure should be carried out as much as possible, and is sifted to the ileocecum. The peeling layer from the ileocecum is connected with that from the head side. The mobilization of the right colon is completed. After extending the umbilical wound, the anastomosis is performed by functional end-to-end anastomosis directly. Essential points: The operator has kept standing between the legs without changing the position during the operation. In the dissection of Surgical trunk, the direction of the peeling coincides with the running of the blood vessel, and by using the umbilical port, it becomes possible to peel the blood vessel stably with a fixed view. Furthermore, since it is not necessary to organize the codes associated with body position change and operator movement, it seems to be an appropriate method that conforms to the standardization.

Conclusions: We present the surgical procedure which has been stylized in our hospital since more than 15 years.
Oncologic Impact of Anatomic Extent of Metastatic Lymph Nodes Metastasis in Stage III Colon Cancer: Implications for Adjuvant Chemotherapy

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**Background:** Oxaliplatin-based chemotherapy regimen improves the survival outcomes of stage III colon cancer patients. However, its serious toxicity is well known. The purpose of this study was to distinguish the survival outcomes among patients who underwent curative resection for stage III colon cancer with or without oxaliplatin.

**Methods:** Between January 2010 and December 2014, a total of 254 patients who underwent curative resection for stage III colon cancer were analyzed. The patients were classified into groups with isolated pericolic lymph node metastasis (PLN, n = 175) and extra-pericolic lymph node metastasis (ELN, n = 79). Clinicopathological features, 3-year disease-free survival (DFS), and overall survival (OS) were analyzed with and without oxaliplatin in the PLN group who had a better prognosis than the ELN group.

**Results:** At a median follow-up of 48.5 months, the PLN group showed significantly improved DFS and OS compared with the ELN group (3-year DFS, 88.7% vs. 69.6%, p < .001; 3-year OS, 95.8% vs. 77.8%, p < .001). By contrast, there was no significant difference in DFS and OS between the oxaliplatin and the non-oxaliplatin groups of PLN (3-year DFS, 89.1% vs. 88.2%, p = 0.460; 3-year OS, 99.0% vs. 92.0%, p = 0.137). In the multivariate analysis, the addition of oxaliplatin to the PLN group resulting in no significant difference in prognosis of OS (p = 0.594).

**Conclusion:** The addition of oxaliplatin to the adjuvant chemotherapy regimen was not associated with a better prognosis in PLN subgroups compared with fluorouracil-based modality.
Retrospective comparison survival between Single-access and Conventional Laparoscopic surgery in rectal cancer

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The innovation of laparoscopic surgery for rectal cancer can classified into 2 group, firstly is instrument such as robotic surgery. The second is technique such as Transanal total mesorectal excision (TaTME), single access laparoscopic surgery. All innovation showed the result in low rates of morbidity and mortality while achieving comparable pathologic outcomes. Since 2011, most reports of single-access laparoscopic surgery (SALS) for rectal cancer have shown comparable pathologic outcomes to those of conventional laparoscopic surgery (CLS), and SALS is claimed to be superior to CLS in reducing complications, less discomfort, and faster recovery rates. This study aimed to compare the survival outcomes of the two approaches. Materials and methods From 2011 to 2014, 81 cases of adenocarcinoma of the rectum and anal canal were enrolled. The operations were anterior, low anterior, intersphincteric and abdominoperineal resections. The data collected included postoperative outcomes of operation. The oncological outcome were collected in 3 years, 5 years survival, local recurrence and metastasis. Results Single access laparoscopic surgery (SALS) was performed on 38 patients and conventional laparoscopic surgery (CLS) was utilized in 43 cases. The demographic data of 2 groups were similar with no statistically significant differences. Intraoperative data of operative time, volume of blood loss and conversion rate were similar. The postoperative period showed that the no significant difference in postoperative complication, pathological result between groups. The oncologic result were similar in 3 years survival (100% and 97.67%), 5 years survival (92.10% and 88.37%), local recurrence rate and metastasis rate. The factor related to survival in both groups was occurrence of metastasis (p<0.001). Conclusion Single-access laparoscopic surgery and conventional laparoscopic surgery for rectal and anal cancer had comparable postoperative, pathological and survival result.
Mesocolon defect closure in laparoscopic left colectomy by mesenteric patch to prevent internal hernia

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Background: Mobilization of the Treitz’ ligament and splenic flexure have been described as risk factors of internal hernia (IH) due to mesocolon defect in left-sided resections for colon cancer. Though defect closure could reduce the risk for IH, it is often technically demanding to close the large defect. In addition, incomplete closure may leave a narrow residual defect that could paradoxically increase small bowel obstruction risk.

Purpose: The aim of this study was to evaluate the efficacy of the procedure of mesocolon defect closure in laparoscopic left colectomy by mesenteric patch to prevent IH.

Methods: We retrospectively reviewed 147 patients who underwent colorectal resection between January 2016 and December 2018 in Sumitomo Besshi Hospital. Seven cases (4.8%) among them were performed following procedure 1) The inferior mesenteric vein was cut at the level of the inferior border of the pancreas, 2) Having a mesocolon defect at the lateral side of the Treitz’ ligament, 3) With splenic flexure mobilization, 4) Anastomosed by stapled functional end-to-end anastomosis. Surgical procedure: Mesocolon closure is started at the site of anastomosis toward the inside extracorporeally. Then the residual defect is suture closed in counterclockwise by using jejunal mesentery from caudal edge of the defect laparoscopically. Continuous suturing with barbed sutures is useful for the procedure.

Result: Six out of the seven cases were performed mesenteric patch to close the mesocolon defect. Of the 6 patients, 3 cases had postoperative complication not less than grade II. One had anastomotic leakage due to pancreatic fistula in the case of combined resection of pancreatic tail and spleen. One had a stasis at the Treitz’ ligament and needed nasogastric drainage. One had paralytic ileus. No patients had IH.

Conclusion: Jejunal mesenteric patch is easy and considered to be useful to prevent IH.
Is there any difference in long-term cancer recurrence between laparoscopic and robotic surgery in mid/low rectal cancer?

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Background The aim of this study was to investigate the long-term oncological outcomes of robotic surgery for mid/low rectal cancer compared with those of laparoscopic surgery.

Methods An institutional database was searched for all patients who underwent laparoscopic or robotic surgery for stage I–III mid/low rectal cancer between January 2009 and December 2013. Patients who underwent intersphincteric resection or lateral pelvic lymph node dissection were excluded. There was a total of 533 patients, of whom 415 patients underwent laparoscopic surgery and 118 patients underwent robotic surgery. Propensity score analyses were performed to compare oncological outcomes for each group. The main outcomes were 5-year disease-free survival, 5-year pelvic-recurrence, and 5-year distant recurrence.

Results One hundred and eighteen patients were included in each group, and the two groups were well balanced in terms of basic characteristics, perioperative treatment, and pathological stage. The circumferential resection margin was positive in one case in the robotic group. The 5-year disease-free survival rate was 87.5% in the laparoscopic group, and 86.6% in the robotic group (P=0.772). The 5-year pelvic recurrence rate was 6.2% and 5.6%, respectively (P=0.720). The 5-year distant recurrence rate was 10.4% and 10.0%, respectively (P=0.942). The location of pelvic recurrence was not significantly different between the two groups. Multivariate analysis revealed that preoperative chemoradiotherapy, pT3–4 tumors, and pN2 were independently related to disease-free survival. In patients who had preoperative chemoradiotherapy and pT3–4 tumors, the 5-year disease-free survival and 5-year distant recurrence rates were 58.3% and 41.7% in the laparoscopic group and 81.3% and 9.8% in the robotic group, respectively (P=0.136 and P=0.029, respectively).

Conclusions Robotic surgery for mid/low rectal cancer shows similar long-term oncological outcomes with laparoscopic surgery. Further studies are required to confirm whether patients with risk factors of disease recurrence can be considered as appropriate candidates for robotic surgery.
Clinical Efficacy and Safety of Early Adjuvant Chemotherapy for Stage III Colon Cancer: Short-term outcomes of a multicenter prospective randomized controlled trial, NCT01460589

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Background We aimed to determine the safety and oncologic efficacy of early adjuvant chemotherapy in patients with stage III colon cancer.

Methods Patients treated by curative surgery for stage III colon cancer were enrolled into this phase 3, open-label randomized trial. After curative surgery, patients were randomly assigned to early induction group (ECT; FOLFOX are initiated within 14 days postoperatively), or conventional induction group (CCT; FOLFOX are initiated between 4 and 8 weeks postoperatively). The primary end point was 3-year disease free survival. Secondary outcome was surgery-related complication during chemotherapy and chemotherapy related toxicity.

Results From September 2011 to December 2018, the intention-to-treat population comprised 402 patients from 7 tertiary-referral hospitals; 206 were randomly allocated to the CCT and 196 to the ECT. The median time to initiation to chemotherapy was 29 (IQR, 26-33) days in the CCT and 14 (IQR, 13-15) days in the ECT (p=<0.001). The median number of chemotherapy cycles were 12.0 (CCT) and 12.0 (ECT) (p=0.067). The rate of completed 12 cycles of chemotherapy was 65.5 % in CCT and 72.4 % in ECT (p=0.165). There were no differences in surgery-related complications during chemotherapy. There were no differences in side effects of chemotherapy. Treatment-related grade 3/4 adverse events occurred in 31.0 % of CCT and 26.6 % of ECT (p=0.441). The most common grade 3/4 adverse event was neutropenia (20.4 % in the CCT and 15.6 % in the ECT, p=0.317). There was no treatment-related death during the chemotherapy period. During the median follow-up 49.9 months, overall recurrence rate was 14.2% in the CCT and 14.0% in the ECT, respectively (p=1.00).

Conclusions Early initiation of adjuvant FOLFOX within 2 weeks is feasible and safe in patients with underwent radical surgery for stage III colon cancer. Long-term results of this trial are needed to confirm its efficacy.
Short-term outcome of the patients with robotic surgery for rectal cancer

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**Aim:** To evaluate the short-term outcome of patients who underwent robotic surgery for rectal cancer.

**Patients and Methods:** Rectal cancer patients who had robotic surgery in Tohoku University Hospital between 2016 and 2019 were retrospectively analyzed. Patient characteristics, perioperative factors, complications, and pathological findings were investigated.

**Results:** Fourteen patients (male: 10, female: 4, median age: 66.5 (39-76)) with adenocarcinoma of the rectum underwent robotic surgery. Median Body Mass Index (BMI) of those patients was 24.8 (20.1 - 27.0). Robotic surgeries by da Vinci S Surgical System and da Vinci Xi Surgical System were carried out in 3 patients and 11 patients, respectively. Regarding operative procedures, Low anterior resection (LAR), high anterior resection (HAR), abdominoperineal resection (APR), and intersphincteric resection (ISR) were carried out in 11, 1, 1, and 1 patient, respectively. The patients with LAR (10) and ISR (1) had diverting ileostomy (11/13, 84.6%). The median operation time was 424 min (294 - 615), median blood loss was 37 ml (10 - 604), median post-operative hospital stay was 19 days (11 - 65). No conversion to open laparotomy or laparoscopic procedures was observed. The median number of retrieved lymphnodes was 9 (2 - 30). Two patients showed post-operative complications (Clavien-Dindo classification 3a and 3b), which were an intrapelvic abscess and an anastomotic leakage. Pathological stage of cancers (TNM 8th) was stage I (n = 6), stage IIA (n = 3), and stage IIIA (n = 4), respectively [pCR (n = 1) excluded]. There was no recurrence of rectal cancer during median follow-up term 7 months (1 - 39).

**Conclusion:** Robotic surgery for patients with rectal cancer seems to be feasible. Further clinical experience is necessary to evaluate the effectiveness and to determine appropriate patients for robotic surgery.
Postoperative C-reactive protein and inflammatory profiles can predict early and late anastomotic leakage in rectal cancer patients who underwent preoperative chemoradiotherapy, followed by sphincter-saving surgery with defunctioning stoma

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**Background:** Anastomotic leakage (AL) is still one of the most devastating complications after rectal cancer surgery. One strategy for preventing symptomatic AL is proximal fecal diversion. For rectal cancer patients who received preoperative chemoradiotherapy (CRT), surgeons mostly make a defunctioning stoma after sphincter-saving (SS) surgery. However, little is known about its effect for these specific patients.

**Purpose:** We aimed to evaluate the long-term outcomes of AL in patients who underwent SS surgery with defunctioning stoma after preoperative CRT. We also aimed to evaluate the prognostic factors of AL for these patients based on the variables determined during their first hospital stay.

**Methods:** Rectal cancer patients who underwent SS surgery after preoperative CRT were retrospectively reviewed.

**Results:** A total of 314 patients (77.5%) among 405 rectal cancer patients had defunctioning stoma after preoperative CRT, followed by SS surgery. AL occurred in 66 patients (16.3%); 47 patients (18.2%) in stoma group and nine patients (9.9%) in non-stoma group. A late leak was more frequently found in stoma group as 12.7%. Among 40 patients with late AL in stoma group, 12.7% were asymptomatic. A total of 22.8% had permanent stoma, and 22.8% underwent a re-do operation in stoma group. Even after re-do operation, chronic presacral sinus still remained in 59.6%. In the multivariate analysis, $\geq$12 of CRP at postoperative 3 days ($P=0.004$), $\geq$7 of CRP at postoperative 5 days ($P<0.001$) and $\geq$8 of neutrophil-lymphocyte ratio (NLR) at postoperative 5 days ($P<0.001$) were significantly associated with higher AL in stoma group.

**Conclusion:** Rectal cancer patients with defunctioning stoma had a high frequency of AL, especially dominantly in late AL. Postoperative CRP and NLR during the first hospital stay could predict not only early but also late leak. We should have paid attention for patients who have elevated CRP and NLR, which are at high risk of AL and finally may develop into chronic presacral sinus.
Long-term oncologic outcomes for selective lateral pelvic node dissection in locally advanced rectal cancer

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Background: Although lateral pelvic node (LPN) metastasis is a major cause of local recurrence in patients with rectal cancer, controversy still remains on the treatment of suspected LPN metastasis. In a previous study, we reported the significance of lateral pelvic node dissection (LPND) for rectal cancer patients who had suspicious LPN on pretreatment MRI even after preoperative chemoradiotherapy (CRT).

Purpose: We aimed to evaluate the oncologic outcome for TME with selective LPND after preoperative CRT in locally advanced rectal cancer who had suspicious LPN on pretreatment MRI.

Methods: Of 445 patients who received preoperative CRT for rectal cancer between 2011 and 2016, 94 patients underwent TME plus LPND. Patients’ characteristics, MRI findings, operative and pathologic findings, and oncologic outcomes were analyzed retrospectively.

Results: During study period, metastatic rate of LPN was 30.9%. There was no significant difference in 3-year disease-free survival (DFS) between LPN positive and negative groups (67.9% vs. 71.9%, P=0.611). However, 3-year local recurrence-free survival rate was poor in LPN positive group (80.8% vs. 96.4%, P=0.052) although 3-year distant recurrence-free survival rate was similar between the two groups (P=0.881). On multivariate analyses, ≥ 8 of unilateral harvested LPN (HR, 3.595; 95% CI 1.365-9.468, P=0.009) and advanced ypT stage (HR, 3.647; 95% CI 1.076-12.367) were significantly associated with poor DFS. Patients who were identified ≥ 8 of unilateral harvested LPN showed better 3-year DFS (P=0.005) and both 3-year local and distant recurrence-free survival (P=0.055 and P=0.014).

Conclusion: LPND after preoperative CRT did not compromise the survival if it is completely dissected for patients who had suspicious LPNs. However, these results should be confirmed by large-cohort studies with long-term follow-up in rectal cancer patients who have suspicious LPNs.

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**Introduction:** Laparoscopic colectomy has been established as a standard surgical treatment for safe oncologic outcomes and better early surgical outcomes, such as decreased postoperative pain and early rehabilitation. Recently, single-port laparoscopic approach also has been widely accepted in terms of benefits for minimally invasive surgery. The aim of this study was to evaluate the safety and early surgical outcomes of single-port laparoscopic colectomy.

**Methods:** Between Jan 2016 and Jun 2019, consecutive 72 patients who underwent laparoscopic anterior resection (AR) for colorectal cancer were retrospectively reviewed. All surgeries were performed by single beginner surgeon and single port-AR was performed in selected patients. Early surgical outcomes including conversion, complication and hospital stay were compared according to the single-port and conventional multi-port approach.

**Results:** There were 17(23.6%) and 55(76.4%) patients who underwent single-port AR and multi-port AR, respectively. The female were more received single-port AR than male (37.0% vs. 15.6%, p=0.038). The patients with rectal cancer were more received conventional multi-port AR than those with sigmoid colon cancer (87.5% vs. 49.1%, p=0.047). The conversion rate of single-port AR was 5.9%, which is similar with conventional multi-port (1.8%). The rate of postoperative 30days complication was 7.3% in multi-port AR and there was no complication in single-port AR. Other surgical outcomes including the number of harvested lymph nodes, operative time, estimated blood loss, postoperative pain score and postoperative hospital stay, were similar between two groups.

**Conclusion:** In terms of early surgical outcomes, the single-port AR seems to be safe and feasible especially in beginner surgeon with detailed patients selection.
Short and long-term outcomes of overlap anal sphincter repair for faecal incontinence following sphincter injury: a systematic review

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Introduction: Several techniques are used to repair the anal sphincter following injury. We aimed to comprehensively analyse the short and long-term outcomes of overlap repair for patients presenting with faecal incontinence following anal sphincter injury.

Methods: A systematic review of MEDLINE and Google Scholar articles published between January 2000 and May 2019 was conducted; additional studies were identified by searching individual references. Studies that described the outcome specific to overlap sphincter repair for faecal incontinence were selected based on pre-specified inclusion criteria with a minimum follow up period of 1 year. The primary outcome was the short and long-term assessment of faecal incontinence.

Results: A total of 21 studies described outcomes of overlap sphincter repair. However, 14 studies had other surgical techniques in addition to overlap repair and therefore excluded from the analysis. Finally, data from 7 studies including 419 repairs were analysed. All studies used at least one objective instrument. However, there was significant heterogeneity in the reporting of outcomes. The majority were females (94.98%, n=398) and the mean age was 43.9 years. The majority were due to obstetric injuries (85.2%, n=357). All (n=7) studies described long-term outcomes and the majority(n=6) had statistically significant improvement in the continence. However, one study described poor outcomes in terms of overall continence. Two studies mentioned both short-term and long-term outcomes. The long-term scores were significantly better compared with the pre-operative scores. However, compared to short-term scores, a statistically significant deterioration was noted in the long-term.

Limitations: This study was limited by heterogeneity of outcomes and the paucity of level 1 data precluding a meta-analysis.

Conclusion: The majority of the studies described good long-term outcomes in terms of anal continence after overlap sphincter repair. However, further studies are needed to identify factors associated with poor outcomes to assist in patient selection for overlap repair.

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Introduction: Treatment of pararectal cavities associated with complex fistula-in-ano (CFA) is challenging due to difficulty in delineating the anatomy, achieving cure and high rate of recurrence. Our hypothesis is that treating the pararectal cavities before dealing with the fistula tract leads to better outcome. In this study, we describe the efficacy of irrigation tubes in the treatment of pararectal cavities associated with CFA.

Methods: A descriptive study was conducted at the Professorial Surgical Unit, National Hospital of Sri Lanka. Thirty-six patients with pararectal cavities(detected by 2D-Endoanal ultrasonography-EAUS) in association with CFA were included. All patients underwent examination under anesthesia (EUA). An irrigation tube was inserted to the pararectal cavity and the primary fistula tract was tagged with a drainage seton. The pararectal cavities were irrigated with a pre-specified antiseptic solution and the patients were followed-up at three weekly intervals to assess cavity reduction.

Results: The majority were males (97.2%, n=35). Primary fistula tract in 28 patients (77.8%) was trans-sphincteric and inter-sphincteric in 8 patients (22.2%). Mean time of cavity contraction was 36.5 (range:21-112) days. Complete healing was seen in 86.11% (n=31), with 4 patients (11.1%) being lost to follow-up and 1 patient (2.7%) having a persistent perianal fistula after 6 months of follow-up. Those who had complete healing were followed up for a median duration of 6 (range, 3-20) months and there were no recurrences.

Conclusions: In the treatment of pararectal cavities, irrigation yielded satisfactory results. A case control trial with larger numbers and assessment of cavity size pre and post procedure by 3D-EAUS/MRI evaluation will be more useful for more objective evaluation of the efficacy of this novel intervention.
COMPARISON OF OUTCOME IN SINGLE INCISION LAPAROSCOPIC APPENDECTOMY VERSUS CONVENTIONAL THREE PORT LAPAROSCOPIC APPENDECTOMY.

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Introduction: Minimal invasive surgery (MIS) is a modern and safe improvement in field of laparoscopic surgery. Single incision laparoscopic appendectomy (SILA) is a major breakthrough in MIS and has become standard procedure for acute appendicitis in place of conventional three port laparoscopic appendectomy (CTLA).

Objectives: To see the potential advantages in terms of operative time, duration of hospital stay, post-operative pain and cosmetic results in SILA and CTLA groups.

Materials and Methods: 96 patients were divided in two groups; group SILA (cases) and CTLA (control). Each group comprised 48 patients. All cases were performed by consultant who were competent enough and trained in MIS.

Results: We found that there was statistically no difference in operative time (p>0.05) and post-operative pain (p>0.05) of both procedures but statistically significant outcome was observed in duration of hospital stay (p<0.005) and cosmetic result (p< 0.005). Post-operative analgesia usage was same in both groups with similar outcome of control. Surgical wound healed in all patients of both groups without complication but noticeably had shown no scar mark on three months follow up in patients of SILA group. Almost all patients in SILA group were discharged on same day on oral diet.

Conclusion: This study showed that results of SILA are better in terms of cosmoses and less duration of hospital stay in the presence of non-significant operative time of two procedures. Staying with promise of minimizing in MIS to SILA, cosmetic satisfaction and minimal hospital stay are its comprehensible advantages.
Comparison of short-term outcome between diverting colostomy and colonic stent as a bridge to surgery for left colonic malignant obstruction

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Background The self-expanding metallic stent (SEMS) has been comprehensively investigated as a bridge to surgery. SEMS enables the control of acute colonic obstruction. However, comparative studies between diverting colostomy as another bridge procedure and SEMS are few. Thus, the aim of this study was to compare these two procedures.

Methods In this retrospective cohort study, patients who received diverting colostomy and SEMS for acute left colonic obstruction between February 2016 and August 2018 were included. They were classified into the colostomy group (n = 27), including 4 patients who had SEMS inserted previously, and the SEMS group (n = 23). The clinicopathologic parameters, pathologic results, and short-term outcomes were compared.

Results No significant differences were found in clinicopathologic characteristics and complication rates between the two groups. After the bridge procedures, the SEMS group showed a higher rate of laparoscopic colonic resection than the colostomy group (100 vs. 76%, P = .023). The colostomy group showed a higher rate of rectal cancer (24.0 vs. 9.1%, P = .019) and later recovery of flatus (3 vs. 2 days, P = .011) than the SEMS group. Additionally, the length of resected colon was longer in the colostomy group than in the SEMS group (33.9 vs. 23.4 cm, P = .007).

Conclusions Diverting colostomy showed acceptable complication rates and feasible performance. However, SEMS might permit higher laparoscopic resection rates and faster recovery of bowel habits than diverting colostomy. An individualized approach is necessary considering the advantages and disadvantages of both procedures.
Intracorporeal versus Extracorporeal Anastomosis Following Laparoscopic Right Hemicolecetomy for Colon Cancer: Short Term Clinical Outcomes

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Introductions. The aim of this study was to compare intraoperative performance and postoperative outcomes of laparoscopic right hemicolecetomy (LRHC) performed with intracorporeal anastomosis (ICA) with those of LRHC performed with extracorporeal anastomosis (ECA) in a single medical institution.

Methods. The following data from our institution-maintained database were reviewed to identify patients with colon cancer who underwent LRHC during January 2017 to March 2018: demographic and disease-related characteristics, pTNM stage, intraoperative outcomes (operative time, blood loss, and number of harvested lymph nodes), and postoperative outcomes (postoperative complications, anastomotic leakage, and total number of days of hospital stay).

Results. A total of 78 patients were identified, of whom 22 underwent LRHC with ICA and the remaining 56 underwent LRHC with ECA. There was no significant difference in patient demographic and disease-related characteristics. Mean operative time was shorter in the ICA group than in the ECA group (143.4 vs. 160.89 min, p = 0.048); mean measured blood loss was also lesser in the ICA group than in the ECA group (34 vs. 45.1 ml, p = 0.086). No significant difference was detected in terms of the number of harvested lymph nodes, postoperative complication rate, and anastomotic leakage rate.

Conclusion. Using an ICA approach in performing LRHC is safe and results in a shorter operative time.
Comparison of operative outcomes (including depressed postoperative skin scar incidences) between Conventional Linear Skin Closure versus Purse-string Skin Closure in Ileostomy Reversal

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Introduction Ileostomy closure is one of the most frequently performed surgeries. Currently, two techniques comprise most of the stoma reversals performed: conventional linear skin closure (LC) and purse-string skin closure (PS). In this study, we investigated the advantage and disadvantages of two closing methods.

Materials and Methods The retrospectively collected data was based on 116 consecutive patients who underwent ileostomy takedown between October 2015 and January 2019 in the tertiary hospital colorectal surgery part. Conventional linear closure was performed in 67 patients and purse-string suture was performed in 49 patients. The medical records including antibiotics use duration, oral antibiotics use were reviewed and postoperative outcomes, including SSI, OPD visit frequencies, scar features and incisional hernia were analyzed.

Results LC group shows incisional hernia more than PS groups. (9 vs 3 P=0.029). Postoperative antibiotics use were different (12days vs 3days, p=0.009). And skin depression of scar site were more often in PS groups.(8 vs 0 ,P=0.02)

Conclusion Purse-string skin closure showed comparable outcomes in terms of severe complication rates (SSI or incisional hernia) to those of linear skin closure. Thus purse-string skin closure could be a good alternative to the conventional linear closure. But in young, overweight patients PS suture can makes skin dimple after wound healing so it could be considered before which technique is chosen.
Practicality of SOLOassist II, a robotic camera control system with 3D scope for laparoscopic surgery on rectal cancer

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A steady field of view is very important during a laparoscopic surgery. In particular, a fixed image is required so that one can fully use the characteristics of a 3D scope. “SOLOassist II” (a robotic camera control system) is a joy-stick controlled scope folder that allows the operators to control its scope. The system provides surgeons with a stable and rock-steady field of vision, even in extreme endoscope positions. In addition, one assistant becomes free from the tiresome work of operating the scope, and can focus on more exacting tasks. A 3D scope and a steady field of vision using the SOLOassist II enable surgeons to perform easier and safer surgical procedures.

During April 2018 to May 2019, 43 patients with rectal cancer who were operated in our department were enrolled this survey. 35 operations were performed with SOLOassist II(SOLO), and 8 were with an assistant scope operator (SO). Out of 35 operations performed with SOLO, 18 operations were with 3D scope, 15 with 10mmHD (high definition 2D), and 2 with 5mmHD. Out of 33 operations with 10mm3D (n=18) or 10mm HD (n=15), the median operation time were 312min (178-433) and 334min (193-568), respectively. The frequency of use of 3D scope changed dramatically from 5 operations out of 17 in upper half of this period (Apr. 2018 to Sept. 2018), to 13 operations out of 16 in latter half (Oct.2018 to May 2019). In this small study we were not able to show any statistical data of the advantage of using 3D scope with SOLO. However, choice of scope has dramatically changed, with more surgeons choosing the 3D over 10mmHD. It suggests that surgeons feel the 3D/SOLO is more convenient, and that they experience less stress while operating with 3D/SOLO.
“WHEN BOTH ENDS MEET: THE ENDOSCOPIC FRENCH KISS TECHNIQUE” - Achieving Luminal Patency after Complete Anastomotic Stricture

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BACKGROUND: This is a case of an 82-year-old female who underwent Laparoscopic Low-Anterior Resection with Diverting Transverse Colostomy for Rectal Adenocarcinoma Stage I (T2N0M0). The operation and hospital course was uneventful. However, flexible proctoscopy exam prior to colostomy takedown showed complete closure of the anastomosis. Therefore, conventional balloon dilatation technique was unsuitable for this condition. We applied a “kissing” technique since patient has a stoma; using a colonoscope from the anal side and gastroscope from the oral side thru the stoma.

OBJECTIVE: To describe the endoscopic management of colonic anastomotic strictures using the “kissing technique” under fluoroscopic guidance on a patient who underwent Laparoscopic Low-Anterior Resection with Diverting Transverse Colostomy. To our knowledge, the technique we used in this case has not been previously reported.

INTERVENTION: A standard colonoscope was inserted thru the anus to locate the anal aspect of the anastomotic stricture. Stricture was 8cm from the anal verge. Thru the distal side of the transverse colostomy, a standard gastroscope was then inserted to locate the caudal aspect of the anastomotic stricture. Stricturotomy was done using a needle-knife as it is guided via transillumination from the gastroscope at the otherside of the stricture. Stricturoplasty was done using CRE Balloon under fluoroscopic guidance. Insertion of Self-Expanding Metallic Stent (20x60mm, Fully Covered) under fluoroscopic guidance.

CONCLUSION: The application of this technique is suitable for complete colorectal anastomotic stricture with a diverting stoma. The procedure was easily performed and yielded an effective result, in which the present outcome with our patient was satisfactory. However, the risk and long-term results of this method could not be assessed because of limited experience.
Robotic Partial Excision of Levator-ani Muscle (PELM) for Locally Advanced Low Rectal Cancer Invading Ipsilateral Pelvic Floor

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Purpose/Background: Tumors at the level of the anorectal junction had required abdominoperineal resection with a permanent colostomy to achieve an adequate resection margin especially negative circumferential resection margin (CRM). However, in the cases of tumor invading ipsilateral levator-ani muscle and intact external sphincter, en bloc resection of the rectum with levator-ani muscle including tumor would be possible. Based on this idea, preliminary cadaveric study, author started this procedure since 2011 under the consent of patient. The partial excision of levator-ani muscle (PELM) technique enables preserving the anal sphincter function with obtaining oncologic clearance and avoiding permanent colostomy in those patients. The purpose of this study is to analyze the short-term and functional outcomes following PELM

Methods/Interventions: Data on 24 consecutive patients who underwent PELM according to the involved direction for pathologically proven low rectal cancer were retrospectively collected. All 24 patients presented low rectal cancer at the anorectal ring level that was suspected to invade or abut to the ipsilateral side of the levator-ani muscle.

Results/Outcome(s): Among 24 patients with HLE, there were 2 patients with CRM less than 1mm. Postoperative complication rate was 29.2%. Among 11 patients who underwent diverting ileostomy closure after the index operation, the mean Memorial Sloan Kettering Cancer Center score was 64.9 at 1 year after temporary ileostomy takedown. Accessing their incontinence scale, mean Wexner score was 11.0.

Conclusion/Discussion: PELM is a novel sphincter-preserving technique that can be a treatment option for low rectal cancer invading ipsilateral levator-ani muscle, which has been an indication for abdominoperineal resection (APR) or extralevator APR. However, the long-term outcomes of this procedure still need to be assessed to confirm its oncologic and functional safety.
A comparison of Single port laparoscopic, Conventional laparoscopic, and Conventional robotic surgery in patients with sigmoid colon cancer: Is there any real need to have surgical drain?

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Introduction Conventional laparoscopic or robotic surgery has been placed as a standard option in the treatment of sigmoid colon cancer. Recently, advance in technology and accumulation of experience has enabled surgeons to do more minimized incision technique such as single port surgery. However, there is still concern regarding technical feasibility and safety of single port surgery. The aim of this study was to compare the early perioperative results among 3 different surgical methods.

Methods Between January 2010 and December 2015, patients who underwent minimally invasive surgery (MIS) for sigmoid colon cancer were retrospectively identified from Yonsei Colorectal Cancer Electronic Database. Single port laparoscopic anterior resection (SLAR) was performed using specially designed multichannel port system for the entry port with 3.0 cm sized umbilical incision. Conventional laparoscopic anterior resection (CLAR) and Conventional robotic anterior resection (CRAR) were performed using multiport system. Surgical drain was not used in SLAR group after surgery. Short-term outcomes including pathologic result, morbidity, and perioperative recovery were compared between 3 groups.

Results Patients were subdivided into CLAR group (n=534), CRAR group (n=37), and SLAR group (n=64). Baseline characteristics did not differ between the groups. However, mean operation time showed differences. (CLAR vs. CRAR vs. SLAR: 187.03 min vs. 219.97 min vs. 163.89 min, p < 0.01). Mean intraoperative blood loss (CLAR vs. CRAR vs. SLAR: 63.36mL vs. 77.84mL vs. 39.68mL, p=0.362), the incidence of intraoperative transfusion, TNM stage, total lymph node retrieval, the duration of hospital stay and overall complication rate had no significant differences. The number of anastomotic leakage events was 5 (0.9%) in CLAR group, 1 (2.7%) in CRAR and 1 (1.6%) in SLAR.

Conclusion SLAR with shorter operation time is comparable to CLAR and CRAR in the treatment of sigmoid colon cancer. Surgical drain may not be considered routinely after SLAR.
Feasibility and safety of single-incision laparoscopic surgery for non-perforated appendiceal mucocele

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**Introduction:** Appendiceal mucocele (AM) is a descriptive term for mucinous distension of the appendiceal lumen regardless of the underlying pathology. It is essential to remove the distended appendix without rupture because spillage of mucus into the peritoneal cavity can lead to pseudomyxoma peritonei (PMP). Recently the safety and feasibility of conventional laparoscopic surgery (CLS) for AM were reported. However, there has been no report on single incision laparoscopic surgery (SILS) for AM.

**Methods:** We retrospectively analyzed the medical records of patients who underwent surgery for non-perforated AM diagnosed with computed tomography (CT) between January 2010 and December 2018. We excluded patients who showed strongly suspected malignant lesion, including PMP and perforation in preoperative CT. Patients were divided into two groups according to whether they underwent CLS or SILS. Pathologic findings were categorized into two groups: non-neoplastic and neoplastic.

**Results:** 116 patients were enrolled in this study. Patients’ demographics were not different between two groups except diameter in preoperative CT scan, which showed larger in the CLS group. SILS group showed shorter operation time (89.0 ± 61.5 vs. 56.2 ± 25.8, P<0.001). Perforation during surgery occurred only one patient in each group. The postoperative hospital stay was shorter in the SILS group (3.7 ± 2.4 Vs. 1.8 ± 0.9, P<0.001). The pathologic outcome was not different between the two groups. No recurrence was detected in all patients. Neoplastic lesion such as adenoma and LAMN was highly detected. No recurrence was detected in all patients.

**Conclusions:** In conclusion, SILS for AM appears feasible and safe in the current study. The perioperative short-term outcomes were acceptable, which showed shorter operative time, and shorter hospital stays without increasing the rupture risk. Moreover, we could observe the oncological safety of SILS for LAMN confined to the appendix.
Single Incision Laparoscopic appendectomy in Complicated appendicitis

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Purpose: Recently, the single incision appendectomy has been widely used for treating appendicitis. The aim of this study was to evaluate the safety and feasibility of single incision laparoscopic appendectomy compared with conventional laparoscopic appendectomy in complicated appendicitis.

Materials and Methods: We retrospectively collected data from 908 patients who underwent laparoscopic appendectomy for complicated appendicitis between July 2007 and April 2015. The patients were classified into two groups according to the operative methods:

Methods: Single incision appendectomy and Conventional appendectomy. The evaluated parameters included patient characteristics, operative details, postoperative complications classified according to Clavien-Dindo classification.

Results: Single incision appendectomy and conventional appendectomy were performed in 451 (49.7 %), 457 (50.3 %) patients, respectively. Body mass index (P=0.048), history of abdominal surgery (P=0.012), location of appendix (P=0.001), severity of inflammation (P<0.001) and size of appendix (long axis P=0.004, cross section diameter P=0.020) was significantly different between two groups. Operation time was significantly shorter in single incision appendectomy (51.3±23.6 minute, P<0.001). Open conversion case was more frequent in conventional appendectomy (P<0.001). Time to first soft diet (1.8±1.3 days, P<0.001), postoperative hospital stay was significantly shorter (4.4±2.7 days, P<0.001) in single incision appendectomy. In the cases of periappendiceal abscess, immediate appendectomy was more frequent in conventional appendectomy compared with single incision appendectomy (88.8 % Vs. 53.2 %, P<0.001), operation time was significantly shorter in single incision appendectomy (60.4±29.4, P<0.001), and drain insertion was more frequent in conventional appendectomy (96.6 %, P<0.001). Interval appendectomy was shorter operation time (50.7±21.7, P<0.001) and more frequent drain insertion (30.8 %, P<0.001), compared with immediate single incision laparoscopic appendectomy.

Conclusions: In this study, single incision appendectomy was technically feasible and safe in complicated appendicitis in terms of shorter operation time, faster time to first diet and less hospital stay compared with conventional appendectomy.
Laparoscopic right colectomy with complete mesocolic excision using a combination of anterior and retroperitoneal approach

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**Background:** Recent studies have showed the oncological effectiveness of complete mesocolic excision (CME) for treatment of right colorectal cancer. However, there are some concern about its safety and complication rate compared with conventional colonic resections. A worldwide standardized procedure of right colectomy with CME has not been established. We demonstrate safe and precise laparoscopic procedure using a combination approach of anterior and retroperitoneal dissection.

**Operative Technique:** The procedure is begun with an anterior approach. Following an opening of the omental bursa, the mesentery of the transverse colon is cut away along the inferior border of the pancreas, and the front of the SMV and the SMA are exposed. That is a cranial margin of the resection. The Henle’s gastro-colic trunk is exposed, and an accessory right colic vein is treated safely. The hepatic colonic flexure is freed from the Gerota’s fascia and the Duodenum from cranial to caudal. A retroperitoneal approach is used in the next step. The ileo-colonic mesentery is divided from the retroperitoneal organs, and the dissection plane is reached the space made with the anterior approach. Then the SMV and the SMA are exposed according to a medial approach. A delicate and careful dissection can be revealed the roots of the ICA/V and the MCA/V with D3 lymph node dissection. Each of vessels is cut at the root and the MCA is dissected with the right branch.

**Results:** A total of 68 patients with right-side colon cancer underwent laparoscopic right hemicoelectomy using this approach. All procedures were successful without any serious intra-operative complications or any conversion to open surgery. No grade ≥3 post-operative complications occurred.

**Conclusions:** The use of a combination of anterior and retroperitoneal approach might be a feasible procedure for laparoscopic right hemicolecotomy with CME. We would like to show the precise techniques with video presentation.
CME with D3 lymphadenectomy: Surgical technique overcoming survival discrepancy of colonic tumour sidedness in the adjuvant setting.

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BACKGROUND: Studies show right sided colonic cancers fair worse than the left with poorer short- and long-term survival rates regardless of stage or type of treatment including cancers with genetic predispositions, with differing responses to adjuvant therapy. Our surgical resection plane for right colonic cancers involves removing the mesorectum with its lymphatic tissue up to its central vascular origin with high lymph node yields. Technique may have an impact on survival and surgical outcome as well as tumour biology. AIMS: Whether tumour sidedness had an effect on survival after complete mesocolic excision (CME) with D3 lymphadenectomy in patients who underwent adjuvant chemotherapy for stage II & III colon cancers

METHODS: n=584 colon cancer patients with adjuvant chemotherapy for stage II and stage III from our prospectively collected database (2006-2015). All underwent CME with D3 lymphadenectomy. Right sided (cecum, ascending, hepatic flexure and transverse colon), left (splenic flexure, descending, sigmoid colon). 5-year overall survival (OS) and systemic and local recurrence free survival (RFS) rates were compared between the two groups.

RESULTS: Right sided n=282, left sided n=302. Median follow-up 60 months. Right sided colon cancer showed larger tumor size (5.42 vs 2.98 cm, p=0.048), more advanced pT stages (pT3 and T4; 96.8% vs 90.1%, p=0.005), higher number of retrieved lymph nodes (33 vs 26, p<0.001), more 30-days postop complications, especially ileus (7.4% vs 3.0%, p=0.015). No difference in 5-year overall survival (85.8% vs 88.6%, p=0.466), disease free survival (83.4% vs 85.0%, p=0.831), local recurrence free survival (97.5% vs 98.5%, p=0.477), and systemic recurrence free survival (85.9% versus 87.0%, P=0.940) between the two groups.

CONCLUSION: Our data has shown no difference in oncological outcome between right and left colonic cancer resections when Complete Mesocolic Excision with D3 lymphadenectomy was performed in the adjuvant chemotherapy setting for stage II & III colonic cancers.
Clinical outcomes and effectiveness of laser haemorrhoidectomy: a systematic review

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**Introduction** Laser haemorrhoidectomy is increasingly used in the treatment of symptomatic haemorrhoids and several studies have attempted to describe its clinical outcomes. In this systematic review, we aimed to comprehensively analyse the clinical outcomes and effectiveness of laser haemorrhoidectomy.

**Methods** A systematic review of MEDLINE and Google Scholar articles published between January 2009 and May 2019 was conducted; additional studies were identified by searching individual references. Studies that described the clinical outcomes and effectiveness of laser haemorrhoidectomy were selected based on pre-specified inclusion criteria with a minimum follow up period of 3 months. The clinical outcomes, effectiveness and complications were analysed.

**Results:** A total of 18 studies described the outcomes of laser haemorrhoidectomy. However, 3 studies were excluded because of combined treatment modalities and differences in energy source. Finally, data from 15 studies (3-randomized controlled trials and 12-prospective studies) including 1709 patients were analysed. There was significant heterogeneity in the reporting of outcomes. The majority were males (63.4%, \(n=1083\)) and the mean age was 44.8 years. The majority (99.35%) included grade 2 and 3 haemorrhoids. In the majority (97%, \(n=1659\)), the 980nm-wave length diode laser was used as the energy source. Doppler guided localization was performed in 6 studies (\(n=579,33.8\%\)). All studies reported low post-operative pain scores. Of which, eight studies showed significantly lower pain compared with open technique. Furthermore, six studies showed significantly less intra and post-operative bleeding compared with open technique. Six studies reported long-term follow up results and were found to be satisfactory in terms of symptom relief and recurrence.

**Limitations:** This study was limited by heterogeneity of outcomes precluding a meta-analysis.

**Conclusion:** Laser haemorrhoidectomy had acceptable clinical outcomes for grade 2 and 3 haemorrhoids with lower rates of post-operative pain and bleeding compared with open technique and satisfactory long-term outcomes.
Laparoscopic Versus Open Synchronous Resection for Liver Metastases of Colorectal Cancer: A multi-center propensity score matched study

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**Background:** Synchronous liver resection for colorectal cancer had been one of the major surgeries accompanied with significant postoperative complications. However, with advances of surgical techniques such as a 3D-view scope, laparoscopic liver resection has been widely adopted for colorectal liver metastases recently. We aimed to evaluate the short- and long-term outcomes of laparoscopic synchronous resection for liver metastasis of colon cancer compared with open resection.

**Methods:** We analyzed prospectively collected cohort data of 412 patients who underwent synchronous resection of colorectal cancer and liver metastases for curative intent between January 2002 and June 2018 in 2 tertiary referral hospitals. The variables related with short-term outcomes were baseline patient characteristics, perioperative outcomes including postoperative complication and hospital stay, and pathologic outcomes. To adjust the selection bias, we performed a 1:1 ratio propensity score (PS) matched analysis. The survival analysis was done with Kaplan-Meier analysis, and the risk factors for survival outcomes were evaluated with Cox regression analysis.

**Results:** There were a total of 52 (12.6%) patients in laparoscopic group and 360 (87.4%) patients in open group. Open group had more advanced colorectal cancer and multiple, bilobar liver metastasis than laparoscopic group. After PS matching, 52 patients were selected in each group and resulted comparable baseline characteristics between two groups. Laparoscopic group had better short-term outcomes, including less blood loss (300 vs. 400 mL; p=0.015) and shorter hospital stay (8 vs. 11 days; p<0.001) compared to open group. Laparoscopic group showed comparable recurrence-free survival (RFS) (3-year: 57.1% vs. 47.5%, 5-year: 49.9% vs. 45.1%; P=0.41) and liver-specific recurrence rate (3-year: 24.9% vs. 36.8%, 5-year: 34.3% vs. 39.9%; P=0.19) with open group, whereas overall survival (OS) was significantly better than open group (3-year: 87.8% vs. 77.9%, 5-year: 87.8% vs. 53.7%; P=0.04). In multivariable analysis, laparoscopic surgical approach itself was not an independent risk factor for RFS (HR 0.657; 95% CI 0.401-1.078; P=0.097), liver-specific recurrence rate (HR 0.544; 95% CI 0.274-1.079; P=0.081) and OS (HR 0.521; 95% CI 0.227-1.195; P=0.124). On the other hand, multiple hepatic metastases and increased estimated blood loss were independent risk factors for all oncologic outcomes.
Conclusions: Synchronous laparoscopic liver resection for colorectal liver metastases offers significant better short-term outcomes and comparable long-term oncological outcomes with open liver resection.

Bariatric and Metabolic Surgery

Discussion on the rationality of Single-anastomosis duodenoileal bypass with sleeve gastrectomy (SADI-S) as the first choice on super obesity patients

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Objective To evaluate therapeutic effect and sharing experience of laparoscopic single-anastomosis duodenoileal bypass with sleeve gastrectomy (SADI-S) as the first choice on super obesity patients (BMI>50 kg/m2).

Methods from January 2016 to January 2019, 20 patients with super obesity were treated in our center. Preoperative BMI of all the patients was more than 50 kg/m2. All the patients underwent 3D laparoscopic SADI-S after multidisciplinary evaluation and preoperative preparations. Surgical duration, intraoperative bleeding volume, the percentage of excess weight loss (%EWL) within 1 year after surgery and the remission rate of diabetes were counted and analyzed.

Results SADI-S was conducted in all the 20 patients under 3D laparoscopy, without conversion to open surgery. The surgical duration was 95~210 min (mean, 110.4 ± 12.8 min), the intraoperative bleeding volume was 20~100 ml (mean, 32.3 ± 4.7 ml), the postoperative hospital stay was 5~14 d (mean, 8.1 ± 1.6 d). One month, three months, six months and one year after surgery, %EWL was (21.35 ± 8.12)%, (43.14 ± 5.19)%, (64.50 ± 10.39)% and (73.81 ± 8.47)%, respectively. Up to the end of one-year follow-up, 17 of the 20 patients with super obesity were combined with type 2 diabetes, and 14 had complete remission, with remission rate of 82.3%.

Conclusions SADI-S, as a new surgical method for super-obese patients, takes into account the advantages of both LSG and LRYGB in design. It is characterized by relatively simple operation, a few complications and significant short-term effect. However, this study is a single-center and small-sample study. Therefore, its long-term effect, safety and diagnosis
and treatment of other obesity complications still need large-sample, multi-center and long-term comparative studies. Moreover, it needs to be further compared with other new surgical methods.
Efficacy of Intraperitoneal Instillation of Bupivacaine after Bariatric Surgery: Randomized Controlled Trial

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**Introduction:** Obesity is one of the greatest health problems. Bariatric surgery is more effective than non-surgical options; however, postoperative pain is bound to a greater morbidity. Control of postoperative pain is important in facilitating patient convalescence. In this study, we assessed the efficacy of intraperitoneal instillation of bupivacaine after bariatric surgery.

**Methods:** A hundred patients who underwent bariatric procedures including sleeve gastrectomy, sleeve gastrectomy with cardioplasty, gastric bypass, and gastric mini bypass (one anastomosis gastric bypass) were included in the study. Patients were divided into two groups randomly, 50 patients for each; group I had intraperitoneal instillation of 40 ml bupivacaine 0.25% at the end of the procedure, while group II had normal saline instillation. Monitoring of pain control in the first 24 h after surgery was done using the visual analogue scale (VAS) to assess the efficacy of intraperitoneal bupivacaine instillation and its effect on the overall opioid usage, postoperative nausea and vomiting (PONV), and shoulder tip pain.

**Results:** Pain scores were significantly lower in group I compared to group II at recovery, 2, 4 and 6 h after surgery, P = 0.004, 0.001, < 0.001, and 0.001 respectively. However, there were no significant differences between 12 and 24 h postoperatively. Additionally, there was a significant difference regarding the need for rescue analgesia at recovery P = < 0.001*. Further analysis revealed lower morphine consumption via PCA in group I compared to group II P= 0.013*. There were no significant differences with the use of intraperitoneal bupivacaine as regards nausea, vomiting, or shoulder tip pain, P = 0.688, 0.249, and 0.487, respectively.

**Conclusions:** Intraperitoneal instillation of bupivacaine provides a good analgesia in the early postoperative period, reduces the overall consumption of opioid, and decreases the rescue analgesia requirement in the first 24 h after surgery.
Removal and revision for Failed Adjustable Gastric Band

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**Background:** The operation rate of adjustable gastric banding (AGB) is decreasing due to weight loss failure and long-term complications in Korea. The aim of our study is to investigate reasons and outcomes of removal of gastric band (RGB) and evaluate the weight loss results.

**Methods:** A retrospective review of a prospectively maintained database was collected from January 2013 to December 2018.

**Results:** A total of 180 patients underwent RGB in this period. The mean age was 35.5 ± 8.7. The mean weight and body mass index (BMI) at primary gastric banding (PGB) were 90.6 ± 20.0 kg and 33.8 ± 6.7 kg/m2, respectively. The average time from PGB to RGB was 51.6 ± 24.2 months. Mean BMI decreased after PGB, from 35.5 ± 8.7 to 29.8 ± 6.5 kg/m2. The mean percentage of excess body mass index loss was 45.7 ± 79.7% at RGB. Revisions amounting to 138 (76.7%) were band removal only, 20 (11.1%) were band removal with conversion sleeve gastrectomy, 3 (1.7%) were band reposition and 1 (0.6%) were band replacement. The most common indications for revision were weight loss failure (n=91, 50.6%), Pouch dilatation (n=34, 18.9%), Band slippage (n=26, 14.4%), Intolerance (n=18, 10.0%), and band erosion (n=16, 8.9%). Two out of 180 (1.1%) patients had complications during revisions. However, there was no postoperative 30 days mortality.

**Conclusion:** The most common indication for RGB was weight loss failure. Band slippage and gastric pouch dilatation were frequent complications for revisions. Although AGB is believed to be a reversible procedure, simultaneously conversion procedures were considered for treating weight loss failure.
Outcome of laparoscopic sleeve gastrectomy on type 2 diabetes mellitus

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Background: A laparoscopic sleeve gastrectomy (LSG) is the most common procedures for morbid obesity worldwide. LSG has been known to improve type-2 diabetes mellitus (T2DM). The aim of this study is to investigate the outcome of anti-diabetic effect after LSG.

Methods: We examined data from 27 patients, who had T2DM and underwent LSG at Shiga University of Medical Science Hospital between October 2008 and August 2018 and were followed-up for more than 1 year after LSG. The data was collected retrospectively including demographics, weight metrics, HbA1c, C-peptide, duration of T2DM, insulin use, and a daily dose of insulin. Modified ABCD score and Individualized Metabolic Surgery (IMS) score were calculated. Complete Remission (CR) was defined as HbA1c<6.0% without anti-diabetic agents and Partial Remission (PR) was defined as 6.0%≦HbA1c<6.5% without anti-diabetic agents. The comparison between before and after LSG in HbA1c, and the number of insulin user was analyzed with Wilcoxon signed-rank test and Chi-squared test.

Results: Of the 27 patients, median age (range) was 46(21-66), female was 59.3%, median initial body weight before LSG was 108(83-155) kg, median initial body mass index (BMI) before LSG was 40.7(32.4-55.1) kg/m2. Median preoperative HbA1c was 7.6(5.7-12.8) %, median preoperative fasting C-peptide was 2.8(0.6-5.6) ng/ml, median duration of T2DM was 9(0-22) years, a number of insulin user was 11(40.7%), median Modified ABCD score was 5(1-8) points, and severity of IMS score (Mild/Moderate/Severe) were 3/13/11, respectively. After LSG (median followed-up period was 57(12-94) months), HbA1c was decreased to 6.0(5.0-9.7) % (p<0.001), and the number of insulin user was decreased to 3(11.1%, p=0.027). The number of CR/PR were 13(48.2%)/4(14.8%), respectively. Remission (CR+ PR) rate was 63.0%. In the moderate severity according to IMS score, the remission rate was 76.9%.

Conclusion: LSG was effective on T2DM with obesity.
Can Chinese T2DM Patients with BMI 20-32.5 kg/m2 Benefit From Loop Duodenojejunal Bypass With Sleeve Gastrectomy?

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**Background:** Loop duodenojejunal bypass with sleeve gastrectomy (LDJB-SG) is a simplified biliopancreatic diversion with duodenal switch. Objectives: This study investigated the therapeutic outcomes of LDJB-SG and predictors of type 2 diabetes mellitus (T2DM) remission in Chinese patients with a body mass index of 20 to 32.5 kg/m2. Setting: A university hospital.

**Methods:** This retrospective study included 28 T2DM patients with a BMI of 20 to 32.5 kg/m2 who underwent LDJB-SG. T2DM remission, weight loss, postoperative nutrition status, and complications at 1- and 3-year follow-up were assessed. Remission of T2DM was defined as a fasting blood glucose <7 mmol/L and HbA1c <6.5% for 1 year without pharmacological intervention.

**Results:** At 1-year follow-up after LDJB-SG, the T2DM remission rate was 75% (21/28), and the mean total weight loss (TWL) was 23.6%. The 3-year T2DM remission rate and TWL% were 68.4% (13/19) and 20.3%, respectively. Univariate and multivariate analysis indicated that duration of T2DM was the only risk factor associated with T2DM remission (P < 0.05). LDJB-SG improved the metabolic syndrome by increasing the high-density lipoprotein cholesterol level (P = 0.0157), decreasing waist circumference (P < 0.0001), and decreasing triglycerides (P = 0.0053). Postoperative complications of LDJB-SG included malodorous flatus (64.3%), accidental diarrhea induced by greasy food (57.1%), de novo gastroesophageal reflux disease (28.6%), anemia (25%), fatigue (21.4%), underweight (17.9%), intolerance to cooked rice (10.7%), constipation (7.1%), and steatorrhea (3.6%).

**Conclusion:** LDJB-SG resulted in acceptable T2DM remission and metabolic improvement at 1- and 3-year follow-up in Chinese T2DM patients with a BMI of 20 to 32.5 kg/m2. T2DM duration may serve as the predictor of T2DM remission. LDJB-SG should be performed with caution because of the high incidence of postoperative complications.
Hybrid reinforcement of the staple line could decrease the postoperative bleeding after sleeve gastrectomy

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**Background:** Leak and hemorrhage after sleeve gastrectomy (SG) are small probability events, but have devastating outcomes. Objective: This study is compared the complications of the whole layer running suture to a novel hybrid method with the purse string suture of the His angle, inverted suture of proximal staple-line and oversewing of distal staple-line with omental coverage.

**Methods:** We retrospectively collected the data of 678 patients who received SG. The patients were divided into two groups according to the different staple line reinforcement (SLR) methods.

**Results:** Of 678 patients included in the study, 66.2% developed active staple line bleeding after stomach transection. 18.1% had staple line dehiscence. Perioperative mortality was 0.15%. Among 678 patients, 319 received hybrid suture, while 359 received running suture. Hybrid suture exhibited shorter total operation time and suture time of the staple line \( (P<0.0001) \). The mean time of purse string suture was 1.67±0.62 min. Despite similar frequency and patients’ numbers of suture site bleeding, hybrid suture required less extra coagulation for hemostasis. 7 patients (1%) had postoperative bleeding. All these patients received running suture of SLR with the incidence of 1.95%. Three patients underwent emergency reoperations and the other four patients received conservative treatment and recovered. There was no postoperative bleeding in patients with hybrid suture of SLR \( (P<0.05) \). Leak was detected in two patients (0.3%) in running suture group. There was no leak in hybrid suture group. There was no postoperative obstruction within all patients.

**Conclusion:** Hybrid suture may decrease the postoperative bleeding after sleeve gastrectomy.
Short-term effect of Metabolic & Bariatric Surgery on Patients with Comorbid Obesity Hypoventilation Syndrome and Obstructive Sleep Apnea

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Objective To evaluate the short-term effect of metabolic and bariatric surgery (MBS) on patients with comorbid OHS and OSA.

Methods Retrospective data of all patients accepting MBS at our center between June 2014 and June 2018 were reviewed. All the candidates attended polysomnography (PSG), daytime arterial blood gas analysis (ABGA), physical as well as laboratory examinations when admission for screening purposes. Included patients were followed up for six months after MBS, and the outcomes in term of obesity, OSA and OHS severity were analyzed in this study.

Results There were 167 patients, who were diagnosed with OSA based on PSG, undergoing MBS at our center between June 2014 and June 2018, A total of 36 subjects with comorbid OHS were enrolled in this study according to the inclusion and exclusion criteria [laparoscopic sleeve gastrectomy (LSG) n=29, laparoscopic roux-en-Y gastric bypass (LRYGB) n=7]. Compared with baseline data, the mean PaCO2 decreased from 50.3±8.5 mmHg to 40.5±4.1 mmHg, and the mean AHI decreased from 90.6±42.4 events/h to 27.0±23.7 events/h after MBS, indicating that hypercapnia and sleep apnea were both improved after postoperative weight loss. While MBS improved OHS as well as OSA severity, this did not always translate into complete resolution of OSA, in combination with no statistical correlation (P>0.05) between weight loss and the improvement in sleep apnea. On the univariate and multivariate linear regression analysis, the results supported a predictive role for baseline age in the post-surgical remission of OHS.

Conclusions MBS could help to control both hypercapnia and sleep apnea in obese patients with comorbid OHS and OSA in the short term. The effect of MBS on OHS was partly free from pure postoperative weight loss, and may be less favorable as age increases.
Correlation Between Obstructive sleep apnea and Nonalcoholic Fatty Liver Disease in Patients with Morbid Obesity, Before and 6 months After Metabolic and Bariatric Surgery

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Objective To analyze the correlation of pre-operative conditions and post-operative improvement between OSA and NAFLD in patients undergoing MBS.

Methods Consistent with the inclusion and exclusion criteria, a total of 120 subjects between January 2016 and June 2018 were enrolled in this study. Upper abdominal CT scan outcomes, sleep records, physical and biochemical parameters were evaluated for screening purposes at baseline; and all included subjects were followed up for 6 months after operation. Fatty liver is defined as a liver/spleen Hounsfield unit ratio (LSR) < 1.0 for CT scan; NAFLD fibrosis score (NFS) was used to distinguish advanced fibrosis; and polysomnography (PSG) could help assess the prevalence and severity of OSA in the study population.

Results The prevalence of NAFLD was high as 90.8% (n = 109). There were significant differences in ALT, AST, LSR and NFS among groups (P < 0.05), and the LSR was correlated with PSG parameters such as AHI, ODI, MSO2, NSO2, LAT and SIT90 at baseline. At the 6-month follow-up visit, MBS achieved excellent results in both NAFLD and OSA conditions. Pearson analysis demonstrated that an improvement in liver fat deposition was positively and significantly correlated with improved AHI, ODI, MSO2, NSO2, LAT, and SIT90, instead of the change in BMI after operation. In addition, the results in the univariate and multivariate linear regression analyses supported preoperative LSR and SIT90 as two independent predictors for the effect of MBS on liver steatosis.

Conclusions MBS plays a pivotal role in the control of medical conditions in obese patients with OSA and NAFLD. Furthermore, preoperative LSR and SIT90 were two independent predictors for the effect of MBS on liver steatosis in the short term.
Assessment of liver volume reduction after preoperative acute weight loss for bariatric surgery at King Chulalongkorn Memorial hospital : a computed tomography-based analysis

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**Background:** Super-obese patients (BMI ≥ 50 kg/m²) have a higher perioperative risk undergoing surgery due to hepatomegaly, massive adiposity, and severe co-morbidities. Most of the guidelines recommended performing the laparoscopic Roux-en-Y gastric bypass (LRYGB) in this patient group as staged operation to lower the risk by reducing the liver size and volume, as well as improving co-morbidities conditions. Our center used to offer laparoscopic sleeve gastrectomy (LSG) as the staged operation for LRYGB in super-obese patients. The main disadvantage of staged operation is the patients need to undergo the re-operation. To overcome this disadvantage, we use the 2 weeks preoperative acute weight loss (AWL) follow by LRYGB to facilitate LRYGB as the single operation.

**Objectives:** Our study aimed to evaluate the efficacy of preoperative AWL in reducing the liver volume assessed by computed tomography (CT). As well as evaluated the reduction of co-morbidities’ severity.

**Materials and Methods:** All super-obese patients were admitted with a diet of 800 kcal/day for 2 weeks prior to LRYGB. The co-morbidities were monitored and recorded. The liver volume was measured from CT before and after AWL.

**Results:** Our study recruited 9 patients (4 male and 5 female) with a mean age of 38.5. The mean BMI reduced from 54.6 kg/m² (baseline) to 49.4 kg/m². The mean left lobe liver volume reduced from 696.75 ml. (baseline) to 531.28 ml. (23.8%), which is statistically significant. The co-morbidities’ parameters also demonstrated the improvement after the AWL.

**Conclusions:** The preoperative AWL is effective method to reduce the liver volume prior to LRYGB in super-obese patients. We demonstrated the effectiveness of volume reduction by using CT as objective assessment. Preoperative AWL may potentially play a role to decrease the severity of patients’ co-morbidities in a short period before surgery.
Adequate enoxaparin dosage for venous thromboembolism prophylaxis in bariatric surgery

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Background: Venous thromboembolism (VTE) is a common postoperative complication that may lead to serious problems. Morbidly obese is an independent risk factor for VTE with an increased risk greater than 2-3 folds. Proper dosing regimen of enoxaparin for VTE prophylaxis in morbidly obese is not clearly defined in available guidelines and there are no reported studies pertaining to the adequacy of prophylactic dosage used in Thai population.

Objectives: To assess the achievement of desired target anti-factor Xa level after the administration of enoxaparin for VTE prophylaxis in patients planned for bariatric procedure.

Materials & Methods: An observational descriptive study carried out on morbidly obese patients scheduled for bariatric procedure in King Chulalongkorn Memorial Hospital since January 2019. All recruited patients received either 40 mg or 60 mg of enoxaparin subcutaneously 12 hours before the scheduled operative time. Blood specimens for peak 4-hour anti-factor Xa level were collected at 4 hours after the administration of enoxaparin. The target range of anti-factor Xa level was defined between 0.2-0.5 IU/ml.

Results: There were 30 patients that underwent bariatric procedure during our study period. 11 patients received 40 mg of enoxaparin while 19 patients received 60 mg. The mean anti-factor Xa levels were 0.20 IU/ml in the 40 mg group and 0.33 IU/ml in the 60 mg group. The percentage of target level achievement in both groups were 63.34% and 89.47% respectively (p-value 0.08). There was no patient that obtained levels exceeding 0.5 IU/ml of anti-factor Xa. There was no significant perioperative bleeding complication in both groups.

Conclusions: For VTE prophylaxis in bariatric procedure, enoxaparin dosage at 60 mg subcutaneously more achieved the desired target levels of anti-factor Xa when compared to 40 mg without any unwanted complications. The trend of anti-factor Xa level is inversely proportionate to increasing body weight and BMI.
COMPARISON OF LONG-TERM WEIGHT LOSS AFTER LAPAROSCOPIC SLEEVE GASTRECTOMY AND LAPAROSCOPIC ROUX-EN-Y GASTRIC BYPASS FROM A SINGLE CENTER IN THAILAND

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Introduction: Laparoscopic sleeve gastrectomy (LSG) and laparoscopic Roux-en-Y gastric bypass (LRYGB) are two of the most widely used bariatric procedures in Thailand however, a comparison of long-term outcomes is still limited. The aim of this study is to compare the degree of long-term weight loss of these two procedures.

Materials and Methods: A retrospective analysis was performed for all patients who underwent LSG or LRYGB between April 2005 and May 2018 at a single institute with at least 1 to 5 years follow up. Demographic data (age, sex, preoperative body weight, excess body weight, body mass index (BMI) and co-morbidities) were collected. Primary outcomes were percentage of total weight loss and percentage of excess weight loss. Secondary outcomes were postoperative complications.

Results: Of the total 334 patients, 153 underwent primary LSG and 181 patients underwent LRYGB. Preoperative BMI in the LSG group was significantly higher than the LRYGB group (53.7 ± 12.3 kg/m^2 vs 48.4 ± 8.3 kg/m^2, p <0.001). Co-morbidities between LSG and LRYGB groups were similar. Mean percentage of excess weight loss (%EWL) at 5 years was 36.7 ± 51.0% in the LSG group vs 62.3 ± 25.3% in the LRYGB group (p = 0.04). Mean percentage of total weight loss (%TWL) at 5 years was 19.2 ± 23.0% in the LSG group vs. 27.9 ± 11.8% in the LRYGB group (p = 0.252). At 5 years, no significant difference was found in the percentage of patients who had >50%EWL between groups. Overall complications were 4.3% in the LSG group vs. 11.7% in the LRYGB group (p = 0.011). There was no mortality.

Conclusion: Our center revealed that LRYGB had better results than LSG in terms of percentage excess weight loss at 5 years. On the other hand, LSG had lower overall complications than LRYGB.
The Safety and Efficacy of Clipping the Stapler Line in Patients Undergoing Laparoscopic Sleeve Gastrectomy

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Background: Obesity is a public health problem especially in Saudi Arabia. There are many surgical procedures for its management. One of them is Laparoscopic Sleeve Gastrectomy (LSG). However it has post-operative complications as bleeding and leak.

Objectives: To determine the safety and efficacy of clipping the stapler line in patients undergoing LSG.

Methods: This is a retrospective cohort study that involved all patients who underwent LSG at King Khalid University Hospital under Professor Abdullah Aldohayan from July 2015 till May 2018. It included 146 patients divided into two groups randomly, the clipping group included 72 patients who have undergone LSG with clipping of the stapler line, and the non-clipping group that included 74 patients who have undergone LSG without clipping of stapler line. After that we compared the incidence of postoperative complications including bleeding and leak in the two groups.

Results: The results indicated that there was no statistically significant difference between the two groups regarding patients’ demographic criteria or the risk factors for post-operative complications. Also the results revealed that no statistically significant differences between the two groups regarding post-operative bleeding where p-value=1, or leak where the p-value = 0.324.

Conclusion: There is no significant difference in postoperative bleeding and leak in laparoscopic sleeve gastrectomy between reinforcement clipping stapler line and non-reinforcement of it.

Keywords: Bariatric Surgery, Laparoscopic sleeve gastrectomy, Bleeding, Leaks, clipping stapler line.
A Comparative Study of Adjustable Intragastric Balloon Insertion versus Laparoscopic Sleeve Gastrectomy

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Background: Though being considered as an option for treating morbid obesity, doubt on the effectiveness of intragastric balloon insertion does exist.

Objective: To compare treatment outcomes between Intragastric Balloon insertion (IGB) and Laparoscopic Sleeve Gastrectomy (LSG).

Methods: All patients in Vajira hospital who underwent 12-month IGB insertion (Spatz3®) or LSG during 2012-2017 were included. The eligible criterion was a BMI of 31- 40 kg/m² (obesity class I-II). Data were collected from medical records and via telephone interview in order to evaluate excess weight loss, co-morbidity status, complications, and quality of life by EQ5D5L score.

Results: 16 patients were included (average Baseline BMI of 35.4 kg/m² and 35.3 kg/m² from IGB and LSG group respectively). Average excess weight was 38.7 kg in both groups and average percentage of excess weight loss at 6, 12, and 24 months after the operation were 58.5% vs 23.9%, 77.0% vs 21.6%, and 74.9% vs 6.2% in LSG and IGB group respectively (p-value <0.001). Co-morbidity improvement was shown in 6 out of 7 patients for LSG group but none in IGB group. Reflux severity was not significantly different between 2 groups. In IGB group, however, all reflux symptoms disappeared after balloon removal. According to the interview, the quality of life was higher in the LSG group when compared with IGB group (EQ VAS score 90 vs 79.3; p-value 0.083).

Conclusion: In class I-II obesity patient, LSG is a better modality when compared with IGB.
Impact of Bariatric Surgery on Cardiovascular Risk Reduction in Korean Obese Patients

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Purpose: Morbid obesity is a well-known risk factor for cardiovascular disease (CVD). This study aimed to quantitatively evaluate the effects of bariatric surgery on CVD risk reduction in Korean obese patients by using three CVD risk prediction models (Framingham General Cardiovascular Risk Score [FRS], Pooled Cohort Equation [PCE], and Korean Risk Prediction Model [KRPM]), and to investigate which procedure between laparoscopic Roux-en Y gastric bypass (LRYGB) and laparoscopic sleeve gastrectomy (LSG) is a better option for CVD risk reduction.

Materials and Methods: We retrospectively reviewed all obese patients who underwent bariatric surgery at a single institution from October 2009 to May 2016. Of the 1034 patients reviewed, 83 patients (6.5%) who met the criteria for calculating the FRS, PCE, and KRPM scores and had a follow-up of at least 1 year were included in this study.

Results: The FRS, PCE, and KRPM scores were significantly decreased at postoperative 1 year (10.47±7.30% to 6.33±4.59%, P=0.000; 5.45±6.25% to 2.75±2.75%, P=0.000; and 4.53±2.96% to 3.49±2.13%, P=0.000, respectively) in LRYGB. The PCE and KRPM scores were significantly decreased (4.13±3.63% to 2.42±2.45%, P=0.004 and 4.14±1.95% to 3.22±1.94%, P=0.000, respectively) in LSG, but not the FRS (9.43±3.58% to 5.63±3.24%, P=0.118). There was no difference in absolute risk reduction in FRS, PCE, and KRPM between LRYGB and LSG (4.13±5.08% and 3.80±3.50%, P=0.788; 2.70±0.52% and 1.72±0.49%, P=0.799; and 1.03±1.85% and 0.92±0.97%, P=0.776, respectively).

Conclusion: LRYGB and LSG can equally significantly decrease the CVD risk in the Korean population, based on FRS, PCE, and KRPM.
Robotic Assisted Roux-en-Y Gastric Bypass for Morbidly Obese Patients: The First Case Series in Thailand

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**Introduction:** Laparoscopic Roux-en-Y gastric bypass (RYGB) is the standard of bariatric surgery as effective treatment for weight loss procedure and related comorbidities. Recently, robotic approach has been increasing because of its help overcome limitations of laparoscopic surgery. The objective of this study was to establish the outcome of robotic assisted RYGB in Thailand.

**Method:** Twenty-five patients who underwent robotic assisted RYGB between March 2017 and June 2019 were included. Demographic data, preoperative weight, BMI and comorbidities were collected. Outcome included operative time, postoperative pain, length of stay and complication. One-year surgical outcome, percent excess weight loss (%EWL) and comorbidity resolution, were also analyzed.

**Result:** The mean patient’s age, preoperative weight and BMI were 40.2 ± 8.8 years, 126.2 ± 26.9 kg and 46.3 ± 6.9 kg/m2, respectively. Mean total operative time was 243.8 ± 62.4 minutes. Median robot docking time was 7 minutes (range 3-30). Median postoperative pain score was 3 (range 1-6). Median length of hospital stay was 4 days (range 3-7). There was no 30-day postoperative morbidity and mortality. At 1 year follow up, mean %EWL was 59.2 ± 14.8%. The result of comorbidities resolution, the overall complete diabetic remission was 80% and hypertension resolution was 50%.

**Conclusion:** Robotic assisted RYGB for bariatric surgery is safe and effective procedure with comparable weight loss outcome and comorbidity resolution to laparoscopic surgery.
Preparation and Postoperative in Bariatric Surgery

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Bariatric surgery is the only proven modality to manage the severely obese and being accepted for improved safety and patient recovery. In 2013, the American Medical Association (AMA) recognize obesity as a disease state with multiple pathophysiological aspects requiring a range of interventions to advance obesity treatment and prevention. To get successful result when doing bariatric surgery, we must do a good preparation before and after surgery. Before surgery we have to tell the patient to have Liquid diet (high protein and low calories) 5 – 7 days before surgery, and preparation operation with well-organized team. Stop smoking and alcohol. And then after surgery we will collaborate with Clinical Nutritionist to perform diet regulation. There are several things that must be considered after bariatric surgery: no spicy, sour, drink carbonated beverages consumption, no alcohol and smoking, the patient also must have vitamins, exercise (according to the patient's capacity), food intake following Nutritionist regulation, hopefully drink clear fluid et least approximately 2 Liters / day.
Endocrine Disease

Prophylactic Antibiotic in Transoral Endoscopic Thyroidectomy Vestibular Approach (TOETVA): A randomised controlled pilot study

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Introduction: Wound infection in Transoral Endoscopic Thyroidectomy Vestibular Approach (TOETVA) is debatable. This study was conducted to compare the infection rate between single dose and 7 days prophylactic antibiotic.

Methods: From June 2018 - October 2018, 80 patients who underwent TOETVA were included in the pilot RCT study and divided equally into two groups by lottery sampling technique with IRB approval. Single dose Amoxicillin-clavulanic acid was given before the incision in the first group (1D) and continued for 7 days in the second group (7D). Patient demographics and variables, including operative time, blood loss, length of stay (LOS), complications, thyroid bed and wound culture, ESR, CRP, WBC, neutrophils were collected and compared.

Results All patients characteristics were similar. Operative time, blood loss, and LOS were comparable; 192.16±75.45 vs 168.17±38.31 minutes (p=0.052), 32.33±29.06 vs 31.72±3.63±0.87 mL (p=0.48), and 3.76±1.22 vs 3.63±0.87 days (p=0.318) in 1D and 7D respectively. WBC on day 1 and 8 were different statistically significant; 10,725.00±2,420.63 vs 12,605.02±2,545.19 (p=0.002) and 6,865.33±1,161.67 vs 6,351.66±1,037.05 (p=0.04) in 1D and 7D respectively. Neutrophil on day 1 and 8 were different statistically significant; 80.18±5.59 vs 82.89±4.49 (p=0.007) and 66.46±8.62 vs 58.59±6.21 (p=0.0001) in 1D and 7D respectively. ESR on day 1 and 8 were comparable; 21.71±8.79 vs 18.73±9.12 (p=0.106) and 25.41±7.33 vs 29.53±14.61 (p=0.091) in 1D and 7D respectively. CRP on day 1 was comparable; 44.37±25.26 vs 49.95±28.56 (p=0.217) in 1D and 7D respectively. CRP on day 8 was different statistically significant; 2.26±1.54 vs 4.19±3.72 (p=0.006) in 1D and 7D respectively. All culture was no growth. No case (0%) had wound infection. Three cases (3.75%) had temporary hoarseness. Two cases (2.5%) had temporary mental nerve injury. Six cases (7.5%) had seroma.

Conclusion There is no difference in wound infection rate in both groups. Single dose prophylactic antibiotic may be given for TOETVA.
Trans-breast endoscopic thyroidectomy with selective lateral neck dissection: a series of first 42 patients

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**Introduction** Endoscopic thyroidectomy has been adopted worldwide because it can avoid neck scaring. However, there are seldom reports concerning completely endoscopic lateral neck dissection because of technical limitations. Thus, we present our initial experience in trans-breast endoscopic thyroidectomy with selective lateral neck dissection.

**Materials & Methods** All the patients were treated in one institute, from January 2017 to April 2018. We performed endoscopic surgery via a breast approach for total thyroidectomy along with selective lateral neck dissection (levels IIa, IIb, III and IV). The detail operative procedures, indications and inclusion criteria were shown in our previous report and SAGES 2019.

**Results** A series of 42 cases were managed with this technique, but 2 cases were converted to open approach because of operating difficulty. Finally, this technique yielded adequate oncological dissection in other 40 patients, while avoiding a large neck incision. Among these 40 patients, level III+IV dissection had been performed in 18 patients and levels II+III+IV dissection had been performed in 22 patients. The mean age, BMI and sex was 39.5±10.6 year-old, 24.0±3.2 and 3/37, respectively. The average operative time of total operation and lateral neck dissection was 233.5±32.8 and 129.3±19.8 min. The mean dissected lateral lymph nodes were 5.0±2.0 (level II) in 22 cases and 15.0±3.5 (level III+IV) in 40 cases. In addition, with no severe adverse events to date, such as asphyxia, main nerves injury and permanent hypoparathyroidism etc. However, unexpectedly, had some mild and common complications like transient hypocalcemia (15%), transient horse (5%), controllable lymphatic leakage (7.5%) and controllable jugular vein injury (5%).

**Conclusion** It is feasible and safe to perform lateral lymph node dissection (levels IIa, IIb, III and IV) with endoscopic thyroidectomy via a breast approach. It can provide an option for selected patients who favor cosmetic results.
Foley Balloon to Facilitate Working Space Creation in Transoral Thyroidectomy

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**Introductions:** Thyroidectomy via transoral, vestibular approach leaves no scar in the body surface. It is a good option for patients who are indicated for thyroidectomy but have cosmetic concern. However, its working space is relatively small and difficult to create compared with other remote access thyroidectomy.

**Methods:** After creating a tunnel from the chin to the sternal notch, a Foley catheter with stylet was inserted through the middle oral incision. Sequential balloon insufflation was done to dilate the whole subcutaneous tract.

**Results:** After dilation with a Foley catheter, the subplatysmal space is larger and the subsequent trocar insertion becomes much easier. Hemostasis is secured by balloon compressing the surrounding tissue. Additional sharp dissection is performed to widen the working space to the desired boundaries.

**Conclusions:** Foley balloon dilatation is a simple and effective technique to overcome the difficulty during the initial stage of working space creation. It can be applied in all transoral thyroidectomy.
**Improving Surgical Ergonomics during Bilateral Axillo-Breast Approach Endoscopic Thyroidectomy via Transient X-shaped Mastopexy**

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**Background:** Bilateral axillary-breast approach (BABA) endoscopic thyroidectomy is a good choice for patients who are concerned about the cosmetic results. It uses the breast tissue as a pivot to give the surgeon better maneuverability of the surgical instruments. However, it is difficult to use this method in patients with small breasts or flat chest.

**Methods:** We developed a transient “X-shaped Mastopexy” method to raise and augment the breast tissue to facilitate the surgical procedure by using fabric adhesive tape. The difference between before and after reshaping was quantified by measuring the angle of breast tilt and the distance between relevant anatomical landmarks.

**Results:** Fifteen patients underwent this procedure before undergoing BABA thyroidectomy without observed skin injury. The mean breast tilt angle increased from 3.2 to 9.8 degrees, which has a more than threefold increase (+6.6 degree, 206%). Besides, the mean distance between the cricoid cartilage and nipple was reduced by 1.9 cm (-8%), and the mean distance between the axillary incision and nipple increased by 1.1 cm (9%).

**Conclusions:** Transient X-shaped mastopexy is easy to perform and significantly improves the surgical process without significant adverse effect. It can be used in all BABA thyroidectomy.
Comparative outcome between endoscopic thyroidectomy with breast axillary approach and conventional open thyroidectomy

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Objective: To compare the outcomes and complications of endoscopic versus conventional open thyroid lobectomy

Patients and Methods: A retrospective study was performed in 319 patients who underwent thyroid lobectomy at the institute between October 2008 and October 2018. Patients in endoscopic group is 122 and 197 in open thyroidectomy group

Results: Endoscopic thyroidectomy (ET) was done successfully in 122 patients with a median age of 42 years and median tumor size of 3.8 cm. Conventional open thyroidectomy (OT) was done in 197 patients with a median age of 47 years and median tumor size of 4.2 cm. There were no statistical significance in sex, age and side of tumor between the two groups. Median operative time was significantly longer in the ET group at 124 (sd 34) min vs. the OT group at 84 min (sd 25), p < 0.001. Median postoperative pain score, rated from 1 to 10, was statistical significantly less in the ET group at both 24 hours and 48 hours, and blood loss was statistical significance less in the ET group (both p-values < 0.001).Median postoperative hospital stay in ET group was shorter than that in the OT group: 4 days vs. 5 days respectively (p < 0.001)There was no statistical significance in the complication rates, but the cosmetic satisfaction was statistical significance superior in the ET group.No statistical significance complete thyroidectomy rate after pathological report was cancer in both groups

Conclusion: ET (breast-axillary approach) is safe and superior to OT in terms of postoperative pain, blood loss, hospital stay, and cosmetic for patients undergoing thyroid lobectomy.

Keywords: Endoscopic thyroidectomy, Open thyroidectomy, Outcomes
Innovation and Technology

CORRELATION OF POST-OPERATIVE STRETCH PAIN AND INSUFFLATION PRESSURE AMONG PATIENTS UNDERGOING BASIC LAPAROSCOPIC SURGICAL PROCEDURES: A PROSPECTIVE RANDOMIZED CONTROLLED STUDY

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Introduction: Laparoscopy or minimally invasive surgery for both appendicitis and cholecystitis has long been accepted as the gold standard procedures due to their well-established advantages over the open surgery techniques. Carbon dioxide is the gas used for achieving pneumoperitoneum with a wide range of safe intraabdominal pressure set; however, no set pressure is recommended for lesser post-operative pain while achieving ample technical space during the surgical procedure.

Methods: One hundred twenty five (N=125) patients were gathered, all admitted and underwent basic laparoscopy procedures in our institution from February 1, 2017 to April 30, 2018. Seventy (n=70) underwent regular pressure insufflation, while fifty-one (n=51) underwent low pressure insufflation for basic laparoscopy procedures. Four (4) patients were voided from the study.

Results: Heterogenous distribution was seen in both regular and low pressure groups with regards to demographics. There was no significant difference in 3 parameters, namely: operative time (p= 0.335), rescue analgesia required (p= 0.0951), and trocar pain complaints (p= 0.5815). Very strong statistical significance was seen in the 12-hr VAS scores (p= 0.0008) between the two groups, with the 24-hr VAS (p= 0.0358) scores having a significant difference as well. There were no morbidities nor mortalities in either group.

Conclusion: Low pressure insufflation was demonstrated safe and clinically beneficial on the merits of lesser degree of both early and late post-operative pain. Low pressure insufflation is a safe and feasible option with no added risk of prolonged operative time or any adverse peri-operative events.
A Prospective randomized trial to compare time to complete laparoscopic skill test between 3D imaging system and Ultra-high definition (4K) laparoscopic system

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BACKGROUND; 3D (Three dimensional) imaging system can improve depth perception of surgical field and have many studies showed that can improve inanimate laparoscopic skill compared with 2D system. Development of 4K (Ultra high definition) imaging system, the advantage include more detailed, color-correct images and greater depth perception. We compared the effect of 4K imaging system to time for complete laparoscopic skill test over 3D imaging system

METHOD: Sixth year medical student and first year resident were assign in to two groups (3D first and 4K first) to perform 3 laparoscopic skill test (ring transfer, pattern cutting, suture/knotting) of both system. Time to complete all tasks and each tasks were measured and number of mistake were note in both groups. All participants completed questionnaires about inconveniences that was occurred when performed skill test.

RESULT: Time to complete all tasks in 3D imaging system was shorter than 4K imaging system (661 sec vs. 746.88 sec, p < 0.001). If consider time to complete each task the result showed shorter time in 3D imaging system than 4K in all task, ring transfer.

CONCLUSION: The 3D vision systems significantly improved speed and accuracy when compared to the 4K vision system based on shorter performance time in non experience trainees.
Factors Affecting Lymph Node Harvest in Minimally Invasive Gastrectomy for Gastric Cancer

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FACTORS AFFECTING LYMPH NODE HARVEST IN MINIMALLY INVASIVE GASTRECTOMY FOR GASTRIC CANCERS

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Introduction Gastric cancer is the fourth most widespread cancer in the world. Proper lymphadenectomy guaranteed both oncologic radicality and appropriate tumour staging.

Objective To review the factors affecting lymph node harvest in minimally invasive gastrectomy for gastric cancer


Results 77 patients were included in the study period. 24 of them received robotic-assisted laparoscopic surgery (R), 22 received conventional laparoscopic approach (L), 31 underwent open surgery (O). The basic demographics were comparable among the three groups. Lymph node harvest was similar in both Robotic and Open group but significantly higher than the Laparoscopic group (p= 0.02 and p= 0.015 respectively). Intraoperative use of indocyanine-green (ICG) would enhance lymph node harvest (p= 0.05). It was also found that back-table sectioning of specimen and sending lymph node in stations increased the lymph node yield.

Conclusion Intraoperative use of ICG together with robotic-assisted approach would give higher lymph node harvest that would ensure oncologic radicality and proper staging. Back-table sectioning of specimen further enhanced lymph node yielded.
Lichtenstein repair of indirect inguinal hernias with acellular tissue matrix grafts in adolescents and young adult patients (13 to 45 years old)

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**Objective** To evaluate the outcomes of Lichtenstein hernioplasty using acellular tissue matrix (ACTM) grafts in adolescents and young adult patients (13 to 45 years old).

**Methods** In this study, 317 patients, 13 to 45 years old, with primary unilateral indirect inguinal hernias, received Lichtenstein hernioplasty using ACTM mesh. The outcome measures were the length of the operation, postoperative visual analogue scale (VAS) pain score, length of hospitalization, postoperative complications and recurrence rate.

**Results** The operative time was (31.2±5.8) min and the length of hospitalization (1.4±0.7) d. The minimum follow-up was 24 months, there were 2 post-operative wound infections (0.6%) and fully recovered by change of dressing for 1 month; there were no chronic postoperative pain (visual analogue score > 4, lasted 3 months) or local foreign body sensation occurred; 13 patients (4.1%) developed scrotal hydroceles and recovered by the scrotal punctuation. There were no recurrences and other complications.

**Conclusions** Lichtenstein hernioplasty using ACTM grafts is a safe and available treatment in adolescents and young adult patients (13 to 45 years old).

**Keywords** Hernia, inguinal; Herniorrhaphy; Acellular tissue matrix
Indocyanine green enhanced fluorescence imaging as a technique for objective assessment of bowel viability

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Introduction: Anastomotic leak is the most common cause of mortality after Roux en Y Gastric Bypass (RYGB). Gastrojejunostomy (GJ) is the most common site of leak after RYGB. Many factors play a role but tissue ischemia is the most important etiology for GJ leak. In doubtful cases of ischemia detected intra operatively, anastomosis should be taken down and a new anastomosis should be constructed.

Case report: A 48-year-old lady with body mass index of 56.7 Kg/m2 a known case of Diabetes Mellitus, Hypertension and Hypothyroidism while creating an alimentary limb and performing a circular GJ during a standard RYGB developed doubtful ischemia and discolouration of terminal end of alimentary limb which appeared to involve the GJ. Indocyanine green (ICG) was injected intra operatively to assess the perfusion. GJ and alimentary limb showed normal uptake of the dye and preserved vascularity. This approach avoided unnecessary dismantling and reconstruction of GJ. Post operatively patient had uneventful recovery.

Conclusion: In doubtful cases of tissue viability ICG provides an objective evidence of patent vascularity and perfusion of affected tissues. This is an added armamentarium in a minimally invasive surgeon’s arsenal which one should not hesitate to use for benefit of the patient.
Laparoscopic Adrenalectomy for Large Adrenal Masses: A Systematic Review of the Literature on Feasibility and Safety

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Aims: Laparoscopic adrenalectomy (LA) is the standard technique for the excision of adrenal masses. As large adrenal masses (≥5.0 cm) were previously a contraindication for LA, the feasibility and safety of LA for such masses has not yet been determined, and this is what we aim to address in this study.

Methods: In July 2019, we conducted a systematic review of all studies involving LA of masses ≥5.0 cm. This was completed using Pubmed, Embase, Cochrane Library and ScienceDirect. Data selection and quality assessment were performed by two reviewers independently. No meta-analysis was conducted due to heterogenous clinical background and data.

Results: In the 31 studies reviewed, we found that in 485 LA procedures, the average mass size was 9.39 cm. The majority of masses were found to be benign, and the most common masses were pheochromocytomas. The mean operating time, estimated blood loss and hospitalization post-operatively were 143.67 minutes, 103.04 ml and 3.22 days respectively. Complications were found in a low percentage (8.87 %) of cases reviewed, the most common being bleeding which required transfusion. Conversions to open adrenalectomy were found in a low percentage (1.24 %) of cases reviewed, the most common reason for conversion was bleeding followed by firm attachments leading to difficult dissection.

Conclusion: The general trend found in the studies reviewed showed that LA is a feasible and safe procedure for uncomplicated large adrenal masses. Compared to open adrenalectomies, LA is associated with fewer complications and lower post-operative morbidity, as well as shorter post-operative hospitalization periods.
Laparoscopic Skill Qualification System in Japan

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It is obvious that the outcome of surgery is much influenced by surgeon’s skill. In laparoscopic surgery, surgeon’s skill has crucial meaning because laparoscopic surgery is generally demanding than the identical procedures in open surgery. To qualify the surgeons who have enough skill to perform and teach the procedures, JSES established an Endoscopic Surgical Skill Qualification System (ESSQS) in 2004 and run the system to date. The detail of the system was previously described. (Kimura2010, Mori 2010) By 2017, a total of 5,839 surgeons applied to ESSQS and 1985 surgeons have been qualified (qualification rate 34%). ESSQS has several subspecialties, namely esophagus, stomach, colon, biliary, inguinal hernia, spleen, liver, and pancreas. The total number of applicants/qualified surgeons and qualification rate (%) were as follows: in esophagus:250/97 39%, stomach:1553/521 34%, colon:2212/640 29%, biliary:1200/521 43%, inguinal hernia: 291/79 27%, spleen:66/34 52%, liver:140/37 26%, and pancreas:56/23 41%, respectively. The issue complicating the ESSQS is inter-rater agreement, which is expressed by kappa value (Cohen). The kappa value ideally exceeds 0.40 for reproducible qualification, but it actually fluctuates between 0.1 to 0.5 in ESSQS. Through the consensus meetings to discuss the difference in judgement, the procedure has been much standardized. It is of greatest importance whether the ESSQS qualifies surgeon shows better surgical outcome when compare with no qualified surgeon. To investigate this problem, short term result, including duration of op, EBL, complication rate, and length of postoperative hospital stay was studied in the biliary, stomach and colon groups. The results in 1895 procedures showed better out-come in all parameters studied for the ESSQS qualified surgeons. The difference in short term results was more evident in the stomach and colon groups. We thus concluded that the skill level of laparoscopic surgeons can be subjectively assessed and the qualified surgeons can offer better surgery.
Outcome of Laparoscopic Varicocelectomy by Mass ligation technique for Symptomatic varicocele

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Background- Varicocele therapy is a controversial issue. No single approach is adopted as the best therapeutic option. Testes get blood supply from testicular artery, cremasteric artery and artery to the vas deference. So ligation of testicular artery in the abdomen do not cause ischemia to the testis. This was already demonstrated in many studies. Classical Palomo varicocelectomy also consisted of open ligation of testicular vessels in the retroperitoneum. Mass ligation of testicular vein and artery is technically easy and fast by Laparoscopy. Chance of missing some veins are also less. Henceforth recurrence is also less. Recurrence and hydrocele formation after Laparoscopic varicoclectomy with only vein ligation is very high, which made it unpopular.

Methods- Fifty six patients with both unilateral and bilateral grade 2 to grade 3 varicoceles, were operated over a period of 5 five years in Jahurul Islam Medical college Hospital. All were operated by laparoscopy with en-mass ligation of testicular vessels in the retroperitoneum. They were followed up for a period of six months after surgery.

Results: The average operation time was 27±3 minutes. Average post-operative hospital stay was 32±7 hours. There were no technical failures requiring conversion to open varicocelectomy. There was no incidence of hydrocele formation nor testicular atrophy. One patient with bilateral varicoceles had 50% reduction of his varicocele, which was considered a recurrence. All other patient had complete reduction of varicocele. One patient developed hemo-peritoneum due to dislodgement of hemo-clip, requiring laparotomy. He did not require any further surgery for his varicocele.

Conclusion: Laparoscopic varicocelectomy with mass ligation technique is safe, effective, less time consuming and easy to perform. Recurrence and post-operative complications are minimum. Plastic hemo-lock should be used rather than titanium heom-clip for ligation of testicular vessels. There is no incidence of testicular atrophy or any adverse effect on testis.
Reduced Port Video-assisted Thoracoscopic Surgery (RP-VATS) for Congenital Cystic Lung Disease in Child

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**Background:** The optimal timing for lobectomy for asymptomatic congenital cystic lung disease (CCLD) including congenital pulmonary airway disease (CPAM) at birth is unclear. Varying reports regarding lobectomy via video-assisted thoracoscopic surgery (VATS) for neonates and children make it difficult to select an alternative minimally invasive procedure. We perform reduced port video-assisted thoracoscopic surgery (RP-VATS) using one window and punctures method or Two Windows Method for CCLD in child.

**Methods:** We retrospectively reviewed the records of 16 children (aged ≤5 years) who underwent anatomical segmentectomy or lobectomy for CCLD. The patients were divided into a VATS group (n=12) and Open group (n=4).

**Results:** Regarding age at operation (21days-5years, median 2years old vs. 9days-2years old, median 1.2years old), median body weight (9.3, ranged 3.7-18.0Kg vs. 8.8, ranged 2.5-11Kg), prenatally diagnosis of CCLD, and preoperative complications, there were no statistically significant differences between the VATS and Open group. The maximal diameter of the cystic lesion in the VATS group tended to be smaller than that of the thoracotomy group but was not significantly different. However, the cyst/thorax (C/T) ratio (maximal cyst diameter's/greatest thorax diameter) of the VATS group was significantly smaller than that of the thoracotomy group (median 0.5 vs 0.7, p=0.03). The C/T ratio parameters were measured from the most recent CT or MRI of the day of the surgery. All cases with C/T ratio<0.5 were able to undergo thoracoscopic lobectomy despite preoperative complications. However, 3 of 6 cases (50%) with C/T ratio>0.5 needed thoracotomy.

**Conclusions:** The evaluation of the relative size in preoperative imaging may be useful for ascertaining the indication and optimal timing for VATS for CCLD in neonates and infants. When deciding the optimal age for surgery in asymptomatic CCLD, the size of the lesion should also be considered.
Video Presentation
Single-port retrorectal incisional hernia repair – a new approach

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**Introduction:** Incisional hernia is one of the most common complications after abdominal surgery. Several methods have been introduced, and yet, there is no consensus on the best method of repair. We present a novel method for hernia repair which uses the retromuscular sublay mesh repair through a single incision at the pubic area to improve cosmesis.

**Methods:** Medical records of patients who underwent single-port retrorectal incisional hernia repair from May 2018 to December 2018 were reviewed. Patients were placed in supine position and a 3 cm incision was made in the pubic area below the panty line. A flap is made upwards until the defect is found and bilateral rectus sheathes are dissected. A mesh is then placed between the posterior rectus sheath and the muscle.

**Results:** A total of 30 patients with midline incisional hernia underwent single-port retrorectal incisional hernia repair. Mean age was 59.0 ± 12.5 years with an average BMI of 23.4 ± 2.7. All the patients had midline hernia defect with an average of 3.4 ± 2.2 cm. Mean operation time was 59.6 ± 30.1 minutes and estimate blood loss was 32.6 ± 36.5 ml. There was no postoperative complication, and 27 (90%) patients were discharged on the day of surgery.

**Conclusion:** The single-port retrorectal incisional hernia repair is safe and effective while providing good cosmesis to selected patients with incisional hernia.

**Video link:** [https://drive.google.com/open?id=1EJw5jogZl67JR0XJ9qV2Nz5-wF3V1_Ro](https://drive.google.com/open?id=1EJw5jogZl67JR0XJ9qV2Nz5-wF3V1_Ro)
The knack of transabdominal pre-peritoneal repair for incarcerated and scrotal hernias

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Laparoscopic repair for chronically incarcerated and scrotal hernias can be technically challenging. We present a case of left indirect inguinal hernia with incarcerated sigmoid colon that was successfully treated with transabdominal pre-peritoneal repair or TAPP. With the patient under general anesthesia, a 30-degree laparoscope was introduced through a 12-mm trocar inserted at the umbilicus. Two 5-mm trocars were placed at the level of the transumbilical line, one on the right and one on the left. The sigmoid colon incarcerated in the left internal ring was identified. First, manual reduction from the abdominal surface was attempted but was unsuccessful. Second, reduction by directly handling the bowel with laparoscopic forceps was tried, but it was also unsuccessful. A peritoneal incision was then made 1 cm above the internal inguinal ring and just outside the right medial umbilical folds. Preperitoneal dissection was performed, and the hernia orifice was visualized extraperitoneally. The sigmoid colon was reduced gently through the peritoneum without adding any relaxing incisions. SURGIMESH XD of 11×15 cm was placed, and the peritoneum was completely closed with absorbable running sutures. Operation time was 90 minutes, and intraoperative blood loss was almost zero. TAPP provides a great view of the incarcerated contents and usually allows for a straightforward reduction. However, it is not easy in some cases such as those of incarcerated and scrotal hernias. Bowel reduction might then become an important and technically challenging process in such cases. We believe two techniques make TAPP useful in overcoming this difficulty. First, it can be performed extraperitoneally if reduction is unsuccessful by direct bowel handling. Second, the hernia orifice needs to be adequately extended before bowel reduction is started. No relaxing incisions are needed if dilation of the hernia orifice is performed extraperitoneally. We demonstrate these techniques in this video presentation.

Video link: https://drive.google.com/open?id=1ygbNDUZgoV5iTii9cT8aHupMYz78z
Large paraesophageal hernia with GERD : Laparoscopic repair with suture and absorbable mesh fixed by glue with Nissen fundoplication

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Large paraesophageal hernia is a rare condition. Symptoms including chest pain, epigastric pain, dysphagia, reflux, sometimes recurrent aspiration pneumonia. Paraesophageal hernia repair is indicated in symptomatic patients. This video demonstrates our technique of laparoscopic paraesophageal hernia repair. Presenting case is a 53 years old woman suffered from severe chest pain 3 times in 1 month. CXR and CT scan showed large paraesophageal hernia with 2/3 of stomach occupied in left lower chest. Laparoscopic paraesophageal hernia repair and Nissen fundoplication was conducted. Dissection was carried around the hiatus. Hernia sac was taking down and excised. Short gastric vessels were divided. Stomach was encircled. Distal esophagus was mobilized. Hiatal defect was closed with no absorbable suture. Floppy Nissen fundoplication was done for prevention of GERD. Due to concern of long-term migration and erosion of non-absorbable mesh, absorbable mesh with keyhole silt was used to reinforced. Cyanoacrylate glue was applied to fixed the mesh in place. Our institute had experiences of this technique in 4 patients. 2 case were large paraesophageal hernia. 2 case is sliding hernia with GERD. Early result was promising. 1 case had symptoms of dysphagia and need of readmission and getting better in a week. No recurrence was reported.

Video link: https://drive.google.com/file/d/1NsyOknzCiNOPISH55Mu42eow6IYFFpEA/view?usp=sharing
The role of an attenuated posterior rectus sheath in totally extraperitoneal repair

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The number of transabdominal pre-peritoneal repairs performed in Japan is approximately four times that of totally extraperitoneal repair, or TEP. We introduced conventional TEP in our institution in 2004 and single-port TEP in 2009. Most of the cases have been performed by supervised trainees without serious surgical complications. In this video, we show technical points of our single-port TEP for a patient with left direct inguinal hernia. Operation time was 45 minutes, and intraoperative blood loss was almost zero. With the patient under general anesthesia, a 2.5-cm transumbilical incision was made and subcutaneous tissue was dissected. The anterior sheath was opened and the posterior sheath was exposed. A Lap Protector Mini (LP; Hakko Co., Ltd., Nagano, Japan) was inserted into the preperitoneal space, an EZ-Access port (Hakko Co., Ltd.) was mounted onto the LP, and three 5-mm trocars were introduced through the EZ-Access. The preperitoneal space was dissected gradually using a rigid 30-degree, 5-mm laparoscope and standard straight laparoscopic instruments without dissection balloon. We are convinced that recognizing the presence of an attenuated posterior rectus sheath (APRS) extending up to the internal inguinal ring is very important for creating a clean preperitoneal space. Fat tissue including a branch of the inferior epigastric vessels was dissected to the ventral side (toward the posterior rectus muscle), whereas the APRS was dissected to the posterior side. Although there is significant variation in the extension of the APRS fibers, the avascular plane without fat tissue can be exposed widely in most cases. This allows visualization of the inguinal floor to help make the anatomy easy to understand for inexperienced surgeons. TEP repair is a challenging technique with unfamiliar anatomy and a limited operative field. However, we are confident that recognition of an APRS sheath shortens the learning curve even for single-port surgery.

Video link: https://drive.google.com/open?id=1q88lRNFf5kCVU9-lam4mAurgkZ8-h9Kj
Laparoscopic transversus abdominis release for abdominal wall hernia; step by step

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Abdominal wall hernia is one of the most common surgical diseases addressed by general surgeon. There had many techniques for repair abdominal wall hernia was developed. Minimally invasive operative technique has revolutionized the field of surgery. First report of laparoscopic ventral hernia repair (LVHR) was in 1992, the operation has grown in popularity with the belief that it may offer shorter hospital stays, improved patient outcomes, and fewer complications than traditional open procedures. We present a newly minimally invasive technique to repair these defects, by laparoscopically. In this video, we describe a technique for laparoscopic transversus abdominis release in 69-year-old female patients in Chulalongkorn hospital Bangkok, Thailand. She had previous abdominal surgery about 2 years ago due to small bowel intussusception, present with midline abdominal wall defect 8 cm, 3 months PTA no obstructive symptom. This video demonstrates a technique for operative field set up, port placement, and step by step of operation. Operative time was 268 minutes. Estimated blood loss 20 ml, pain score after operation was 3-4 and 0-1 prior discharge. Length of stay was 6 days. There were no perioperative complication. On initial follow-up visit 3 weeks, there was no evidence of wound complication, bulging, or hernia recurrences. At 2 months follow up no evidence of hernia recurrence. Conclusion: Laparoscopic transversus abdominis release is a good technique to repair complex abdominal wall defects with reduce pain, fast recovery and resolve problem about contact between MESH and intestine

Video link: https://drive.google.com/open?id=1UedyGLls4yxfqGVnJv3yyYhm9zWVF8SE9
Laparoscopic intraperitoneal onlay mesh in incisional hernia after appendectomy

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We present a 67-year-old woman she had history of appendectomy 5 years ago and explore laparotomy for ovarian cystectomy about 5 years ago. She denied underlying disease. Now she presented with reducible mass at RLQ. Her physical examination shown reducible mass at RLQ and palpable defect size 3 cm in diameter with long midline surgical scar. Her BMI was 30 kg/m2. Preoperative CT scan finding shown abdominal wall hernia size 2.2*2.7 cm with contained small bowel loop. This VDO shown a laparoscopic IPOM plus in Hatyai hospital experience. Key step in this procedure is to obtain pneumoperitoneum and insert the first trocar with optical port-adhesiolysis, closure defect with transfascial suture, Mesh measurement and fixation. The result was excellent. The patient was no post op wound complication include SSI, seroma and the patient can discharge on 2nd post-operative day.

Video link: https://drive.google.com/file/d/1YySaB6Q6hLn7cWScbfhM-KPR18ya25al/view?usp=sharing
Single-stage Laparoscopic Excision of Infected Urachal Cyst

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The urachus is a tubular vestigial remnant of the cloaca and allantois. It extends along the midline from the bladder dome toward the umbilicus. It obliterates before birth, and rarely persists into adulthood. We describe a case of a 19-year-old Bangladeshi male who presented with a tender and discharging umbilical mass. A computer tomography scan was done, and it showed an infected urachal sinus complicated by an abscess formation at the umbilicus. Traditionally, the infected component was allowed to drain and treated with antibiotics before formal excision of the remnant. Such procedures were also performed via open approach. Our patient underwent a single-stage laparoscopic excision of the infected urachal cyst on index admission and had a good post-operative outcome. A complete urachal tract excision is thus important in avoiding recurrence, with laparoscopic approach being superior to open in terms of cost and recovery. Furthermore, proper closure of sheath at site of infected umbilicus is also crucial in preventing a potential umbilical hernia.

Video link: https://1drv.ms/v/s!Aky6mB9vhLUZpgpihWpiUYkpslbs?e=eaL3Gh or https://drive.google.com/file/d/1d35nTyVElW5MX1LqQu9hSa2Pblk8b9WD/view?usp=sharing
Redo Laparoscopy for a Failed TEP repair

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Recurrence after inguinal hernia surgery is still a common problem. With the advent of laparoscopic techniques we have been able to confer the benefits of minimally invasive surgery with equal or even less rates of recurrence according to some studies. According to International hernia society guidelines recurrence after posterior approach surgery should be treated with anterior approach and vice versa. Relaparoscopy can be done, though challenging, in recurrence to provide the benefits of MIS and to identify all the possible sites of hernia that can be missed by open approach. Moreover proper dissection and placement of mesh over the entire myopectineal orifice of fruchaud will further decrease the chances of recurrence. Redolaparoscopy is challenging but possible and safe under experienced hands.

Video link: https://drive.google.com/file/d/13E1NRtZsikBW124P8ZLGxnaDKAO52yEJ/view?usp=sharing
Lap. repair of Large lumbar hernia with component separation

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Management of ventral hernias are fairly standardized. Small hernias can be managed by suture repair or mesh repair. It can accomplish by either open or laparoscopic technique. Management of large ventral hernias are particularly challenging. Although closure of such large defects under GA in a paralysed patient might be possible intra-operatively, such closure will be under tension. This produces raised intra-abdominal pressure which might progress to abdominal compartment syndrome. Closure of defect under tension will also be associated with higher recurrence rates as compared to tension free closure. There is no standard protocol for management of these hernias. Various techniques have been described but component separation technique is associated with better outcomes. Component separation technique helps in tension-free closure of large hernial defects. There are 2 types of a component separation, anterior and posterior component separation techniques. Initially it was described by open approach and was first described by Ramirez et al in 1990. Major drawbacks of open approach are the local complications associated with it, like haematoma, seroma, wound infection, wound dehiscence, skin necrosis. It is mainly due to extensive dissection, as skin and subcutaneous tissue needs to be mobilized over a large area to reach external oblique aponeurosis which is retracted laterally. This endangers the blood supply to skin and leads to skin necrosis in the midline and wound dehiscence. In our technique, component separation is done completely by laparoscopic approach with conventional instruments and is relatively easy to master. The technique is different from other endoscopic component separation techniques described in literature and it has various advantages to it which will be described later in the chapter.

Video link: https://drive.google.com/file/d/18hNLs0iHFQR3LhAx-4XRmJLQawVCQJ72/view?usp=sharing
eTEP for atypical sited hernia

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E-TEP is nowadays the recommended procedure for ventral hernias however for atypical site hernias like lumbar, lateral incisional hernias there is not that much literature supporting the procedure (level IV evidence). Here we present a case of right iliac fossa hernia post open appendectomy that we managed by E-TEP. We went into retrorectus plane, reduced contents intraperitoneally, did right TAR, closed the muscular defect with v-lock 1 no. and closed the post defect and rectus sheath with 1-0 v lock (prolene), linea was approximated with 1-0 v lock. Mesh was placed in, about 20 x 30 cm and fixed to anterior abdominal wall and coopers ligament. We conclude that though e-tep is a new technique and there is level IV evidence for its support for hernias at atypical sites like lumbar, lateral incisional hernias, it can be done though it needs adequate expertise in laparoscopy.

Video link: https://drive.google.com/file/d/1qfaRuYoPqvxQJv3PtY9KPY7QUG8t3cnx/view?usp=sharing
Laparoscopic Paraduodenal Hernia Repair

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Video link:

https://drive.google.com/file/d/1d6fKkbOqi-tLnN5ZasNhxFXjZmggAOWx/view?usp=drivesdk
Dieulafoy's lesion

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Dieulafoy's lesion is usually considered to be a rare but important cause of upper gastrointestinal bleeding. Current endoscopic methods used to treat Dieulafoy's lesion include injection, with or without thermal methods, and mechanical methods. The latter include variceal ligation and hemoclips. A 72-year-old Thai male, with history of hypertension presented with hematemesis 2 days PTA. There were no history of acid peptic disease, non-steroid anti-inflammatory drugs intake, chronic liver disease, or antiplatelet or anticoagulant drugs. He arrived at emergency room with mild pallor and tachycardia, and an important hematemesis. His laboratory exams were: hemoglobin 9.1g/dL, Hematocrit 27.1%, Platelet count 96,000. Other hematological and biochemical investigations were within normal limits.

After resuscitation therapy with fluid, plasma and blood infusion, he underwent an esophagogastroduodenoscopy (EGDS) that revealed an active bleeding submucosal vessel (Forrest classification Ia) at lesser curvature with a NBBV (Forrest classification IIa) at body. After rinsing and aspiration, it is identified the source of bleeding, with no signs of local inflammation, or peptic lesions like. We performed an epinephrine injection and hemoclips at both lesions. Therefore, both bleeding were stopped.

Video link:

https://drive.google.com/file/d/1KLm_gSLjMHxzebE7T1NUoTlI87QYZmK/view?usp=sharing
STEP BY STEP INSTRUCTIONAL VIDEO OF LAPAROSCOPIC D2 SUBTOTAL GASTRECTOMY WITH ROUX-EN-Y GASTROJEJUNOSTOMY FOR SURGEONS IN TRAINING IN A SINGAPORE TERTIARY INSTITUTION

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Tan Tock Seng Hospital is second largest hospital in Singapore. It is affiliated to two medical schools in Singapore and it is a training hospital for both undergraduates and postgraduates. Minimally Invasive surgery for both benign and malignant diseases of upper gastrointestinal tract becomes more and more popular nowadays due to better cosmetic outcomes and faster recovery. In our department, all the residents have to view the step by step instructional videos of minimally invasive surgeries before they can assist in the cases or perform on their own under the supervision of consultant surgeons. The viewing of the instructional videos help them understand the procedures better. The viewing of videos also can help them recognize the importance of steps and standardization of steps. The videos can help them improve their learning experience and shorten their learning curve. We would like to present the step by step instructional video of laparoscopic D2 subtotal gastrectomy with Roux-en-Y gastrojejunostomy for surgeons-in-training rotated to our department.

Video link:

https://youtu.be/XmtxAE_0P_0
https://drive.google.com/file/d/1ZRvQ_163eXP8SsEVF03SuhezBD1IatEy/view?usp=sharing
Rare cause of silent duodenal perforation

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Perforations of Gastrointestinal tract due to ingested foreign body is rare (1%). Common site of perforations are angulated areas like Ileoacaecal junction, sigmoid colon and duodeno-jejunal flexure. Dentures are a common risk factor. We describe a rare cause of duodenal perforation due to a fish bone and the surgical management of the patient in this video. Contrast imaging is usually needed to establish the diagnosis and also to identify and locate the foreign body for pe-operative planning. Although imaging will be non-specific in majority of cases, however identification of foreign body with associated thickened bowel loops, increased mesenteric fat density, localised collection of extra-luminal gas pockets or abscess strongly suggest the diagnosis. Surgical intervention is almost mandatory in those cases. Treatment usually involves resection of involved segment though primary repair and abscess drainage for sealed perforations have been described in literature. Patients are rarely aware of the foreign body ingestion and high index of suspicion is required to make a diagnosis of ingested foreign body in acute abdominal conditions especially in extremes of age.

Video link:

https://drive.google.com/file/d/1URPJPg5R9nx92hbd4KWtPbCcRc2KiKBw/view?usp=drivesdk
Laparoscopic transhiatal diverticulectomy

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A 67-year-old Thai male had been regurgitating his food 2-3 times/month for 4 years. A CT chest revealed 2 epiphrenic diverticula 11x7.6 cm and 3.2x3.4 cm, with necks below the carina and close to the EGJ, respectively. An upper GI study (UGIS) was compatible with the CT scan results and revealed a type I hiatal hernia. An esophageal manometry was normal. Therefore, since his diverticula were symptomatic, we decided to operate. A pre-operative esophagogastroduodenoscopy (EGD) was done to rule out stomach pathology, and clear food particles. In the OR, the gastrohepatic ligament and right and left crura were opened with an advanced sealing device. The diverticula were dissected from the adjacent pleura. The large diverticulum was divided with 4 Endo-GIA staples and the small one with 2 Endo-GIA staples under endoscopic visualization to avoid compromising the esophageal lumen. The crura were repaired and a Dor fundoplication was constructed. A scope check confirmed no luminal narrowing, and the operation concluded. Another UGIS was done on post-operative day 7 which showed no leakage or luminal narrowing. He had no dysphagia, no regurgitation, and no chyle leakage after he started an oral diet on day 7. Key points: 1) Complete pre-operative investigations are helpful for operative planning, 2) The laparoscopic transhiatal approach is feasible in large esophageal diverticula at a high level combined with crural repair, 3) Direct visualization is helpful for avoiding lumen narrowing, and 4) Long instruments are needed in high level diverticula.

Video link:

https://drive.google.com/file/d/1ozp70vSX_X5_YziRZ8bm8MtWCHhyETb8/view?usp=sharing
The role of minimally invasive surgery for management of small bowel obstruction

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Background: Small bowel obstruction (SBO) is one of the common surgical emergencies encountered. Up to 60% of patients requires surgical treatment. Explore laparotomy is the standard approach to treat SBO. However, laparoscopic approach is gaining popularity. Objective: To demonstrate the feasibility and safety of laparoscopic approach for the treatment of SBO and outcomes after surgery.

Methods: We report series of 4 cases. The first case was an 87-year-old male presented with abdominal pain. CT scan showed dilatation of jejunum with abrupt change in caliber at proximal ileum. The second case was a 63-year-old female presented with abdominal distension and vomiting. She has a past history total abdominal hysterectomy 10 years ago. CT scan showed dilatation of small bowel with transition point in the terminal ileum. The third case was 26-year-old female presented with abdominal pain and could not pass gas. CT scan showed the intussusception at ileum. The fourth case was 35-year-old presented with severe abdominal cramping. CT scan showed distal small bowel obstruction. The operative steps include safe access to the abdomen, diagnostic laparoscopy, adhesiolysis and inspecting the entire intestine.

Results: There was no intra-operative complication such as bowel injury or bleeding. There were no conversions to open surgery in our series. Laparoscopic approach is associated with minimal postoperative pain, shorter hospital stay and lower risk of post-operative morbidity.

Conclusion: Laparoscopic approach for SBO is safe, feasible and effective. The careful preoperative evaluation and safe surgical technique play a role to improve the treatment outcomes.

Video link:

https://drive.google.com/file/d/1jle_hLRk8kN-Yuccpoi0wLqYJ8yQzDJX/view?usp=sharing
THORACO-LAPAROSCOPIC ESOPHAGECTOMY WITH RIGHT COLON INTERPOSITION FOR CORROSIVE STRicture OF ESOPHAGUS

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Background: Colon is one of the preferred conduits for esophageal replacement following corrosive esophageal injury. Use of both right and left colon has been described.

Methods: Pre-operative evaluation: A 23 years old female presented with dysphagia for both solids and liquids following acid ingestion 8 months back. She had undergone 3 unsuccessful balloon dilatations and hence referred for surgical management. Barium swallow showed stricture of entire thoracic esophagus from 20cm onwards upto just above Gastro-esophageal junction with normal filling of stomach.

Surgical Details: Surgery was carried out in 3 phases – Abdominal (laparoscopic), Thoracic (thoracoscopic) and then again Abdominal (laparoscopic). Initially, patient was placed in supine position with leg split. Right colon was mobilized medial to lateral by retrocolic tunneling, Ileo-colic vessels were temporarily clamped with bull-dog clamps and adequate blood supply to right colon and terminal ileum was ascertained. Subsequently, ileocolic vessels were divided, terminal ileum was transected and right colon and terminal ileum were mobilized based on middle colic artery. Then, GE junction was mobilized and laparoscopic transhiatal mobilization of lower esophagus was done upto inferior pulmonary vein. Esophagus was transected at GE junction using linear stapler. Right mediastinal pleura was incised and colonic conduit was placed in right thoracic cavity. Now, patient was placed in semi-prone position and ports were placed in right thorax. Remaining mobilization of thoracic esophagus was done. Esophagus was divided at thoracic inlet after ascertaining adequate vascularity and luminal patency of proximal end. End-to-end hand-sewn esophago-ileal anastomosis was performed at thoracic inlet using interrupted 3-0 PDS sutures thoracoscopically. Patient was again placed in supine position. Transverse colon was transected now, just distal to middle colic vessels, to ensure adequate length of conduit. Hand-sewn end-to-side colo-gastric anastomosis was done on anterior surface of stomach. Side-to-side ileo-transverse anastomosis was done using staplers.

Video link:

https://drive.google.com/file/d/19A7sv5vpyeagjxwfsTGYJZsgeehDrGM/view?usp=sharing
Background: Acquired non-malignant is an uncommon disorder with a high degree of morbidity and mortality. Etiology includes iatrogenic injury, prolonged ventilation, high endotracheal/tracheostomy tube cuff pressure, pulmonary tuberculosis, corrosive ingestion etc. Management options include interventional treatment such as esophageal and/or airway stenting, sealing the fistula tract with glue, fibrin plug or endoclips, and laser or argon plasma coagulation (APC). Surgical options include direct closure of the tracheal and oesophageal defects with or without a muscle/omento flap, tracheal resection and anastomosis with primary esophageal closure, esophageal diversion etc. Here, we describe a novel technique for treatment of acquired non-malignant TEF - Thoracoscopic stapler division of fistula tract.

Methods: Case 1: 56 years old male, with previous history of pulmonary tuberculosis, presented with complaints of cough following food intake since 25-30 years. Evaluation elsewhere revealed TEF followed by three failed attempts of endoscopic APC with clipping. OGD scopy and MDCT chest confirmed presence of tracheo-esophageal fistula with fistulous opening at 28cms in esophagus. He underwent thoracoscopy in semiprone position. Following esophageal mobilization, fistula tract was located with the help of intraoperative endoscopy, dissected all around and divided with 45mm white linear stapler. Pleural flap was raised and interposed between two divided ends. Case 2: 24 years male, on ATT for tubercular lymphadenitis since 4 months, developed violent cough on oral intake since 2 months associated with vomiting and was diagnosed to have left broncho-esophageal fistula (1cm long, 4mm wide). Covered SEMS was placed endoscopically thrice which migrated repeatedly with recurrence of symptoms. Following evaluation and optimization, he underwent thoracoscopic mobilization of fistula tract and division with 60mm white stapler.

Video link:

https://drive.google.com/file/d/1-Z5CbR73IZM_rWYwGSfSdXqZvqaylrB/view?usp=sharing
Post fundoplication - Wrap migration with gastric perforation

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This video describes complication followed by fundoplication and its management. In this video we have treated the complication caused by the previous surgery and we have done redofundoplication in the same sitting.

Video link:

https://drive.google.com/file/d/1qkvwLd4PtJ-WrFM78s0vQYZNtfzUDKn/view?usp=sharing

https://drive.google.com/file/d/1Txly6TCbFaiPwfPpSakDXfEYi4ejj8ps/view?usp=sharing
LAPAROSCOPIC VAGAL SPARING TRANSHIATAL ESOPHAGOGASTRECTOMY WITH STAPLED ESOPHAGOGASTROSTOMY FOR RECURRENT PEPTIC STRicture OF THE ESOPHAGUS

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Background: Peptic esophageal stricture has become uncommon since the introduction of proton pump inhibitors (PPI’s). Endoscopic dilatation along with PPI is the standard treatment. However, surgery is required for refractory or recurrent strictures which fail multiple attempts at endoscopic therapy. This is a video presentation of laparoscopic vagal sparing transhiatal esophago-gastrectomy with stapled esophagogastrostomy for recurrent peptic stricture of esophagus.

Methods: Case history and pre-operative evaluation: 40 years male, a known case of peptic esophageal stricture, presented with complaints of dysphagia for solids. He had undergone CRE balloon dilatation 4 times over a period of 3 years followed by bio-degradable self-expandable stent placement. However, symptoms recurred each time. On evaluation, there was a 4cm long stricture with severe luminal narrowing in the lower esophagus, starting from 35 cm onwards upto GE junction.

Surgical details: Patient was placed in supine with leg split position. Following port placement, stomach, and GE junction mobilized preserving both Vagi and vascular arcades by staying close to stomach wall. Transhiatal mobilization of lower esophagus was done upto 2cm above the stricture under intra-operative endoscopic guidance. Peristriuctural fibrosis was noted with pleura and vagi densely adherent which were dissected away carefully. Esophagus transacted by firing linear stapler above the stricture and gastric conduit was made by serial firing of staplers from incisura to fundus. Anvil of 25mm circular stapler introduced through mouth and brought out through transected end of proximal esophagus. Specimen extracted through 1.5cm transverse incision in left lumbar region and stapler head introduced through same incision. End-to-side stapled esophago-gastric anastomosis done.

Discussion: Recurrent or refractory strictures which fail endoscopic management require surgical intervention. Minimal invasive surgery in these patients is associated with early recovery, early resumption of diet, short hospital stay and minimal morbidity.

Video link:
MINIMALLY INVASIVE TREATMENT OF GASTRIC GASTROINTESTINAL STROMAL TUMORS: LAPAROSCOPIC AND ENDOSCOPIC APPROACH

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The gastric GISTs represent approximately 70% of all gastrointestinal GISTs. With evolving multimodality approach for management of GIST, surgical resection remains the mainstay of treatment. Laparoscopic surgery is considered a good option, since the biological behavior of these tumors allows for curative resection without the necessity for large margins or extensive lymphadenectomies. They can be managed by endoscopic, laparoscopic and combined approaches. here we present our cases managed by laparoscopic and combined laparoscopic and endoscopic procedures.

Video link:

https://drive.google.com/file/d/1ahDteHQKkB0yZIQ9M16m6tOgk_m7-Lc/view?usp=sharing
**Laparoscopic Heller Myotomy: Step-by-step operative approach**

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Achalasia is one of the most common primary motility disorder of the esophagus. Its incidence is six per 100,000 population per year. The absence of peristalsis in the esophageal body and non-relaxing lower oesophageal sphincter are the common characteristics of classic achalasia. High resolution manometry is the main investigation for definite diagnosis with the absence of the abnormalities from esophagoscopy. There are varieties of treatments of achalasia such as medications (Calcium channel blocker, Nitrate) Endoscopic method (Esophageal balloon dilatation, Botulinum toxin injection, POEM) and Surgical method esp. laparoscopic Heller Myotomy with fundoplication. Laparoscopic Heller Myotomy with partial fundoplication is the gold standard treatment of achalasia nowaday. The main purpose of this procedure is for releasing the non-relaxing lower esophageal sphincter. The steps of operation include: Gastrocolic ligament division, Phrenoesophageal membrane dissection and crus of diaphragm exposure, Fundus of stomach mobilisation with short gastric vessels sealing, Mediastinal esophageal dissection, esophagogastric seromyotomy and partial fundoplication. The Outcome of this procedure is the relief of dysphagia in more than 90% of patients with low incidence of reflux disease. (less than 10%) This Video presentation is created for review step-by-step operative techniques in Laparoscopic Heller Myotomy with Dor Fundoplication from Maharat Nakhonratchasima hospital, Thailand. This patient was a 29 years old man presented with gradual onset of dysphagia for one year. Esophagogastroscopy was absence of abnormalities and high resolution manometry suspected achalasia type 1. He was scheduled for Laparoscopic Heller Myotomy with Dor Fundoplication. After the operation, his dysphagia symptom was absence and his Eckardt was zero.

**Video link:** https://1drv.ms/v/s!BPWvFM_e0gI1ggSLNhQRv8uEeAPF?e=VTiLAJ
LAPARASCOPIC MODIFIED SUGIURA TECHNIQUE FOR INTRACTABLE ESOPHAGEAL VARICEAL BLEEDING SECONDARY TO PORTAL HYPERTENSION

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This is a case of 74-year-old female presented with persistent hematemesis. Patient is diagnosed with Liver Cirrhosis, portal hypertension and classified under Child’s B. With constant bleeding upon admission, laboratory results showed anemia and blood was transfused. The patient underwent esophagoduodenoscopy (EGD) and subsequent medical management were given in attempt to control variceal bleeding. Series of rubber band ligation (RBL) with clipping were provided. However, medical and endoscopic management failed to control the upper GI bleeding which prompted surgical intervention. The patient underwent esophagogastric devascularization via Laparoscopic Modified Sugiura procedure. Indications for esophagogastric devascularization in controlling variceal bleeding include failure of medical and endoscopic treatment, Child’s A and B without chronic ascites, and rescue therapy for patient not candidate for selective shunts, transhepatic portosystemic shunts or transplantation. Several devascularization techniques were developed, one of the most notable procedure is Sugiura. It includes systematic ligation of the perforating variceal channels with preservation of the longitudinal collateral vessels, preservation of the vagal trunk plus esophageal transection and subsequent pyloroplasty. Several modifications were done in attempt to simplify the procedure. One of which is performing the procedure via laparoscopic approach. This has been the standard practice for various indications for splenectomy, but reports are limited with its use on splenectomy and devascularization in portal hypertension. Various studies showed laparoscopic procedure was safe and effective compared to open procedure.

Video link:

https://drive.google.com/file/d/1kfEUJAuY_euPNqb6PVN2SyZi2OvOO1ME/view?usp=sharing
Laparoscopic Heller cardiomyotomy and Dor fundoplication

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Achalasia is a primary oesophageal motility disorder characterized by the absence of oesophageal peristalsis and impaired relaxation of the lower oesophageal sphincter (LOS) in response to swallowing. The majority of cases are idiopathic, but the condition can be associated with malignancy (especially gastroesophageal junction). Achalasia may be treated using endoscopic techniques such as pneumatic dilatation and per-oral endoscopic myotomy (POEM) or by surgery using laparoscopic Heller cardiomyotomy and Dor fundoplication. End-staged acalasia may need oesophagectomy. This video demonstrates the management of dysphagia leading to the diagnosis of achalasia and the steps taken to perform laparoscopic Heller cardiomyotomy and Dor fundoplication. The selection of specific treatment option for achalasia patients depends on the availability and experience of laparoscopic surgeons and therapeutic endoscopists. The risks and benefits and the long term success rates of each treatment option should be discussed with achalasia patients to meet their needs.

Video link:

https://drive.google.com/open?id=1AzFKOL0Sk7YtObvCdcXA3e78W0YP65h7
Usefulness of articulating laparoscopic instrument during laparoscopic gastrectomy for gastric adenocarcinoma patients.

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The use of articulating joint is one of the advantages of robotic surgery. Recently laparoscopic device which can utilize articulating joint have been introduced. The aim of this study is to evaluate clinical usefulness of the articulating laparoscopic instrument.

From January 2017 to June 2019, 327 patients had elective laparoscopic radical gastrectomy for primary gastric cancer at Seoul National University Bundang Hospital by a single surgeon. With the introduction of new articulating instrument at May 2018, ArtiSential® (Livsmed, Seongnam, Republic of Korea) was used in all laparoscopic gastrectomy. Patients were allocated to both groups (non-articulating vs articulating) by historical control. Propensity score matching for demographic and clinicopathological variables was used to minimize the shortcomings of retrospective study. Early postoperative outcomes including operation time, estimated blood loss and early postoperative complication rates were analyzed between two groups. After propensity score matching, there were no significant differences between two groups regarding demographics, operative and pathologic characteristics. The analysis of early postoperative outcomes showed favorable result for the articulating group.

This study presented that articulating laparoscopic instrument is clinically useful and safe. A large sized, prospective randomized controlled study would be needed.

Video link:

https://drive.google.com/file/d/1iR7esUxmBHaJiLcNLvTWmywlfHkQtvyZ/view?usp=sharing
Solo reduced ports laparoscopic distal gastrectomy with D2 lymphadenectomy, INTACT Billroth I gastroduodenostomy using articulating instruments

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The use of articulating joint is one of the advantages of robotic surgery. Recently laparoscopic device which can utilize articulating joint (ArtiSential® ;Livsmed, Seongnam, Republic of Korea) have been introduced. These instruments consist of bipolar Fenestrated forceps, monopolar maryland dissector, monopolar spatula and needle holder. By using ArtiSential in Solo reduced ports laparoscopic distal gastrectomy, operation could be performed more safely and efficiently

Video link:

https://drive.google.com/file/d/1iR7esUxmBHaJiLcNLvTWmywlfHkQtvyZ/view?usp=sharing
Endoscopic Management for Iatrogenic Duodenal Perforation

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ERCP is the current gold standard for biliary clearance but it has its own complications. Iatrogenic bowel perforation accounts to less than 1%. This is a case of a 53-year old female with Obstructive Jaundice secondary to choledocholithiasis. ERCP was being performed however, on long scope maneuver, the duodenoscope was pushed through the posterolateral aspect of the duodenum and eventually perforating it. After identifying the injury, the endoscopist decided to close the defect using an over the scope titanium clip. After 5 days of observation and diet progression, the patient was discharged with no other complications.

Video link:

https://drive.google.com/file/d/10vLEHcbEGbnvkH2zOcf5oAej6kGp2x3Y/view?usp=drivesdk
Total Laparoscopic reconstruction of J-Pouch and Liner stapling technique following total gastrectomy

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This video describes our technique of Total Laparoscopic reconstruction of J-Pouch and Liner stapling technique following total gastrectomy. Jejunal Pouch Reconstruction following total gastrectomy offers better short-term outcomes and good quality of life compared with the conventional RY reconstruction.

Video link:

https://drive.google.com/file/d/1zdNTMmCbZXpNZZPQbJgCscp96OzBEmCB/view?usp=sharing
Double-Glove Technique Hand-Assisted Laparoscopic Extended Right Hemicolecotomy: A useful method in limited resource practice

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Double-Glove Technique Hand-Assisted Laparoscopic Extended Right Hemicolecotomy: A useful method in limited resource practice

Piratthima Vachiraprakarnsakul MD FRCST, Romyen Jitmungnan MD FRCST, Woramin Riansuwan MD FRCST FASCRS

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Background: Comparing to conventional laparoscopic colectomy, hand-assisted laparoscopic surgery provides better exposure, traction and palpation which is useful in patients with large tumor and patients with severe intraabdominal adhesion from multiple previous abdominal operations. It also shortens the operative time and decreases the learning curve of beginners in laparoscopic colectomy. However, this procedure requires an additional equipment such as the hand-port platform which additional cost is needed. We therefore present this video using double-glove technique instead of a commercial hand-port platform in hand-assisted laparoscopic extended right hemicolecotomy and en-bloc wedge resection liver segment VI. The feasibility of this technique will be evaluated.

Case Presentation: A 63-year-old Thai woman with a history of previous open cholecystectomy and abdominoplasty, she had presented with chronic abdominal pain. Her colonoscopy revealed an ulceroproliferative mass at hepatic flexure colon. Biopsy was reported as moderately differentiated adenocarcinoma. Abdominal CT scan showed an irregular wall thickening at hepatic flexure which adhered to segment VI of the liver. There were no liver metastases. The patient underwent hand assisted laparoscopic extended right hemicolecotomy and en-bloc wedge resection liver segment VI through a 7-centimeter mid-midline hand-port incision using a double-glove technique. The patient recovered uneventfully after surgery and she was discharged on postoperative day 6.

Conclusions: Double-glove technique hand-assisted laparoscopic colectomy is feasible and can be used instead of the commercial hand-port platform. Because of cost reduction, this method is useful in a limited resource practice.

Video link: https://drive.google.com/open?id=1vnK2ZT8qdAeEMOeaw7nwQ0dgSZ29ut9u
Laparoscopic Left Hemicolecetomy for splenic flexure cancer. How i do it?

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Splenic flexure mobilization is the most challenging procedure for laparoscopic colorectal surgery because the operation was perform in the most complex anatomical area and difficult to created the good operative exposure. Misunderstanding in the dissection plane may cause severe intra-operative complication such as splenic vein injury or pancreatic injury. We have 3 operative approach for laparoscopic splenic flexure mobilization 1.medial approach 2.superior approach and 3.lateral approach. This video present the 68 years old Thai male with large adenocarcinoma at splenic flexure. The stepwise approach to perform laparoscopic left hemicolecetomy with full splenic flexure mobilization which is follow the CME/CVL technique. The operative step are 1.medial to lateral left sided colon mobilization, 2.central vascular ligation( Lt colic vessel and Lt branch middle colic vessel), 3.superior and lateral approach to complete splenic flexure mobilization and 4.exteriorization and anastomosis. The final pathological report show moderately differentiated adenocarcinoma T3. All 23 lymph nodes were negative and the resection margin was free. The patient can be discharge form the hospital on the fourth post operative day without complication. conclusion : laparoscopic left hemicolecetomy for splenic flexure cancer is very challenging procedure. The stepwise operative approach for splenic flexure mobilization is essential to help the surgeon perform the operation safely.

Video link: https://drive.google.com/file/d/18Rim2Q5ww3AgFzigitKVrIRlnWsuvlVe/view?usp=sharing
Laparoscopic Right hemicolecotomy

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A Thai male 59 years old presents with abdominal pain and abnormal passing stool for 4 months. He lose weight 3 Kg within 2 weeks. Colonoscope found large proliferative mass with contact bleeding 70 cm from anal verge. His CEA was 1.31. CT has found mass 6.3 cm at ascending colon no metastasis. Steps in this case were central mesocolic excision then central vascular ligation which include Ileocolic a., Rt colic a., Rt. Branch of Middle colic artery and colic branch of gastrocolic trunk. The specimen was retrieved to abdominal wall and performed extracorporeal resection with ileocolic anastomosis SSA with GIA 80, 100 mm. Operative time 130 minutes and 50 ml of blood loss, no immediate complication. The patient can discharge on post operative day 4th without complication.

Video link:

https://drive.google.com/file/d/1cbpneBXUnQGpea83wVRM38hISH08wWhL/view?usp=sharing
Laparoscopic Low anterior resection

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A female 75 years old presents with passing mucous bloody stool for 2 months. She was processed to do colonoscope and biopsy with result cannot exclude cancer. The location of tumor was at 15 centimeters from anal verge. And She has no other mass or metastasis from CT preoperative evaluation. Proper treatment for her is Laparoscopic low anterior resection. Which her condition was excellent for fellowship training. The technique in this case were Identified and cut IMA then medial to lateral approach up to tail of pancreas and dissect along Lt paracolic gutter up to splenic flexure. After free proximal part, Start mesorectal dissection, posterior to both lateral side. Cut distal margin with Endo GIA 60 mm and bring colon to abdominal wall to cut proximal margin with insert Anvil for circular stapler 29 mm. (Double stapler anastomosis) colonoscopic with Air leak test was done for check leakage and JP drain and rectal tube were place. The result was excellent. The operative time was 150 minutes. The margin Mesenteric, proximal, distal were 15, 12, 4 by order. Minimal blood loss, no complication and the patient can discharge on postoperative day 4th.

Video link:

https://drive.google.com/file/d/1kMggefPXz6mn0EsuyKcH94nAYq6SXP/view?usp=sharing
Laparoscopic complete mesocolic excision (CME) for transverse colon cancer

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The aim of this video is to describe the anatomical landmarks and the surgical technique for complete mesocolic excision (CME) during a laparoscopic resection for transverse colon cancer. Vascular distribution of an individual patient is confirmed by 3D vascular construction using preoperative CT scan. Lymph node dissection is started from the line connecting horizontal part of duodenum with Treitz ligament. Dissection is continued along SMV and SMA, and middle colic artery and vein are cut at the root. Dissection between the visceral fascia covering the pancreatic head and the transverse mesocolon is performed just cephalad to the gastrocolic trunk. Continuing the dissection enables to reach the lesser sac. Next, descending mesocolon is widely mobilized from the lateral side of IMV. Dissection between the pancreatic body and the transverse mesocolon is performed from the inferior edge of the pancreas, up to the lesser sac. Then transverse mesocolon is dissected along the pancreas, up to the tail. We complete the dissection of the root of the transverse mesocolon with recognizing pancreas and vessels. The transverse colon is resected outside the body, and then stapled anastomosis is performed. Blood flow of the anastomosis site is checked using ICG. We compared treatment outcomes between 28 patients who received laparoscopic transverse resection by this method and those with open surgery using propensity score matching. As a result, operative time was shorter in open group (207min v 170min, p<0.01). Blood loss was smaller in laparoscopic group (6ml v 107ml, p<0.01), and the number of harvested lympho nodes was larger in laparoscopic group (18 v 15, p=0.06). Although the incidence of postoperative complication was similar in both groups, postoperative hospital stay was statistically shorter in laparoscopic group (8days v 11days, p<0.01). In conclusion, using the pancreas and SMV/SMA as the landmarks to perform laparoscopic CME is feasible.

Video link:

https://drive.google.com/open?id=1bYZlewKCvJLIRINkyQCmuNzDLu3bg0W-
Hand-assisted laparoscopic right hemicolecomy and drainage of iliopsoas abscess in a complex perforated right sided diverticulitis patient

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Background: Perforated colonic diverticulitis could be successfully managed by intravenous antibiotics and percutaneous drainage. However, resection of perforated segment and drainage of abscess is required in more complex perforated diverticulitis cases. Although laparoscopic surgery should be attempted in these patients because of better postoperative recovery comparing to open surgery, but a recent study has demonstrated that it should be attempted later in the learning curve. We therefore present this video to demonstrate the effectiveness of hand-assisted laparoscopic right hemicolecomy and drainage of iliopsoas abscess in a patient with complex perforated diverticulitis of ascending colon.

Case Presentation: A 58-year-old woman with underlying dyslipidemia, allergic rhinitis, and morbid obesity, she had presented with right side abdominal pain, right back pain, and right leg pain with low grade fever for 4 months. Colonoscopy was performed and found diverticulosis along sigmoid colon to transverse colon but the scope could not be reached the cecum. Barium enema revealed a long segment of irregular filling defect at the ascending colon. Abdominal CT scan showed thickening of ascending colon and right iliopsoas abscess. The patient underwent hand assisted laparoscopic right hemicolecomy with hand sewn end to end ileo-transverse colostomy anastomosis and drainage of right iliopsoas abscess. The patient recovered uneventfully after surgery.

Conclusions: Because of the benefit of palpation and better traction, hand assisted laparoscopic surgery is safe and effective in management of complex perforated diverticulitis patients and should be considered in the early learning part of laparoscopic surgery.

Video link:

https://drive.google.com/open?id=135qFjBNHCc-vV0NK1NCNt5ibSubCYcYO
Robotic Pelvic Exenteration

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Reports of minimally invasive pelvic exenterative surgery are still limited. In this video, we present a case of robotic pelvic exenteration (ultralow anterior resection with enbloc cysto-prostatectomy and ileal conduit) in a patient with locally advanced low rectal cancer who had undergone neoadjuvant chemoradiation. A repeat MRI rectum performed 6/52 post chemoradiation showed that the rectal tumour was still invading the prostate gland. This was a combined multi-disciplinary surgery performed by the colorectal surgeon and urologist in attendance. A hybrid technique was employed, with the abdominal phase of the anterior resection, including lymphovascular dissection and mobilisation of the colon performed laparoscopically. This was followed by the docking of the da Vinci Si robot on the left side of the patient, for the pelvic phase of the surgery. Rectal mobilization was performed first with the initial portion of the total mesorectal excision (TME) performed posteriorly and laterally. Thereafter, the urologist completed the cysto-prostatectomy enbloc with the rectum. This then allowed the rest of the TME to be completed. After distal transection of the rectum, the entire specimen was removed via an umbilical extraction site. A stapled end-to-end colo-anal anastomosis was then performed. Finally, the ileal conduit was constructed on the right side of the patient’s abdomen.

https://drive.google.com/open?id=1IQg61deuGZEslAm9FwvlHgD4Gj7wzgA5
Laparoscopic management of diverticular colovesical fistula - Video presentation

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Laparoscopic management of diverticular colovesical fistula is challenging. Traditionally it has been considered as contraindication for laparoscopy. A total of 24 patients underwent total laparoscopic approach where mobilization of colon, sigmoid colectomy, excision of fistula by either stapler or by resecting wall of urinary bladder and colorectal anastomosis by circular stapler was done. The fundamental steps includes removal of fistula, excision of the diseased sigmoid colon with ligation of sigmoid vessels, restoration of bowel continuity and faecal diversion if deemed necessary. Here we present a video demonstration of our technique for total laparoscopic management of diverticular colovesical fistula.

Video link:

https://drive.google.com/file/d/1IMnSySvF5GFUmkhgRh9-fVhshtxuDhC/view?usp=sharing
Laparoscopic ventral rectopexy for overt external rectal prolapse

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Laparoscopic ventral rectopexy (LVR) has proved to be an effective treatment for external rectal prolapse with low recurrence, low morbidity and no mortality. It is a nerve-sparing technique with limits rectal mobilization, reducing post-operative constipation and sexual dysfunction. However, there are some concerns about the mesh-related complications, suitability of the technique and long-term recurrence of rectal prolapse. This paper reports on the techniques of LVR for external rectal prolapse and its short-term outcome. A 65-year-old female G3P3A0, vaginal delivery with history of prolong 2nd stage of labor, presented with external rectal prolapse without clinical of obstructed defecation or fecal incontinence for 7 months. Defecography showed deep Cul-de-sac with external rectal prolapse, redundant sigmoid colon without pelvic floor descend. Colonoscopy and anorectal manometry were normal. Preoperative Wexner constipation score (CSS = 0) and SF 36 quality of life score were evaluated. Laparoscopic ventral rectopexy with biological mesh was performed. Postoperative period was uneventful. At 3-month follow up, she was doing well with no evidence of recurrence rectal prolapse. The Short Form (36) Health Survey (SF-36) was improved in all aspects and there was no new onset constipation (CSS = 0) and incontinence. Laparoscopic ventral rectopexy is a promising procedure of dealing with external rectal prolapse. Suitable patient selection is crucial. Furthermore, the appropriate preoperative evaluations and meticulous surgical techniques are essential to optimize postoperative outcomes.

Video link:

https://drive.google.com/open?id=1OPcPAA7hzMLJr7f2YDwIMPoTP1_269WA
Laparoscopic ISR with Lateral Pelvic Lymph Node Dissection After Neoadjuvant Chemo-radiation in Locally Advanced Lower Rectal Cancer, Initial Experience

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Background: Lateral lymph node metastasis was present in 15-20% of lower rectal cancer and the risk of pelvic recurrence would decrease by 50% and the 5-year survival rate would improve by 8% when LLND was performed for T3 or T4 lower rectal cancer.

Objective: This video demonstrates the step of Laparoscopic ISR with right LPLND after neoadjuvant chemo-radiation in locally advanced lower rectal cancer

Results: A 46-year-old man presented with tenesmus and partial large bowel obstruction last 4 months ago. He received pre-operative CCRT for lower to mid rectal cancer from clinical stage IIIB: cT3N2M0 and two significant right internal iliac nodes (1.4 and 1.2 cm.). He was underwent to surgery in the ninth week after the last dose of chemo-radiation. There are 4 key steps: 1) High ligation of IMA and IMV then medial dissection of mesocolon along white line of Todd. 2) right Lateral Pelvic Lymph Node Dissection in 3 planes include common iliac LN, obturator LN and internal iliac LN  3) Rectal mobilisation (TME): started with posterior mesorectal dissection from the rectosacral fascia and preserve hypogastric nerves. The next step is anterolateral dissection. This part in the narrow pelvic and post CCRT fibrosis, so accidental damage to the neurovascular bundle at 10 and 2 o’clock. Dissection continues to the lower end of mesorectum until see puborectalis muscle. 4) Transanal specimen extraction then end-to-end with a single layer Handsewn coloanal anastomosis. Total 4 ports are used and Protective ileostomy was performed. Operative time is 310 minutes and total blood loss is 300 ml. Total hospital stay is 5 days with post-operative impotence about 3 months and improve now.

Video link:

https://drive.google.com/file/d/14MJ5yg4K7CY87DBzs7kQe_15Qa-xpCY/view?usp=sharing
A case of Locally advanced rectal cancer resected by Laparoscopic total pelvic exteration

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Background: Locally advanced rectal cancer (LARC) is a difficult hurdle in rectal cancer treatment. Rectum is located posterior to the urogenital organs. In LARC, especially in male, cases of tumor with anterior extension may require total pelvic exenteration (TPE). Whereas TPE is invasive, recent development in laparoscopic surgery has enabled laparoscopic approach to TPE and was introduced at our hospital. Case presentation: A 71-year-old male was diagnosed with rectal cancer invading to the seminal vesicle and prostate, with right pelvic lateral lymph node enlargement. The serum CEA level was increased at 565 µg/l, although there was no distant metastasis in PET-CT. We initiated systemic chemotherapy of FOLFOXIRI considering to the potential distant metastasis. After 7 cycles of FOLFOXIRI the tumor shrank, and no distant metastasis was observed via imaging studies. We added chemoradiotherapy to improve local control. After chemoradiotherapy, TPE was indicated according to the preoperative imaging. Operative method: We performed using 5 port sites and a 10mm flexible scope. I exposed the internal obturator muscle. The metastatic lymph node invaded the right obturator nerve, so this nerve was resected. Bilateral ureters were also resected near the urinary bladder. I used the stapler to cut the internal iliac artery, but the hemostasis was insufficient, therefore a clip was added. The dorsal vein complex (DVC) was resected using a vessel sealing system after ligation, and the urethra was resected using a stapler. The other team started the dissection from the perineum, and TPE was completed. The operating time was 810 minutes and the blood loss was 755ml. Conclusion: Laparoscopic TPE was successfully performed for LARC after neoadjuvant therapy. Our treatment strategy was safe and oncologically feasible.

Video Link:

https://drive.google.com/file/d/1EpsBBJtaTcvA7t41lqD4_O-WpcxZDJs3/view?usp=sharing
Laparoscopic repair with omentoplasty for High Recto-vaginal fistula - video presentation of technique

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Conventionally high rectovaginal fistulas (RVF) are repaired by open surgery through abdominal approach. Laparoscopic approach is rarely performed and is technically challenging owing to the complex and narrow anatomy of pelvis. Our technique is to perform adhesiolysis followed by delineation and excision of the fistula tract. The defect is closed with intracorporeal sutures with omentoplasty. Our demonstration shows that laparoscopic approach is feasible and safe.

Video Link:

https://drive.google.com/file/d/1RqN9OhbWKxkL.v5XUXjXTwJ9ntdColA2s/view?usp=sharing
Laparoscopic TPC IPAA

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A total proctocolectomy with ileal pouch-anal anastomosis removes the entire colon and rectum while preserving the anal sphincter and, hence, normal bowel function and fecal continence. It is technically challenging as it involves dissection involving all four abdominal quadrants and pelvis. The optimal laparoscopic approach has not been established. Here we present a video demonstration of our safe and feasible technique for laparoscopic TPC with IPAA.

Video Link:

https://drive.google.com/file/d/1XiaYPCbLSfV_lG0r-Cv0vde5DkdLsgue/view?usp=sharing
Laparoscopic extended right hemicolecotomy with radical lymph node dissection

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Optimal surgical approach for colorectal cancer includes the technique of complete mesocolic excision and central vascular ligation. Lymphadenectomy for clinically node-positive colorectal cancer is a therapeutic dissection which leads to improve overall survival. For hepatic flexure cancer, the main supply artery is middle colic artery (MCA). The lymph nodes are distributed around the superior mesenteric vein (SMV) and the superior mesenteric artery (SMA).

This video shows the technique of radical lymph node dissection along the SMA and SMV in laparoscopic extended right hemicolecotomy in a 76-year old woman diagnosed with hepatic flexure cancer with extensive nodal metastasis.

The stepwise approach was as follows: 1. Identify the SMV: a transverse curvilinear incision was made along the inferior aspect of the ileocolic vessels and dissecting proximally until the SMV was identified. 2. Division of ileocolic pedicle: the ileocolic vein (ICV) was isolated at the ICV-SMV junction. The ileocolic artery was also divided near the origin on SMA. 3. Medial to lateral mobilization of mesocolon 4. Dissection of Gastrocolic trunk (GCT) 5. Identify SMA and dissection of middle colic trunk: dissection along the SMV proximally revealed MCA trunk at the origin from SMA, then divided. 6. Exposure of lesser sac and hepatic flexure mobilization: Hepatocolic attachments and lateral attachments were divided. 7. Lateral and inferior dissection: the remaining attachments of cecum and ascending colon were mobilized. The terminal ileum were elevated off the retroperitoneum, avoiding injury to gonodal vessels and ureters. 8. Specimen extraction and extracorporeal anastomosis via the extended periumbilical incision

Conclusion: The laparoscopic extended right hemicolecotomy with radical lymph node dissection can be performed in order to achieve CME principle along with therapeutic lymph node dissection in patient with clinically node positive hepatic flexure cancer.

Video Link: https://drive.google.com/open?id=1rRTqg_S5BY2RF0cwhmdqsrpmAx0oXFRt
Combined robotic intersphincteric resection and total prostatectomy with urethrovesical anastomosis for a complex recto-prostatic urethral fistula: A novel approach

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INTRODUCTION: Rectourethral fistulas are a rare but difficult to treat complication following the surgical or radiological treatment of both rectal and prostate cancers or post traumatic perineal injury. There are more than 40 published techniques on the management of recto-urethral fistulas. The sheer number of the different approaches shows that no single technique has gained widespread acceptance, or superiority over the others. We present a case of a large recto-prostatic urethral fistula treated by a combined robotic approach.

METHOD: A 59-year-old man was treated with a robotic anterior resection for a T3N2M0 rectal adenocarcinoma in 2015 followed by adjuvant radio and chemotherapy. In 2017 he developed lung metastasis and underwent a Left Upper Lobe VATS with curative intent. In 2018 he presented with recurrent urinary tract infection symptoms with a rectoprostatic-urethral fistula visible on MRI. In November 2018 he underwent dual diversion by laparoscopic loop ileostomy and suprapubic catheter insertion to reduce both local inflammation and for symptom control. Six weeks later, a combined robotic approach was performed, starting with an intersphincteric neo-rectal resection, which included the fistula tract and division of the rectum below the previous anastomosis. After the rectal resection, the prostate was resected followed by the urethrovesical anastomosis. The bladder was mobilised down to allow for a tension free anastomosis. A hand sewn colo-anal anastomosis was performed via a transanal approach. The histopathology of the specimens was reported as fibrotic fistula tract without any signs of malignant recurrence. A post-operative cystostomy showed no extravasation of contrast and the sigmoscopy showed no mucosal recurrence of malignancy.

CONCLUSION: In the era of minimally invasive surgery and advanced robotic technology, this complex patient was able to benefit from a multidisciplinary approach in the treatment of a challenging pathology.

Video Link:
https://drive.google.com/file/d/1VJ644Gam0os_AKwciY_5h6HPO3X7p6Dm/view
Laparoscopic anterior resection with en bloc paraaortic lymph nodes dissection with bilateral salpingo-oophorectomy: the strategy of paraaortic lymph node dissection

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Backgrounds: Patients with colon cancer and paraaortic lymph node (PALN) metastasis had a poor prognosis. According to the American Joint Committee on Cancer (AJCC) staging system classified PALN as M1 disease. Paraortic lymph node metastasis (PALNM) is one of the treatment options. This video presents the strategy of laparoscopic paraaortic lymph node dissection in sigmoid cancer with PALNM patient.

Material and methods: A 65-years-old female diagnosed with sigmoid cancer with PALN enlargement. She underwent laparoscopic anterior resection for primary sigmoid cancer and PALND for PALNM. The strategy of PALND started by identification of the left ureter and left gonadal vein from lateral to medial approach. Incision of peritoneum from the aortic bifurcation upward to the inferior border of the pancreas. The PALNs and all lymphovascular tissue along the common iliac vessels and aorta were removed. The dissection plane extended laterally to the left gonadal vein. The splenic flexure was mobilized for tension-free anastomosis. The with bilateral salpingo-oophorectomy was performed. The end-to-end anastomosis was done using circular stapler.

Results: The operative time was 4 hours and blood loss was 80 ml. The length of hospital stay was 7 days. The pathological result was pT4aN2M1. The patient came to the OPD for follow-up, there was no postoperative complication.

Conclusions: Laparoscopic PALND is safe and feasible for PALNM in colon cancer patient. Laparoscopic approach provided a good exposure to identified anatomy for PALND.

Video Link: https://drive.google.com/open?id=17SIk_3-46sfknxPKiPe_EUWXxwh8b8d3
SMA-first approach for T4 ascending colon cancer involved 2nd part duodenum and mesentery

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Background: Since complete mesocolic excision (CME) was proposed in 2009 by Hohenberger et al. It has accepted as the standard operation for the radical resection of right-side colon cancer. With this procedure, the origin of colonic arteries should be exposed to ensure maximum harvest of regional lymph node. The medial boundary of the colon resection still controversial. Although most surgeons perform the dissection along the axis of the SMV but the SMA-first has been recognized as one of the most challenging surgery among colon procedures. This video shows the technique of “SMA-first” approach in Laparoscopic right colectomy with wedge duodenum in a 74-year-old male diagnosed ascending colon cancer with local invasion to 2nd part duodenum and mesentery. The tumor causes shortening of ileocolic vessels and tenting of SMA and SMV. Presentation of case: The dissection is initiated with identification of the ileocolic artery and vein at the root of SMA and SMV. The dissection is then continued cephalad along the SMA. The right branches of the middle colic vessels are ligated. After the vascular dissection is completed, continued to separation the mesocolon from the retroperitoneal organs. The division of the gastrocolic ligament is continued until the hepatic flexure is reached then performed inferior and lateral dissection. Because of tumor involved 2nd part duodenum, fully lateral and medial Kocherization is performed in this case. Specimen extraction and extracorporeal anastomosis via the extended periumbilical incision. This procedure was successful without complication. Total operative time 5.20 hours.

Conclusion: Surgical dissection following the guidance of SMA could be useful in case of locally advanced right-side colon cancer that involved mesentery and shortening of vessels. Understanding the important anatomical landmark and operative approach technique make this operation feasible and safety.

Video Link: https://1drv.ms/v/s!AmUivuRVzjCbgjSwAKv2MCEzdeGE?e=rbXgks
Laparoscopic pelvic exenteration with immediate pelvic reconstruction using mucosa-removed colonic flap

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Background: Pelvic exenteration has been associated with complications such as massive bleeding. Morbidities including pelvic sepsis have been reported and myocutaneous flap is recommended to minimise the risk, but the open laparotomy is required. This video demonstrates the benefit of minimal invasive approach to this high risk operation. Concept of enbloc resection, effective bleeding control technique, and immediate reconstruction was applied.

Materials and Methods: A 62 years old man diagnosed with rectal cancer with prostate and seminal vesicle invasion was presented. He underwent preoperative chemoradiation followed by laparoscopic pelvic exenteration with pelvic reconstruction. The detail of the procedure included mobilization of left colon and rectum. Then the dissection started on the lateral side of both ureters and on the urinary bladder. Both ureters were divided to enable the further dissection to the pelvic floor. The medial branches of pelvic vessels were individually cut. The dissection continued to the symphysis pubis where the dorsal venous complex were identified and sutured on both lateral sides. The colonic flap was harvested using low ligation of IMA and preservation of left colic vessels. The transection was made at the sigmoid-descending junction. The perineal dissection was performed. The pelvic floor was cylindrically cut. The urethra was divided and the dissection continued upward on the prostate to meet the dissection plane of the laparoscopic approach. The pelvic exenteration specimen was removed via the perineal wound. Mucosectomy of the colonic flap was performed and and the flap was used for pelvic reconstruction. The Pfannenstiel incision was made for creation of ileal conduit and colostomy.

Results: There was no intraoperative complications and no blood transfusion required. The patient could walk postoperative day 2 and discharged home safely. There was no postoperative complications.

Conclusion: The detail technique is effective for this complex surgery and provides good outcomes.

Video Link:

https://drive.google.com/file/d/11b2zDvit7Mj-w-yj76tBjKiEHLxiw_94/view?usp=sharing
Laparoscopic liver resection using the inter and outer Laennec approaches

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Background: To perform laparoscopic liver resection safely and accurately, the inter and outer Laennec approaches were developed based on the structure of Laennec’s capsule, which is composed of two layers surrounding the major hepatic vein: hepatic and cardiac Laennec’s capsule. Surgical techniques: [Outer Laennec approach] The patient with hepatocellular carcinoma (HCC) underwent laparoscopic S8 segmentectomy. Parenchymal transection of the medial side of the liver was initiated; the root of the middle hepatic vein (MHV) and right hepatic vein (RHV) was exposed. The space between the hepatic Laennec’s capsule and liver parenchyma (outer Laennec approach) was entered. This approach can maintain the strength of the vein wall because the two membranes cover the hepatic vein. After S8 Glissonian pedicle dissection, parenchymal dissection was completed. Operative time was 236 minutes, and estimated blood loss was 10 mL. The patient was discharged on postoperative day 5.
[Inter Laennec approach] The patient had two HCC lesions. One was located in segment 4, compressing the MHV; the other in segment 7, involving the RHV. Laparoscopic left medial sectionectomy and extended right posterior sectionectomy with RHV resection were performed. The MHV was exposed from the root side, and the tumor was carefully ablated from the MHV with the inter Laennec approach by entering the space between the hepatic and cardiac Laennec’s capsule. After left medial sectionectomy, extended right posterior sectionectomy with RHV resection was performed. Using the inter Laennec approach, the MHV and function of the liver could be preserved and the tumor could be completely removed. Operative time was 649 minutes, and estimated blood loss was 300 mL. The patient was discharged on postoperative day 10. The surgical margin was negative.

Conclusion: The inter and outer Laennec approaches are safe and useful. Depending on the tumor location, either approach can be selected.

Video Link:

https://drive.google.com/file/d/1efGq78UZaCg3v6o-5hpvSFxcBr6FzFys/view?usp=sharing
Application of intraoperative fluorescence imaging in laparoscopic left hepatectomy for the HCC; detect the cancer, guide for anatomical resection and identify the bile duct simultaneously

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Recently, intraoperative fluorescence imaging using indocyanine green (ICG) has widely been used to open or laparoscopic HPB surgery, for real-time visualization of biological structures and assessment of blood perfusion. Identification of hepatic tumors IV injected ICG accumulated in the cholangiocarcinoma or hepatocellular carcinoma, hepatic segmentation by intraoperative injection of ICG and fluorescence cholangiography excreted into the biliary tract that was injection for identification of hepatic segmentation.

Sixty eight-years old male patient who have 3.5cm sized hepatic tumor located in the hepatic segment 4 underwent laparoscopic left hepatectomy. Of note, a small 7mm sized satellite tumor located in the segment 8 that was detected in the ICG fluorescent image during laparoscopic exploration, which was not detectable by intraoperative ultrasonography. The satellite nodule was removed by laparoscopy simultaneously. We herein demonstrate three kinds of application of ICG-fluorescence imaging, detection of tumor, hepatic segmentation and fluorescent cholangiography in a time with video

**Video Link:**

https://drive.google.com/file/d/1xQTgJ6OxQ8cL1-Mh8rpxaasndChyKGY-/view?usp=drive_web
Subtotal Cholecystectomy for the Difficult Gallbladder

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Introduction: Laparoscopic cholecystectomy is the gold standard for the treatment of gallbladder stones. Its advantages over open cholecystectomy are well-documented. However, it is associated with a greater number of bile duct injuries. Laparoscopic subtotal cholecystectomy is a viable bail-out option when there is severe inflammation of the hepatocystic triangle and the critical view of safety cannot be achieved.

Case #1: A 41-year-old male consulted because of epigastric pain of 2-days' duration. Patient had anicteric sclerae and was positive for the Murphy's sign. Blood tests revealed leukocytosis. Ultrasound showed a distended gallbladder with thickened walls. Patient underwent laparoscopic subtotal cholecystectomy (fenestrating type). Post-op course was unremarkable.

Case #2: A 66-year-old male consulted because of intermittent right upper quadrant pain with radiation to the back of 2-days' duration. This was associated with undocumented fever. The patient's blood pressure was 80/50. Physical examination revealed tenderness in the right upper quadrant of the abdomen. Blood tests showed elevated WBC and alkaline phosphatase. Ultrasound revealed a markedly distended gallbladder with multiple shadowing echoes in the lumen; common bile duct and intrahepatic ducts were not dilated. Patient underwent tube cholecystostomy. A few days after, laparoscopic subtotal cholecystectomy (reconstituting type) was done. Post-op course was unremarkable.

Discussion: There are two types of subtotal cholecystectomy. The fenestrating type is when the gallbladder is not occluded. In this procedure, the cystic duct may or may not be sutured. The reconstituting type of subtotal cholecystectomy involves closing the lower end of the gallbladder creating a remnant gallbladder. The fenestrating type has a higher incidence of post-operative biliary fistula whereas the reconstituting type may result in recurrence of symptomatic cholelithiasis. Conclusion: Laparoscopic subtotal cholecystectomy offers the advantages of minimally invasive surgery in the treatment of cholecystitis in patients with unclear anatomy.

Video Link: https://1drv.ms/s!AhAJbvwWsaZZgc19phAej7B_IRGzKA
Standardization of pure laparoscopic donor hepatectomy in living donor liver transplantation

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**Background:** We have introduced laparoscopic hepatectomy since 1997, and accumulated cases have been about 800 cases including major hepatectomies. From 2012, we have introduced pure laparoscopic donor hepatectomy (PLDH) in living donor liver transplantation (LDLT). We herein present our surgical procedure and clinical outcome in this presentation.

**Surgical Procedure:** We start the operation via 6-trocar approach. After the liver biopsy and gallbladder removal, the liver is completely mobilized. The corresponding Glissonean pedicle is encircled and controlled using Nitta forceps. Then we confirm the demarcation line employing both temporal Glissonean pedicle clamping and intraoperative sonography. Parenchymal transection is performed along with the demarcation line employing Pringle maneuver. Only the corresponding hepatic artery and portal vein are dissected from the Glissonean pedicle and taped. Regards to the hepatic duct, intraoperative cholangiography reveals the appropriate cutting line. After heparinization, the corresponding hepatic duct, hepatic artery, portal vein is subsequentially clipped and divided. Finally, the corresponding hepatic vein is divided with a linear stapler and the liver graft is put in a plastic bag and procured from a suprapubic incision.

**Results:** Until August 2019, 19 patients underwent PLDH. Enrolled donors’ characteristics are as follows. The mean age, graft type, estimated graft volume, and estimated future remnant liver was 38.5 years old, 11 and 8 for male and female, 15 and 4 for right and left lobe type, 601 mL, and 44.4 %, respectively. With respect to surgical outcomes, the median operative time and blood loss were 308 minutes and 150.5 mL, respectively. Donor complication occurred in 1 patient with Grade IIIa bile leakage.

**Conclusion:** In LDLT, PLDH employing the Glissonian approach is a promising laparoscopic procedure for both the donor and the recipient outcome. In near future, PLDH will be more sophisticated as cases are accumulated.

**Video Link:**
https://drive.google.com/file/d/1ZNrXT2AI5umd78rkhfYwH3eiRuY8T1c7/view?usp=sharing
The suspension method for laparoscopic subtotal pancreatectomy by Huang's loop

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Introduction: Laparoscopic subtotal pancreatectomy is the accepted treatment strategy for resectable malignancy or other tumors of the pancreas. Because of the novel tools developed for laparoscopic technique, pancreatic transection by linear stapler or Hemo-lock is widely used. However, due to retroperitoneal organ, sometimes it is very difficult to approach pancreas via laparoscopic method. Huang’s loop was previous published for blood control during laparoscopic liver resection. Due to its elastic characteristics, we modified it for the application to pancreatic hanging assistance. We share an easy technique of hanging and suspension of pancreas when doing laparoscopic subtotal pancreatectomy.

Case presentation: This 61 y/o male patient is a patient who has medical history of hypertension with and chronic hepatitis B with medical follow up. He complained about intermittent abdominal dull pain for 1 month. Further abdominal CT was arranged and showed a large, homogeneous and well-demarcated fluid collection in the body and tail of the Pancreas (11 cm). We performed laparoscopic subtotal pancreatectomy with spleen preservation by Warshaw’s technique. Due to reduced ports for 2 working instruments and 1 camera, pancreatic suspension was hold by Huang’s loop when freed from retroperitoneal space. Gentle and continuing suspension by Huang’s loop helped the surgery go smoother and faster. On post-operative day 8, the patient got discharged uneventfully. Further pathology report showed intraductal tubulopapillary neoplasm.

Conclusion: Laparoscopic subtotal pancreatectomy could be assisted by Huang’s loop. It helps to identify pancreatic margin from retroperitoneal tissue. Gently suspending by Huang’s loop will keep continuing contralateral traction to create a wider operative field for surgical process.

Video Link:
https://drive.google.com/file/d/1R5-iaRLr_xRy1mqFFyZyMj2aelaknYYf/view?usp=sharing
Total Laparoscopic pancreaticoduodenectomy: Resection and Reconstruction

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Total laparoscopic pancreaticoduodenectomy (TLPD) is one of the most advance abdominal operation due to the anatomical location and the surrounding major vasculature. Although laparoscopic surgery for oncology is rapidly growing in worldwide, laparoscopic surgery for pancreaticoduodenectomy has been slower than with other abdominal procedures because of the complexity and longer operative time. Fortunately, with new advances in laparoscopic technology and instrument within the past decade, TLPD is beginning to gain wider acceptance. TLPD was first reported in 1994 by Ganger and Pomp and since then, several series reported on the safety and feasibility of TLPD. At the earliest stage, the advantage of TLPD were questionable because of long operative time. But recent data shown that TLPD might not only be safe and feasible, but it might result in improved perioperative recovery, lower blood loss and equivalent oncologic outcome when compared with open surgery. However, randomized controlled trial is needed to evaluate differences between these groups.

In this video, we describe a technique for Total Laparoscopic Pancreaticoduodenectomy of ampullary carcinoma in a 56-year-old female in Bangkok Metropolitan Administration (BMA) General Hospital Bangkok, Thailand. This video demonstrates a technique for resection, review anatomy and mainly focus on reconstruction part.

Video Link:

https://drive.google.com/open?id=10MN81r0CoEVinPQ8FYqqM7d7y0GilxiSk
A feasible and oncologically adequate modification of laparoscopic RAMPS: doing less for more

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Background: Radical Antegrade Modular Pancreatopancreatico-splenectomy (RAMPS) has been regarded as a safe and effective treatment. Nevertheless, we had questioned the necessity of ligating both splenic vessels at their origin, radical node dissection and resecting pancreas at this point, as described by Strasberg in 2003, which may be time-consuming and had risk for bleeding. In some diseases (eg. ductal adenocarcinoma), free parenchymal and circumferential margin is just oncologically enough and more radical node dissection does not provide survival benefit from current evidence. We propose a modification of the classical RAMPS which is oncologically adequate, can lessen operative time, and has less bleeding risk.

Method: We present a case of a 43-year-old female who had a 4-cm cystic lesion at tail of pancreas. Laparoscopic anterior RAMPS was scheduled. Trocars were placed and pneumoperitoneum was made. The gastrocolic ligament was divided. The stomach was lifted exposing the proximal splenic artery which was controlled. The splenic vein was exposed. The splenic vessels were then ligated. Resecting the pancreatic body was done, at the point which give favorable parenchymal margin, with an endoscopic stapler, with prolonged peri-firing compression (PFC - Nakamura, 2011). Dissection in the anterior RAMPS plane was done. The spleen was mobilized. The specimen was removed.

Results: The operation took 6 hours and 6 minutes. Estimated blood loss was 200 ml. No postoperative complications. The drain was removed at postoperative day 5. The patient was discharged at postoperative day 6. Histopathology was solid-cystic pseudopapillary tumor with vascular invasion and invasion into splenic lymph nodes with free resected margin. No lymph nodes metastases out of 15 nodes.

Conclusion: This modification of RAMPS is safe and feasible for the tumor at pancreatic body/tail which does not need radical node dissection, can lessen operative time, requiring shorter learning curve while providing adequate oncologic resection.

https://drive.google.com/open?id=1XtA2IGNED49aN5aU2dILoKWHFl0BHBZ
Pancreatic pseudocysts, common sequelae of acute or chronic pancreatitis and trauma, are fluid collections arising in or adjacent to the pancreas enclosed by a wall of fibrous granulation tissue, but lacking a true epithelial lining. Interventions indicated for symptomatic, large (> 6 cm in diameter), complicated and persistent (> 6 wk) PPs, include percutaneous, endoscopic or surgical approaches. With the advent of minimally invasive techniques such as cystogastrostomy, cystojejunostomy and cystoduodenostomy, laparoscopy plays a great role in the management of PPs. Moreover, laparoscopic cystogastrostomy has been described as a safe and efficacious alternative to open drainage of PPs in adults. The patient underwent laparoscopic cystogastrostomy. Harmonic scalpel was used to create anterior gastrostomy at the maximal displacement site of the stomach. A laparoscopic needle was introduced to confirm the location of the pseudocyst and to sample fluid. Then, the scalpel was used to create a cystogastrostomy opening approximately 4 cm in size between the adherent posterior and anterior wall of the pseudocyst. Cystic collections were sucked out and necrotic materials were removed gently. Cystogastrostomy closed continuously with achieving hemostasis. The anterior gastrostomy was closed continuously with absorbable suture material.

**Video Link:**

https://drive.google.com/open?id=1I5Poz-ciqVm3mu6IK8NHRInBXUNXBF7J
3 Port Mini Laparoscopic Cholecystectomy with Intracorporeal knot tying

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Mini Laparoscopic Cholecystectomy was described as early as 1982 as an alternative to conventional Laparoscopic Cholecystectomy using 3 mm hand instruments. Sharing with you a modified mini Laparoscopic Cholecystectomy technique using 3 ports with Intracorporeal knot tying in diseased gall bladder with stones. This is a single surgeon experienced, multicenter wide of whom the author has done more than 300 cases of 3 Port (5mm) Laparoscopic Cholecystectomies with Intracorporeal knot tying for the last 6 years. The author started with the 4-port technique for several years ago before shifting to 3 Port technique. For the last 5 months the author this time applied the 3 Port (5mm) Laparoscopic Cholecystectomy with Intracorporeal knot tying to 3 Port Mini Laparoscopic Cholecystectomy with Intracorporeal knot tying technique with good results. No leak, a safe and fast procedure, very less pain, reproducible and cost effective without using clips or hemolok. The technique uses an initial approach to lateral mid body exposure of the gall bladder followed by lateral and medial dissection proceeding to the funds first before going down to the infundibulocystic junction. The critical view of safety is achieved by opening the lateral border of the infundibulocystic junction. It also serves as another armamentariium to surgeons who would like to advance by honing their knot tying skills.

Video link:

https://drive.google.com/file/d/17PzSXQKiSKfUyT7E3YMZTFxkIP7YSqMI/view?usp=sharing
Laparoscopic distal pancreatectomy with splenic-preserving

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Recently, laparoscopic distal pancreatectomy generally considered a practical method that has been adopted worldwide for benign and borderline malignant pancreatic tumor. However, to isolate the splenic artery and vein from the pancreatic parenchyma remains technically difficult because the splenic artery, the splenic vein and its branches often meanders at the border of the pancreas. Our institute sent this VDO case to illustrate straightened splenic vessels method in spleen preserving laparoscopic distal pancreatectomy. The straightened splenic vessels method is a safe approach for separating the splenic artery and vein from the pancreatic parenchyma. However, larger prospective studies are needed to further evaluate the feasibility of the straightened splenic vessels method.

Video link:

https://drive.google.com/file/d/1gA3uDySuX0n0tA7mYf1O6qQNJJlq7s7la/view?usp=sharing
Simplify laparoscopic right hepatectomy

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**Background:** Laparoscopic right hepatectomy (LRH) is technically complex procedures and justified in advance laparoscopic liver surgery in Iwate criteria. Well plan surgery in each step was important. Inflow control by extracorporeal pringle maneuver was essential to decrease blood loss while low CVP and pneumoperitoneum help decrease bleeding from hepatic vein. Superficial and deep landmark from demarcated line and middle hepatic vein was facilitate for keep correct direction plane while perform liver parenchymal transection.

**Material and Methods:** This video was demonstration how to perform LRH in patient with intrahepatic cholangiocarcinoma in right lobe liver

**Result:** Patient was good recovery with operative time 5 hr, estimated blood loss 50 cc with no complication patient was discharge at postoperative day 6.

**Conclusion:** LRH was safe and feasible Extracorporeal Pringle maneuver was fast and effective MHV guide parenchymal transection was the key for correct direction plane

**Video link:**

[https://drive.google.com/file/d/1esLHBdR3Pk8SO-cKqMMjYetPPHh2_YRf/view?usp=sharing](https://drive.google.com/file/d/1esLHBdR3Pk8SO-cKqMMjYetPPHh2_YRf/view?usp=sharing)
Laparoscopic cholecystectomy in Situs inversus totalis

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**Introduction:** Situs inversus is a congenital condition which the internal viscera are reversed from their normal position. This condition found about 0.01% from normal population. Because the relationship between the organs is not changed, most people in this condition have no medical symptoms or complications. There is no evidence that show the risk of gallstone in situs inversus totalis [2]. Cholelithiasis or cholecystitis in this condition are challenging in diagnostic and operative technique.

**Video description:** A 82-year-old woman, she came with intermittent left upper quadrant pain without jaundice for a year. MRCP show multiple CBD stone. ERCP with stone removal were performed. She had no comorbidities. 3 Months after remove CBD stone, she was appointed to cholecystectomy. The operating room was set in modified technique. Surgeon and assistant were on the right side of the patients. 4-port technique was used. After pneumoperitoneum was created, visceral organ was explored. The laparoscopic finding confirmed a left-sided liver and gall bladder, with a severe adhesion. Lysis adhesion was performed with monopolar cauterization and sharp dissection. Fundus down technique was used. Cystic duct and artery were identified. Cystic artery was resected, using metallic clip. Cystic duct was ligated with double Endoloop and resected.

**Video link:** [https://1drv.ms/v/s!Al2e4pQjtETL8UQkqeEBSeTh9brW?e=TXapeK](https://1drv.ms/v/s!Al2e4pQjtETL8UQkqeEBSeTh9brW?e=TXapeK)
Laparoscopic left hepatectomy for colorectal liver metastasis using individual inflow control technique

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Background: Laparoscopic left hepatectomy is alternative for open hepatectomy and individual ligation technique is an effective procedure inflow control. Here, we present a case of a 75 years old male who was diagnosed with colorectal liver metastasis at left hepatic lobe. laparoscopic left hepatectomy by individual ligation technique was scheduled.

Method: Trocars were placed and pneumoperitoneum was created. The falciform ligament was divided toward suprahepatic inferior venacava. Left hepatic artery was identified, ligated and divided followed by left portal vein. The liver was mobilized and lifted to achieve clear anatomical view of hepaticoduodenal ligament which was encircled with a tape. The parenchymal transection was performed after the demarcation line was visualized. The left hepatic vein was encircled and divided by endoscopic stapler, the left intrahepatic bile duct was divided by endoscopic stapler later. The specimen was removed, after the bleeding and bile leak was checked, a closed suction drain was placed.

Results: The operative time was 7 hours 30 minutes. estimated blood loss was 400 ml. no immediate postoperative complication. The drain was removed at postoperative day 5 the patient was discharged at postoperative day 7. Histopathological report was moderately differentiated adenocarcinoma with presence of tumor emboli in vascular channels and perineural invasion without involvement of hepatic vein, hilar and parenchymal resection margin. Conclusion Laparoscopic left hepatectomy with individual ligation is a safe and feasible procedure for colorectal liver metastasis at left hepatic lobe

Video link

https://drive.google.com/file/d/13xJtuZxdy5rHp7Zd6KmKO5oN17MI1II/view?usp=drivesdk
Laparoscopic left lateral sectionectomy in situs inversus totalis patient

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Laparoscopic liver resection in situs inversus totalis patient is very challenging operation. The complete mirror image effect makes the operation difficult for inexperienced surgeons. For the surgeon who mastered both hands surgical technique can easily manage the patient with this rare condition by switch from the right to left hand operation. But for the single dominant hand surgeon may need to adjust the procedure for suitable of their technique. We here to present the case of situs inversus totalis patient who was diagnosed colorectal liver metastasis which plan to perform left lateral sectionectomy. In this video, we described the step of operation which included patient position, trocar placement and detail of operation.

Video Link: https://1drv.ms/u/s!AsbS0Zg6bh03cv3vUXzjevNaRoU?e=OLZAWn
Laparoscopic left hepatectomy for colorectal liver metastasis using individual inflow control technique

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Conclusion: Laparoscopic left hepatectomy with individual ligation is a safe and feasible procedure for colorectal liver metastasis at left hepatic lobe.

Video Link:

https://drive.google.com/file/d/13xJtuZxdy5rHp7Zd6KmKO5oN17MI11I/view?usp=drivesdk
**Laparoscopic Donor Hepatectomy**

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The video demonstrates Laparoscopic Donor Hepatectomy Patient Position: Under general anaesthesia, the patient is placed in supine position with legs abducted, the left arm tucked in, and a sandbag is placed behind right hemi-thorax/shoulder. Central venous access and right radial artery cannulation are obtained for invasive blood pressure monitoring. After skin preparation with povidone–iodine solution, the patient is draped. Primary surgeon stands in between the legs and on the left side of the patient depending on the requirement of dissection while camera surgeon stands on the right side and assistant surgeon stands on the left side of the patient Technique - Access and mobilisation- Hilar dissection-Parenchymal transection-Organ procurement-Management of liver remnantConclusion Total laparoscopic donor hepatectomies can be done safely, in the hands of experienced minimally invasive surgeons who are also experienced in liver transplant surgeries, with good results.

Video Link:  
https://drive.google.com/file/d/15NSO33LFNq-TWpa73gzveze1rvLZwl3/view?usp=sharing

**Laparoscopic Pancreatoduodenectomy using artery first approach**

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Minimally invasive laparoscopic pancreatoduodenectomy is technically feasible and safe. An artery first approach to pancreatoduodenectomy is a critical technique to assess the SMA involvement by the tumour quite early in the dissection phase. It also ensures complete oncological clearance around superior mesenteric vessels and also reduces the blood loss during surgery. In this video, we show the technique of laparoscopic pancreatoduodenectomy using artery first approach. The procedure begins with mobilisation of hepatic flexure colon down. The superior mesenteric artery is identified by following the first jejunal branch to the inferior border of pancreas. The superior mesenteric vein is skeletonised and spleno portal confluence is dissected. These two manoeuvres expose the SMA and inferior pancreaticoduodenal artery (IPDA) is clipped and divided. Subsequently after accessing the operability,
duodenum is transected, bile duct and GDA are divided. Complete hepatoduodenal, celiac and uncinate clearance is undertaken. Jejunum is transected, pancreas neck is divided and specimen is removed. Reconstruction is done using duct to mucosa pancreatojejunostomy, heptaticojejunostomy and duodenojejunostomy.

Video Link:

https://drive.google.com/file/d/1H8bNtFoFaZAKa9C20QEPstOpUkrOZUH5/view?usp=sharing

**Laparoscopic Pancreatoduodenectomy using artery first approach**

Parthasarathi, R

India

bharath_cumar@yahoo.com

Minimally invasive laparoscopic pancreateoduodenectomy is technically feasible and safe. An artery first approach to pancreateoduodenectomy is a critical technique to assess the SMA involvement by the tumour quite early in the dissection phase. It also ensures complete oncological clearance around superior mesenteric vessels and also reduces the blood loss during surgery. In this video, we show the technique of laparoscopic pancreatoduodenectomy using artery first approach. The procedure begins with mobilisation of hepatic flexure colon down. The superior mesenteric artery is identified by following the first jejunal branch to the inferior border of pancreas. The superior mesenteric vein is skeletonised and spleno portal confluence is dissected. These two manoeuvres expose the SMA and inferior pancreateoduodenal artery (IPDA) is clipped and divided. Subsequently after accessing the operability, duodenum is transected, bile duct and GDA are divided. Complete hepatoduodenal, celiac and uncinate clearance is undertaken. Jejunum is transected, pancreas neck is divided and specimen is removed. Reconstruction is done using duct to mucosa pancreatojejunostomy, heptaticojejunostomy and duodenojejunostomy.

Video Link:

https://drive.google.com/file/d/1H8bNtFoFaZAKa9C20QEPstOpUkrOZUH5/view?usp=sharing
Concomitant laparoscopic splenectomy with cholecystectomy for a patient with cholecystitis and hereditary spherocytosis – is it necessary? - a video presentation

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Introduction: Hereditary spherocytosis is the most common constitutional erythrocyte membrane disorder. It is due to defect in RBC membrane protein. It results in unconjugated hyperbilirubinemia which is insoluble in bile and gets precipitated in biliary tract forming pigment stones. 21-63% of hereditary spherocytosis patients have gallstones and 20% of them are symptomatic. Surgery for cholecystitis is the choice of the day, but it does not cure the basic pathology. Role of concomitant splenectomy will take care of it but are associated with its complication.

Case: 40year old gentleman with 1month pain in the right upper quadrant and fever since two days. He is a known case of cholelithiasis and Hereditary spherocytosis on treatment and has received multiple times blood transfusion. Examination showed icterus, tender right upper quadrant and moderate splenomegaly. Investigations revealed unconjugated hyperbilirubinemia and MRCP showed calculus cholecystitis and splenomegaly. He underwent laparoscopic cholecystectomy and splenectomy after prior immunisation. Findings were moderate splenomegaly and multiple pigmented blackish gallstones. Postoperatively he is doing well.

Discussion: For a patient with gallstones in hereditary spherocytosis, only cholecystectomy doesn’t remove the source. Hemolysis will continue leading to intrahepatic and common bile duct stones. Hence concomitant splenectomy with cholecystectomy has a better role. On the other side concomitant cholecystectomy with splenectomy for asymptomatic gallstones is not always necessary and has to be followed up on regular basis.

Conclusion: Concomitant splenectomy with cholecystectomy for a patient with cholecystitis and hereditary spherocytosis will prevent further stone formation and further complications. Here i present a video of the above concomitant procedure.

Video Link:
https://drive.google.com/open?id=1BuIEVnBBHg5AaDLlwBn7Jk1MnPq10ygD
The Dauntless Endoscopic Doublet for the Management of Sleeve Gastrectomy Leak

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Background. Laparoscopic sleeve gastrectomy (LSG) is an effective procedure to enhance weight loss with rare complications. However, if the complications do occur, they may lead to significant morbidity and mortality. Minimally invasive approaches have been recently recognized as viable options in the management of these complications. Self-expanding metallic stents can cover the leaking part and protect the rest of the staple line. Over-The-Scope-Clip (OTSC) is a clipping device with a strong adequate tissue grasp and compression without causing ischemia or laceration. Both can be applied immediately during endoscopy, preventing spillage of gastrointestinal content into peritoneal space.

Case Presentation, Methods and Results. A 24-year-old diabetic male, with a BMI of 56 kg/m2 underwent stapled LSG. Post-op day 1, patient was noted to be pale and with decreasing hemoglobin levels. Diagnostic laparoscopy was done: 2.7 litres of blood clots were evacuated. Post-op day 9, patient was noted to be febrile. CT revealed subhepatic fluid collection and stranding densities at the surrounding region suggestive of abscess formation. CT-guided percutaneous pigtail catheter insertion and drainage of abscess were done. However, on Day 18 post-op, patient still had persistent fever. Repeat CT scan revealed interval increase in subhepatic fluid. OTSC was applied on the fistula and placement of a fully-covered megastent was done via endoscopic guidance. Slow diet progression was initiated and regular follow-ups were scheduled. Post-op day 59, follow-up endoscopy and removal of megasent was done showing an intact staple line with no extravasation of contrast on fluoroscopy.

Conclusion. Complications in bariatric surgery are traditionally managed by open surgery. In our institutional experience, sleeve gastrectomy leak was successfully managed using the dual modality of an OTSC and a megastent. Through this experience, we may conclude that we can safely combine measures to ensure a favorable result.

Video Link:
https://drive.google.com/open?id=1yM7EiBlePobXMNqU3Q030kJoC6JdIMC
Laparoscopic repair after laparoscopic sleeve gastrectomy complication

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Laparoscopic sleeve gastrectomy is a common and standard surgical weight-loss procedure in morbid obesity patients. There are many complications of sleeve gastrectomy include the gastric leakage, remaining one of the most feared complications. This video presents a patient who developed sepsis at first week post sleeve gastrectomy. Although, the management of this complication cannot be clearly recommended. Multi-modality can be performed. For this patient, endoscopic esophageal stenting and collection drainage were used before, the patient still remaining clinically not improved. The laparoscopic surgical repair was suitable options in this case.

**Conclusion:** The sequence and choice of management should be individualized according to clinical presentation. Surgical repair can be approached laparoscopically by experienced surgeons in specialized centre.

**Video Link:**

https://drive.google.com/file/d/10bVf0IsB9uXUzbiAzF6uHkGo_9sabUBu/view?usp=sharing
The “Mini Mini” Gastric Bypass: MIS strategies enhancing recovery and cosmesis

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Aims: The Mini Gastric Bypass (MGB) was so named as a reference to a minimally invasive form of Gastric Bypass, now generally referred to as MGB-OAGB, yet often involves as many as three 12mm ports and two 5mm ports. The author has applied reduced port and mini-laparoscopic approaches to this procedure, resulting in minimal pain, scarring and length of stay together with excellent safety and weight loss outcomes. The technical aspects and outcomes will be discussed.

Methods: A single surgeon series of reduced port (number and size) MGB-OAGB cases will be presented, focusing on videos of key points of technique. Only one 12mm umbilical port was used in each case, with three other ports comprising either 5mm or even mini-laparoscopic instruments. Complementary non-surgical strategies to enhance recovery will also be discussed.

Results: This single surgeon series demonstrated outcomes with short lengths of stay, no leaks, bleeds, transfusions or returns to theatre, and with excellent cosmesis. Patients were often discharged as early as 24 hours post op, with no discharge narcotic analgesia medications.

Conclusion: Minimising port numbers and sizes results in less pain and therefore less reliance upon narcotic analgesia and its associated side effects. Length of stay is also minimised with patients benefiting from enhanced recovery and near-scarless outcomes without compromising safety.

Video Link:

https://drive.google.com/open?id=1dva0Ph6fk2iPkAzgH3do-G332XFUXyd
Acute abdominal pain after Laparoscopic Roux-En-Y Gastric bypass

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This VDO show interested intraoperative finding. A lady of 20, BMI 40 with multiple comorbidity disease, underwent Laparoscopic sleeve gastrectomy. Postoperative she got leakage from staple line then revision surgery, Laparoscopic Roux-En-Y gastric bypass, has been performed. She has been discharged 2 weeks postop. 6 weeks after Laparoscopic Roux-En-Y gastric bypass she got acute abdominal pain and on physical examination she had pelvic peritonitis. CT scan show appendix was 0.9 cms without signs of inflammation. Diagnostic laparoscopy was performed and finding show ischemic band at distal ilium with turbid fluid. Adhesiolysis and appendectomy as well as peritoneal lavage was performed. She has been discharged 3 days postop.

Video Link:

https://drive.google.com/a/kku.ac.th/file/d/1CLbyoj-SXlvmIWztJDS1M75WzwXYLImA/view?usp=drivesdk
Indocyanine Green (ICG) Fluorescence-Guided Laparoscopic Left Adrenalectomy

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Background: One of the difficulties encountered in laparoscopic adrenalectomy is accurate localization of the adrenal gland and its vein at the retroperitoneum. Recently, the technology of indocyanine green fluorescence has improved the visualization and localization of the adrenal gland and its vein, given the limitation of tactile feedback in laparoscopy.

Objectives: To demonstrate the use of indocyanine green fluorescence in laparoscopic adrenalectomy. To contribute to the limited literature available in the use of ICG fluorescence in adrenal surgery.

Materials & Method: This is a case of a 63-year-old female with primary hyperaldosteronism secondary to left adrenal mass who underwent ICG Fluorescence-Guided Laparoscopic Left Adrenalectomy. The patient received a pre-operative dose of 2cc of 25mg/5cc ICG solution upon general anesthesia induction. Activation of fluorescence mode was done to objectively visualize the borders of the left adrenal gland and aid during dissection. Intraoperative dose of 2cc of 25mg/5cc ICG solution was administered, identifying and localizing the adrenal vein prior to ligation and transection.

Results: Fluorescent illumination of the left adrenal gland was noted, clearly visualizing its borders and making the dissection more accurate and guided. Left adrenal vein was also identified and localized with great confidence. Patient tolerated the procedure well, with no note of complications and hypersensitivity reaction to ICG immediately and on follow-up.

Conclusion: ICG fluorescence guidance in laparoscopic left adrenalectomy is simple to do. This technique further enhanced the visualization of the borders of the adrenal gland making the lines of resection more accurate, and made vascular localization easier. Ultimately, ICG fluorescence-guided surgery may improve safety in our patients undergoing laparoscopic adrenalectomy.

Video link:
https://drive.google.com/file/d/1VENeDMzr55OTbVlw2_SHFYIc6xIhLmA5/view?usp=sharing
Laparoscopic resection of retroperitoneal paraganglioma behind the Spiegel lobe using laparoscopic liver mobilization technique in a kyphotic patient

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Extra-adrenal paraganglioma is a rare form of neuroendocrine neoplasm capable of catecholamine secretion. The surgical risks associated with tumor location are compounded in this case of a kyphotic patient. This report presents the successful application of laparoscopy on extra-adrenal paraganglioma located behind the Spiegel lobe in a kyphotic patient. Operation was performed after one-week of \( \alpha \)-blocker administration. Laparoscopic approach in the left hemilateral Decubitus position with table rotating provided optimal access for safe tumor resection after complete hepatic right lobe mobilization. The patient’s postoperative course was uneventful. The results support that laparoscopic approach can be a safe and effective method for resecting extra-adrenal paraganglioma in a challenging case of a kyphotic patient.

Video link:

https://1drv.ms/v/s!AqjJZvi3I7XaBpTo1TL4DPpXFsiaI
Laparoscopic Resection of Large Phaeochromocytoma.

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Laparoscopic surgery, compared to open surgery, allows for faster recovery, a shorter hospital stay and lower morbidity. However, large adrenal tumours are recognised as a relative contraindication for laparoscopic removal. Additionally, this was a functional adrenal tumour with the potential to drastically alter the haemodynamics of the patient. We present a case of a 45-year old lady who was found to have a giant adrenal mass while being investigated for abdominal bloatedness, after being diagnosed with hypertension 2 years earlier when she presented with recurring headaches. Further work-up confirmed a functional phaeochromocytoma with a size of 11cm in its largest dimension. Laparoscopic removal of the lesion was elected after scrutiny of the imaging showed no invasion into surrounding structures. As shown in the video, laparoscopic removal of large/giant adrenal tumours was performed adequately and safely. The patient recovered well post-op without complications and was discharged well on post-op day 2.

Video link:

https://drive.google.com/file/d/1QlLhxZWsfTxNCiMn1br-nY_OwR0Et7r/view?usp=drivesdk
Single Incision Laparoscopic Transmesocolon left adrenalectomy

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Background: Currently, Lap. Adrenalectomy is used mainly by using 4~5 trocar sites when performing Lt. adrenalectomy. In this case, we study about the Lt. adrenalectomy using ‘Single umbilical incision with transmesocolon method’ according to the recent trend of pursuing the minimally invasive operative method.

Case: A 44-year-old female primary aldosteronism patient with a left adrenal lesion has anatomy and general condition that enables laparoscopic adrenalectomy. Surgical technique: Under GEA, start surgery with supine position. Install the globe port in the single umbilical incision. It is a method to apply incision to the mesocolon of T-colon, dissection of the left adrenal vein, and en-bloc resection including adrenal gland and adrenal artery, to complete the left adrenalectomy.

Conclusion: It is thought that there is not much difference in the patient’s surgery time. And, there was no complication during surgery, and the patient recovered well after surgery. The single incision with transmesocolon method has created a new method for safe and fast operation, and may provide a new direction for the left adrenalectomy.

Video link:

https://catholicackr-my.sharepoint.com/:f:/g/personal/gospel4_catholic_ac_kr/Ep04nW4TgLfuZPbievTcVUBd1uAvS9Q9nGJWU0OMxkZcRA?e=71NlEe
Laparoscopic cortical-sparing adrenalectomy for right aldosterone-producing adenoma: How we make it safe?

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Introduction: Aldosterone Producing Adenoma (APA) is one of the most common benign adrenal tumors which laparoscopic adrenalectomy is the gold standard treatment. Many studies have reported that laparoscopic cortical-sparing adrenalectomy is safe and feasible for APA. However, intra-operative localization of the tumor in order to achieve an adequate surgical margin is challenging. Therefore, we demonstrated the use of indocyanine green (ICG) with a specialized laparoscopic fluorescence imaging system as well as intraoperative ultrasound (IOUS) to facilitate tumor localization.

Objective: This video demonstrated the step-by-step technique of laparoscopic cortical-sparing right adrenalectomy and localization of the adrenal adenoma.

Materials and Methods: We presented a 34-year-old male with hypertension persistent hypokalemia. His plasma aldosterone (PAC) and plasma aldosterone-renin level (PAC/PRA) were 19.14 ng/dl and 26.58, respectively. Abdominal computed tomography showed a 1.4x0.9 cm, lipid-poor right adrenal nodule. He was diagnosed with right APA. Laparoscopic cortical-sparing right adrenalectomy with transperitoneal approach using ICG and IOUS for tumor localization was planned for this patient.

Results: The ICG tumor uptake maximally 5 min after 5 mg of ICG intravenous injection. The operative time was 58 min, blood loss was 5 ml, hospital stay was 3 days, postoperative potassium and PAC/PRA day 1 were 3.7 mmol/L and 0.45, respectively. The patient was discharged home uneventfully day 2. Pathology showed adrenal cortical adenoma, size 1.7x1.5 cm and free margin.

Discussion and Conclusion: Laparoscopic cortical-sparing adrenalectomy is safe and feasible for APA. Furthermore, the utilization of ICG and IOUS are highly effective in terms of tumor localization and achieving the adequate surgical resection.

Video link:

https://drive.google.com/file/d/1YXKlx1TriC5XGmbRRWTvb_HGeVVIZgNV/view?usp=sharing
Feasibility and Safety of Laparoscopic Adrenalectomy with Concurrent Cholecystectomy

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There has been no reported case of adrenal myelolipoma managed with laparoscopic adrenalectomy in the Philippines. Secondly, data on combined laparoscopic adrenalectomy with cholecystectomy are limited. Here we present a 70-year-old, Filipino, male diagnosed with a right adrenal myelolipoma and incidental cholelithiasis. The patient underwent a one-staged removal of the adrenal gland and gallbladder through laparoscopic technique. The patient was placed on a left lateral decubitus and no change of positioning was done for the removal of the gallbladder. No complications developed post-operatively. A literature review was also done about this combined procedure. After a search for English literature in PubMed, only 4 papers (8 patients) have reported about concurrent cholecystectomy during laparoscopic adrenalectomy. Balla et al. (2018) reported the first series of laparoscopic bilateral adrenalectomy via an anterior approach. Three patients with concurrent cholecystectomy developed complications. However, these were of low-grade morbidity based on Clavien-Dindo classification and all 3 were cured of their disease. However, the reported cases did not specify the size of the mass and patient positioning during surgery. In our case, the patient had an uneventful post-operative course. Despite limited data, performing concurrent cholecystectomy during laparoscopic adrenalectomy appears feasible and safe with an added benefit in terms of costs and avoids anxiety for going through a second surgery.

Video link:

https://drive.google.com/file/d/1Hz6lDd3uu0Kd0ha1A3xRNMRKaN6apjN0h/view
Pure Single-incision robotic right hemicolectomy with the da Vinci SP surgical system

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Minimally invasive surgery (MIS) for colorectal disease has gained popularity for its better short-term outcomes and non-inferior long-term outcomes than conventional open surgery. In the advancement of MIS, single-incision laparoscopic surgery (SILS) was developed to minimize incision related pain and complications with maximal cosmetic effect. Recent studies showed the advantages of SILS for its less postoperative pain and better patient recovery compared to multiport laparoscopic surgery with comparable oncological outcome for colorectal cancer. Despite of these advantage of SILS, the technique is challenging even for an experienced laparoscopic colorectal surgeon for its restriction in the triangulation and retraction. Robotic surgery using the Da Vinci surgical system (Intuitive Surgical, Sunnyvale, Ca, USA) had been verified as a safe and effective procedure for colorectal disease with its advantage of stable and magnified three-dimensional view, increased freedom degrees of the devices, enhanced dexterity, superior ergonomic design and shorter learning curve. Recently, Intuitive Surgical launched the da Vinci SP surgical system (dVSP) in 2018, which was developed as a novel robotic platform to perform robotic single-incision surgery and overcome the aforementioned difficulties in SILS. It has two joints called endo-wrist and elbow in the robotic instruments and articulating endoscope permitting flexible movement. All robotic instruments are inserted through a cylindrical single port with a diameter of 2.5cm. Up to date, its use has mainly been in urological and gynecological procedure. Herein, we report our experience of the initial case of pure single-incision robotic right hemicolectomy using the dVSP.

Video Link:
https://drive.google.com/file/d/1sBB39KvS5urgX2zekGnbHZbZ7NePDc1x/view?usp=drive_web
Pure laparoscopic radical resection for Bismuth type IV hilar cholangiocarcinoma

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Introduction Surgical resection is the only curative treatment for hilar cholangiocarcinoma. Laparoscopic hepatectomy has been used to treat several types of liver neoplasms. However, technical issues have limited the adoption of laparoscopy for the treatment of hilar cholangiocarcinoma. To date there is not report of minimally invasive procedure for Bismuth type IV hilar cholangiocarcinoma in the literature. We recently had a patient who underwent a pure laparoscopic extended right hepatectomy and lymph node dissection and hepaticojejunostomy for a type IV hilar cholangiocarcinoma. Methods The tumor was 3.5×2.5×0.7 cm in diameter and located in the right bile duct and common hepatic duct. Radiological examination showed that hepatic artery and portal vein was not invaded. After the division and mutilation of the right hepatic artery and the right portal vein, short hepatic veins were divided and cut off with clip and ultrasound knife from the anterior face of the vena cava. Mobilization was performed after the devascularization of the right liver, followed by the transection of liver parenchymal with CUSA and ultrasound knife. Finally, left hepatic bile duct jejunum Roux-en-Y reconstruction was performed. Results This patient underwent successfully with a totally laparoscopic procedure. An right hepatectomy (right hemihepatectomy combined with caudate lobectomy) and complete lymph node dissection and hepaticojejunostomy were performed in this operation. The operation time was nearly 515 min, and the intraoperative blood loss was about 600 ml. Conclusion Pure laparoscopic resection for hilar cholangiocarcinoma was proved safe and feasible in selected patients and when performed by surgeons with expertise in liver surgery and minimally invasive techniques, which enabled the patient to recover early and have an opportunity to receive chemotherapy as soon as possible. Further studies are still needed to confirm the benefit of this approach over conventional surgery for hilar cholangiocarcinoma.

Video Link:

https://stucqmueducn-my.sharepoint.com/:v:/g/personal/xyfdl_stu_cqmu_edu_cn/EdrzYv-sbPBAmrPKbvTetHsB8qPst2NrZlw4y45MPlvu6g?e=66IjlV
First Malaysia Uniportal Video-Assisted Thoracoscopic Surgery lingulectomy with segmentectomy

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Introduction: Uniportal video-assisted thoracoscopic surgery (VATS) segmentectomy is usually more difficult than lobectomies. Compared to thoracotomy, uniportal thoracoscopic segmentectomy associated with a shorter length of stay and with equivalent morbidity and mortality.

Objectives To report our first Malaysia Uniportal VATS lingulectomy with segmentectomy masterclass and demonstrate the safety and efficacy of performing Uniportal VATS.

Case presentation: A 69 years old, man with underlying hypertension, ECOG 1, diagnosed with rectosigmoid adenocarcinoma, Duke B with no distant metastasis in 2017. He underwent anterior resection with no adjuvant chemotherapy. During active surveillances noted his CEA level rising in trend hence proceeded with PET-CT scan which showed hypermetabolic left superior lingular left upper lobe lung lesions, suggestive of metastasis. HPE of the CT guided biopsy of the lesion was metastatic adenocarcinoma likely colorectal in origin. Decision made for Uniportal VATS lingulectomy with segmentectomy. Intra-op noted left lung mass was close to inter-lobular pulmonary artery. Patient was discharged home well in 48 hours with a small post-op wound. Pathological examination of the specimen revealed metastatic adenocarcinoma.

Discussion: Single port VATS segmentectomy follows the principles of major pulmonary resections by VATS that is individual dissection of segmental veins, segmental arteries and lobar segmental bronchus with a no rib spreading, video-assisted thoracoscopic approach. We began performing VATS lobectomies/ segmentectomy/ metastectomy in UMMC since Jan 2011. Initially conventional 3 ports evolved to 2 ports since 2017. From 2011 up to date, we have performed 186 major pulmonary resections by VATS. We started performing first 5 Uniportal VATS since August following masterclass by Diego Gonzalez.

Conclusion: Single-port VATS segmentectomy is a complex but feasible and safe procedure in experienced centres.

Video Link: https://drive.google.com/open?id=1tKlml3QP4LUmj3inql-kn1mlXN7HsF09
Endoscopic Nipple-Sparing Mastectomy and Sentinel Lymph Node Biopsy with Immediate Breast Reconstruction

Domingo, Lawrence

Lawrence F. Domingo, Clarence Pio Rey C. Yacapin, Karen D. Mascardo, Judy Carissa M. Atazan Ospital ng Muntulupa, Muntinlupa City, Philippines

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Endoscopic Surgery has its roots from as early as 936 AD by Arabian Albukasim until its formal development on 1853 by French Physician Dr. Desormeaux. Laparoscopic cholecystectomy was first performed on 1987 by French Physician Dr. Mournet and later was adopted to be the Gold Standard procedure for Calculous Cholecystitis. At present, Breast Endoscopic Surgery is an accepted therapeutic option for Stage I and Stage II breast cancer. In our institution, Ospital ng Muntulupa located at Muntinlupa City, Philippines, we have successful done an Endoscopic Nipple-Sparring Mastectomy and Sentinel Lymph Node Biopsy with Immediate Breast Reconstruction case. This was our first case in our institution. The patient was a 54-year-old female diagnosed with Invasive Mammary Cancer Left St IA (T1N0M0). We are proud to present our documentation for this case.

Video link: https://drive.google.com/open?id=1E3jx19l2LYivq3cRa2gDg4cWy17mWoC4
LAPAROSCOPIC PYELOLITHOTOMY - IS IT JUSTIFIED FOR LARGE RENAL STONE IN RURAL SETUP

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WE COMPARED LAPAROSCOPIC PYELOLITHOTOMY (LP) WITH PERCUTANEOUS NEPHROLITHOTOMY (PCNL) FOR LARGE RENAL STONE. 50 CASES OF LP WERE COMPARED WITH 50 CASES OF PCNL THE SIZE OF STONE TAKEN INTO STUDY WERE MORE THAN 1.5 CM IN ALL MEDICALLY FIT PATIENTS IRRESPECTIVE OF AGE & SEX

CONCLUSION

LP IS EQUALLY GOOD PROCEDURE THAN PCNL IN THE HANDS OF GOOD LAPAROSCOPIC SURGEON

POST OP PAIN IS LESS IN LP THAN PCNL

STONE FREE RATE IS MORE IN LP THAN PCNL

SSI IS LESS IN LP THAN PCNL

OPERATIVE TIME AND HOSPITAL STAY IS MORE IN LP THAN PCNL

Video Link: https://www.youtube.com/watch?v=hsf1tazP4sg
EVALUATION OF TRAINING MODEL FOR LAPAROSCOPIC CHOLECYSTECTOMY ON RESIDENCY TRAINING IN RAJAVITHI HOSPITAL: RAJAVITHI HYBRID MODEL

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Background: Rajavithi hybrid model (RHM) was innovated by the team of surgeons in the department of surgery, Rajavithi hospital. The aim of this study is to demonstrate face validity and construct validity of the RHM before using it for resident training in laparoscopic cholecystectomy (LC).

Materials and methods: From January 2017 to April 2017, the participants (n=30) were assigned to perform LC in the RHM simulator. The RHM consists of 1) training box with camera inside connecting to computer and LCD display 2) rubber model resembling stomach, duodenum, and liver. There was a space inside the liver enough to insert part of porcine liver, gallbladder, and common bile duct. All participants were divided into two groups: experience group; EG (n=15) who had performed more than 50 LC procedure and non-experience group; NEG (n=15) with less than 50 LC procedure. Each participant performed one LC procedure via this simulator. Face validity was assessed with questionnaires for realism of the operation in six aspects on a five-point Likert scale (Total score=30). The operative time and the incidence of tearing gallbladder during the procedure were recorded to evaluate the construct validity.

Results: The RHM was found to be realistic (22.6±3.4). There was no difference between EG and NEG in terms of realism assessment for RHM simulator (21.7±3.8 vs. 23.6±2.7; p=0.127). The highest score of realism was found in clipping and cutting procedure (4.2±0.7). The operative time (minutes) in EG is shorter than NEG (15±2.4 vs. 32±4.1; p<0.001). The incidence of tearing gallbladder during the procedure in EG was lower than NEG significantly (16.7% vs. 83.3%; p=0.008).

Conclusion: The RHM provides more realistic sensation to practice LC before performing LC in the patients. This simulator can distinguish the different level of skill performing LC in each surgeon.

Video Link:
A Curious Case of Appendiceal Diverticulum: Laparoscopic Extended Appendectomy Using Endostapler

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Introduction: Diverticulum of the appendix is a very uncommon disease that usually is asymptomatic and mostly found as an incidental finding in histopathology reports. The incidence of diverticula in appendectomy specimens ranges from 0.004%-2.1%. If appendiceal diverticulitis occurs, symptoms usually mimic those of an acute appendicitis, such as right lower quadrant pain, anorexia and fever.

Case Presentation, Methods and Results: Our case is a 48-year-old female, s/p 3 laparotomies (1997, 2009, 2011) for gynecologic pathologies. Patient reported a 2-yr history of recurrent loose bowel movements with associated epigastric and right lower quadrant discomfort. Initial colonoscopy done revealed friable erythematous, mucosa at the terminal ileum. One year prior to admission, patient experienced recurrence of abdominal pains and loose bowel movements. Repeat colonoscopy revealed a 2.0 cm submucosal tumor near the appendiceal opening. Patient was scheduled for an elective diagnostic laparoscopy with possible appendectomy. During laparoscopy, the appendix was identified and mobilized to expose the base and the appendiceal mass near the base. A linear stapler was used to excise part of the cecum together with the appendiceal mass and appendix. The procedure lasted for approximately an hour, with no intraoperative complications. Patient was temporarily placed on NPO post-operatively, and feeding as started the next day. The patient was discharged on the 2nd day post-op.

Conclusion: Appendiceal diverticulitis is most often diagnosed as acute appendicitis. If left ignored, risk of complications and perforation increase. Appendiceal diverticula are also often associated to higher risk of neoplasm (carcinoid tumors and mucinous adenomas). Appendectomy should be performed in order to establish a pathological assessment and to check for coexistent neoplasm. Prophylactic appendectomy may be performed in case of incidental finding of appendiceal diverticula to avoid the risk of perforation. This our institutional experience in the successful management of an appendiceal diverticulum.

Video Link:

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Sigmoidopexy is applied as an alternative surgical treatment of sigmoid volvulus due to its lower comorbidity and mortality rate than sigmoidectomy, especially for elderly patients under poor nutritional status. We report a case of successful single-port laparoscopic sigmoidopexy in a 78-year-old man with recurrent sigmoid volvulus. The patient received sigmoidoscopy and rectal tube detorsion, decompression and bowel preparation before the operation. Multi-port laparoscopic sigmoidopexy has been reported in the literature. However, the anchor points to the abdominal wall in a sigmoidopexy are still an art to chose. The ideal anchor points should include maintaining the alignment of colon without causing obstruction or volvulus, preventing internal herniation of small intestines and keeping away from the abdominal midline in case of further laparotomy. The advantages of single port surgery are as follows: no disturbances of anchor points by the working ports, less adhesion and less pain. The fixation to the abdominal wall could be easily achieved by extracorporeal knot technique. No intraoperative or postoperative complication was noted. The patient defecated the night following the operation and requested discharge the next day with laxatives prescribed to prevent constipation. Long-term follow up is suggested.

Video link:

https://drive.google.com/file/d/1mqj4voEyn5tXReOBzOqFxrpCwajt-0Fj/view?usp=sharing
Laparoscopic pyeloplasty combined with transpelvic anastomosis stenting in treatment for hydronephrosis in children

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Background: Diversion of urine is important to the outcome of urinary plastic surgery. The result of transpelvic anastomotic stenting and JJ catheter need to be evaluated. Purpose: To evaluate the result of an early series of patients who underwent laparoscopic pyeloplasty combined with transpelvic anastomotic stenting in treatment for hydronephrosis.

Materials and methods: from January 2016 until August 2019, there were 14 cases be operated by this technique. The follow-up ranged from 2 months to 30 months. Result of series of patients were focus on some variable: operation time, time of retaining stent, the length of stay in hospital, the rate of compliation and re-do pyeloplasty needed.

Results: no need to change the opened operation or re-do pyeloplasty in all cases. One case has urine leakage self-limiting. The medium length of stay in hospital is 8.1 days. The pre-operative clinical symptoms were abdominal pain, which improved immediately after removing the stent for 2 weeks. Changing of kidney size of dAP on ultrasound are rather slow, just improved post-operating 3 months in most of cases.

Conclusions: The good early result of this technique shows that the combining transpelvic stenting can be another choice in urine diversion after laparoscopic pyeloplasty. No need to spend anaesthesia for removing the draining tube-like double J.

Video link:

https://drive.google.com/file/d/10LVeFVTuj_ePcqU_KLaFyb1F5zhbNYAK/view?usp=sharing
Peritonitis in critical illness patient treatment by laparoscopic approach

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Introduction: Critically ill patients need intensive care since they are highly complex patients, requiring an active and multidisciplinary professional team as well as the use of advanced technology. When presented critically ill patients with peritonitis which diagnosis is a clinical diagnosis. The differential diagnosis could vary from acute appendicitis, gangrenous small bowel or even acalculous cholecystitis which is rare in most patients with acute cholecystitis but often seen in critically ill patients. Acalculous cholecystitis is an inflammatory disease of gallbladder without evidence of gallstones or cystic duct obstruction, usually associated with more serious morbidity and higher mortality rates than calculous cholecystitis. Thus, in doubtful cause of peritonitis, we sometime needs intra-operative diagnosis. In this case, we use laparoscopic approach to confirm the diagnosis and treatment.

Video description: A 77-year old man with acute aortic dissection S/P partial aortic arch replacement with CKD presented with feeding intolerance and right lower abdominal pain. CT scan showed acalculous gangrenous cholecystitis, fecalith in appendix and edematous and fat stranding of distal small bowel. Due to uncertain diagnosis, we decided to perform laparoscopic diagnosis and treatment surgery. At the operation, surgeon and assistant were on the left side of the patient. After creating pneumoperitoneum, laparoscopic findings were gangrenous cholecystitis and segmental impending perforated jejunum. We used three ports technique for cholecystectomy and another port place at suprapubic region for appendectomy. Laparoscopic cholecystectomy performed with monopolar cauterization and blunt dissection. Cystic duct and artery were identified. Cystic duct was secured with PDS loop. Laparoscopic appendectomy was done and closed stump with Hem-o-lok clip. Laparoscopic assisted small bowel resection was done.

Video link:

https://drive.google.com/open?id=1Y2YAvmEIOvouBe2lie_17cedTXe46qMw
Videobronchoscopy in the treatment of foreign bodies of the respiratory tract in children

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Aspiration of a foreign body and its long stay in the tracheobronchial tree causes the development of chronic bronchopulmonary complications in 1.3 - 8% of cases. So, timely removal of foreign bodies of the respiratory tract depends on proper diagnosis.

In 2 - SamMI clinic 1350 children with foreign bodies of the respiratory tract were treated. Of these, 52% were boys and 48% were girls. In the period up to 3 months and above 25.3% of patients were delivered, up to 1 month 18.7%, and most were received on 1-10 days from the onset of the disease.

After conducting endoscopic studies in 1200 patients, various foreign bodies were found. The majority of foreign bodies account for 61.7% of the right bronchus. The corresponding share of the left bronchus is 38.3%. Organic foreign bodies are removed in 84% of cases, inorganic in 16%.

In 70 cases, with complications caused by the presence of foreign bodies of the respiratory tract, subsequent operations were performed: lobectomy in 27, pulmonectomy in 6, abscessotomy in 6, thoracocentesis of 28 patients. Bronchotomy with removal of a foreign body was performed in 2 cases and a wedge-shaped resection of the lung lobe in 1 case.
Peritonitis in critical illness patient treatment by laparoscopic approach

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Introduction: Critically ill patients need intensive care since they are highly complex patients, requiring an active and multidisciplinary professional team as well as the use of advanced technology. When presented critically ill patients with peritonitis which diagnosis is a clinical diagnosis. The differential diagnosis could vary from acute appendicitis, gangrenous small bowel or even acalculous cholecystitis which is rare in most patients with acute cholecystitis but often seen in critically ill patients. Acalculous cholecystitis is an inflammatory disease of gallbladder without evidence of gallstones or cystic duct obstruction, usually associated with more serious morbidity and higher mortality rates than calculous cholecystitis. Thus, in doubtful cause of peritonitis, we sometime needs intra-operative diagnosis. In this case, we use laparoscopic approach to confirm the diagnosis and treatment.

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Video Link: https://drive.google.com/open?id=1Y2YAvmElOvouBe2lie_l7cedTXe46qMw
Laparoscopic approach to a large adrenocortical oncocytoma.

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INTRODUCTION: Adrenocortical oncocytomas are extremely rare tumors, considered to be non-functional and of low malignant potential. Despite the great advance in laparoscopic techniques, there are extremely limited reports of laparoscopic approach of adrenocortical oncocytomas. We describe a case of laparoscopic approach to a large adrenocortical oncocytoma, underlining the safety and feasibility of laparoscopy in the surgical management of these extremely rare adrenal tumors.

PRESENTATION OF CASE: A 45 year-old male was referred for surgical evaluation after the incidental discovery of a large left adrenal mass, during ultrasound examination due to abdominal colic. CECT revealed a 10cm x 12cm mass with a well circumscribed capsule, with no evidence of infiltration of the neoplasm to periadrenal tissues. The patient underwent laparoscopic left adrenalectomy, running an uneventful postoperative period. Histopathology revealed the evidence of an adrenal oncocytoma.

DISCUSSION: Recent studies have demonstrated that approximately one third of adrenocortical oncocytomas are associated with hormonal hypersecretion, as well as that one fifth of them demonstrate malignant biological behavior. From this point of view, there is emerging evidence in favour of the necessity of surgical excision as the treatment of choice. In spite of the progress of laparoscopic surgery, very few cases of laparoscopic excision of these tumors have been reported up to date. CONCLUSION: Laparoscopic surgery offers a safe alternative in confronting adrenocortical neoplasms, even when the biological behaviour of the tumours cannot be pre-operatively evaluated in a definite way.

Video Link:

https://drive.google.com/file/d/1UzNrtK9ZysltR1skrYHz4KLj4cHgRe75/view?usp=sharing
Simple laparoscopic technique to stop bleeding from splenic injury

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Splenic injury from blunt abdominal trauma was traditionally treated by splenectomy. In hemodynamically stable patient, splenic preservation was an alternative treatment, aiming to reduce long term risk of overwhelming post-splenectomy infection (OPSI). Partial splenectomy was technically challenged. Non-operative treatment was preferred in most center, but failure of non-operative treatment was report, and need for salvage splenectomy. This video will demonstrate simple laparoscopic technique that could stop bleeding effectively. Presenting case is a 13 years old girl fell, who down from a horse 3 hours before coming to hospital. Initial vital sign showed tachycardia and low blood pressure, responded well to fluid resuscitation. CT scan showed splenic laceration grade 4 at upper hilum with moderate amount of hemoperitoneum. This patient was a candidate for non-operative treatment. However, laparoscopy was conducted to enhance success rate of splenic preservation. Laparoscopy revealed of hemoperitoneum 900 cc. Blood was sucked out, taking care not to remove blood clot around the spleen. There was slow venous blood oozing from the spleen. Gauzes were packed around the spleen. Bleeding was stopped. After removal of gauzes, bleeding was demonstrated again, showing that packing is effective. Oxidized cellulose (Surgicel) was packed around the spleen instead of gauze. Then bleeding was stopped. Drain was placed and showed no bleeding at all. Patient recovered well from surgery. This technique is simple, safe and effective in selected case. This could enhance success rate of splenic preservation, reduce need of blood transfusion, and could avoid second surgery to remove the packing.

Video Link: https://drive.google.com/open?id=1rYdN55TxSTlhQRvHL7-1dGHdn5hVM_fU
RIGHT SIDED VIDEO ASSISTED THORACIC SURGERY (VATS) THYMECTOMY FOR NON THYMOMATOUS MYASTHENIA GRAVIS: OUR SURGICAL EXPERIENCE


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Video Assisted Thoracic surgery (VATS) Thymectomy is a major component of minimally invasive technics with increasing number as a consequence of advancements in modern technology. VATS for the management of non thymomatous myasthenia gravis as well as the management of small thymomas and other benign thymic pathology, has been gaining in acceptance and popularity as an alternative to median sternotomy approach. Although VATS thymectomy has been described in several variations and current preference for today is left sided VATS approach due to its exposure in critical areas of dissection, here we share our technique with Right Sided VATS approach and tips to prevent the pitfalls, learned from our experience with this approach.

Video Links:

https://drive.google.com/file/d/1OJcXIfXpAkBy4O0gYnc7aN-m2qfw9I7-/view?usp=sharing
Podium poster
Upper Gastroenterology Disease

Laparoscopic Surgery for Advanced Adenocarcinoma of esophago-gastric junction with neo-chemotherapy.

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Introduction: Adenocarcinoma of esophago-gastric junction (AEG) is still one of the most difficult surgical situations in gastric cancers as its variable classifications and managements. Aim: To evaluate the resectability and early results of laparoscopic surgery for advanced AEG with neoadjuvant chemotherapy (neoCx).

Method: Prospective case series study. All patients with advanced AEG and no distant metastasis will have 3 to 6 cycles neoCx (Epirubicin, Oxaliplatin and Capecitabine). LS will be performed with aim of curative resection 4 to 6 weeks after finishing chemotherapy.

Results: From February 2017 to August 2019, at Choray hospital, 22 patients with advanced AEG had been included into study. There were 16 males and 6 females. Patients’ mean ages was 62.3 ± 11.4 (46 – 83). Clinical T stages included 4 cases with cT2, 4 cases with cT3, 8 cases with cT4a and 3 cases with cT4b. Exploratory laparoscopy had been done in 3 cases due to peritoneal metastasis. Laparoscopic proximal gastrectomy (LPG) with double tract reconstruction had been done in 1 case and laparoscopic total gastrectomy (LTG) had been done in 18 cases. Mean operation time for laparoscopic gastrectomy was 157 ± 16.9 mins (130 – 190). There were no conversion. Proximal resection margin were negative in all cases. Mean lymph nodes (LN) harvested was 9.3 ± 3.7 (5 – 20 LN). Mean LN metastasis were 3.8 ± 2.3 (0 - 13 LN). There was no anastomotic leak after surgery. Overall morbidity was 0.9% (2 cases): one case with wound infection and 1 case with mild pneumonia. No operation mortality was noted.

Conclusion: LS with LTG or LPG for advanced AEG with neoCx is feasible and safe with good early results. LS is also benefit for those with peritoneal metastasis which was not detected before operation. Long term follow-up is necessary to evaluate oncological results as well as quality of life of these patients.
GE Junction Tumour II and III Management Protocol in a Tertiary Care Referral Centre in India.

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Introduction: Margin negative resection (R0 resection) is widely considered the most crucial requirement after resection of a GI, liver or pancreatic cancer. Adenocarcinoma of GE junction is classified as group of epithelial carcinomas arising from a zone 5 cm below or above the GE Junction and mandatorily involving the GE junction. Siewert classified adenocarcinomas arising from GE junctions into three categories based on endoscopic findings in relation to anatomic cardia. He advocated Extended Total Gastrectomy for II, III Tumours.

Materials and Methods: This is a retrospective and Prospective study of patients who underwent surgery for GE junction tumours between March 2014-March 2019. All consecutive patients undergoing Extended Total Gastrectomy for GE junction tumours in the above specified time period are included in the study. Total number of patients in the present study are 90. Major questions needed to be addressed were 1. What is the proximal margin positivity in GE junction tumours resected in our hospital? 2. Did the TNM stage of the disease have a bearing on such proximal margin positivity?

Results: Initially margin positivity was high (12 in 60 patients). As positivity was high, we changed the treatment plan to include neoadjuvant therapy with DCF regimen and included frozen section of all proximal margins. After this, in the remaining 30 patients only 3 patients had positive margins. Of 15 patients with margin positivity all the patients were T3-T4, N2-N3 disease.

Discussion: The Oesophageal margin shrinks longitudinally after resection and the in vivo measurement is much longer than in the resected specimen. The overall shrinkage for the whole specimen after fixation was about 50%. In the West, 5 cm in vivo proximal resection margin is the acceptable standard.

Conclusion: With the addition of neoadjuvant therapy and frozen section analysis of proximal margin, the rate of margin positivity reduced in patients with GE Junction II and III Adenocarcinomas.
A liver protective retraction technique providing a wider view of the operation field for laparoscopic proximal gastrectomy: Hepatic left lateral segment inverting method

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Introduction: In laparoscopic proximal gastrectomy, hepatic left lateral segment often obstructs the operation view especially around the esophageal hiatus. It’s completely exclusion and protective retraction is needed for safe procedure. So, we developed hepatic left lateral segment inverting method.

Methods: We performed a retrospective review of 81 consecutive patients who underwent laparoscopic proximal gastrectomy. The patients were divided into two groups; the Nathanson’s liver retractor group (n=41) and the hepatic left lateral segment inverting method group (n=40). We compared the perioperative liver enzyme change between the two groups. In the hepatic left lateral segment inverting method, the round ligament, the falciform ligament, the coronary ligament, the left coronary ligament, and the left triangular ligaments were resected. Next, the hepatic left lateral segment was inverted to the right direction and the hepatogastric ligament was divided along the hepatic left lateral segment to expose the Arantius duct. As a result of enough mobilization, the hepatic left lateral segment is completely inverted and such condition is maintained without retractor.

Results: The hepatic left lateral segment inverting method provided a satisfactory view of the working fields even during laparoscopic mediastinal manipulation via the esophageal hiatus. Significant differences were observed in perioperative changes of AST and ALT between two groups (AST, p =0.008; ALT, p =0.014). Postoperative change to baseline of AST and ALT on POD1, 2, 3, and 5 were significantly lower in the hepatic left lateral segment inverting method group than the Nathanson’s liver retractor group (AST, p =0, 0, 0, and 0.005; ALT, p =0, 0, 0, and 0.005).

Conclusion: The hepatic left lateral segment inverting method may be useful for laparoscopic proximal gastrectomy from a standpoint of not only better operative view but also liver protection.
3D Vision Application to Gastroscopy and Colonoscopy

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The Gastro Esophageal Reflux Disease (GERD) Center of Taiwan Yuan Sheng Hospital had utilized the MonoStereo® 3D endoscopic visualization system to perform gastroscopy and colonoscopy examinations and surgeries by which to observe the clinical practice (response) of the system from March to August 1st, 2019. The system which was invented by MedicalTek Co., Ltd had applied in gastroscopy and colonoscopy combined with polypectomy was completed 527 and 86 examinations separately. While performing the gastroscopy examination, MonoStereo® 3D endoscopic visualization system precisely calculates the depth and the distance of endoscope. The system can also reduce the touch to irrelevant area for preventing the pharyngeal reflex, and decrease the duration and discomfort of endoscopic examinations, especially the insertion of endoscope. The 3D imaging system also increase the detection rate of early manifestations of type 0-IIc and type 0-IIawithout any endoscope zoom-in manipulations. While performing polypectomy with snare, the 3D imaging system can provide more accurate depth and angle to reduce the duration of procedure, estimating the relative distances between surgical instruments and lesions efficaciously to insert biopsy clip or needle into accurate position for preventing additional mucosal injuries. The completion rate is 100% and there is no need to switch back to 2D image mode while applying 3D imaging system in examination and surgery. The surgeon did not suffer the dizziness, headache, nausea, diplopia nor blurred vision while using 3D imaging system during the procedures. Furthermore, the 3D system shows good efficacy and safety in ARMS (Anti-Reflux Mucosectomy), esophageal radiofrequency ablation, ESD (Endoscopic Submucosal Dissection) and Stretta procedure.
A saviour: CRE Balloon Retrieval of An Obstructed Oesophagus By “King of Fruits’ Seed.

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**Introduction:** Foreign body ingestion and food bolus impaction are encountered commonly in clinical practice. Such an obstruction in 90% of cases passes spontaneously, however about 10-20% requires endoscopic removal and 1% surgical intervention.

**Objectives:** To report the rare successful novel extraction technique of the object in an obstructed oesophagus endoscopically.

**Case presentation:** A 28 years old gentleman with no previous medical illness, alleged swallowing a durian seed and subsequently unable to swallow his saliva. Neck X-ray showed radio-opaque shadow at T1. Scope by ENT team showed yellowish foreign body seen in the oesophagus. Subsequently, patient subjected for gastroscopy noted durian seed impacted at upper oesophagus, just below cricopharyngeus. Attempted retrieval using various methods which was unsuccessful. CRE balloon was introduced through the endoscope and advanced beyond the durian seed and insufflated up to 15mm. The seed was retrieved successfully with the help of CRE balloon. Full endoscopic examination of the oesophagus and gastric were performed and noted pressure ulcer at the upper oesophagus due to durian impaction. Patient was discharged next day with proton pump inhibitor.

**Discussion:** Durian also known as “King of Fruits”, with an ovoid slippery surface seed popularly consumed in South East Asia. However, owing to the seed size could lead to detrimental airway interruption over few narrowing sites leading to asphyxia and succumb to death. There are only few literature reported to date in regards to CRE balloon retrieval of foreign body over upper gastrointestinal tract. This hydrostatic balloon has become an innovative maneuver that allows a control, secured intraluminal manipulation of foreign body.

**Conclusion:** Managing removal of ingested foreign body can be challenging one especially in cases where foreign body size equivalent to width of oesophagus. However, there are various endoscopic accessories could bring a success in its retrieval such as CRE balloon.
Early results of Totally Laparoscopic near total gastrectomy for gastric cancer management

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**Background:** Laparoscopic distal gastrectomy for gastric cancer has accepted and widely used all over the world. However, even experienced surgeons, totally laparoscopic near total gastrectomy for gastric cancer still suffered some challenges and controversies among surgeons around the world, although gaining strength in the several recent decades, especially in lymphadenectomy and reconstruction. In Viet Nam, there’re still no any research about totally laparoscopic near total gastrectomy and lymphadenectomy for gastric cancer, especially the middle third stomach tumors.

**Objectives:** To describe the results from the clinical and anatomopathological point of view and early results in totally laparoscopic near total gastrectomy and D2 lymphadenectomy for gastric cancer.

**Method:** This is a prospective study. Analyses data from patients submitted to totally laparoscopic near total gastrectomy and D2 lymphadenectomy. The data of 40 patients showed have been submitted to laparoscopic near total gastrectomy from Jan 2018 to May 2019. The clinical datas and surgical outcomes is evaluated.

**Results:** 40 patients underwent totally laparoscopic near total gastrectomy and D2 lymphadenectomy, the average operation time is 224,5 minutes (range, 150 to 360 minutes), the average anastomosis time is 32 minutes (range, 15 to 50 minutes), the average blood loss is 25,6 ml (range, 10 to 90ml). No case dued to any internal operating complication. There were no deaths, and morbidity rate was 4%, including one developed pneumo-pleural effusion, and one developed surgical site infection. The average hospital stay is 7,8 days (range, 5 to 14 days). No case dued to leakage of gastrojejunostomy and duodenal stump.

Conclusions: Laparoscopic near total gastrectomy for gastric cancer is safe, feasible. Furthermore, it is also reliable in patients with middle third, and even upper third gastric cancers, and could be routinely applied.
**Keyword:** Totally laparoscopic near total gastrectomy, gastric cancer, lymphadenectomy, subtotal gastrectomy, distal subtotal gastrectomy, subtotal gastrectomy with very small remnant stomach.
Safety and feasibility of robotic total gastrectomy for proximal gastric cancer: a retrospective cohort study

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**Introduction:** Since RG has been covered by national health insurance in Japan from April 2018, the number of robotic gastrectomy (RG) has been increasing. By using robotic approach for surgical treatment of gastric cancer, surgeons can perform lymph node dissection more precisely and meticulously. On the other hand, advantages of robotic total gastrectomy (RTG) for gastric cancer located in the upper third of the stomach still remain to be elucidated. The aim of this study is to evaluate the safety and feasibility of RTG for surgical treatment of gastric cancer located in the upper third of the stomach.

**Methods:** Among 128 cases of RG, we evaluated the short-term outcomes of the patients who underwent RTG (33 cases) in our institutions from 2012 to 2019. In detail, we retrospectively evaluated post-operative complications, amylase levels of drainage fluid (d-AMY), number of retrieved lymph nodes and post-operative hospital stay, using our prospectively maintained database.

**Results:** There were two (6.1%) postoperative complication of Clavien-Dindo classification Grade 3 in 33 RTG cases (pancreatic fistula and ileus). The median level of d-AMY was 385 IU/L. The average of lymph node retrieval numbers was 57. The median post-operative hospital stay was 13 days.

**Conclusion:** RTG for proximal gastric cancer was considered to be safe and feasible, despite the small number of patients and retrospective nature of this study. The results of sufficient retrieval number of lymph nodes and low d-AMY level suggested that endoscopic surgeons could perform sufficient lymphadenectomy with oncologic and surgical safety by using robotic approach.
Introduction: Successful treatment of fistula-in-ano is sometimes challenging, due to difficulty in the recognition of the internal opening and the course of the fistula tract. Although Goodsall’s rule was accepted in the past as a method to determine the course of the fistula, recent data have shown conflicting results. Therefore, this study was aimed to study and scrutinise the predictive accuracy of Goodsall’s rule.

Methods: A sample of 260 patients with simple fistulae were studied. Hydrogen peroxide was injected through the external opening and the appearance of air bubbling in the anal canal indicated the location of the internal opening. The morphological parameters including the site, the number of internal and external opening/s and the course of the tract were also recorded. Associations were established using Chi Square test.

Results: The median age of the participants was 39 (range :18-77) years. The majority (n=205,78.8%) were males. Of the study group, 33.8% (n=88) had inter-sphincteric fistulae, 49.6% (n=129) trans-sphincteric fistulae and 16.5% (n=43) superficial fistulae. The overall predictive accuracy of Goodsall’s rule in our patients (n=195) was 75%. High predictive accuracy was noted in superficial fistulae (n=41/43, 95.3%) and inter-sphincteric fistulae (n=72/88, 81.8%) compared to transphincteric fistulae (n=82/129, 63.6%). The difference observed was statistically significant (p<0.001).

Conclusion: Although Goodsall’s rule was not accurate in 25% of all fistulae, it can still be used as a guide in locating the path of the tract and the internal opening in the majority of simple fistulae. However, since 1 in 4 fistulae did not comply with Goodsall’s rule, surgeons should take precautions not to miss any unusual variations.
Appendectomy-open versus laparoscopic, 02 years experience.

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**Background:** Appendectomy is a very common surgery performing in every country. Most of the cases it is performed by open approach. But now a days laparoscopic Appendectomy is gaining popularity due to its beneficial results and acceptance by the patients. Aim of our study is to asses and compare role of laparoscopic Appendectomy with open appendectomy in acute or recurrent acute appendicitis.

**Methods:** Total 150 cases were studied post operatively. We have divided the patients as 50 patients in group A (laparoscopic appendectomy) and 100 patients in group B (open appendectomy). Two groups were compared in respect of operating time, length of hospital stay, post-operative pain and nausea, complication rate and time to return to normal activity.

**Results:** The study includes 150 cases. Mean age in group A was 28.14 years and in group B was 25.19 years. Timing of operation varies on the basis of position of Appendix, surrounding adhesions etc. The average operating timing was more in open appendectomy (33.05 min) as compared to the time taken in performing Laparoscopic appendectomy (28.15). Duration of hospital stay was 1.3 days shorter in laparoscopic appendectomy group then open appendectomy group. Less complication in laparoscopic appendectomy group.

**Conclusion:** Our study concludes that Laparoscopic appendectomy is safe, simple and effective technique in comparison to open appendectomy. Laparoscopic appendectomy helps patient for early return to heavy activities and less requirement of post-operative analgesia.
Laparoscopic hepatectomy was explored to remove the lesions located in the left or anterior hepatic segment. However since 10 years ago, the indication was dramatically expanded regardless of benign or malignant lesions, size and location of the tumor by enthusiastic HBP surgeons in every institution in the world. There have been two main obstacles. One of the obstacles to overcome for safe surgery was control of the bleeding during dissection to mobilize of the liver and hepatic transection, another is oncologic safety. Prevention of major bleeding from hepatic artery, portal or hepatic vein is crucial for successful outcome for the laparoscopic major hepatectomy. Bleeding from the portal vein or hepatic artery can be controlled by hepatic vascular inflow occlusion (Pringle maneuver) whether for open or laparoscopic approach. The duration or interval of the clamping was established very well. Intermittent clamping, 15 minutes clamping and 5 minutes reperfusion, is very safe up to 322 minutes for the patient who has normal liver function, and it is applicable to cirrhotic liver. However, bleeding from the major hepatic vein tearing may be disastrous during laparoscopy, while it can be controlled by compression with sponge gauze and suture repair during open hepatectomy. While it can be controlled by traction longitudinally closed with shutting the opened hole by, and the bleeding hole can be sutured. If there is bleeding unable to control within minutes, it should not be reserved to convert to open surgery for safety of the patient.
Conversion of Laparoscopic Cholecystectomy to Open Cholecystectomy, A personal experience

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Background: Laparoscopic Cholecystectomy (LC) has become the gold standard treatment for gallstone disease. However some laparoscopic cholecystectomies need to be converted into an open cholecystectomy for various reasons. Three cases which were converted to open cholecystectomy were recorded and studied.

Methods: The study was done on 50 patients with symptomatic cholelithiasis. Elective laparoscopic cholecystectomy were performed in all cases. Demographic study, detail procedures, outcome and complications were recorded. This study was carried out in Surgical Ward, Yangon General Hospital from January 2017 to April 2019

Results: The mean age of study population is 50 years. Male to female ratio is 1:4. Out of 50 patients, 3 patients (6%) required conversion to open cholecystectomy. Among them 1 patient was female with Diabetic Mellitus and history of repeated attacks of abdominal pain and found to have fibrosed and contracted gall bladder. Another patient was also female and had a history of previous operation with LSCS scar and dense adhesions. Calot’s triangle could not be identified after careful dissection. The third patient was male and had history of repeated attacks of abdominal pain and found to have dense adhesions during surgery. Preoperative USG also revealed very much thickened gallbladder.

Conclusion: Careful history taking and clinical examination plus thorough pre-op investigations can help predict difficult laparoscopic cholecystectomy and likelihood of conversion of laparoscopic cholecystectomy to open surgery. Further study involving greater number of samples may be able to identify the predictors of difficult cholecystectomy and likelihood of conversion.
Single-incision Laparoscopic Treatment for Mirizzi Syndrome McSherry Type II: A Retrospective Study of Ten Consecutive Patients.

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**Introductions:** We have presented our technique of laparoscopic transfistulous bile duct exploration (LTBDE) for Mirizzi syndrome McSherry type II in a recent study. Herein we report our first ten cases of single-incision LTBDE (SILTBDE).

**Methods:** Ten consecutive patients underwent SILTBDE for Mirizzi syndrome McSherry type II by a single surgeon in a period of 78 months. Transfistulous removal of the impacted stone(s) followed by primary closure of the gallbladder remnant was performed in all the patients except one, in whom an additional choledochotomy on the common hepatic duct was required for stone clearance. No bile duct drainage was necessary.

**Results:** Four patients (40%) had their diagnoses of Mirizzi syndrome established by preoperative imaging, while others (60%) were confirmed during the operations. The operative time was 264.3 ± 64.9 min (156-358 min) with an estimated blood loss of 71.2 ± 121.4 mL (2-300 mL). The stone clearance rate was 100%. The postoperative and total length of hospital stays were 3.9 ± 1.2 (2-5) days and 6.6 ± 2.8 (3-13) days, respectively. Eight procedures (80%) were accomplished as single-incision laparoscopic approaches, while no procedure was converted to an open operation. There were two postoperative transient hyperamylasemiae (20%) and one superficial wound infection (10%) in this series; all were treated conservatively (Clavien-Dindo grade I). During the average 10.4-month follow-up period, no biliary stricture or stone recurrence was identified.

**Conclusions:** SILTBDE is safe and efficacious for Mirizzi syndrome McSherry type II by experienced laparoscopic surgeons. Long-term follow-up is mandatory.

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Introduction: Obstructive jaundice secondary to choledocholithases is treated either via endoscopic retrograde cholangiopancreatography (ERCP) with or without surgery, or by open cholecystectomy with common bile duct (CBD) exploration. However, ERCP-capable institutions are limited in the Philippines, and the advent of minimally-invasive surgery has lessened the indispensability of open surgery. Choledochoscopic extraction of common bile duct stones is a relatively novel technique in stone retrieval while likewise facilitating gall bladder removal.

Methods: A total of thirty-seven (N=37) patients who underwent procedures for choledocholithases from January 1, 2015 to July 31, 2017 were gathered. Twenty-two (n=22) underwent choledochoscopy, fourteen (n=14) underwent open cholecystectomy with CBD exploration, and one (n=1) underwent ERCP followed by laparoscopic cholecystectomy. Several parameters were measured, namely hospital stay, resumption of diet, operative time, presence of retained stones, complications and mortalities. Age and sex was heterogeneously distributed in all groups.

Results: Statistical significance was present in 2 parameters, namely immediate post-operative complications and operative time. There was likewise presence of retained stones in two patients who underwent open CBD exploration, however, it is not statistically significant. There was no significant difference in total hospital stay as well as in resumption of diet. There were two mortalities noted in the open surgery group.

Conclusion: Choledochoscopic extraction of CBD stones has been demonstrated as comparable, safe and clinically beneficial procedure compared to the standard therapies which are ERCP, and open CBD exploration, particularly in institutions which are not ERCP-capable but with complete amenities for minimally invasive surgery.
Laparoscopic Cholecystectomy in patients with Portal Cavernoma: Is it safe?

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**Introduction:** Portal Cavernoma is associated with the network of collateral vessels around the portal vein. It is typical of chronic portal vein thrombosis (PVT) with or without portal hypertension. There are few reports of Laparoscopic cholecystectomy in patients with Extra hepatic portal venous obstruction associated with portal cavernoma. Laparoscopic Cholecystectomy was considered as a contraindication in portal cavernoma patients in view of difficult dissection and risk of bleeding. But with growing experience and improved maneuver ability and haemostasis, laparoscopy is possible in such cases. We describe our experience with Laparoscopic Cholecystectomy in a case series of six patients with Symptomatic Cholelithiasis associated with portal cavernoma.

**Methods:** A retrospective observational study of six patients of Cholelithiasis associated with portal cavernoma was performed from May 2014 to August 2018. Indication of surgery was symptomatic gallstone disease. In four of the patient pre-operative diagnosis of portal cavernoma was established using imaging techniques. Other two patients were diagnosed to have portal cavernoma incidentally during the surgery.

**Result:** Laparoscopic Cholecystectomy was successfully performed in five patients. EndoGI stapler was used in two of the patients for division of cystic duct. Fundus first approach was employed in one patient. However, one patient was converted to open due to Emphyema, dense adhesions and inadvertent bleeding.

**Conclusion:** Laparoscopic Cholecystectomy is a safe procedure in Symptomatic Cholelithiasis with Portal Cavernoma patients in experienced hands with careful and cautious dissection techniques.
3D Laparoscopic Liver Resection is Safe and Feasible

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**Background:** Since its inception, laparoscopic surgery is ubiquitous in clinical practice. The new generation three-dimensional (3D) laparoscopic system reputedly combines the benefits of traditional laparoscopic surgery with improved quality of vision and depth perception. Whilst it is known that 3D laparoscopic hepatectomy increases surgical performance under laboratory conditions, it remains unclear whether it improves outcomes in clinical practice. We report case series 3D laparoscopy hepatectomy.

**Materials and Method:** We report 16 patients who underwent 3D laparoscopic hepatectomy February 2017 to July 2019. Clinical profile of patients, intra-operative details and operative outcome were reported.

**Results:** Mean age of patients was 57.4 (Range 31-78) years and 9 patients (56.25%) were male. The indications for surgery were Hepatocellular Carcinoma 43.8% (n=7), Intrahepatic Cholangiocarcinoma 12.5% (n=2), Liver Metastasis from Colonic Adenocarcinoma 18.8% (n=3), Liver Metastasis from Nasopharyngeal Carcinoma 6.3% (n=1) and hepatic adenoma 18.8% (n=3). Median operative time was 183.4 (Range 56-339) minutes. Median operative blood loss was 265.6 (Range 50 - 900) milliliters. Mean length of hospital stay post-operatively was 4.2 days (Range 3 - 7 days). There was no open conversion, bile leak and liver failure post-operatively. There was no mortality.

**Conclusion:** 3D laparoscopic hepatectomy is safe and feasible.
Early vs delayed cholecystectomy for acute cholecystitis. Where to go?

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Acute cholecystitis is a frequent surgical problem worldwide that can result in to life threatening complications leading to significant morbidities and mortality. Laparoscopic cholecystectomy (LC) is the gold standard operation for symptomatic or complicated Gallbladder stone. The debate continues worldwide regarding laparoscopic cholecystectomy for acute cholecystitis with either early or delayed. There are multiple factors contributing to this decision. Many RCTs and meta-analysis have shown clinical outcomes to favor early LC with significant shorter total length of hospital stay compared with delayed LC. Also, there is confusion in the optimal timing for early LC with definitions of early varying from 3 to 7 days. Risk stratification might be used to support the decision for early vs delayed LC in certain situations. There are alternative strategies to manage patients with acute cholecystitis when early LC considered high risk with significant mortality. This topic reviews the literature that have investigated the outcomes of early versus delayed LC including mortality rates, complication rates, length of hospital stay and conversion rates to open procedures.
Portomesenteric and splenic vein thrombosis after laparoscopic sleeve gastrectomy; Review of literature and experience from Oman

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Aim of the study: To spot the light on the rate of Portomesenteric and splenic vein thrombosis after laparoscopic sleeve gastrectomy during the period from 2012-2019 in Oman. Methods: This is a retrospective study on patient underwent SG at Royal hospital in Oman and presented to us with portomesenteric and splenic vein thrombosis. The number of patients included in this study was 465 patients operated from 2012-2018. Patients preoperative data were collected including (patient’s demographics, any associated comorbidities, any other risk factors for thrombosis). At presentation, the clinical features including (presenting symptoms, all labs and radiological investigations) were collected. Results: Our study was conducted on 465 patients underwent Lap. SG in a period from 2012-2018. Out of these patients underwent LSG we found that 3 patients had PMVT with an incidence of 0.7%. All patients managed medically and 1 of them required laparoscopic exploration followed by laparotomy for limited bowel ischaemia and underwent bowel resection anastomosis. Follow up of all cases was good with no mortality. Conclusion: Though there is no specific prophylaxis concerning portomesenteric and splenic vein thrombosis, we propose the application of standard thromboembolic prophylaxis including mechanical prophylaxis, pre and postoperative heparinization to all patients which continue for 5-10 days postoperatively, applying ERAS principles, all helped in decreasing the rate of PMVT incidence. We lack full investigations and studies to determine other risk factors for thrombosis and still the question is with all these measures PMVT can be prevented totally or not?
Torsion of gallbladder

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Torsion of gallbladder can mimic symptoms of acute cholecystitis and be definitely diagnosed intraoperatively either during open or laparoscopic procedure. In my institute, we recently experienced a case of this condition and completed the operation with laparoscopy. Therefore, we would like to demonstrate the video about clinical pictures of this condition and how we perform the procedure.

Video Link:

https://drive.google.com/file/d/1xxVrknsHDKmejhuQL2EZnW3ghW3eK/view?usp=sharing
Step approach, laparoscopic pancreaticoduodenectomy in resection phase

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**Background:** laparoscopic pancreaticoduodenectomy (LPD) now been established as safe and feasible when performed by experience hepatobiliary surgeons in high-volume centers. Surgeons have to deal with bleeding from vascular around pancreas so that advance laparoscopic skill and knowledge of vascular variation was required. Because of long operation time, well plan surgery in each step such as detail of procedure in each position of surgeons, surgical technique for vascular control and lymph node dissection seem very essential.

**Material and methods:** This video were demonstration how to perform LPD in resection phase in patient with ampullary cancer

**Result:** Patient was good recovery with operative time 8 hours, estimate blood loss 150 cc. with no complication. Patient was discharge at post-operative day 12.

**Conclusion:** LPD was safe and feasible. Take down hepatic flexor colon is facilitated to dissection at Trunk of Henle. SMA and SMV were identified and dissection by medial uncinate approach combine with intestinal derotation technique. Bleeding control by clip with bipolar device was excellence.

**Video Link:**

https://drive.google.com/file/d/1jl5mDeQxMmMIvpZYBVkzh7xagJKtax2v/view?usp=sharing
Short-term outcomes of laparoscopic bariatric surgery by an experienced gastric surgeon

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**Background:** National insurance program decide to cover bariatric surgery in Korea this year. Due to the relative small population of morbid obese patients and the absence of national insurance, it was not performed enough in Korea. We report initial short-term outcomes of bariatric surgery perfomed by an experienced laparoscopic gastric surgeon.

**Method:** Before national insurance coverage, a few cases were performed rarely from 2012. We retrospectively compared 6 patients between 2012 and 2014 (group A), and 17 patients in this year (group B). We performed laparoscopic sleeve or Roux-en Y gastric bypass surgery (RYGB) decided by the surgeon’s decision and preoperative patient’s comorbid conditions.

**Results:** In general characteristics, group A were all females (n = 6), but group B included 11 males (64.7%) and 6 females (35.3%). For operative procedures, laparoscopic sleeve gastrectomy was performed in 5 (83.3%) and RYGB in 1 case (16.7%) in group A and laparoscopic sleeve gastrectomy was performed in 12 (70.6%) and RYGB in 5 (29.4%, including resection RYGB, 3 cases) in group B. In short-term outcomes, median hospital stay was 3.0 and 5.0 days (p = 0.004). There was no complication in both groups. Median weight loss was 11.6% and 10.3% (p = 0.155) in 1 month, 22.7% and 19.0 in 3 months. Excessive weight loss was 48.8% and 39.9% (p = 0.533) in 1 month and 50.2% and 34.9% in 3 months (p = 0.489).

**Conclusion:** Laparoscopic bariatric surgery gave on the rise and feasible for experienced laparoscopic gastric surgeon in Korea. Long-term outcomes and improvments of comorbid conditions are expected for these patients in our country.
Laparoscopic Sleeve Gastrectomy (LSG) For Patients Aged More Than 60 years

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Introduction: Obesity is accelerating in both elderly and children and it's known to decrease quality of life causing multiple life threatening comorbidities, according to the (WHO), the worldwide prevalence of obesity nearly tripled between 1975 and 2016. Bariatric surgery is one of the most effective treatment modalities for morbidly obese patients and proved to be superior to medical treatment. There is lack of data and studies in the elderly population especially in the Arab gulf. In our study, we aim to prove that LSG is safe for patients older than 60 years.

Methodology: Retrospective study that included data from all patients who have medical files at KSUMC from year 2011-2017 and done primary laparoscopic sleeve gastrectomy at the surgical center of obesity and research, King Saud University Medical City, Riyadh, Saudi Arabia. Patients undergone redo-surgeries and didn’t present with any comorbidities were excluded. Results were compared to existing matched data with patients of younger age.

Discussion\ Results: There was a total of 56 patients, 27 Patients <60 and 29 Patients >60 with a mean BMI of 39.5 kg\m2. Proportion of comorbidities in the older population was higher compared to younger population. Comorbidities resolution were found to be significantly higher at the last patient follow-up in both populations. All patients in the elderly population resolved from OSA at one year follow up (100%) and higher resolution rate in dyslipidemia and back pain was in the younger population. Only 1 complication of bleeding in the elderly group happened which was managed conservatively. EWL% at 1 year was above 50% in both groups. Mean LOS was longer in the elderly population compared to the younger population.

Conclusion: Our results can be used to promote the safety of laparoscopic sleeve gastrectomy in the elderly population as opposed to many previous studies that discouraged it.
Tips for concomitant cholecystectomy during bariatric surgery without additional trocar insertion

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**Introductions:** With growing number of patients treating morbid obesity with surgery, rate of performing concomitant cholecystectomy (CC) is also increasing. To perform conventional cholecystectomy, surgeons usually need to insert additional trocar, especially epigastrium. Considering the aspect of cosmetic and cost-effectiveness while maintaining surgical safety, we have been performed CC during bariatric procedure without additional trocar insertion.

**Methods:** From May to July 2019, we performed 4 cases of CC in morbidly obese patients who had gallstone, polyp or fundal adenomyomatosis on preoperative imaging work-up. 1 patient had Laparoscopic Roux-en-Y gastric bypass (LRYGB), and 3 patients had Laparoscopic sleeve gastrectomy (LSG). For LRYGB, 5 trocars were inserted and for LSG 4 trocars were inserted as same manner for bariatric procedure only.

**Results:** One patient was male, and other were female. All patients underwent CC without additional trocar insertion. Mean operating time for CC was 23 minutes and there was no postoperative complications. In 1 case, there was gallbladder perforation and cystic artery bleeding during the surgery, but was managed without any additional procedures. Mean hospital stay was 5.75 days (6, 7, 5, and 5, respectively) and patients were discharged at postoperative day 3 or 4.

**Conclusions:** Concomitant cholecystectomy during bariatric surgery without additional trocar insertion is feasible. Not only considering the number of trocar itself, but also the cosmetic effect for patient is worthwhile to perform.
Comparison of Handsewn versus Linear Stapled versus Circular Stapled Techniques for Gastric Pouch-Jejunal Anastamosis in Laparoscopic Roux-en-Y Gastric Bypass for Morbidly Obese Patients in a Singapore Institution

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Introduction: We aim to compare three methods of gastric pouch-jejunal (GPJ) anastomosis in our study: Handsewn, circular and linear stapled anastomosis. Outcome measures include operative factors, postoperative complications, excess weight loss (%EWL) and glycemic control at one year.

Methods: Retrospective review of patients who underwent laparoscopic Roux-en-Y gastric bypass (RYGB) from January 2012 to 2015 was conducted using a prospectively collected database.

Results: Among 134 subjects, 72 (53.7%) were in the linear stapler group, 20 (14.9%) in the circular stapler group and 42 (31.3%) in the handsewn group. Mean age, BMI, gender and co-morbidities were comparable for all three groups. The mean (SD) total operative time was shortest for the linear stapler group 170 (79) minutes as compared to 185 (103) minutes in handsewn and 214 (63.8) minutes in the circular stapler groups (p=0.05). GPJ anastomosis with circular stapler was associated with higher leak rates than linear stapler and handsewn groups (p=0.015). Stricture rates, anastomotic ulcers and postoperative haemorrhage were comparable between the groups. The length of stay were comparable between all three groups (p>0.05). At 6 months postoperatively, %EWL was comparable between the three groups. At one-year postoperatively, handsewn group had the greatest %EWL and Hba1C reduction as compared to the linear and circular groups, (p= 0.05 and p= 0.08).

Conclusion: Handsewn and linear GPJ anastomosis in RYGB are superior in terms of lower leak rates and shorter operative times. The handsewn group was associated with the most %EWL and HbA1c reduction at one-year post surgery.
Sleeve with proximal jejunal bypass

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BACKGROUND: new procedures in bariatric surgery are getting popularity like MGB, SADI, etc. sleeve with proximal jejunal bypass is also gaining grounds.

AIM: to study the outcome of sleeve with PJB in terms of weight loss, DM remission and HTN control.

METHOD: this case series was conducted at department of surgery Jinnah Hospital Lahore, from July 2018 to June 2019. six cases were operated by me and short term follow-up was done.

RESULTS: we found that sleeve with PJB has comparable short term weight loss, DM & HTN remission.

CONCLUSION: this study shows that sleeve with PJB is a good procedure with comparable short term outcome.KEYWORD: sleeve with PJB, DM remission, MGB, weight loss, HTN remission
Purpose: Recently, various types of laparoscopic instruments have been developed. We would like to introduce an articulating laparoscopic instrument that operates like a robotic instrument.

Methods and Results: We performed several laparoscopic surgeries such as single incision appendectomy, cholecystectomy, gastrectomy, and laparoscopic multiport donor nephrectomy using an articulating laparoscopic instrument. Operative details were not significantly different between conventional and articulating instruments. However, the articulating laparoscopic instrument was very useful for difficult situations that could not be reached using conventional laparoscopic instruments due to their limited direction and interaction between instruments.

Conclusions: The articulating laparoscopic instrument is very useful for especially single port laparoscopic surgery and some difficult situations.
Utility of a novel grasper with aspiration hole on the tip to decrease surgical smoke in laparoscopic surgery.

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**Background:** Surgical smoke or mist might be a one of major concern in laparoscopic surgery. The smoke may contain toxic gases and biological or viral products from tissue destruction. Moreover, it induces poor visibility, delay the procedure to clear the smoke, and difficulty of closer approach during activating of energy devices. We report utility of a new style forceps which has hole on the tip to suction surgical smoke and intra-abdominal fluid.

**Novel product:** Dolphin (Hope-denshi co., Japan) has been developed as a laparoscopic gripping forceps with aspiration hole on the tip. This new grasper has a hollow through the entire length with a diameter of 2.5mm in the body diameter of 5mm. However, it remains high rigidity and keeps the function of atraumatic grasper. It allows to catch tissues firmly and/or delicately. After connecting an exhaust tube to the grasper, we can choose the way to evacuation of surgical smoke; to use a foot-operated pedal, or an attached button on the handle. Either to close or open the grasper, surgical smoke can be evacuated immediately from the producing point before the smoke reaches the lens of laparoscope. Moreover, when the grasper is close, some intra-abdominal exudate and blood can be easily aspirated from the hole on the tip without a change of other forceps. It makes not only to keep operative field dry and clean but also to reduce the time. Especially it might be made so effective elimination of smoke and exudate in a misty situation at a narrow space, for example, in a deep pelvic rectal surgery after preoperative chemo-radiotherapy.

**Conclusions:** To reduce surgical smoke and keep surgical field clean, we demonstrate a novel useful grasper with aspiration hole on the tip in a video presentation.
Hybrid Resection of Intragastric Gastrointestinal Stroma Tumour (GIST).

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Gastrointestinal stromal tumour (GIST) is the most common mesenchymal tumour involving the gastrointestinal tract. Local excision with a tumour free surgical margin is the standard treatment. To minimize surgical trauma, a hybrid procedure has developed, named the endo-laparoscopic approach. A 45-year-old male had gastroscopy done for dyspepsia with incidental findings of a submucosal gastric lesion of 20x25mm at the gastric cardia which is 1cm distal to the cardioesophageal junction (COJ). An enhanced computed tomography (CT) thorax supported the diagnosis of submucosal tumour at gastric cardia. Hybrid endo-laparoscopic GIST resection was performed. A 10mm video port was applied through infraumbilical incision via Hassan's technique and pneumoperitoneum was created with CO2 insufflation. Assistant performed gastroscopy simultaneously to inflate the gastric to facilitate the insertion of intragastric balloon working ports. subsequently the 10mm camera port was advanced into gastric. The submucosal tumour was identified by endoscopic as well as laparoscopic view. It was resected using endostaplers. the resected specimen retrieved transorally using endoscopic grasper. The gastric port incisions were approximated with intracorporeal sutureinterruptedly. The operative time was 90 minutes with minimal blood loss. Patient was allowed nourishing fluids 12 hours post operation. Histopathology examination confirmed it was a GIST with low risk of malignancy. Patient was followed up with gastroscopy 2 months later which showed staple line intact with no residual disease. Hybrid (endo-laparoscopic) resection of intragastric GIST with endostapling technique is a well-establish procedure which minimize the risk of tumour seeding in the case of iatrogenic GIST capsule ruptured.
e-TEP versus TEP for inguinal hernia repair.

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**Background:** Hernia is the abnormal exit of an organ or fatty tissue such as the bowel, through the wall of the cavity in which it normally resides. Treatment includes pure tissue repairs to prosthetic repairs under open or laparoscopic approach. Now a days, minimal invassive surgery for hernia repair is accepted by every corner of the world. TEP & e-TEP are excellent laparoscopic approach for inguinal hernia repair. In our centre we performed both of the procedures. In technical aspects e-TEP is better approachable than TEP.

**Methods:** It is a non-randomized comparative study. The study consists of patients with laparoscopic hernioplasty during the period of one year (from July 2018 to July 2019). Total 20 cases were included in the study (10 cases of e-TEP and 10 cases TEP). Data were collected by follow up visit and questionnaire.

**Results:** The study includes 20 patients among which 10 were placed in group A (e-TEP Group) and 10 cases were placed in group B (TEP group). Mean operating time in group A was 108.5 min while in group B was 114 min. Pain scoring in group A was less with 75% patients giving score 1-2 (mild pain). All are male. Mean age for e-TEP was 26.5 yrs & for TEP was 35.6 yrs.

**Conclusion:** Inguinal hernia repair is one of the most frequently performed general surgery procedure. Laparoscopic extra peritoneal mesh is safe and efficacious. e-TEP is the modification of classical TEP approach. It is easier to master than classic TEP method.
Background: Umbilical and paraumbilical hernia are common surgical problem. Conventional open surgical repair is replaced mostly by laparoscopic prosthetic repair due to its beneficial effects like less post-operative pain, shorter hospital stays, early return to heavy activities. Though sometimes debate regarding optimal surgical approach, most of the cases laparoscopic approach is proved with good outcome. Aim of our study is to compare a short-term outcome following laparoscopic versus open repair of umbilical and paraumbilical hernia.

Methods: It is a prospective comparative study between 2017 to 2018. We have divided 30 patients into group A (laparoscopic) and group B (open group). Both groups were compared in respect of duration of surgery, use of drains, complications like wound infection, seroma and hematoma, return to normal activities, duration of hospital stay.

Result: Total 30 patients were included in the study. In group A 12 patients underwent laparoscopic repair and in group B 18 patients underwent open repair (12 patients underwent primary suture repair and 6 patients underwent mesh repair). Hernia size were considered in repair technique. Hernia size were similar in laparoscopic and open mesh repair group and both were larger than open primary suture repair group. Group B in comparison to group A had longer operating time, more frequent use of drains, higher complications rate and prolong time to return to normal activities. Lower recurrence rate in laparoscopic group.

Conclusion: Laparoscopic umbilical and paraumbilical hernia repair is technically safe, effective and feasible with a better clinical outcome. Though the cost in laparoscopic repair is higher than open repair but in respect of beneficial effect it is mostly accepted by the patients.
Open versus Laparoscopic inguinal hernia repair in Combined Military Hospital-Study period 2016 to 2018.

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Background: Hernia is the abnormal exit of an organ or fatty tissue such as the bowel, through the wall of the cavity in which it normally resides. Repair of inguinal hernia is one of the commonest operations performed by surgeons around the world. Treatment includes pure tissue repairs to prosthetic repairs under open or laparoscopic approach. Though so many options are available but none is superior to others. Aim of the study is to compare the effectiveness of laparoscopic hernia repair with open hernia repair.

Methods: It is non-randomized comparative study. The study consists of 100 cases (30 cases of laparoscopic hernioplasty & 70 cases of open hernioplasty) whose were performed in the department of general surgery unit during the period of 2016 to 2018. Data were collected by follow up visit and questionnaire.

Results: The study includes 100 patients among which 30 cases were placed in group A (laparoscopic group) 70 cases were in group B (open group). Mean operating time in group A was 103.67 min and in group B was 55.5 min. Pain scoring was less in group A with 75% patients giving score 1-2 (mild pain). 4 patients having discomforting pain.

Conclusions: Inguinal hernia repair is one of the most frequently performed general surgery procedures. Because of the large socio-economic impact of inguinal hernia repair, it is the responsibility of the surgeon to consider the most advantageous approach in each given situation. Laparoscopic pre peritoneal mesh repair for inguinal hernia is safe and efficacious and offer definitive advantages over open mesh repair and should be an available option for all patients requiring elective hernioplasty.
Treatment of laparoscopic inguinal hernias using 3D prostheses gives less pain after surgery: prospective study about 400 patients

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3D prosthesis use in the treatment of inguinal hernias by laparoscopy gives less postoperative pain, this is a prospective study concerning the use of non-fixation 3d prostheses in the treatment of laparoscopic inguinal hernias in 400 patients, our results are excellent especially in postoperative chronic pain and postoperative recovery.
Comparison of using phasix, soft mesh or optilene meshes in Laparoscopic inguinal hernia repair with stander mesh size of 15cmx15cm.

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Background: An inguinal hernia is common and account for 75% of all abdominal wall hernias. The lifetime risk of inguinal hernia is 27% in men and 3% in women, therefore it considers one of the most common operations in general surgery. Laparoscopic inguinal hernia repair originated in the early 1990s and showed comparable outcome to open repair.

Objective: To evaluate the use deferent types of mesh in Laparoscopic Trans Abdominal PeriPeritoneal inguinal hernia repair for the recurrence rate, post-operative complications and chronic pain.

Methods: This is a retrospective cohort study that involved all patients who underwent Laparoscopic Trans Abdominal PeriPeritoneal inguinal hernia repair at King Khalid University Hospital under one surgeon from January 2016 till July 2019. It included 58 patients were evaluated for the risk factors of recurrence and complications. After that, we compared the outcomes among different types of mesh, which are phasix, soft mesh, and optilene. We use the stander mesh size of 15 cm x15 cm with advice to avoid prostration and docking for one-year post operatively.

Result: A total of 59 patients were included. Our result showed there is no recurrence of hernia among all the patients. Also, there is no significant difference between the different types of meshes in term of seroma formation, wound infection or chronic pain in two years follow up.

Conclusion: The technique with the size of mesh 15cmx15cm and avoiding severe stress on the repair may be the factors will decrease the recurrence and complications of hernia repair.
Double Mesh Repair in Huge Abdominal Musculoskeletal defect.

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Background: Incisional hernia refers to a hernia developed at the same site of previous abdominal surgery. It is considered one of the most common complications after abdominal surgery. Different techniques have been used for incisional hernia repair. In this case report, we adopted the two-mesh technique for a huge incisional hernia with big muscular defect.

Method: A case of incisional hernia with multiple abdominal wall defects (Midline defect 5.4 cm, RT defect 1.1 cm, LT defect 3.4 cm), which were repaired using two-mesh technique Phasix and Ventralight (one absorbable and one non-absorbable) rather than component separation.

Result: 78 Y/O Gentleman, K/C of HTN. Status Post Exploratory Laparotomy + Diversion Colostomy Due to Sharpnel Injury from Missile Attack On 2015. Presented to the Clinic with Incisional Hernia On 2017 (HT: 158 cm, WT: 92 kgs BMI: 31). First OPD visit, He was doing well, no active complain. Clips were removed and given 1-month F/U. Second OPD visit, he was complaining of constipation, moderate abdominal pain and swelling along the midline. Urgent CT Abdomen with Double Contrast Was Ordered To R/O Bowel Obstruction And Assess The Mesh. Third OPD visit, the patient was doing fine, no active complain. The swelling reduced. Fourth OPD visit, F/U CT abdomen showed “Decreased in size of the previously seen anterior abdominal wall subcutaneous fluid collection 11x 6 x 16 cm”.

Conclusion: The repair of huge abdominal defect is the component separation technique. However, this technique is more invasive with a risk of neurovascular damage which maybe the cause of recurrence. We highlight the use of the two-mesh technique in different layers fixed to the peritoneal and fascial side of the abdomen using on absorbable and one non-absorbable mesh. Further studies are needed to answer this question and merit of two-mesh technique.
When patients can prostrate or dock post laparoscopic repair of hernia?


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Objectives: In this article review, we aim to look for the most important and common factors associated with hernia recurrence post hernia repair. In addition to assessing the ways of measuring intra-abdominal pressure in healthy individuals. In our center, we advise the patients to pray on a chair to avoid prostration. Fortunately, we have not encountered any recurrence in a follow-up period of two years.

Methods: To do electronic searches for already published articles, to identify prospective studies that demonstrated factors associated with hernia recurrence post hernia repair. In addition to reviewing the ways of measuring intra-abdominal pressure in healthy individuals. We advise the patient to avoid docking and prostrating for 1 year post-operatively.

Results: Results showed that we have not encountered any recurrence in a follow-up period of two years for patients who underwent inguinal and ventral laparoscopic hernia repairs (70 inguinal and 78 patients with ventral).

Conclusion: The results are encouraging, however prospective studies to avoid docking and prostrating with a control group and follow up after five years will answer the question.
Strategy of laparoscopic repair for recurrent inguinal hernia after usage of mesh.

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**Purpose:** Radical surgery for recurrence after inguinal hernia surgery is difficult due to the effect of modification by the previous surgery, especially in the case of recurrence using mesh, the point is how to deal with the firmly adhered site. We discuss and report the possibility and points of endoscopic radical surgery for recurrent inguinal hernia using mesh in the previous operation.

**Materials:** A total of 26 patients who underwent laparoscopic hernia repair for recurrent cases of transvaginal hernia using mesh. Of the 26 cases, there were 13 cases of plug mesh recurrence, 15 cases of Kugel method recurrence, 1 case of recurrence of UHS method, 2 cases of recurrence of TAPP method, and 5 cases of recurrence after multiple operations.

**Results:** Most cases of recurrence with plug mesh method were recurrence of internal vaginal hernia, and if treatment around the inner inguinal ring was successful, repair by TAPP was a good indication. Recurrent cases with retroperitoneal modification such as Kugel method and TAPP method had both recurrence of external and internal vaginal hernia. The previous mesh handling was the point, and it was possible to repair with the impression that the parts missing in the previous mesh were replenished well. However, it is often difficult to close the peritoneum, so it needs to be devised.

**Conclusion:** Laparoscopic repair for recurrent inguinal hernias is useful because it can be repaired at the same time as observation and can be done according to the case. However, it is necessary to devise and deal with the situation.
Long-Term Outcome of a New Anatomical Mesh for Endo-Laparoscopic Inguinal Hernia Repair.

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**Introduction:** Laparoscopic repair for inguinal hernia with usage of biomaterials has improved surgical outcome. Hernia recurrence is not the only parameter to be considered, other variables like mesh infection, duration of hospital stay and post op pain are also needed to be considered for a successful surgery. New anatomical mesh which don’t need fixation is a new concept, which may subsequently decrease incidence of post op complications.

**Aim:** To verify the safety, feasibility and long-term outcome of a new anatomical mesh.

**Method:** We recruited 12 male patients with 20 inguinal hernias between the periods of Feb 2018 to Jan 2019. All of these patients underwent laparoscopic inguinal hernia repair with the new 3D anatomical mesh. Postoperatively, all patients received standardized post-operative care and analgesics.

**Results:** Our study favors TEP repair which took shorter time as compared to the TAPP repair (66 vs 108 minutes). There was no difference in time to discharge the patients after surgery with an average time to discharge post hernia operation was 23 hours (range 19-29 hours). In regular post-operative visits, none of the patients reported any pain or discomfort over the groin and scrotal area and all had pain score 0. No other complications of indurations, chronic groin pain, testicular complications, recurrences or mesh infections were observed in the 6 months follow up.

**Conclusion:** Our study confirms that 3D anatomical new mesh, for laparoscopic inguinal hernia repair, is safe. Compatibility of shape of mesh to its deployment place gives an advantage of no need of mesh fixation which results in reduction in post-operative complications like pain, and also shortens the surgical duration. We are continually monitoring our post-operative patient in terms of complications but larger studies using this type of mesh is required.
Early outcomes of open vs laparoscopic IPOM repair for small ventral hernias.

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**Introduction:** According to the 2014 International Endohermia Society (IEHS) guidelines, mesh repair is recommended for abdominal wall hernias with defects larger than 2cm, and those larger than 3cm can be considered for laparoscopic mesh repair. In our study, we sought to compare the outcomes of open versus laparoscopic intraperitoneal onlay mesh (IPOM) repair in small ventral hernias.

**Method:** Data of all patients with a single umbilical defect of less than 4cm who underwent surgical mesh repair was collected. Patient demographics, operative findings and regular post-operative follow-up details up to 3 months, including pain scores, recurrence rates, and complications, were recorded.

**Results:** Forty-one patients underwent laparoscopic IPOM repair (Symbotex mesh, Medtronic, USA) and 47 patients underwent open IPOM repair (Ventralex, BD, USA or Ventral-Patch, Medtronic, USA). The mean age for the study population was 51.5 years (range 26-78). There were 50 (57%) males and 38 (43%) females. Para-umbilical hernias were more common (53%). The mean defect size was 2.5cm. The median surgery duration for open IPOM repair was significantly shorter (55 min vs 73 min; p=0.001). There was no significant difference in incidence of seroma formation and surgical site infections post-operatively after 2 weeks. There was also no significant difference in both groups in terms of chronic pain and recurrence at 3 months follow-up.

**Conclusion:** Open IPOM repair for small ventral hernias (less than 4cm) may be superior to laparoscopic IPOM repair in terms of the shorter operative duration, single incision and no additional risk of port site hernias. Moreover, there was no difference in pain scores, wound infection and recurrence rate between the two groups.
An innovative way for placing meshes in laparoscopic hernia repair with total extraperitoneal approach

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**Introduction:** "Giant prosthetic reinforcement of the visceral sac (GPRVS)" was proposed the open posterior preperitoneal repair method by Stoppa in 1965 which was adopted in laparoscopic hernia repair with total extraperitoneal approach (TEP). However, mesh fixation was an issue for recurrence. We used an innovative way for placing meshes in laparoscopic hernia repair with total extraperitoneal approach (TEP) and explained how to do it. Surgical procedures under general anesthesia, the patient was placed in supine position. We used balloon dissection for creating pre-peritoneal space then replaced it by a smaller stay balloon trocar. Three trocars (one 10mm at the pre-umbilical, two 5mm at the lower midline and suprapubic area) were placed. Bilateral indirect type hernia sacs were identified and pushed back. Two B. Braun Optilene Meshes (10*15cm) were joined and trimmed into adequate size which the width was the distance between bilateral anterior superior iliac spine (ASIS). Two slits were made both sides after measuring the distance between ASIS and internal ring. The joined meshes with slits were then folded and inserted into preperitoneal space. After unfolding the meshes, we positioned the meshes in the preperitoneal space. The meshed were fixed by tying the pre-sewn sutures around the spermatic cords.

**Summary:** By introducing the concept of GPRVS in TEP, the meshes could be jointed outside and the size could be adjusted to accommodate each patient. The jointed meshes were easy to open and placed in preperitoneal space. A significant reduction of using fixation tacks or glue could be expected. Long term results should be investigated.
Efficacy of Laparoscopic transabdominal preperitoneal repair (TAPP) for recurrent inguinal hernia.

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**Background:** Currently various techniques have been developed to treat inguinal hernias. However, recurrences continue to be seen after repair of inguinal hernias. The repair of these recurrent hernias is a more complex and technically demanding procedure due to progressively weakened tissues and distorted anatomy with possible high re-recurrence rates. Here we report the effectiveness of laparoscopic inguinal hernia repair to treat recurrent inguinal hernia using TAPP approach.

**Methods:** A total of 23 recurrent hernias were managed using the transabdominal preperitoneal (TAPP) technique. In the last 4 cases tumescent TAPP was performed, where anesthetic solutions were locally injected just beneath the peritoneum. Patients were followed up for 1 year. Longer follow-up evaluation was performed for the patients who underwent surgery in the initial 3 years. Surgery time, postoperative morbidity, and hernia re-recurrences were analyzed.

Results: Average operation time was 78.4 minutes. There was less pain in the postoperative period compared to open surgery. Tumescent TAPP further decreased these postoperative pains. Seroma developed in one patient. At a follow-up assessment after 1 year, one patient still had discomfort, however, there was no re-recurrence during observation period up to 3 years.

**Conclusions:** The morbidity including recurrence rates after laparoscopic repair seems to be as low as for laparoscopic repair of primary hernias. Although technically demanding, laparoscopic transabdominal repair could be considered as first choice strategy for recurrent hernias, which facilitates anatomical identification and precise repair of recurrent hernias.
Endocrine Disease

Laparoscopic Management of Pheochromocytomas – A Single Centre, Single Surgeon's Experience

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Purpose: Laparoscopic management of pheochromocytomas presents a unique surgical challenge due to variable anatomical presentation and potential catecholamine surge during operative manipulation. We report a single centre, single surgeon’s experience with laparoscopic removal of pheochromocytomas.

Materials and Methods: Between 2012 and 2019, 12 patients presented with features of pheochromocytomas. Of the patients 10 had adrenal origin, and the remaining 2 patients were diagnosed with sporadic extra-adrenal pheochromocytoma during hypertension evaluation. Although 4 patients had a history of hypertension, only 2 reported symptoms (episodic flushing, headaches, blurred vision) associated with excess catecholamine production. All patients had markedly increased preoperative urinary and plasma normetanephrine and/or norepinephrine levels, and 3 had positive I131 metaiodobenzylguanidine scan. In each case tumor location was accurately identified on computerized tomography before surgery.

Results: Laparoscopic resection of adrenal and extra-adrenal pheochromocytoma was successful in 11 patients. Open conversion was required in 1 patient, due to significant adhesion of the extra-adrenal tumor to the IVC, and a concern for possible local invasion. Mean laparoscopic operative time and blood loss were 118 minutes (range 80 to 180) and 120 cc (range 75 to 200), respectively. Three 10 mm ports in a standard triangular fashion were used for the left adrenal tumors. For the right adrenal tumors, a fourth port (10 mm) was inserted for liver retraction as needed. None of the patients had a hypertensive crisis intraoperatively, and all had unremarkable postoperative recovery with an average hospital stay of 3.8 days (range 3 to 4). Plasma and/or urinary norepinephrine and normetanephrine levels returned to normal range postoperatively in all cases. There has been no tumor recurrence at a median followup of 14 months (range 9 to 36).
Conclusions: With careful surgical planning and appropriate preoperative pharmacological blockade, laparoscopic surgery can be safely performed in patients with both adrenal and extra-adrenal pheochromocytomas with minimal morbidity.
Transoral Endoscopic Thyroidectomy Vestibular approach (TOETVA) surgical results: experience in a single center.

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**Backgrounds:** Transoral endoscopic thyroidectomy vestibular approach (TOETVA) is an innovative alternative technique to perform thyroidectomy which provides excellent cosmetic and surgical results. The purpose of this study is to report our experience with TOETVA and its surgical outcomes.

**Methods:** Between July 2018 to June 2019, a total of 40 cases who underwent TOETVA at Chiangrai Prachanukroh Hospital comprising 39 females (97.5%) and 1 male (2.5%), the mean age was 41 years old (age range of 25-69 years). Out of these patients, 16 patients were pathologically diagnosis as single nodular goiter (40%), 9 patients had multinodular goiters (22.5%), 9 had Graves’ disease (22.5%), 4 had follicular adenoma/neoplasm (10%), 1 had papillary microcarcinoma (2.5%) and 1 had chronic thyroiditis (2.5%). All TOETVA surgeries were accomplished using conventional laparoscopic instruments.

**Results:** TOETVA was performed on 40 consecutive patients. 36 patients were successfully treated by TOETVA and 4 patients who had Graves’ disease were converted to open thyroidectomy due to bleeding. Average thyroid size was 8.10 ± 8.08 cm. Average median operative time was 140 ± 148 mins. Median estimate blood loss was 40 ± 368 ml. Mean visual analog scale for pain were 4.70 ± 3.42 and 3.68 ± 2.64 on the first and second post-operative day respectively. Median length of stay was 5 ± 1.95 days. Temporary hoarseness occurred in 2 patients (5%) and 3 patients experienced transient hypoparathyroidism (7.5%). No permanent hoarseness or other complications occurred.

**Conclusion:** TOETVA is a safe and effective surgical treatment for thyroid disease with excellent cosmetic outcome. This technique is a reasonable alternative treatment for those patients who demanded to avoid a neck scar.
TOETVA - An experience with respect to Safety & Feasibility in Small setup Hospital in Rural India - A series of 19 cases of Thyroid surgeries by Transoral Endoscopic Thyroidectomy - Vestibular Approach (TOETVA) technique.

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Background: TransOral Endoscopic Thyroidectomy - Vestibular Approach (TOETVA), an alternative surgical technique for thyroid surgery is slowly gaining widespread popularity. TOETVA is made popular by Prof. Angkoon Anuwong from Thailand.

Aims & Objectives: Majority of TOETVA surgeries are performed in the tertiary care specialised institutes. It’s safety & Feasibility in small setup hospitals has not been reported until now. This study reports on the safety & Feasibility of TOETVA in smaller operative setups in smaller cities of India.

Methods: Advanced Instrumentation along with essential Operation Theatre setup were utilised for performing Total of 19 TransOral Endoscopic Thyroidectomy – Vestibular Approach (TOETVA) procedures.

Results: Total 19 patients were operated by TransOral Endoscopic Thyroidectomy – Vestibular (TOETVA) Technique from May 2018 till July 2019. Three SubTotal Thyroidectomies & 15 Hemithyroidectomies were performed. One patient underwent TOETVA for Thyroglossal cyst. One patient was converted to open after completing the hemithyroidectomy as EtCO2 could not be maintained below permissible level and the specimen retrieval was done through a small incision in the neck. Proper patient selection along with proper instrumentation & OT setup helped complete the procedures were completed without any untoward incidences.

Conclusions: The TOETVA procedure can be performed in the small setup hospitals with utmost safety. This study helps us to recommend feasibility & safety of TOETVA even for small setup of hospitals. Expertise & experience of the operating surgeon in endoscopic surgeries with proper training in TOETVA technique is essential.
Less pain and reduced risk of early postoperative ileus after clipless vs. conventional laparoscopic appendectomy

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Laparoscopic appendectomy (LA) is increasingly performed as a short-stay however, some patients require prolonged hospitalization because of postoperative ileus and pain; therefore we introduced clipless LA, using an ultrasonic energy device only for coagulation. A total of 1,013 patients (clipless LA; n=290 and conventional LA; n=723) who underwent LA at our hospital between January 2015 and February 2018 were analyzed. The mean operative time was shorter (P < 0.001) and postoperative pain score at 24 h was lower (P < 0.001) for clipless than for conventional LA. There were no significant differences in postoperative complications, except regarding early postoperative ileus (clipless LA; 18.1% vs. conventional LA; 31.6%, P = 0.025) and operative method had significantly influenced on early postoperative ileus (relative risk, 0.505; 95% confidence interval, 0.257–0.994; p = 0.048). In conclusion, clipless LA had comparable operative safety with significantly reduced postoperative ileus and pain, compared to conventional LA.
Emergency general surgery models in Australia.

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**Background:** Emergency general surgery (EGS) patients experience superior outcomes when cared for within an Acute Surgical Unit (ASU) model. However, the EGS structures in most Australian hospitals remains unknown.

**Objectives:** This study aimed to describe the national spectrum of EGS models.

**Methods:** An observational study was performed in March–April 2019 of general surgical registrars and senior surgeons in all Australian public hospitals of medium (>2,000 patient separations per-annum) or greater peer group. Small, children’s and private hospitals were excluded. Primary outcomes were incidence of each EGS model. Secondary outcomes were the relationship of EGS model to objective hospital variables, and qualitative reasons for choice of model.

**Results:** One hundred and nineteen of 120 eligible hospitals participated (99%), including 107/120 senior surgeons and 115/116 registrars, with four sites not involving registrars in EGS on-call. Sixty-four hospitals (54%) reported utilising an Acute Surgical Unit (ASU) (28%) or Hybrid EGS model (26%), while the remaining 55 (46%) employed a Traditional model. ASU implementation was significantly more common amongst hospitals of greater peer group (p<0.0001), bed number (p<0.0001), surgeon pool (p=0.0003) and trauma service sophistication (p=0.0002). Leading reported drivers for ASU commencement were aims to improve EGS patient care and decrease after-hours operating, while common barriers against ASU uptake were insufficient EGS patient load or surgeon on-call pool.

**Conclusion:** ASU or Hybrid models of care for EGS patients may be more widespread than currently reported. Introduction of such structures is heavily dependent on hospital and staff size, trauma subspecialisation and EGS patient throughput.
Communication and management of incidental pathology in a cohort of 1,214 consecutive appendicectomies.

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**Background:** Important incidental pathology requiring further action is commonly found during appendicectomy, macro- and microscopically. It is unknown whether the acute surgical unit (ASU) model affects the management and disclosure of these findings.

**Methods:** An ASU model was introduced at our institution on 01/08/2012. In this retrospective cohort study, all patients undergoing appendicectomy 2.5 years before (Traditional group) or after (ASU group) this date were compared. The primary outcomes were rates of appropriate management of the incidental findings, and communication of the findings to the patient and to their general practitioner (GP).

**Results:** 1,214 patients underwent emergency appendicectomy; 465 in the Traditional group and 749 in the ASU group. 80 (6.6%) patients (25 and 55 in each respective period) had important incidental findings. There were 24 patients with benign polyps, 15 with neuroendocrine tumour, 11 with endometriosis, 8 with pelvic inflammatory disease, 8 Enterobius vermicularis infection, 7 with low grade mucinous cystadenoma, 3 with inflammatory bowel disease, 2 with diverticulitis, 2 with tubo-ovarian mass, 1 with secondary appendiceal malignancy and none with primary appendiceal adenocarcinoma. One patient had dual pathologies. There was no difference between the Traditional and ASU group with regards to communication of the findings to the patient (p=0.44) and their GP (p=0.27), and there was no difference in the rates of appropriate management (p=0.21).

**Conclusion:** The introduction of an ASU model did not change rates of surgeon-to-patient and surgeon-to-GP communication nor affect rates of appropriate management of important incidental pathology during appendectomy.
Laparoscopic Surgery in a Field Hospital Setting. A Malaysian Field Hospital (MFH) Experience.

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Introduction: Laparoscopic surgery offers many advantages over open method in terms of earlier return to work, less post-operative pain, lesser wound infection, earlier mobilization and better cosmesis. However, it is usually done in a tertiary centre. There is only one publication exist regarding laparoscopic surgery in field hospital (n=7) in 1994 by the US army. The feasibility of laparoscopic surgery in field hospital generally remains untested.

Objective: To assess the feasibility, safety and challenges of performing laparoscopic surgery in field hospital setting.

Methodology: All patients underwent laparoscopic surgery from 1st September 2018 to 16th February 2019 in Malaysian Field Hospital, Cox Bazaar, Bangladesh. A total of 29 patients (14%) had laparoscopic surgery from a total of 207 surgeries performed in the operating theatre. 11 patients had laparoscopic inguinal hernia repair, 6 had diagnostic laparoscopy, 4 had laparoscopic appendicectomy, 2 had laparoscopic cholecystectomy, 2 had laparoscopic varicocelectomy, 1 had laparoscopic assisted colostomy, 1 had thoracoscopic decortication for grade 3 empyema thoracis and 2 had laparoscopic drainage for pelvic abscess.

Results: There were no 30-day mortality. 4 cases were converted to open. Mean operating time was 60 minutes. Blood loss was minimal except for one case. No intra operative complication except for air leak for thoracoscopic decortication and average length of hospital stay was 3 days. 2 patients converted to open had post op ileus and 1 patient had recollection of abscess. None required reoperation. Average length of hospital stay was 3 days. Challenges preoperatively include advanced diseases, limited logistical support and the need for accurate clinical diagnosis and intraoperatively the need to utilize intracorporeal suturing and lack of energy device.

Conclusion: Laparoscopic surgery in field hospital setting is feasible, safe although challenging.
Estimation of simultaneous operative treatment’s effectiveness on patients with calculous cholecystitis combined with varicose.

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Introduction. Pulmonary embolism (PE) and acute thrombosis of deep veins of lower limbs are the most frequent complications after operative interventions, especially if there are predisposing conditions of blood circulation.

Material and methods. There were 30 patients (12 male, 18 female) in thoracoabdominal department of II Clinic of Tashkent Medical Academy from April 2018 up to December 2018. Average age of patients was 34.1 years. Varicose disease of both lower limbs was diagnosed on 10 patients, on 20 patients – of one lower limb. Average duration of varicose was 10.8 years, calculous cholecystitis — 7.1 years. Determining of treatment tactic was based on evidence of varicose disease, condition of ostial valves, valves of communicant veins, data of ultrasonic investigation on lower limbs’ veins, ultrasonic investigation of abdominal cavity’s organs’, severity of concomitant pathology. These patients were undergone simultaneous operative intervention according to II class of severity by ASA classification. Liquidation of vascular pathology was reached by performing crossectomy and phlebectomy Narat (16 patients) and by Babcock-Narat (14 patients), with further laparoscopic cholecystectomy. Postoperative care included anticoagulant, antiaggregant, phleboprotective therapy.

Results. Results of effective treatment were based on parameters of patients’ coagulogram after the operation and clinical manifestations. In postoperative period in 2 (6.67%) cases was developed acute thrombosis of deep veins of shin, whereas PE have not been detected. Researching the results of coagulogram allowed to find out decreasing of INR up to 0.4-0.52 (average deflection 21.82%); PTT up to 20-23 (average deflection 17.4%); increasing of fibrinogen up to 431-517 mg% (average deflection 14.2%).

Conclusion. On operative treatment of patients with comorbidity, tactic, which was determined by our algorithm, with adequate anticoagulant, antiaggregant and phleboprotective therapy is an effective method of prophylactic of coagulation system, which may cause fatality.
Creation of space for dissection in Thoracoscopic splanchnectomy by Capnothorax compared to standard method

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**Introduction:** Splanchnicectomy is performed for pain relief in chronic pancreatitis when pharmacological methods have failed. Performing the surgery by thoracoscopy reduces the morbidity of thoracotomy. Creation of space for dissection usually mandates to collapse the ipsilateral lung by using a double lumen tube. As the procedure is bilateral during the procedure adjustments need to be altered. In addition, as the procedure is done in full prone position tube adjustments may be difficult. Alternatively, lung collapse can be obtained by creating a pneumothorax using CO2 (capnothorax) while ventilating both lungs with a single lumen tube.

**Objective:** To assess the adequacy of space created by capnothorax induced lung collapse in bilateral thoracoscopic splanchnicectomy.

Method: All patients undergoing thoracoscopic splanchnicectomy were done by above technique. The space created was assessed by having adequate room to insert working ports, instrumentation and free visualization of the sympathetic chain. The time taken for procedure, blood loss, CO2 insufflation pressure, conversions to open procedure and cardio respiratory parameters and any post-operative pulmonary complication were recorded.

**Results:** Forty one patients underwent procedure since January 2012 to 2018 August. The insufflations pressure used was 8mmHg. The cardio-respiratory parameters were stable. With the prone position collapsed lung fell away from posterior mediastinum providing a clear picture of the sympathetic chain and adequate space for instrumentation and dissection. The average time per side was 20 minutes with no measurable blood loss. There were no conversions to open procedure. No postoperative complications were noted.

**Conclusions:** Lung collapse obtained by a capnothorax provided adequate space for dissection during bilateral thoracoscopic splanchnicectomy.
The presentation, management and follow-up of the acute complications of jejunoileal diverticula

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PURPOSE: Diverticula of the small bowel (SB) are rare but can cause acute complications of diverticulitis, perforation, bleeding and obstruction. Given the rarity of this pathology further study into their clinical presentation, management and follow-up is warranted.

METHODOLOGY: Hospital coding database was searched for all cases of “diverticula”, “diverticular haemorrhage” and “diverticulitis” as primary or additional diagnosis over a 2-year period. Inclusion criteria were that of confirmed jejunal and ileal diverticula causing acute complication of bleeding, inflammation, perforation or obstruction. Files were reviewed looking at presentation, investigations and management. Follow-up data up to eight years was reviewed for any recurrence or further complications.

RESULTS: Of 378 patients with diverticula, 10 symptomatic jejunoileal diverticula cases were identified. There was a 9:1 M:F predominance, age ranged 22-95. Eight patients had diverticulitis: one uncomplicated, three with localised perforation and four with free intraperitoneal perforation. Presentation was non-specific. CT abdomen was the most commonly used investigation. A total of six patients required a laparotomy and SB resection and two were managed conservatively. Two patients had bleeding, both chronic and intermittent which did not require acute intervention. In long term follow-up, one patient was lost to follow-up, one patient had a recurrence of diverticulitis at seven years, eight patients did not have further episodes, although four were deceased within three years due to other causes.

CONCLUSION: Jejunoileal diverticula rarely cause acute complication. Presentation is non-specific and CT abdomen was the most useful investigation. Diverticulitis with perforation was the common pathology with a surprisingly high rate of emergency surgery required.
The comparison between Interval appendectomy and Open appendectomy of medical expenses in Japan.

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**Objective:** Interval appendectomy (IA) for perforated appendicitis is known effective and safety. This time we test a hypothesis that IA is lower medical cost procedure than single-stage open appendectomy.

**Methods:** We defined that IA was two-stage therapy - antibiotic therapy and surgery for appendiceal abscess. 37 IA patients group was underwent laparoscopic appendectomy from December, 2012 to October, 2017, 2-3 months after treating antibiotics. The other side we defined 16 Immediate open-abdomen appendectomy (ImA) patients group, they were performed operation from April, 2011 to November, 2012. We compared the complications ratio, total medical expenses and total hospitalization about two groups. Now "medical cost" is defined Japanese DPC (Diagnosis Procedure Combination) which is combined flat fare (for each disease) and maneuvers charges such as an operation or treats.

**Results:** IA group: As for 24 men, 14 women. Age was 51 (17 - 78) years old. BMI was 23 (16.1 - 31.5). ImA group: As for 9 men, 7 women. Age was 49 (16 - 90) years old. BMI was 23.1 (14.8 - 32.5). We did not recognize the significant difference. The total medical expenses are IA group/ImA group; 921,085 yen (710,360 yen - 1,924,538 yen)/88 9,281 yen (692,450 yen - 2,149,854 yen) where did not recognize the difference (p=0.8). Also we did not recognize the significant difference in IA group/ImA group for the total hospitalization 13(7-54)/11.5(4-45) days. The postoperative complications ratio does'n't accept the significant difference in IA group/ImA group (p=0.45).

**Conclusion:** We were not able to prove our hypothesis. Sample size is limited and may be the type II error.
Staff education for the introduction of endoscopic surgery Providing high quality medical care in Cambodia

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Background: As a pioneer in Japanese-style medical exports, our hospital opened in Phnom Penh, Cambodia in October 2016 and provides medical care 24 hours a day, 365 days a year. Preparation for introduction of endoscopic surgery started in June 2018. A non-experienced treatment method for non-Japanese staff provides basic education to doctors and comedies, and treatment began in January 2019. Report on our staff training efforts.

Methods: 1) Lectures by doctors certified by the Endoscopic Surgery Society In order for the staff of the entire hospital to understand in common, past surgical videos are presented and implemented three times using diagrams and models. 2) Out-of-hospital training (operation assistance staff) We visited at the Olympus Thailand Training Center for all endoscopic surgical materials maintenance and wet lab training. 3) Team simulation. We conducted dry labs three times using actual equipment, and examined countermeasures.

Result: It took 6 months from introduction preparation to the start of treatment, however endoscopic surgery was performed in 23 cases (children 4: appendectomy 2, inguinal hernia 2, adult 19: cholecystectomy 7, inguinal hernia 12), and an adult cholecystectomy patient were treated with laparotomy due to difficulties in operability during surgery, but other cases completed endoscopic surgery without problems after surgery.

Conclusion: While anxiety was raised by inexperienced treatment, it was related to preparation from 0, and the question was solved and preparation was facilitated. In order to further developing and expand the indications for endoscopic surgery in the future, it is considered that high-quality medical care can be continued in the future by having a common sense of purpose and implementing regular feedback.
E-Poster
Abdominal Wall and Hernia

Complication rates analysis of trans-umbilical mode and para-umbilical mode of laparoscopic surgery in general surgery department, a single-center experience

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**Purpose:** Trans-umbilical incision is being used more frequently; cosmetic consideration was one of the main factors. Since the bacteria stick to the deep surface of the umbilicus and the difficulty of closing the wound, a number of surgeons choose para-umbilical incision for preventing postoperative complications. No study has compared the complications of trans-umbilical and para-umbilical incisions. We analyzed the wound complication rates of laparoscopic surgery patients according to the types of umbilical incision.

**Materials and Methods:** A retrospective review was done of 1376 patients who underwent laparoscopic surgery during Jan. 1, 2017 to July 31, 2018, in Changhua Christian Hospital. 963 (70%) patients were treated with the trans-umbilical incision, and 413 (30%) patients were treated with the para-umbilical incision. We compared the post-operative complications according to the two laparoscopic incision modes, with subsequent subgroup analysis stratifying by age, gender, and surgery types.

**Results:** 8 patients had complications after surgery, 1 patient had an incisional hernia and 7 patients suffered a poor healing of wound. There was no difference in complications of age, gender, and eight laparoscopic surgeries.

**Conclusion:** The wound complication rate of trans-umbilical and para-umbilical incision is not different.

**Limitation:** The statistical difficulty since the case number was small, the further study will extend the years and case numbers.
The learning curve of single-port laparoscopic extraperitoneal hernia repair by cumulative sum analysis.

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Introduction: Despite of expected long learning curve (LC) is due to ergonomic difficulty of single port surgery, there is no relevant study on LC of single-port laparoscopic extraperitoneal hernia repair (SILTEP). We aimed to investigate LC of SILTEP for inguinal hernia.

Methods: We retrospectively reviewed of the patients who underwent SILTEP between October 2012 and November 2017 by a single surgeon experienced in laparoscopic TEP in a single institution. The LC was analyzed using moving average (MA) method and cumulative sum control chart (CUSUM) for operation time (OT) and surgical failure. Surgical failure was defined as use of additional ports, open-conversion, postoperative complications (≥ Clavien-Dindo IIIa) and recurrence.

Results: A total of 180 patients were included in this study. The mean age was 58.5±1.25 years, and 171 (95%) patients were male. Additional port insertion and conversion to open surgery were needed in 12 (6.7%) patients for each. Recurrence occurred in 2 (1.1%) patients, and surgical failure was observed in 25 (13.9%). The mean OT was 45.3±1.46 minutes. MA for OT (figure 1) showed trend of decrease in OT, and the CUSUM graph for OT (figure 2) and surgical failure (figure 3) could depict the peak point, following plateau and decrease. We divided the study period into three phases; phase 1 (1st ~57th), phase 2 (58th~84th), phase 3 (85th~180th) based on this finding. The mean OTs (58.4: 51.4: 35.9 minutes, p <0.001) and surgical failure rates (29.8: 11.1: 5.2%, p <0.001) were statistically different. Other demographic variables showed no significant difference.

Conclusions: This study demonstrated the three phases of the LC for SILTEP using MA method and CUSUM analysis for OT and surgical failure. We estimate that approximately 60 cases are needed to overcome LC for SILTEP; further proficiency is expected after accumulation of SITEP experiences up to 80~90 cases.
TAPP for inguinal hernia with 2 mm sized needlescopic instrument
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Introductions Laparoscopic surgery has become a standard treatment for inguinal hernia. However, TAPP with less 5 mm sized needlescopic instrument is very rare and developing. We introduced TAPP for inguinal hernia at Sagamihara kyodo hospital in Japan from 2013, and then we have practiced TAPP using 2 mm sized needlescopic instrument with expectation of less pain and esthetic advantage. We report the needlescopic TAPP technique and treatment results in our hospital.

Methods The 2 mm sized needlescopic instrument we use for operator’s left hand is BJ needle R (NITI-ON co., ltd.). 5 mm trocar is inserted from umbilicus by optical access method. After pneumoperitoneum, 5 mm and 2 mm trocars are inserted from right and left flank. After dissection of preperitoneal layer, a mesh is fixed using a tucker. We generally use 3D Max Light mesh and CapSure (Bard Inc.). A needle of 3–0 POLYSORB (Medtronic Inc.) is pulled in abdomen using 2 mm sized needlescopic instrument from 5 mm trocar for suturing a peritoneum. Only at umbilical 5 mm trocar wound site, fascial defect is sutured.

Results We performed 268 cases of conventional TAPP and 41 cases of needlescopic TAPP from May 2017 till April 2019. In 41 cases of needlescopic TAPP, There were 36 males and 5 females, 40 unilateral and 1 bilateral inguinal hernia. Median operation time was 40 minutes, and only a small amount of blood loss was observed in all cases. The patients were discharged home on the 1st postoperative day. There has been no recurrence and chronic pain during a follow-up.

Conclusions We present our TAPP repair using 2 mm sized needlescopic instrument. We recommend this surgical procedure as a minimally invasive hernia repair. Further large research is necessary to evaluate the impact of it.
Case Report: A Left Paraduodenal Hernia in BINH DAN Hospital

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Internal hernias represent the protrusion of a viscus through a normal or abnormal peritoneal or mesenteric aperture within the confines of the peritoneal cavity. The orifice can be either congenital or acquired. According to Meyers, there are seven subtypes of the internal hernias, based on location. The overall incidence of the internal hernias is 0.2-0.9%. Paraduodenal hernias were the most common type of internal hernia, accounting for approximately 53% of all cases. They are usually diagnosed with the help of CT scan of abdomen and small bowel follow-through apart from thorough clinical examination. The method of treatment reduces the hernia, restores the normal anatomy and repairs the defect through opened surgery or laparoscopic surgery. In our case report, a male patient, aged 45, with an eight-month-old history of recurrent cramping abdominal pain was admitted to hospital. Clinically, a small bowel obstruction was made. A diagnosis of left-sided paraduodenal hernia was confirmed by CT scan of abdomen. He was subjected to laparoscopic hernioplasty. The operation and post-operative recovery were satisfactory. He was discharged after taking three days of post-operative care. This case report aimed to discuss clinical presentation, diagnosing approach and surgical management of paraduodenal hernias.
Case Report: A Lapraoscopic surgery of Spigelian Hernia in BINH DAN Hospital
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Hernia of the anterior abdominal wall, or ventral hernias, represent defects in the parietal abdominal wall fascia and muscle through which intra-abdominal or preperitoneal contents can protrude. Besides popular types of ventral hernias, i.e umbilical hernias and incisional hernias, Spigelian hernias are very rare with a reported prevalence of 0.12-2% among all hernias. They can be congenital or acquired. Physiopathology of these hernias occurs through a defect in the transversus abdominis aponeurosis or Spigelian fascia. They are usually diagnosed with the help of ultrasonography or CT scan of abdomen apart from thorough clinical examination. The method of treatment is the reconstructions of abdominal wall through opened surgery or laparoscopic surgery. In our case report, a male patient, aged 70, with a six-month-old bulge on the left side of abdominal wall was admitted to hospital. A diagnosis of left-sided Spigelian hernia was made clinically, which was confirmed by CT scan of abdomen. He was subjected to Spigelian laparoscopic hernioplasty and a polypropylene mesh was inserted. The operation and post-operative recovery were satisfactory. He was discharged after taking three days of post-operative care. This case report aimed to discuss clinical presentation, diagnosing approach and surgical management of Spigelian hernias.
TAPP For Repairing Inguinal Hernia After Radical Prostatectomy
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Introduction: In recent years, robotic surgery has been introduced as a surgery for prostate cancer. RALP (robotic-assisted laparoscopic radical prostatectomy) has been covered by insurance in Japan since 2012, therefore the number of the surgeries has also been increasing. Even though RALP is said to lower the risk of inguinal hernia complications than open retropubic radical prospectomy, the occurrence of inguinal hernias is still quite high, showing at a rate of about 6.3~20%. There are some reports that laparoscopic transabdominal preperitoneal (TAPP) inguinal hernia repair in patients who have undergone RALP. So we also have applied TAPP for inguinal hernia after RALP.

Methods: Within recent 6 months, we performed two cases of TAPP inguinal hernia repair after RALP. Case1; 78 y/o male. He had left direct inguinal hernia one year and three months before undergoing RALP. As complications after RALP, right inguinal hernia developed in him more. Case2; 74y/o male. He underwent RALP 4 years ago. He found out his left inguinal hernia 1 week ago.

Results: Case1: Left side inguinal hernia is coexisting direct and indirect hernia. Right side is indirect hernia. Operation time is 4h40min. Using mesh size is 13×9cm (left side) and 14×9 cm (right side).

Case2: He has only left side indirect inguinal hernia. Operation time is 1h37min. Using mesh size is 15×10cm. Both cases have been without complications and recurrence.

Conclusion: There are various procedures for repairing inguinal hernias. TAPP method makes it easier to distinguish the type of hernias, and to diagnose and treat contralateral hernia at the same time. Therefore, we think TAPP method is advantageous. TAPP method after RALP is difficult to carry out because of peritoneal sclerosis due to peritoneal detachment during RALP. Although that makes the operation time long, we think it is a better method because TAPP can be safely performed with few complications and recurrences even after RALP.
Two cases of Diastasis Recti: Our initial experience of IPOM Plus repair for Diastasis Recti in Yangon General hospital.
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Diastasis recti is a condition in which the two rectus muscles are abnormally separated which is usually found in women after child birth. Obesity and multiple pregnancy are major associated causes and the main complaints of this condition are cosmetic problem and discomfort even with daily physical activities. The first case was a 56-year-old lady who had normal vaginal delivery for 5 times and the second case was 40-year-old lady who had normal vaginal delivery for 3 times. In both cases, significant diastasis recti was seen and treated by laparoscopic intraperitoneal onlay mesh repair with defect closure (IPOM Plus) using interrupted non absorbable extracorporeal suture and composite mesh reinforcement. Post-operative pain score is high in first two post-operative days but it can be managed with analgesia. There is no significant seroma collection after repair. Post-operative redundant skin fold problem is present up to 3 months follow up but dramatic response and nearly normal after 6 months follow up. Both patients were satisfied with the cosmetic outcomes.
Surgical technique of TAIEPOM (transabdominal intra-extraperitoneal onlay mesh repair) for recurrence hernia with mesh inserted in previous surgery.

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We have experienced 32 patients, 33 lesions of recurrent inguinal hernia with mesh inserted in previous surgery in the past 13 years. Laparoscopic surgery was performed for 18 patients, 19 lesions. Of these patients, closing the peritoneum was difficult in 8 patients. We performed the procedure which we call TAIEPOM (transabdominal intra-extraperitoneal onlay mesh repair) for last 3 out of 8 cases. We use a composite mesh for TAIEPOM and the procedure does not perform planned peritoneal closure from the beginning. The peritoneum is incised on the abdominal side of the hernia orifice and is then detached in pocket form towards the back, and a mesh inserted. Ventrally, as in abdominal incisional hernia surgery, tacking is performed with the pitch which intestine does not invade. The medial umbilical fold is folded outward and fixed in the abdominal wall together with the mesh. Fixing by tacking is impossible in the neural area of the dorsal side and in the femoral artery and vein surroundings. The detached peritoneum is pulled as ventrally as possible, and the mesh sutured by tacking and suturing to fix it. The dorsal area is handled similarly as in routine transabdominal preperitoneal repair (TAPP). Ventrally, repair that is similar to intraperitoneal onlay mesh repair (IPOM) is performed. This is called transabdominal intra-extraperitoneal onlay mesh repair (TAIEPOM). The surgical outcome of 3 cases who underwent TAIEPOM. The median ages were 81 years, the surgery times were 154 minutes, and the postoperative lengths of hospital stay were 4 days. The frequency at which analgesic was used up to the following day was 2.0 times. There was no recurrence and complications were also absent. Although surgery time takes longer than normal TAPP, this surgical modality is likely useful for recurrent hernia where closing the peritoneum is difficult.
Learning and performing Laparoscopic Hernia repair as a young surgeon
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There has been lot of debate on the role of laparoscopy for the repair of groin hernias. Currently, laparoscopic hernia repair accounts for 10 to 20 % of hernia operations worldwide. One of the major reasons for laparoscopy not having gained popularity for repair of groin hernia seems to be the perceived steep learning curve, working in an unfamiliar anatomy and risk of serious complications. Here, I enumerate my experience of learning and performing laparoscopic ventral and groin hernia surgery. As a young surgeon with 5 years of experience and having being part of laparoscopic hernia surgeries during my residency period, I started performing laparoscopic hernia surgery independently since the last two years. A total of 61 cases of groin hernias and 15 cases of ventral hernias were repaired laparoscopically during this time period. There was a definitive learning curve associated in the initial phase. The operative time ranged from 44 to 136 minutes (average 69 minutes). However, there were no major complications, with no conversion or recurrence to date. 4 cases had some degree of seroma formation in the post-operative, which resolved spontaneously in 4 weeks period. There were cases with peritoneal tear in the groin hernia repair, but the procedure did not have to be converted and they were managed intraoperatively. Various studies have suggested that laparoscopic ventral and groin hernia repair is safe and effective for treating such hernias, and the advantages over open repair are less pain, better cosmesis and quicker recovery. So far, many surgeons avoid laparoscopic groin hernia repair since the pelvic anatomy is unfamiliar and the working space is narrow. Additionally, the learning curve for laparoscopic hernia repair is steep, and the technique difficult.
Case report of laparoscopic reduction of retro-ureter incarcerated small bowel obstruction.
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**Introduction:** Various types of internal hernias have been reported including paraduodenal, intersigmoidal, pericecal, foramen of Winslow, as well as transmesenteric and retroanastomotic hernias. Small bowel obstruction secondary to an internal hernia caused by the ureter is rare, and only a few cases have been reported worldwide. We report a case of small bowel herniation caused by the ureter in a woman who underwent radical hysterectomy for cervical cancer. We would like to say what is the way to avoid the complications that may occur during intestinal obstruction surgery. Case presentation: A 53-year-old woman presented with acute abdominal pain and vomiting and reported a history of radical hysterectomy for cervical cancer 6 years prior to presentation. Computed tomography revealed segmental luminal dilatation of pelvic ileal loops, 2 transition zones with the beak sign in the left-sided pelvic cavity, and reduced enhancement of bowel loops. Hydronephrosis with abrupt luminal narrowing of the left distal ureter was also observed. Exploratory laparoscopy revealed incarcerated bowel segments beneath an adhesive band. We did not immediately cut the adhesive band and continued to trace the course of the small bowel and attempted reduction of the hernia. Reduction of the hernia was not difficult; therefore, the entire small bowel could be disentangled from the pelvic adhesions without any small bowel injury. After reduction of the herniated small bowel, we could confirm that the adhesive band was the left ureter (ureteral peristalsis was observed). The reduced segments of the small bowel appeared viable, and resection was not required. The patient was discharged 2 days postoperatively without any complication. Conclusion: Cutting band during adhesiolysis enables release of bowel obstruction. However, owing to the different types of internal hernias that are known to occur, it is essential to confirm the patient’s history and preoperative CT findings to avoid complications.
Robot-assisted inguinal herniorrhaphy by total extraperitoneal approach through a single incision.

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Surgical techniques for transabdominal preperitoneal inguinal hernia repair (TAPP) and total extraperitoneal inguinal hernia repair (TEP) for inguinal hernia have already been established and the pros and cons of these techniques already well known to us. However, only the TAPP technique has been tried for inguinal hernia in robotic surgery. It resulted from the difficulty to secure enough working space in the TEP technique for the robot arm to move freely. To overcome, we performed herniorrhaphy through a single incision. So we share our case experience and introduce the ongoing study for the feasibility and safety of Da Vinci-Xi TEP for inguinal hernia. The first case was a 57-year-old male with right inguinal hernia. A 2.5cm incision was made below the umbilicus, and space was secured using a conventional space maker. After that, a single port for Robot was inserted into the preperitoneal space. At this time, the single port was folded because of the narrow preperitoneal space. This made it difficult to insert the robot arm through the trocar. In addition, it was difficult to secure a working space, so the robot trocar was pulled out as far as possible. However, if the only position of robot arms was fixed, hernia sac dissection was much smoother and more comfortable than laparoscopic TEP. The entire operation time took 1 hour, of which only 20 minutes was robot docking time. A multi-center prospective study was conducted at five hospitals in South Korea to study the stability and efficacy of single incision Robot TEP. In the meeting for the study, it is proposed to use a more flexible single port for laparoscopy than robot. Accordingly, the second case used this laparoscopic single port and reduced the docking time to 10 minutes. A multi-center prospective study is underway in South Korea.
A Case of Reduction En Masse of Inguinal Hernia

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**Introduction**: Reduction en masse of inguinal hernia develops after manual reduction of an incarcerated inguinal hernia because the sac through the abdominal wall but a herniated organ remains incarcerated in the peritoneal space.

**Case presentation**: A 64-year-old male who was hospitalized in the Nagoya City University hospital for complaining of left-sided inguinal bulge and pain. We diagnosed an incarcerated inguinal hernia and manually reduced. On a day from medical examination, the patient complained abdominal pain and fullness. No herniation was observed in the inguinal region. However, abdominal computed tomography (CT) revealed a round mass containing a part of small bowel on the left inguinal region. We diagnosed reduction en masse of an inguinal hernia and performed emergency operation. Exploratory laparoscopy revealed that the small bowel was together with the left hernial sac to have incarcerated into the preperitoneal space. We carefully released the small bowel from the sac and decided that bowel resection was unnecessary because the bowel had no ischemic change. We performed transabdominal preperitoneal (TAPP) hernioplasty. The patient made an uneventful recovery and discharged from hospital on five days after the operation.

**Discussion**: Reduction en masse of inguinal hernia is an extremely rare and it occurs 1 in 13000 inguinal hernia cases. In this disease, the delay in the diagnosis of the hernia brings the bowel resection because of long time ischemic event. Clinical history and CT are useful for making an accurate preoperative diagnosis in reduction en masse. During treatment of this hernia, we think the laparoscopic approach is suitable. Because we can easily detect the incarcerated bowel, allows for the determination of the bowel viability, and can be performed TAPP hernioplasty unless the bowel resection can be avoided.
A strategy for totally extraperitoneal repair of an incarcerated inguinal hernia with intestinal necrosis

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Introduction: According to the European Hernia Society Guideline, mesh can be used in the treatment of incarcerated hernias without intestinal necrosis and peritonitis. However, the usefulness of tension-free hernia repair in the treatment of incarcerated inguinal hernias with intestinal necrosis and intraperitoneal contamination is controversial. Recent reports suggest multi-stage hernia repair for damage control. Herein, we present our single-center experience of using a strategy for the repair of incarcerated hernias with intestinal necrosis and intraperitoneal contamination.

Strategy: We chose totally extraperitoneal repair (TEP) even for incarcerated hernias. If a patient was admitted to our hospital with a diagnosis of incarcerated inguinal hernia, we confirmed the finding of incarceration and strangulation, using laparoscopy because other possible diagnoses include potential, contralateral and incarcerated inguinal hernias, which could result in incarceration of the intestinal tract. If the operative finding suggested incarcerated inguinal hernia with intestinal necrosis and intraperitoneal contamination, we performed immediate high ligation to reduce the risk of incarceration, and considered the strategy to perform a multi-stage hernia repair.

Results: We surgically treated three patients as described between January 2012 and December 2018, without any complications.

Conclusions. For patients with an incarcerated inguinal hernia with intestinal necrosis, we considered multi-stage hernia repair if the general condition allowed. TEP is a low-risk and effective method in terms of intraperitoneal adhesions and mesh infection.
Successful Salvage of Infected Mesh after Laparoscopic Incisional Hernia Repair: A Case Report and Comprehensive Review of Literature

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**Introduction:** Incisional hernia can occur following any abdominal surgery. Prosthetic surgical meshes have been widely used for ventral incisional hernia repair due to its effectiveness, durability and safety. For this reason, laparoscopic intraperitoneal onlay mesh (IPOM) repair has become one of the standard treatments for this condition. Nonetheless, one of the most serious complications of IPOM repair is mesh infection. Once occurred, mesh explantation is often required; this procedure may present a challenge for subsequent abdominal wall reconstruction to prevent reherniation. Mesh salvage could be safely attempted in selected patients, however, only limited success has been demonstrated in previous literature. The current evidence to support an optimal approach for salvaging infected mesh is still lacking.

**Case Presentation:** We present the case of a 52-year-old male with a midline incisional hernia whom underwent laparoscopic IPOM repair. Two weeks after the surgery, he presented with abdominal pain and redness along the mesh placement site with high-grade fever. An abdominal CT scan revealed a large fluid collection at the surgical bed. He was diagnosed with mesh-related surgical site infection and initially managed with percutaneous catheter drainage followed by small incision and drainage of the subsequent cutaneous eruption of abscess. In conjunction with intravenous antibiotics and negative-pressure vacuum dressing, the infection subsided within 2 weeks despite not having the infected mesh removed. Upon one-month follow-up after discharge with a complete 4-week course of oral antibiotics, he remained clinically free from infection and no abdominal wall defect was found.

**Conclusion:** Well-established approaches to treat mesh infection whilst preserving the mesh are disputed but greatly indispensable. Here we report a case of intraperitoneal onlay mesh infection which was successfully managed with a conservative approach. Further research on treatments specifically for intraperitoneal onlay mesh infection is crucial.
Pre-operative Botulinum Toxin Injection and Hybrid Treatment for Complex Incisional Hernias

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Patient is a 57-year old male, BMI of 25.9 who underwent appendectomy with paramedian incision. Two weeks post-op, he noted bulging on his incision accompanied by pain. Six years later, he consulted us with an 11x9x6cm reducible incisional hernia. CT Scan of his abdomen revealed a large abdominal wall hernia with small bowel herniating through the trilaminar muscles. Under ultrasound-guidance, 150 units of Botulinum Toxin Type A, 5mL of sterile saline and 20% lidocaine were injected on the trilaminar muscles on both sides. There had been no adverse events noted. The patient was seen a month after infiltration and noted marked laxity on his abdominal wall and less pain. A repeat CT scan was done 4 weeks post-infiltration of botox. Table 1 compares the initial CT scan of the patient and the scan 4 weeks since botox injection. He underwent hybrid laparoscopic repair 6 weeks since injection of botulinum toxin. We did enhanced view totally extraperitoneal repair (eTEP). Dissection was done until the sac was identified and brought down the peritoneal cavity. The chronicity of the disease caused technical challenges on the isolation of the hernial sac. Opening of the sac revealed small bowel segments with matted adhesions to the abdominal wall. Since there is a large amount of redundant skin to be removed, we excised the skin and proceeded with the hybrid repair. Upon reduction of the bowel into the peritoneal cavity and further dissection of the retrorectus space, there was a final defect of 20x22cm. Each layer was isolated and closed primarily using non-absorbable sutures. A non-absorbable polypropelene mesh was placed above the posterior rectus sheath. No form of mesh fixation done. Polypropelene sutures were used to close each layer of the abdominal wall. The patient’s post-operative course was unremarkable as he was discharged after 2 days.
Laparoscopic Transversus Abdominis Release for Incisional Hernias with Loss of Domain

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Our patient is a 21-year old male laborer at the local public market who underwent laparotomy for a ruptured appendicitis with generalized peritonitis. He noted bulging on his previous incision at two months post-op and has worn an abdominal binder since then. He failed to seek consult due to financial constraints. He then consulted our institution with a large abdominal wall hernia 4 years since his surgery. During this time, he noted pain and discomfort especially during straining. The computed tomography (CT) scan of his abdomen revealed a 10x15cm abdominal wall defect at the linea alba through which bowel herniates. He underwent Laparoscopic Enhanced View Totally Extraperitoneal (eTEP) Repair with Bilateral Transversus Abdominis Release (TAR) and Hybrid Treatment to address the excess skin. 12-mm ports were inserted at the left and right periumbilical areas and at the left lower quadrant, medial to the anterior superior iliac spine. 5-mm trocars were placed at the left upper quadrant, right lower quadrant and at inferior edge of the previous incision. These trocars were all placed at the retrorectus space under direct visualization. Dissection proceeded until the sac was isolated and reduced into the abdominal cavity. With neurovascular bundles preserved, transversus abdominis release was done on both sides to decrease the tension in the repair. The defect after dissection of the retrorectus space measured 11x18cm above which an elastic biostable monofilament polypropylene mesh was placed. Each layer of the abdominal wall was isolated and repaired individually using non-absorbable monofilament sutures. The previous incision was excised for better cosmetic results. An abdominal binder was placed post-operatively for additional support. The patient was started on diet the following day and was discharged at the 2nd post-operative day. He was seen after a month with no recurrence and with good wound granulation.
Spontaneous Transomental Hernia: Laparoscopic Manual Reduction with Primary Repair

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A 39-year-old woman was presented with whole upper abdominal pain with vomiting for 3 days. Before visiting our institution, she had conservative management with a nasogastric tube in local clinic. She had no history of abdominal surgery or trauma. On plain abdominal X-ray, there are multiple air-fluid levels. An abdomino-pelvis computed tomography (A-P CT) scan showed dilated small bowel loops below the liver. An internal hernia with strangulation of the small bowel in the lesser sac was suspected. We performed emergency laparoscopic exploration. The strangulated small bowel loops appeared with congestion. After reduction of small bowel loops, the ischemic signs of the herniated loops recovered. We repaired defect of lesser sac. The patient was discharged on the fourth days after surgery. Herein, we describe a case report of laparoscopic manual reduction with primary repair for transomental hernia which is extremely rare.
Planned Day Case Hernia Surgery for High Risk Patients Improves Outcomes

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**Background:** Day case herniorrhaphy has been shown to be safe and may be associated with cost savings. The admission practices of surgeons in our hospital is not known.

**Aim:** We aim to study the proportion of high-risk patients planned for day case herniorrhaphy, their clinical outcomes and cost differences compared to patients planned for admission after surgery.

**Methods:** A retrospective database of non-emergency, unilateral groin hernia repairs performed in our institution between 2015 and 2018 was reviewed. Patients with charlson co-morbidity index (CCI) score exceeding 3 points were deemed to be high risk. The percentage of patients deemed to be high-risk achieving clinical quality indicators (CQI) between day case and elective herniorrhaphy was compared. CQI was achieved if all 11 factors relating to pre and post-surgical care of these patients was achieved.

**Results:** 531 unilateral non-emergency groin hernias were performed. 310 (56.7%) were repaired in a day case setting whereas 230 (43.3%) in an inpatient setting. 67.8% of the operations utilised minimally invasive approach. 114 patients (21.4%) were deemed to be high risk. 51 (44.7%) were planned for same day surgery whereas 63 (55.3%) were planned for inpatient surgery. The mean CCI score of patients planned for same day surgery was 4.24 +/- 0.71 compared to 4.56 +/- 1.06 (p=0.067) in patients planned for admission. 60.8% of patients who were planned for day case surgery achieved CQI compared to 54.0% of patients planned for inpatient surgery (p=0.569). Directs costs were cheaper in patients planned for same day repair compared to those planned for inpatient repair ($X +/- 1074 vs $(X+1452) +/- 1894, p<0.001).

**Conclusion** High risk patients may also benefit from day case hernia surgery. Day case hernia surgery in high risk patients have significant cost savings compared to hernia repairs performed in inpatient settings.
Laparoscopic Treatment of Incarcerated Internal Hernia through a Defect in the Broad Ligament

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Hernias through the broad ligament are rare with a reported incidence of only 4-7% of cases of internal hernias. Here, we report on a rare case of incarcerated internal hernia through a spontaneous defect in the broad ligament which was repaired using a laparoscopic technique. A 41-year-old female was admitted with colic abdominal pain. Laparoscopic exploration was performed for the diagnosis of intestinal obstruction. Laparoscopic examination confirmed an approximately 10-cm-long ileal loop herniated in the anterior to posterior direction through a left broad ligament defect. A large defect in the broad ligament was closed by an intracorporeal continuous running suture. The patient was highly satisfied with the cosmetic result. In conclusion, laparoscopy could be particularly helpful during pelvic surgery, which usually requires large skin incisions to ensure a good field of view. This approach was cosmetically effective, decreased the postoperative complications, and promoted early recovery to usual activity.
Laparoscopic Diaphragmatic Plication for Unilateral Diaphragm Paralysis

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Introduction: The diaphragm is the primary muscle of respiration, and its weakness can lead to respiratory failure. Diaphragm paralysis can be caused by various causes. Unilateral diaphragm paralysis is an often not recognized cause of dyspnoe. We present a patient with a unilateral phrenic nerve paralysis treated with diaphragmatic plication with laparoscopic. Surgical treatment of unilateral diaphragm paralysis has been described in case reports and in small series since 1980. Although comparison of the available data is difficult, a diaphragmatic plication seems an effective and safe procedure for patients with symptomatic Acquired unilateral diaphragm paralysis improvement of dyspnoea is present in the majority of patients.

Case Summary: a 62-year-old male complained of shortness of breath which started 4 months ago aggravated when the patient lay down. On examination, bowel sound was heard on left hemithorax. Chest X-Ray was performed, which showed hemidiaphragm elevation and presence of small bowel on left paracardia. Heart and trachea deviated to the right. Right costophrenicus sinus dan right hemidiaphragm are normal. The Abdominal CT Scan revealed left lung that invaded to the mediastinum. Diaphragmatic plication was performed by laparoscopic and 5 days after laparoscopic diaphragmatic plication, the patient being discharged from hospital with good condition.

Conclusion: Diaphragmatic plication for unilateral diaphragm paralysis decreases lung compression, ensures remission of symptoms and improves quality of life in long term period. Laparoscopic diaphragmatic plication provides excellent relief of symptoms cause by diaphragmatic paralysis. There is no perioperatice morbidity and hospital stay is short. The laparoscopic approach, therefore, is an alternative surgical alternative for the treatment of phrenic nerve palsy and should be considered in all subtle patients.
Laparoscopic Lumbar Hernia repair: Rare case series

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A Lumbar hernia is a very rare medical condition with less than 400 reported in worldwide. It was first reported by deGarangeor in 1731. Subsequently, Petit and Grynfeltt delineated the anatomical boundaries of the inferior and superior lumbar triangles, respectively, the latter is more common than the other. The majority (80%) of lumbar hernias are acquired due to increased intra-abdominal pressure concurrent with predisposing factors; elderly, chronic lung disease, trauma, surgery and infection and others 20% are from congenital cause. Because of its rarity and nonspecific manifestation, lumbar hernia can be misleading with superficial lumbar mass such as lipoma and biopsy for this inconclusive diagnosis can be harmed to the patients. The diagnosis of this hernia frequently pose a challenge to the attending surgeon. CT scan is the gold standard for differential diagnosis of lumbar hernia from other conditions presented with flank swelling. Ultrasound can be used but should be interpreted by experienced specialist. According to a 25% risk of incarceration and more than 8% chance of strangulation The lumbar hernia should be repaired surgically. In our three case series in Maharat Nakhonratchasima hospital, Thailand. We performed laparoscopic lumbar hernia repair. The patient was placed in a 70-degree semi-lateral position. An 12-mm balloon port was placed at a peri-umbilical location under open technique and 12-15 mmHg pneumoperitoneum was inflated. Flexible laparoscope was applied for visualization. Three 5-mm additional working ports were placed for mobilization of the colon and kidney, Internal organ reduction, and placement of onlay mesh with an adequate overlap in all directions. Endoclose was applied for anchoring the mesh with abdominal wall and laparoscopic tacks were used to fix the mesh. The procedure was completed in 120-300 minutes without major intraoperative or postoperative complications. On one year follow up, patient’s symptoms had resolved without recurrence.
Management of complex incisional hernia by hybrid technique

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Introduction: Incisional hernia is the most common complication after any abdominal surgery. Laparoscopic repairs have gained popularity over the last decade as there is less pain, shorter hospital stay, early return to activity and ability to identify additional defects during the surgery. However, it may be difficult to perform laparoscopy in recurrent complex incisional hernias with dense bowel adhesions due to previous surgeries. It is therefore beneficial to combine both open and laparoscopic techniques (hybrid) for safe adhesiolysis, fascial closure and intra-peritoneal placement of mesh.

Case: We present a case of 63-year-old man with swelling in supraumbilical region of one year duration. He had h/o laparoscopic Intraperitoneal Onlay Mesh Repair for umbilical hernia in 2016. On examination a defect of 5 x 4 cm in supraumbilical region was present which was partially reducible in nature with bowel as content. On diagnostic laparoscopy there were massive adhesions of bowel with the previous mesh. Laparoscopic adhesiolysis was found to be difficult and Open approach was adopted for safe adhesiolysis of bowel with the mesh and fascial closure was done. Finally, laparoscopic intra-peritoneal mesh placement was done.

Conclusion: Hybrid technique involving both open and laparoscopic method is a safe strategy in selected patients with large, recurrent and complex ventral hernia.
Treatment Strategy in Laparoscopic Approach for Recurrent Inguinal Hernia in Adult.

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Background: Recently, transabdominal preperitoneal patch technique—TAPP has become a common procedure and is a minimally invasive surgery. Surgeons occasionally encounter a case of recurrent hernia in adult patients after the primary repair. Recurrent surgery is often difficult due to the effects of the initial surgery.

Method: We retrospectively reviewed reoperation cases of hernia repair between April 2010 and September 2019.

Results: There were 6 cases of recurrent inguinal hernia. The initial surgery performed for each was direct Kugel method (DK): 1 case, mesh plug method (MP): 2 cases, conventional method: 1 case. As an intraoperative finding, in the case of DK, the mesh was shifted from the ideal position. In the MP case, the plug was deformed for the bullet. We compared the operation time, blood loss, and length of hospital stay in the first-onset case group that was performed at the same time as the recurrent case group.

Conclusions: Laparoscopic surgery for recurrent cases is considered to be a procedure that can be safely performed by experienced surgeons. The important point to preventing recurrence is to place an appropriately sized mesh in an anatomically correct position in the initial surgery.
Is laparoscopy the best indication for inguinal hernias for Young worker population?

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Optimal treatment of inguinal hernias is a public health priority. We have adopted the treatment of inguinal hernias by laparoscopic approach to the young and active population, viewing the postoperative advantages of this surgical approach. We will extend our experience over a period of several years from 2015-2021 concerning the management of inguinal hernias by laparoscopy, the age of our patients between 20 and 60 years, the most of our patients are professional young soldiers. Our results were spectacular, especially in the early resumption of activities after 15 days of convalescence, one day hospitalisation, less chronic postoperative pain. The laparoscopy can be an alternative treatment for inguinal hernias in young active populations, viewing the many benefits of this surgical approach.
Atypical mycobacteria in surgical wound- a rising cause of concern?

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**Aims:** Non-tuberculous Mycobacteria are increasingly recognized, now days as an important pathogen in delayed surgical site infection in post-operative cases. The aim of the study was to increase awareness of this atypical mycobacterial infection, prompt diagnosis, and treatment that may ultimately provide better care to patients.

**Methods:** Forty-four patients underwent different kinds of operations in two different private hospitals in Jhapa district of Nepal. All patients were presented with painful, draining subcutaneous nodules at the infection sites. Repeated aspiration of abscess, incision and drainage of the wound were done and specimen was sent for microbiological and histopathological examination. All patients were treated with repeated wound debridement and tab. Clarithromycin and inj. Tobramycin for 45days.

**Results:** Mycobacterium Chelonae were isolated from the purulent drainage obtained from wounds by routine microbiological techniques. Of the forty-four cases, thirty of them had acid fast bacilli stain positive, two had acid fast bacilli culture positive. All the patients except two cases were treated with injection Tobramycin and Clarithromycin for 45 days.

**Conclusions:** There should be high level of clinical suspicion for patients presenting with delayed post-operative wound infections for the diagnosis of non-tubercular mycobactereria as causative agents. These infections not only cause physical but also emotional distress that affects both the patients and the surgeon. Emphasis should be given on good sterilization technique to avoid such infections.
Dreaded complication followed by TAPP

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The laparoscopic transabdominal preperitoneal (TAPP) repair of an inguinal hernia is an established technique associated with low rates of recurrence and complications. Mesh erosion into the sigmoid colon is a rare complication that can cause distressing symptoms to the patient. Here we present a video demonstration of laparoscopic management of mesh penetration into the sigmoid colon with removal of the mesh and sigmoid colectomy. Meshes are most common prosthesis used for inguinal hernia repairs nowadays. They can lead to number of complications early and late. Early complications can be seroma formation, infection, mesh migration, inguinodynia and feeling of foreign body sensations. Late complications could be fistulizations, erosions into skin and bowel. However, we are hereby presenting a rare complication of mesh that had eroded into sigmoid colon after laparoscopic left inguinal hernia repair.
Single incision laparoscopic intra-gastric resection for proximal gastric gastrointestinal stromal tumor

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**Purpose** Single incision intra-gastric resection is a newly developed technique of minimally invasive surgery for local excision of gastric submucosal tumor. The aim of this study is to determine whether this technique is a feasible treatment for proximal gastric gastrointestinal stromal tumor.

**Materials and Methods** During September 2010 to June 2018, 34 patients with proximal gastric gastrointestinal stromal tumor received single incision intra-gastric resection with using of LagiPort in our community hospital were reviewed. Pre- and post-operative variables were collected and analyzed.

**Results** The locations of tumors were esophageal-cardiac junction (n=10), fundus (n=18), and upper body (n=6). All the tumors were successfully excised with the newly developed technique of single incision laparoscopic surgery with using of multi-instrument laparoscopic port and lineal stapler. The specimens were removed from gastrostomy site before the gastrostomies were closed. Intraoperative hemorrhage was minimal. The length of hospital stay (median 5.3 days) was short. During a median follow-up length of 52.5 months, there was no local recurrence developed. No incision hernia or port site recurrence was recorded.

**Conclusion** Single incision intra-gastric resection is a safe and feasible procedure for treatment of proximal gastric gastrointestinal tumor and achieves good surgical results in terms of wide excision, with low recurrences rates and low complication rates.
Ideal Indications of Laparoscopic and Endoscopic Cooperative Surgery (LECS) for Gastric Submucosal Tumors from A Case Series in Taiwan

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Objective  Laparoscopic and Endoscopic Cooperative Surgery (LECS) was recently advocated for gastric submucosal tumors with the advantage of precise localization, safe excision and functional preservation. From this case series, we aim to target suitable cases for this minimal invasive procedure.

Methods  From August 2014 to May 2017, 13 patients receiving LECS for gastric submucosa tumor were enrolled in this retrospective study. The clinical features were collected with size, location and histology of the resected tumor and indication of the procedure.

Results  LECS was performed in 13 patients with 14 gastric submucosa tumor resected. The average size of tumor was 1.85cm (Range: 0.6–4). Most common location was fundus (7/14, 50%), followed by cardia (3/14, 21.4%), body (3/14, 21.4%) and pre-pylorus (1/14, 7.1%). Most common histology was gastrointestinal stromal tumors (8/14, 57.2%), followed by leiomyoma (3/14, 21.4%) and ectopic pancreas (2/14, 14.3%). All procedures achieved margin free and all patients were free of disease until last follow-up.

Discussion  LECS has the advantage of precise lesion location, minimal resection and functional preservation with direct primary repair by laparoscopic stapling device and reinforced suturing after incidental perforation of Endoscopic Submucosa Dissection (ESD). Submucosa tumors located at fundus were the most common indication due to incidental perforation and thinner gastric wall. Tumors located at cardia or pre-pylorus area, which were difficult to approach by laparoscopy only, were also indicated to preserve most gastric function and avoid further gastrectomy. Big size (4cm) was the other indication to take out intact tumor.

Conclusions  LECS could be tailored to manage gastric submucosal tumor effectively with location at fundus, cardia and pre-pylorus area to minimize resection area and preserve most function to achieve significant outcome.
Thoracoscopic esophagectomy for squamous cell carcinoma of the esophagus as pedunculated polyp

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A rare case of pedunculated polypoid, squamous cell carcinoma of the esophagus is reported. An about 60-year-male was admitted to our hospital. Upper endoscopy showed pedunculated polyp in the mid-esophagus. Section of biopsy revealed squamous cell carcinoma. CT examination showed no obvious metastasis to the lymph node or the organ. We performed thoracoscopic esophagectomy by prone position. Post-operative course was fair. Pathological findings showed massive submucosal invasion with lymphatic duct involvement.

Discussion Pedunculated polypoid carcinoma with wide stalk usually invades to submucosa. We suppose pedunculated polypoid, squamous cell carcinoma of the esophagus is one of the good indication of thoracoscopic esophagectomy.
Quality of life changes after totally laparoscopic distal gastrectomy: a comparison with laparoscopy-assisted distal gastrectomy

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BACKGROUND: This study aimed to compare between the short-term quality of life (QoL) outcomes following totally laparoscopic distal gastrectomy (TLDG) and laparoscopy-assisted distal gastrectomy (LADG) for early gastric cancer.

METHODS: QoL data from the European Organization for the Research and Treatment of Cancer were gathered from 785 patients using QLQ-C30 and QLQ-STO22 questionnaires both preoperatively and at 3, 6, 9, and 12 months after surgery. Patients were divided into two groups according to the different types of surgical approaches: 393 patients underwent TLDG and 392 underwent LADG.

RESULTS: In QLQ-C30 assessment, global health status showed an improvement after surgery in both groups, but there was no statistically significant difference in the improvement between the two groups. With regard to functional scales, only preoperative social functioning was significantly better in TLDG compared with LADG, but there was no difference in QoL changes between the two groups for 12 months after surgery. With regard to symptom scales, fatigue, nausea and vomiting, pain, and appetite loss showed maximum deterioration at 3 months after surgery in both groups; the changes in QoL noted over 12 months after surgery recovered without any significant difference between the two groups. In QLQ-STO22 assessment, eating restriction and body image showed progressively worse QoL after surgery in both groups without any significant difference between them.

CONCLUSIONS: Both intracorporeal or extracorporeal anastomosis and mini-laparotomy have no effect on the QoL of patient after distal gastrectomy. Although this study did not demonstrate that TLDG is not superior to LADG in terms of QoL, more studies involving a methodological high-quality comparative analysis are needed to evaluate the appropriateness of TLDG.
Robotic total gastrectomy compared with laparoscopic total gastrectomy for gastric cancer: A propensity score-matched cohort study of long-term outcomes

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Background Robotic gastrectomy for gastric cancer is possible alternative to laparoscopic gastrectomy in terms of technical feasibility and oncological safety. However, robotic total gastrectomy (RTG) is a technically and oncologically challenging procedure for surgeons. Data on long-term survival after RTG for gastric cancer have yet to be reported. The aim of this study was to compare the short- and long-term outcomes of RTG with laparoscopic total gastrectomy (LTG).

Methods We retrospectively reviewed 296 patients (RTG: 60, LTG: 236) underwent curative total gastrectomy for gastric cancer between 2009 and 2016. We performed PS matching using age, sex, body mass index (BMI), ASA, pathologic T stage and pathologic N stage to compare the surgical and oncological outcomes between the two groups.

Results After PS matching, 114 patients (57 patients in each group) were enrolled. The total numbers of retrieved lymph nodes were similar in both groups. The numbers of retrieved lymph nodes around the splenic hilum were similar in both groups. A longer operation time was required for the RTG group than for the LTG group, but less intraoperative bleeding was observed in the RTG group. The overall morbidity and mortality rates of both groups were similar. Between the two groups, there was no difference in the 5-year overall survival rate or disease-free survival rate.

Conclusions RTG was comparable long-term outcomes after gastrectomy over LTG. RTG may be a technically feasible and an oncologically safe alternative in minimally invasive surgery for the treatment of gastric cancer.
Nutritional benefit of robotic pylorus preserving gastrectomy for early gastric cancer

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**Background** Pylorus preserving gastrectomy (PPG) has been recognized as a function preserving surgery for gastric cancer. To improve the wall motion of remnant stomach, the preserving of nerve and well-proportioned anastomosis are important procedures after PPG. Hand-sewn suture using robotic surgery might provide better postoperative function than that of laparoscopic delta-anastomosis.

**Patients and methods** Using Da-Vinci Xi system, all PPG were performed. The length of pyloric-cuff (antrum) was secured 4cm or more and liver/pyloric branch of vagus were preserving as much as possible. The posterior wall of anastomosis was sutured using the robotic stapler and anterior was robotic hand-sewn; continuous and layer to layer suture. We evaluate the nutritional condition; skeletal muscles mass, lean body weight, bone density and total calorie intake in postoperative months 6.

**Results** Of the 246 consecutive patients with gastric cancer who underwent laparoscopic/robotic gastrectomy at our institute between 2016 to 2019, 6 patients who underwent robotic PPG and 192 patients who underwent laparoscopic/robotic distal gastrectomy. The mean operating time was 284 minutes and mean amount of bleeding was 15ml in robotic PPG. No complication was seen in PPG patients. There were no significant difference in other short-term outcomes. Lean body weight and skeletal muscle mass was significantly maintained in PPG compared with distal gastrectomy. No patients developed osteoporosis in PPG.

**Conclusion** Robotic PPG might be one of promising option for early gastric cancer from perspective of postoperative nutrition improvement.
Oncological outcomes of minimally invasive esophagectomy for esophageal cancer

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**Background** Minimally invasive esophagectomy (MIE) is becoming a standard procedure for esophageal cancer patients. However, the impact of this procedure on oncological outcomes remains unclear to date.

**Purpose** To estimate oncological outcomes of MIE for esophageal cancer.

**Methods** A series of esophageal cancer patients who underwent MIE in our hospital were analyzed in this study. These patients were treated with thoracoscopic and laparoscopic approaches (total MIE) or with thoracoscopic and laparotomic approaches (hybrid MIE). The prone position was used in the thoracoscopic stage. Survival probabilities were estimated with the Kaplan-Meier method. The relapse pattern was assessed in the patients with a curative resection.

**Results** A total of 45 patients received MIE between 2012 and 2019. Total MIE was performed in 35 patients. The median age of the patient cohort was 69.0 years and the male: female ratio was 36:9. Chemotherapy or chemoradiotherapy preceded the surgery in 30 patients. Squamous cell carcinoma was a dominant histological subtype (88.9%). Nineteen patients (42.2%) were diagnosed at pathological stage III. A curative resection was achieved in 40 Patients (88.9%). The median number of harvested lymph nodes was 49. The overall and disease-free survival rates at 5 years were 65.1% and 50.6%, respectively. The median follow-up period for survivors was 37.4 months. Of 40 patients with a curative resection, 13 patients relapsed at a median of 6 months after the operation. The first sites of relapse were regional in 6, distant in 6 and combined (both regional and distant) in 1. Relapse occurred in 56.2% of stage III patients.

**Conclusion** Survival rates of MIE were acceptable in our series. Thus, MIE is feasible as a standard operation for esophageal cancer. Multimodal strategies and innovative surgical techniques are necessary to improve prognosis of patients with advanced esophageal cancer.
What is the safest surgical technique for preventing duodenal stump leakage after laparoscopic gastrectomy for gastric cancer? Lessons from 14 years’ experience at a single institute

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BACKGROUND Duodenal stump leakage (DSL) can be a feared and life-threatening complication after gastrectomy. DSL after laparoscopic surgery can be a bigger disappointment than that after open surgery.

AIM To compare surgical outcomes according to three surgical techniques to treat duodenal stump in laparoscopic gastrectomy and establish the best surgical technique to prevent duodenal stump leakage in laparoscopic gastrectomy for gastric cancer.

Materials and Methods A total of 762 patients who underwent laparoscopic gastrectomy for gastric cancer between April 2003 and March 2017 were enrolled. They were divided into three groups based on surgical technique used to treat duodenal stump: only glue group (group G), polyglycolic acid (PGA) sheet and glue group (group P+G), and laparoscopic reinforcement suture with polyglycolic acid (PGA) sheet and glue group (group R+P+G). Clinicopathologic characteristics and surgical outcomes were compared among three groups retrospectively.

Results Overall incidence of DSL after laparoscopic gastrectomy for gastric cancer was 1.0% (8/762). Among them, four patients with major DSL unfortunately died after reoperation. There are no significant differences in surgical outcomes among the three groups, except operation time. The operation time was the shortest in the R+P+G group. Incidences of DSL in G group and P+G group were 2.1% and 1.1 %, respectively. However, there was no DSL in the R+P+G group.

Conclusions Application of polyglycolic acid (PGA) sheet and fibrin glue on laparoscopic reinforcement suture site for stapler line of duodenal stump can be one of prevention methods for DSL after laparoscopic gastrectomy for gastric cancer.
Indocyanine Green (ICG) Fluorescent Lymphography in Laparoscopic Distal Gastrectomy of Gastric Cancer: A Descriptive Discussion of Procedure

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**Introduction:** Lymph node dissection in gastric cancer surgery is an essential procedure not only for exact acquisition of stage but also proper treatment. Realistically, it is impossible to identify complete removal of lymph node in dissected nodal station by naked eye. Materials and

**Methods:** Intraoperative peritumoral endoscopic submucosal injection of diluted indocyanine Green (ICG) was done after the patient was anesthetized. The lymphatic drainage was clearly visualized by using fluorescent imaging.

**Results:** In this case of gastric body cancer, distal gastrectomy was performed. As for the operation, D2 lymph node dissection around the anterior pancreatic capsule and celiac trunk is one of the most challenging task. Here, we present an example of complete dissection by following the plane around the celiac trunk.

**Conclusions:** Fluorescence imaging using ICG is a helpful technology not only for sentinel lymph node navigation surgery but it is also a guide for extensive lymph node dissection. We can assess the route of lymphatic drainage and identify residual lymph nodes in dissected area. In the field of gastric cancer treatment, this concept will be surely helpful to understand lymphatic drainage and make surgeons to perform D1+ or D2 lymph node dissection completely.
Evaluation of postoperative liver dysfunction associated with liver retraction method in laparoscopic gastrectomy

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**Introductions:** Liver retraction in laparoscopic gastrectomy is important to take a good view for laparoscopic procedures, but some studies noted it caused liver dysfunction after the surgery. The aim of this study is to evaluate the relation between liver retraction methods and postoperative liver dysfunction in laparoscopic gastrectomy.

**Methods:** From September 2018 to July 2019, 54 patients who underwent laparoscopic gastrectomy in our institution were included. Liver retraction was performed in one of the following ways: silicon disc (SD) method, Nathanson hook liver retractor (NHLR) method, or hepatic left robe mobilization (HLRM) method. We analyzed postoperative changes of the serum AST and ALT as parameters indicating liver dysfunction, retrospectively. Multivariable analysis was also conducted to clarify the specific factors related with postoperative liver dysfunction.

**Results:** The increase rates of AST and ALT at just after the surgery, on POD1, POD3 and POD7 were compared. The increase rates of AST were significantly lower in SD method than in other two methods at just after the surgery and on POD1. The increase rates of ALT were also significantly lower in SD method than in other two methods at just after the surgery, on POD1 and POD3. There was no significant difference on POD7 in increase rates of AST and ALT. Multivariable analysis revealed that NHLR and HLRM method were independent predictive factors for liver dysfunction.

**Conclusions:** From a viewpoint to prevent postoperative liver dysfunction, our result indicate that SD method is an ideal method in laparoscopic gastrectomy at present.
Laparoscopic treatment of a median arcuate ligament syndrome with refractory dyspepsia

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A 78-year-old woman was referred for evaluation of a 5-year history of refractory dysplasia characterized by postprandial epigastric pain, nausea, and weight loss. On admission, the patient’s height was 147.8 cm and her weight was 44.6 kg. Her vital signs were stable. Physical examination findings were unremarkable. The results of esophagogastroduodenoscopy were also unremarkable, except for the detection of Los Angeles grade A erosive esophagitis. Abdominal computed tomography (CT) findings raised the suspicion of celiac axis compression. We suspected MAL syndrome and performed CT angiography, which revealed a hooked appearance of the celiac axis due to focal narrowing of its proximal portion. Based on the clinical presentation and the results of CT angiography, the patient was diagnosed with MAL syndrome and underwent laparoscopic decompression of the MAL. However, her symptoms persisted after the procedure. CT angiography performed 2 months postoperatively showed complete disappearance of the focal narrowing of the celiac axis. As the patient’s clinical course led us to question whether MAL syndrome had caused the refractory dyspepsia, we performed a more detailed evaluation. Gastric emptying scintigraphy demonstrated a lack of fundus accommodation and a slight delay of gastric emptying. Revised Symptom Checklist-90 responses indicated that the patient had depression and anxiety. She was referred to the Department of Psychiatry, where she was diagnosed with somatic symptom disorder. We thus diagnosed the patient with functional dyspepsia and somatic symptom disorder, and prescribed a proton pump inhibitor, prokinetics, amitriptyline, and olanzapine. Her symptoms improved greatly with this treatment.
Introduction The number of esophago-gastric junction (EGJ) cancer case is increasing in Japan year by year. The aim of this study is to clarify the safe and adequate procedure for lymph nodes (LNs) dissection and anastomosis in VATS-E for EGJ cancer.

Background The 14% of lower mediastinal LNs metastasis or recurrence was found in totally 29 consecutive patients with EGJ cancer from 1999 to 2005 in our Hospital. Widespread LN metastasis from squamous cell carcinoma (SCC) was found in neck, mediastinum and abdomen, and abdomen from Adenocarcinoma (ADC). Sixty five percent of metastatic lymph nodes at right cardia and about 30 percent at lesser omentum and left cardia. 14 percent of lymph node metastasis or recurrence at lower mediastinum was also found.

Methods For Siewert type I, EGJ cancer, we performed the same VATS-E operation for the esophageal cancer. Patients For Siewert type II, EGJ cancer right thoraco-laparo consecutive incision and trans-thoracic esophagectomy was performed from 2007 to 2012 (n=3). For minimally invasive surgery, VATS-E and laparoscopic or open proximal gastrectomy for EGJ cancer are performed from 2014 (n=12). Three ports are used at the 7th, 9th and 5th intercostal space (ICS) for VATS-E and lower thoracic esophagectomy and lower mediastinal LN dissection were performed with pneumothorax by maintaining CO2 insufflation. Esophago-gastric anastomosis are created by functional end to end anastomosis or orvil system (COVIDIENTM) in the chest.

Results 1. There is no complication except for a case with minor anastomotic leakage in VATS-E. 2. Wide operative field is available in the chest for lymph-node dissection of lower mediastinum and anastomosis for EGJ cancer in VATS-E.

Conclusions VATS-E allows us to perform the feasible and safe reconstruction as well as mediastinal LNs dissection.
**Short-term postoperative outcomes of early recovery after surgery (ERAS) program in gastric cancer patients; results of a prospective randomized controlled trial**

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**Aim:** To compare the short-term postoperative outcome of the ERAS program after distal gastrectomy in gastric cancer patients.

**Method:** Total 166 of resectable gastric cancer patients were enrolled in this study from June 2017 to Jan 2019 and 17 patients were excluded according to study protocol. Finally, 149 patients were randomly assigned to conventional group (n=76) and ERAS group (n=73). Perioperative data and postoperative complication (within 90 days after surgery) were compared between two groups with the intention-to-treat principle.

**Results:** There were no differences in perioperative data such as sex, age, body mass index, co-morbidity, ASA, approach (open vs laparoscopic), operation time, blood loss, hospital stay, anastomosis method, extent of lymph node dissection, incidence of co-resection, tumor location, histologic type (WHO and Lauren’s classification), TNM stage (AJCC 8th ed). Overall postoperative complication (PC) rate was 12.8% (19/149 patients) In conventional and ERAS group, PC rate was 10.5% and 15.1% respectively (8/76 and 11/73 patients). There was no statistical difference in PC rate of two groups (p=0.467). Anastomosis leakage (grade IIIa of Clavien-Dindo classification) were each 1 patient in conventional and ERAS group (1.3% vs 1.4%). No mortality was shown in two groups.

**Conclusion:** There were no differences in short-term postoperative outcomes between conventional and ERAS program after radical gastrectomy.
Short-term outcomes of intracorporeal triangular anastomotic technique in totally laparoscopic distal gastrectomy

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**Introduction:** Several anastomotic techniques in laparoscopic distal gastrectomy (LDG) have been reported to date. The delta-shaped anastomosis is widely used in Billroth I reconstruction in Japan. However, the delta-shaped anastomosis has some technical difficulties: unnatural torsion of the remnant stomach and the duodenum, and potentially ischemic triangular areas between the two staple lines. The intracorporeal triangular anastomotic technique, recently reported by Omori, has a potential to overcome the above disadvantages of the delta-shaped anastomosis.

**Methods:** We reviewed a series of patients who underwent LDG with intracorporeal triangular anastomotic gastro-duodenostomy between 2016 and 2019 at our institution. We use endoscopic linear staplers 3 times to create the triangle-shaped anastomosis. The first stapler is inserted from the small holes created at the caudal tips of the gastric and duodenal staple lines. We fire the stapler just posteriorly and parallely to both staple lines to create the base of the triangle. The second stapler is used to close the entry hole of the first stapler. The third stapler trims the anterior side of the first stapling together with the gastric and duodenal staple lines, so as to remove the narrow ischemic area.

**Results:** We performed LDG with intracorporeal triangular anastomotic technique in 18 patients. The median operation time, blood loss and hospital stay were 303 minutes, 35 ml, and 8 days, respectively. Only one patient had anastomotic leakage, which occurred subsequently to a pancreatic fistula.

**Conclusions:** The intracorporeal triangular anastomotic technique is a useful option for Billroth I reconstruction in LDG.
Improved surgical outcomes of laparoscopic gastrectomy compared with conventional open gastrectomy for gastric adenocarcinoma in obese patients

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Background In this study, we explored the safety of laparoscopic gastrectomy in obese gastric cancer patients compared with conventional open gastrectomy based on early surgical outcomes.

Material and methods A total of 462 patients who underwent curative gastrectomy for gastric adenocarcinoma from January 2000 to December 2014 were enrolled. Two obesity cohorts were defined according to a body mass index (BMI) of $\geq 25$ kg/m$^2$ versus $\geq 30$ kg/m$^2$. Those cohorts were further divided into the laparoscopic distal gastrectomy (LDG) and open distal gastrectomy (ODG) groups, and clinicopathologic characteristics were compared with early surgical results.

Results There were no significant differences in clinicopathologic characteristics between the LDG and ODG groups in the BMI $\geq 25$ or BMI $\geq 30$ cohorts. For the overall complication rate, fewer complications were observed in the LDG than ODG group in both cohorts. Among the overall complications, significant differences were observed in the minor complication rates (Clavien-Dindo I or II), but no significant difference was observed in the rate of Clavien-Dindo III or higher complications. For risk factor analysis of postoperative complications, open distal gastrectomy, age $> 60$ years, and BMI $\geq 30$ were independent risk factors for postoperative morbidity among all obese patients.

Conclusions LDG may be a better procedure to improve surgical outcomes in patients with obesity undergoing surgery for early gastric cancer in terms of less excessive blood loss, shorter operation time, and lower complication rates.
Comparison between laparoscopic surgery and open surgery for upper gastrointestinal tract perforation in our hospital

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**Background:** Laparoscopic surgery has been introduced for upper gastrointestinal perforation since 2018 in our hospital.

**Purpose:** The aim of this study was to compare the outcome of laparoscopic surgery with open surgery for upper gastrointestinal tract perforation in our hospital.

Method: Thirty-three patients who underwent laparoscopic or open surgery for upper gastrointestinal tract perforation between January 2009 and January 2019 were enrolled. Patients were divided into the laparoscopic group (L group: n=9) and open group (O group: n=24). The clinical results were compared between the two groups.

**Result:** There were no significant differences in age (p=0.856), sex (p=0.954), perforation site (P=0.407), operation time (p=0.06), blood loss (p=0.646), post-operative length of stay (p=0.540), postoperative complication (p=0.488) between the two groups. Diet start time in the laparoscopic group was significantly shorter than in the open group. (L group: 5POD (2-23) vs O group: 7POD (5-22), p=0.005).

**Discussion:** The diet start time could be significantly reduced by laparoscopic surgery. Generally, laparoscopic surgery seems to extend the operation time, but there is no significant difference from open surgery. Barbed suture does not require slip knots and allows easier and faster suturing time.

**Conclusion:** Laparoscopic surgery might be introduced without a large prolongation of the operation time and have advantage for the diet start time.
A clinical study of gastric submucosal tumors resected by LECS

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Introductions: Laparoscopic and endoscopic cooperative surgery (LECS) has been performed for gastric submucosal tumors (SMT) since 2008. In Japan, LECS has been approved for insurance coverage by the National Health Insurance plan since 2014. From 2010 to 2019, 16 gastric submucosal tumor (SMT) operations were performed in our hospital. Of the 16 surgeries, 11 laparoscopic surgeries were performed and six of those were LECS. One patient underwent LECS and laparoscopic partial resection for multiple GIST. All six patients required histological diagnosis using mucosal incision assisted biopsy or fine needle aspiration. Four patients were diagnosed with GIST, one patient was a glomus tumor, and one patient was a lipoma. Three male and three female patients underwent LECS. The median age was 73 years old (33–83). The tumors were located on various parts of the stomach and were growing in the intragastric. Average tumor size was 3.0cm, and average operation time was 210 minutes, average blood loss was 36.7 ml. No postoperative complications have occurred. The median number of hospitalization days was 9.5 days.

Case presentation: An 83-year-old man was found with a tumor in the antrum using an upper gi series. Esophagogastroduodenoscopy showed a 30mm submucosal tumor. Incision biopsy diagnosed the tumor as a glomus tumor. CT scan showed a 20mm size of tumor in the stomach. There was no lymph node swelling or distant metastasis. The patient consequently underwent LECS. After undergoing endoscopic full thickness resection, the tumor was extracted with a laparoscopic procedure. Operation time was 127 minutes, blood loss was 5 ml, and hospitalization lasted seven days. Glomus tumors are rare and LECS was useful in this case.

Conclusions: LECS is a very useful treatment for intragastric growing SMT tumors.
Port site metastasis due to chimney effect on a patient with laparoscopic and open incision.

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**Introduction** Laparoscopic surgery is becoming the standard approach for treatment of GIST. Port site metastasis after laparoscopy for GIST is a rare occurrence. Aerosolization of tumor cells had been postulated to cause port site metastasis. Chimney effect leads to aerosolization of tumor particles at port sites through gas leaking upon removing the trocar.

**Case History** We report a case of a 69-year-old lady diagnosed with GIST of the stomach who underwent laparoscopic resection of tumor converted into open resection. Metastasis developed at the port site and not on the midline incision. We discuss the factors that may have contributed to the metastasis.

**Conclusion** Laparoscopy resection of GIST tumor is gaining increasing acceptance. The risk of port site metastasis can be minimized by careful deflating the pneumoperitoneum before removing the trocar.

*The figure uploaded shows: Anterior abdominal subcutaneous metastatic nodules at port site
Outcomes of Laparoscopic Gastrojejunostomy for Malignant Gastric Outlet Obstruction

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Background Malignant gastric outlet obstruction (mGOO) not only prevents food intake but it reduces patients’ quality of life (QOL) because placement of a decompression tube is needed. Aim The usefulness of gastrojejunostomy for mGOO was examined.

Materials and Methods From January 2013 to March 2019, 27 patients underwent gastrojejunostomy for mGOO at our hospital. Perioperative parameters including insertion of a decompression tube, operation time, GOO score, and so on were investigated. Furthermore, the open approach and the laparoscopic group were compared.

Results There were 27 cases of gastrojejunostomy in our institution, including 18 by the open approach (Open group) and 9 by the laparoscopic approach (Lap group). Ten cases (37.0%) had a decompression tube inserted preoperatively. The mean operation time was 174 min. The GOO score improved from 1.22 to 2.74. Only one patient died of primary disease because of inadequate intake. A total of 21 cases (77.8%) were discharged home, and 17 cases (63.0%) received chemotherapy after surgery. The survival period was significantly longer in the chemotherapy group than in the non-chemotherapy group (Median survival time: 285 vs 59 days; P=0.0003). Postoperative chemotherapy prolonged survival significantly on univariate analysis and was identified as an independent prognostic factor on multivariate analysis. Comparing the Open and Lap groups, operation time was significantly prolonged, but the GOO score was significantly improved in the Lap group (1.17 vs 2.22; P=0.04). Meal start time tended to be delayed in the Lap group (4.3 vs 6.7; P=0.08).

Discussion and Conclusion Gastrojejunostomy for mGOO not only can improve the GOO score and QOL, but it also contributes to prolonging survival by enabling oral chemotherapy. Laparoscopic surgery for mGOO significantly improved the GOO score but tended to delay meal start time, and further study of additional cases may be required to determine its usefulness.
Three cases of totally laparoscopic duodenal segmentectomy

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Background / Purpose Totally laparoscopic duodenal segmentectomy is technically demanding when the tumor location is the third portion, especially close to the duodenal papilla. We herein report three cases of totally laparoscopic duodenal segmentectomy for the tumors located on the third portion.

Cases We experienced three cases of totally laparoscopic duodenal segmentectomy for duodenal tumors. In all cases, each tumor located on the pancreatic side of the third portion of the duodenum. So we confirmed the position of the papilla and the location of the tumor using the intraoperative gastrointestinal endoscope.

Case 1: A 30-year-old man was diagnosed as GIST. Oral intake was started on 4th postoperative day, and the patient was discharged on the 8th post-operative day.

Case 2: A 40-year-old man was diagnosed as GIST. This patient underwent a laparoscopic gastrojejunal bypass on the 21th post-operative day because of the delayed gastric emptying. He was discharged on the 57th post-operative day.

Case 3: A 70-year-old man was diagnosed as early duodenal carcinoma. He started to intake foods on 3rd postoperative day. However, it was occurred to vomit in 5th postoperative day, and delayed gastric emptying was suspected. He was discharged on the 15th post-operative day. Totally laparoscopic duodenal segmentectomy were performed in all cases.

Discussion When the tumor is the third portion and close to the papilla, intraoperative gastrointestinal endoscopy may be useful for safety procedure of totally laparoscopic duodenal segmentectomy. It is necessary to pay attention to delayed gastric emptying after the laparoscopic duodenal segmentectomy.

Conclusion We reported three cases of laparoscopic duodenal segmentectomy.
Analysis of long-term survival in gastric cancer patients with intra-operative margin positivity: a retrospective observational study of a single institution

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Purpose: This study aimed to evaluate the long-term survival of gastric cancer patients with intra-operative margin positivity on frozen section.

Methods: A total of 2783 patients with gastric cancer underwent gastrectomy between January 2005 to December 2012. 96 patients of them were identified intra-operative margin positivity on frozen section, and re-resection was performed in all patients. The patients were divided into complete resection group (CR, n=54) and non-complete resection group (Non-CR, n=42) according to the final pathologic result.

Results: Mean age was 61.3±13.1 years old, and body mass index was 21.9±3.2 kg/m2. The resection margin of CR group was longer than Non-CR group (1.3±1.9 cm vs. 0.5±1.1 cm, p=0.010). The number of the metastatic lymph node was lower in CR group (7.3±11.5 vs. 19.5±22.6, p<0.001). Tumor size of Non-CR group was larger than CR group (9.1±4.3 cm vs. 6.4±3.9 cm, p=0.003). CR group tends more early cancer related to TNM stage. The specificity of final pathologic confirmation for the frozen section was 96.6%, and for specimen margin was 82.8%. Disease-free survival of CR and Non-CR group was 59.5% and 14.3%, respectively (p<0.001). Disease-specific survival of CR and Non-CR group were 67.6% and 18.8%, respectively (p<0.001). DSS of CR group according to the TNM stage (in stage I, II and III) was 100.0%, 64.0% and 48.3%, respectively. DSS of Non-CR group in stage I, II and III was 100.0%, 33.3% and 14.3% respectively. In the analysis of stratified resection margin, there was no correlation between length of margin and survival.

Conclusion: Although intra-operative margin is positive, it may be expected relatively good prognosis regardless of the length of the resection margin, if the complete resection through re-resection was performed.
Short-term postoperative outcomes of early recovery after surgery (ERAS) program in gastric cancer patients; results of a prospective randomized controlled trial

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Aim: To compare the short-term postoperative outcome of the ERAS program after distal gastrectomy in gastric cancer patients.

Method: Total 166 of resectable gastric cancer patients were enrolled in this study from June 2017 to Jan 2019 and 17 patients were excluded according to study protocol. Finally, 149 patients were randomly assigned to conventional group (n=76) and ERAS group (n=73). Perioperative data and postoperative complication (within 90 days after surgery) were compared between two groups with the intention-to-treat principle.

Results: There were no differences in perioperative data such as sex, age, body mass index, co-morbidity, ASA, approach (open vs laparoscopic), operation time, blood loss, hospital stay, anastomosis method, extent of lymph node dissection, incidence of co-resection, tumor location, histologic type (WHO and Lauren’s classification), TNM stage (AJCC 8th ed). Overall postoperative complication (PC) rate was 12.8% (19/149 patients) In conventional and ERAS group, PC rate was 10.5% and 15.1% respectively (8/76 and 11/73 patients). There was no statistical difference in PC rate of two groups (p=0.467). Anastomosis leakage (grade IIIa of Clavien-Dindo classification) were each 1 patient in conventional and ERAS group (1.3% vs 1.4%). No mortality was shown in two groups.

Conclusion: There were no differences in short-term postoperative outcomes between conventional and ERAS program after radical gastrectomy.
Outcome of dilatation and predictors of failed dilatation in patients with corrosive esophageal strictures.

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**Background:** Outcome of endoscopic dilatation in corrosive esophageal stricture is less known. This study aims to determine the outcome of dilatation and predictors of failed dilatation in patients with corrosive esophageal stricture.

**Methods:** Patients diagnosed of corrosive esophageal strictures were included. Endoscopic dilatation with graded Savary-Gilliard dilator was performed as the first line treatment. Outcome of dilatation was considered favorable when patients were able to swallow solid without intervention at least six months after successful dilatation. Failure of dilatation was defined as one of the following; complete luminal stenosis, inability to perform safe dilatation, perforation, and inability to maintain adequate luminal patency. Surgery or repeated dilatation was indicated in failed dilatations.

**Results:** There were 55 patients with corrosive esophageal strictures. Of 55 patients, 41 (75%) had failed dilatation (38 having esophageal replacement procedure, two continue repeated dilatation and one unfit for surgery). Of 323 sessions of dilatations, eight out of 55 patients (14.5%) had perforations. There was no dilatation-related mortality. Patients with concomitant pharyngeal stricture ($p = 0.0001$), long ($\geq 10$ cm) stricture length ($p < 0.0001$), number of dilatation $>6$ sessions per year ($p = 0.01$) and refractory stricture (inability to pass a larger than 11 mm dilator within three sessions) ($p = 0.01$) were more likely to have failed dilatation. Thirty-two of 38 patients with surgery had good swallow outcome with one operative mortality (2.6%). At the median follow-up of 61 months, overall favorable outcome was 84% after surgery and 25% for dilatation ($p < 0.0001$).

**Conclusions:** Majority of patients with corrosive esophageal stricture were refractory to dilatation. Esophageal dilatations were ultimately failed in three-fourth of the patients. Concomitant cricopharyngeal stricture, long stricture length, requiring frequent dilatation, and refractory to $>11$ mm dilatation were factors associated with failed dilatation.
Gastric Outlet Obstruction, a Rare Presentation of Primary Gastric Diffuse Large B Cell Lymphoma: case report

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Introduction: Primary gastric lymphoma is a rare condition accounting for approximately 3% - 5% of all gastric malignancies. Stomach is the most common site of extra nodal lymphoma; it accounted for 60%-75% of all primary gastrointestinal lymphoma. Common presenting symptoms include epigastric pain, nausea, vomiting, and weight loss. Perforation, bleeding, and obstruction can be rarely found. We report a case of primary gastric lymphoma presented with gastric outlet obstruction.

Case presentation: We reported a case of 48-year-old male who presented with postprandial nausea and vomiting for a month. Signs of dehydration and malnutrition were obviously found. Mild tenderness at epigastrium was noted on examination. No mass found upon palpation. Hypokalemia, hypochloremia, and metabolic alkalosis was shown on laboratory test. Esophagogastroduodenoscopy revealed a large ulcerative mass with contact bleeding on the lesser curvature of the stomach which extended to the pylorus, causing gastric outlet obstruction. Marked distension of the stomach with asymmetrical wall thickening at lower half of the lesser curvature was demonstrated on CT scan. No significant intraabdominal lymph node was seen. Histopathological and immunochemistry study were compatible with high-grade non-hodgkin B-cell lymphoma. Ki-67 staining was positive in 90% of neoplastic lymphoid cells. Endoscopic guided nasojejunal tube placement was attempted but failed due to severe stricture of pylorus. After 2 weeks of CHOP regimen, clinical gastric outlet obstruction has not improved. Patient further underwent gastrojejunostomy bypass. He could tolerate oral alimentation and CHOP regimen was re-administered. Finally, our patient tolerate well and he was discharged home as his clinical improved.

Conclusion: Gastric lymphoma are rarely presented with gastric outlet obstruction. Even though CHOP regimen is the backbone of treatment for B-cell lymphoma. Surgical intervention may be reserved for patient with obstruction as our presented case.
Advanced minimally invasive gastric surgery in community hospitals in Japan -from standardization to robotic surgery-

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Laparoscopic gastrectomy (LG) is now widely performed in high-volume hospitals in Japan. According to the 14th Nationwide Survey of Endoscopic Surgery in Japan, gastric cancer surgery is performed by LG in 53% of cases. On the other hand, LG has not become popular in community hospitals in Japan. In our community hospital, we were able to standardize LG and we performed 204 LG procedures that included 5 partial gastrectomies, 146 distal gastrectomies, 5 proximal gastrectomies and 48 total gastrectomies as well as 40 robotic gastrectomy procedures including of one total gastrectomy, 7 proximal gastrectomies and 32 distal gastrectomies in the period from January 2014 to August 2019. We evaluated 199 patients who underwent LG excluding patients who underwent partial gastrectomy. The average age was 72.1±9.9 years old, mean operation time was 338±105 minutes, mean blood loss was 90±117 ml, and mean postoperative hospital stay was 10.3±6.4 days. Operation related death were 2 cases of aspiration pneumonitis and acute myocardial infarction. However, just Laparoscopic distal gastrectomy, the average age was 71.6±10.8 years old, mean operation time was 266±53 minutes, mean blood loss was 41±42 ml, and mean postoperative hospital stay was 8.3±3.8 days. There was no operation related death. Instructions by appropriate mentors, establishment of a team for laparoscopic surgery including LG, an anatomical understanding of the abdominal cavity and individual surgical trainings are necessary for safely standardizing laparoscopic and robotic gastrectomy in community hospitals.
Laparoscopy-assisted versus Open distal gastrectomy for Locally Advanced Gastric cancer

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Introduction: This is a randomized controlled trial on laparoscopy-assisted distal gastrectomy (LADG) versus open distal gastrectomy (ODG) for locally advanced gastric cancer.

Objective: To attain the consequences of LADG versus ODG, to evaluate the perioperative outcomes, to assess the lymph nodes harvested and to judge local recurrence in LADG versus ODG in locally advanced gastric cancer.

Methods: This study was undertaken at the surgical ward I of Yangon General Hospital, commenced from 1st November 2016 and accomplished on 31st October 2018. The study included 41 patients with LADG or ODG who were allocated randomly. Main outcome measures comprised the duration of operation, blood loss, postoperative pain, time to first flatus pass, postoperative complications, numbers of lymph nodes harvested, postoperative hospital stay and local recurrence within 1 year.

Results: The operative time of LADG was significantly longer than that of ODG (191 ± 55.2 min vs 152 ± 32.7 min) (P = 0.01). Postoperative pain score (VAS) within 48hr was significantly lower in LADG than that of ODG (2.38 ± 0.59 vs 3.81 ± 0.75) (P = 0.001). First time to pass flatus was significantly earlier (2.85 ± 0.79days vs 3.86 ± 0.79days) (P = 0.006). Days of postoperative hospital stay was significantly lower in LADG than that of ODG (5.7 ± 1.8days vs 8.9 ± 2.4days) (P = 0.001). Number of lymph nodes harvested was lower in LADG group than that of ODG but it was not statistically significant (20.19 ± 5.75 vs 23.62 ± 12.71) (P = 0.26). Amount of blood loss was not significantly different between LADG vs ODG (180 ± 83.7 ml vs 161 ± 88.2 ml) (P = 0.48).

Conclusion: LADG is feasible and safe for locally advanced gastric cancer. It can give comparable oncologic effects and better perioperative aftermaths linked to ODG.
A planned trocar placement of laparoscopic distal gastrectomy in gastric cancer patient with permanent sigmoid stoma

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Patients with history of abdominal surgery have high risk for intestinal injuries in trocar placement due to intestinal adhesions to abdominal wall. [Case] A 66-year-old man complained of black stool and visited a nearby clinic. He was diagnosed with gastric cancer and was referred to our hospital. His medical history included abdominoperineal rectal resection with permanent sigmoid stoma (Miles operation). Upper gastrointestinal endoscopy revealed a 50-mm Type I tumor at the greater curvature, which was diagnosed based on biopsy findings as tubular adenocarcinoma. Computed tomography showed a well-enhanced tumor and no lymph node or distant metastasis. Based on the diagnosis of the gastric cancer T2, N0, M0 Stage I, we performed laparoscopic distal gastrectomy. The severity and extension of abdominal wall adhesions was detected using visceral slide technique by abdominal ultrasonography before operation. We placed first trocar at adhesion-free area by visceral slide and detached intestinal adhesion, and then we managed to complete laparoscopic distal gastrectomy. Since the frequency of concomitant occurrence of colorectal cancer in gastric cancer patients is relatively high, we discuss about the strategy of laparoscopic distal gastrectomy with stoma.
Comparison of short-term outcomes between robotic and laparoscopic distal gastrectomy for gastric cancer

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Introduction: In Japan, robotic gastrectomy was published insurance in April 2018. It is expected to be established as a standard operation for gastric cancer in the future. However, there is insufficient evidence for short-term results of robotic distal gastrectomy (RDG). This study aimed to clarify the feasibility of RDG from safety aspects.

Methods: This study included 35 gastric cancer patients who underwent RDG at Hokkaido University from September 2014 to June 2019. Short-term outcomes were compared with 53 gastric cancer patients who underwent laparoscopic distal gastrectomy (LDG) during the same period.

Results: The median operating time was RDG 302 minutes (132-585) and LDG 304 minutes (226-428) (P=0.79). The median intraoperative bleeding was RDG 0 ml (0-255) and LDG 0 ml (0-100) (P=0.72). The incidence of all complications (≥Clavien-Dindo classification III) was similar across the study patients (RDG: 4 cases, LDG: 2 cases). The median length of hospital stay after surgery was RDG 11 (6-28) and LDG 12 (6-42) (P=0.56).

Conclusion: RDG was comparable to LDG in terms of feasibility for gastric cancer. However, there is a need for well-designed prospective randomized controlled studies comparing the two procedures with long-term follow-up, to inform future practice.
Esophageal stent for esophagojejunostomy site leakage and delayed healing due to drainage catheter malposition and hemolok clips

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Introduction: Total gastrectomy can suffer from anastomotic leaks. There are many endoscopy and percutaneous managements in the literature. However, if the device is not placed correctly, wound healing can be delayed. We reported a case of delayed healing due to misplaced drain catheter and surgical clips.

Case presentation: A 59-year-old man was diagnosed with gastric cancer, siewert type II polypoid mass of about 1 cm size, adenocarcinoma with moderate differentiation. Abdominal CT showed some enlarged perigastric lymph nodes suspected of metastasis. Totally laparoscopic total gastrectomy was performed. Roux-en Y esophagojejunostomy was made using overlap method. An intraoperative leak test showed no leakage using indigo carmine and air. EJ anastomosis leak developed 5 days after surgery. A fully covered esophageal stent was placed. A percutaneous drainage catheter was placed into abscess cavity. However, the leaked liquid continued to drain for a month. follow up endoscopy revealed the misplaced drainage catheter through the leak site. The location of the PCD catheter was changed, and another esophageal stent was inserted. But the leak continued for a month. Follow up endoscopy again showed that the catheter tip advanced and slightly across the opening of the leak site. The catheter was again changed. After another one month, the leakage significantly decreased. But two hemolok clips passed across the leak site. Hemoloks were removed. The patient kept nothing per oral intake for a week. Finally, the UGI test no longer showed any leaks. The patient tolerated a soft diet well and was discharged almost four months after initial operation.

Conclusion: Esophageal stents are considered a good solution for the treatment of esophageal leaks. The weakness of the covered stent is that we cannot see the lumen in the stent placement. Wrong placement of drained catheter or surgical material can prevent wound healing.
Intraoperative indocyanine green fluorescence imaging of the pancreatic tail in robotic total gastrectomy with splenectomy

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Background Sufficient blood perfusion of the pancreatic tail may be essential to prevent pancreatic fistula after splenectomy.

Methods Between October 2018 and June 2019, 5 patients underwent robotic total gastrectomy with splenectomy using the da Vinci Xi Surgical System (DVSS). In these patients, the splenic artery was encircled and clamped right distally to the origin of the major pancreatic artery, and then 12.5g of indocyanine green (ICG) was intravenously injected. The same amount of ICG was injected right after stomach resection with lymph node dissection was completed.

Results In all five cases, Firefly™ Fluorescence Imaging immediately illuminated the pancreatic tail, suggesting good blood perfusion in the pancreatic tail without the major pancreatic artery. Thus, the artery was transected at the clamped site. The pancreatic tail similarly emit light after the second ICG injection. Postoperative pancreatic fistula did not occur in any patients.

Conclusion ICG fluorescence imaging may be useful to determine if the splenic artery could be safely transected right distally to the origin of the major pancreatic artery.
Staging Laparoscopy: What have we learned from 50 Upper GI cancer cases?

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**Introduction** Staging Laparoscopy (SL) is an essential step in staging of stomach and lower oesophageal cancer. SL is used to assess locoregional extensions and provides gross idea/status of the condition in situ/live. Staging laparoscopy further complements radiographic imaging by virtue of laparoscopic ultrasound (LUS), allowing biopsies, peritoneal fluid sampling and tissue biopsy.

**Methodology** This is a retrospective study of a case series and review of 50 stomach and lower oesophageal cancer patients over a period of 6 years. 50 patients with stomach and lower oesophageal cancer after a complete preoperative work up underwent SL as a preprocedural before surgical exploration. TNM staging was used to compare with SL with CT used as gold standard. We looked at common findings and standardised techniques and how SL has changed the management of UGI cancers.

**Conclusion** Staging Laparoscopy provides essential information on the cancer status and has good applicability providing systematic, stage/case-based management.
Frail elderly gastric cancer patients undergoing gastrectomy have increased postoperative mortality risk

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**Objective** Frailty has not been evaluated specifically in geriatric (aged ≥65 years) gastric cancer patients undergoing gastrectomy. We aim to assess the effects of frailty on early postoperative outcomes in these patients.

**Methods** A review of a prospective database was performed for geriatric gastric cancer patients who underwent gastrectomy at a single tertiary institute from November 2011 to April 2019. Variables analysed included patient demographics, cancer and surgery related variables, comprehensive geriatric assessment, American Society of Anesthesiologists classification and multidimensional frailty score. The primary outcome was 1-year all-cause mortality. Secondary outcomes were early postoperative complications, postoperative length of stay and in-hospital, 30-day and 90-day all-cause mortality.

**Results** 295 patients underwent gastrectomy for gastric cancer in the study period. The mean age was 77.3 (range 66 – 94) years. 188 (63.7%) patients were males and 172 (58.3%) patients had early gastric cancer. 212 (71.9%), 49 (16.6%), 24 (8.1%) and 10 (3.4%) patients underwent subtotal/distal, total, proximal and pylorus-preserving gastrectomies respectively. 289 (98%) patients underwent minimally invasive gastrectomy with a conversion rate of 9 (3.1%). 82 (27.8%) patients suffered from early postoperative complications, with 22 (7.5%) suffering from Clavien-dindo grade ≥3 early postoperative complications. One-year, 90-day, 30-day and in-hospital mortality rates were 4.7%, 1.5%, 0.7% and 0% respectively. On univariate analysis, patients with high risk multidimensional frailty score (>8) were found to have higher all-cause mortality at 1-year (odds ratio 7.1, p<0.05). On multivariate analysis, high risk multidimensional frailty score continued to be a significant factor for all-cause mortality at 1-year (p<0.05) but did not predict for increased early post-operative complications, length of stay and in-hospital, 30-day and 90-day all-cause mortality.

**Conclusion** Elderly gastric cancer patients undergoing gastrectomy with high risk multidimensional frailty score have increased 1-year all-cause postoperative mortality risk.
Small Bowel Diverticulum: A Rare Source of Obscure Gastrointestinal Bleeding

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**Introduction:** Small bowel diverticula have an incidence of 1-2% in the general population. Jejunoileal diverticulosis occurs mostly in males in the 6th to 7th decades; it is rare in patients below the age of 40 years.

**Case Report:** A 63-year-old male Filipino consulted because of passage black stools of three days duration associated with light-headedness. He did not experience abdominal pain and had no recent intake of NSAIDs. In 2018, he underwent esophagogastrscopy and colonoscopy for suspected GI bleeding which revealed polyps measuring in the body and fundus of the stomach. These polyps were considered to be the culprit lesions. Snare polypectomy was done. Physical examination during admission revealed a BP of 120/70, a pale conjunctivae, and a soft abdomen. Hemoglobin was 86 while INR was 1.06. The patient underwent single-balloon enteroscopy which revealed a large proximal jejunal diverticulum and fresh blood indicating recent bleeding at the diverticulum. A hemoclip was placed 45 cm distal to the pylorus. During surgery, inspection of the small bowel revealed a broad-based diverticulum 15 cm from the Ligament of Treitz. Intraoperative enteroscopy confirmed that this diverticulum was the source of bleeding. A segment of the jejunum containing the diverticulum was resected and anastomosed. Post-op course was unremarkable.

**Discussion:** Most patient with jejunoileal diverticula are asymptomatic but symptoms such as epigastric pain, bloating, or distention have been observed in some patients. Enteroclysis, capsule endoscopy, enteroscopy, CT scan, CT angiography, and laparoscopy offer help in the diagnosis. Patients with diverticular hemorrhage can be managed conservatively but a long-term follow up is required because a significant number of patients report recurrent bleeding.

**Conclusion:** Jejunal diverticulosis is a rare source of gastrointestinal bleeding and may be missed on initial endoscopy. It should be considered in patients with acute bleeding.
A Fatal Upper Gastrointestinal Bleed: Primary Aorto-oesophageal Fistula

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**Introduction:** Aortoesophageal fistula (AEF) is a rare and lethal condition. Thoracic aneurysm, the most common cause, will slowly increase in size over time, erode the aortic wall, create a fistula, and lead to torrential bleeding.

**Case Report:** We are reporting a 67-year-old woman presented with a day history of haemetemesis, preceded with worsening dysphagia. Emergency gastroscopy was performed and noted blood clot at 28-35cm from incisor. Clot removal attempted, resulted massive bleeding, required intubation to secure airway. CTA of thoracic and abdominal aorta was performed as AEF was suspected. It showed multiple saccular aneurysm extending from descending thoracic to abdominal aortal with mural thrombus, compressed onto oesophagus and displaced oesophagus anteriorly with no clear fat plane. Proximal oesophagus was dilated with haematoma. Findings were consistent with AEF. Emergency thoracic endovascular repair (TEVAR) was performed, followed by oesophgeal stenting. Bleeding was secured after stenting. She was planned for definitive treatment later but defaulted follow up.

**Discussion:** The classical triad of midthoracic pain, herald bleeding and fatal hematemesis described in this condition is seen in only one-third of cases. High clinical suspicion is required for timely diagnosis as common investigations routinely done for gastrointestinal (GI) bleeding, including gastroscopy, fails to detect most cases. Diagnosis and treatment decision should be made quickly because of the rapid and mortal course of the disorder. Computed tomography angiogram detect most cases and emergent endovascular repair with stents controls the initial bleeding. The definitive treatment is to repair both the aorta and the esophagus and reconstruct them in staged procedures.

**Conclusion:** AEF is a rare and life-threatening etiology of GI bleeding with poor prognosis due to lack of prompt diagnosis and delay in treatment. Early recognition, a high index of suspicion, and improved clinical care could improves the overall outcome of AEF.
Our experiences: When endoscopic removal fails for distal oesophagus foreign body obstruction!

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Introduction Oesophageal foreign body obstruction commonly categories to boneless vs bone. Majority of obstruction occurs in the post cricoid and upper esophagus followed by the mid-esophagus while only few cases over lower esophagus.

Objectives To highlight a rare case of foreign body caused by cartilaginous part of pork rib and prompt surgical intervention saving a life.

Case presentation 49 years old, gentleman with no known medical illness. He presented with alleged swallowing cartilaginous part of pork rib. Subsequently, patient unable to take orally and experience regurgitation. Otherwise, patient was not in respiratory distress. Fibreoptic nasopharyngoscopy showed pooling of saliva at posterior cricoid region, others normal. Proceeded with gastroscopy (OGDS) which showed foreign body at distal oesophagus with linear erosions at edges and unable to remove. Then, patient underwent open gastrostomy, removal of foreign body at distal oesophagus, oesophageal stent insertion and feeding jejunostomy creation with on table OGDS. Patient was recovering well post operation and was allowed liquid diet. He was discharged well. Repeated OGDS 1 month post operation showed healing oesophageal ulcer, oesophageal stent was removed and feeding J was off. He is now able to tolerate soft diet.

Discussion Foreign body ingestion potentially a life threatening condition which prompts urgent attention and interventions. Although majority of ingested foreign bodies will pass out uneventfully, about 10-20% requires intervention often endoscopically while 1% needing surgical intervention. Commonly seen complications are impaction, ulceration, perforation and potentially death. Endoscopic removal found to be safe and effective however in cases of failure or complications prompt surgical backup should be available.

Conclusion Foreign body being even cartilaginous part could lead to deleterious outcome. Improper management of oesophageal foreign body is catastrophic due to high risk of its associated complications.
Laparoscopic Resection of Large Gastrointestinal Stromal Tumor near Esophagogastric junction

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Introduction Laparoscopic partial gastric resection of gastrointestinal stromal tumors (GIST) is the most feasible in tumors smaller than 5 cm. However, the size of gastric GIST larger than 5 cm is controversial for oncologic outcome especially the tumor located at esophagogastric junction (EGJ). Furthermore, the surgery near the EGJ is difficult because of the high risk of luminal narrowing and deformity of EGJ. In this report, we describe the technique of laparoscopic partial gastric resection of large gastric GIST located near EGJ with intracorporeal manual suturing.

Case report A Thai woman, 67 years old, presented with upper gastrointestinal bleeding. Following resuscitation, esophagoduodenoscopy (EGD) was performed. The submucosal tumor was found near the EGJ and lesser curvature of stomach and then biopsy was done. The pathological result showed chronic inflammation, no H. pylori, no intestinal metaplasia or dysplasia. Computed tomography of abdomen showed heterogeneous arterial enhancing submucosal mass at upper gastric body near EGJ, size 6.2x5.3 cm. The patient underwent laparoscopic resection by anterior gastrotomy following partial gastric resection without breaking the tumor and uninvolving tumor margin. The anterior gastrotomy defect was closed by intracorporeal manual running suture. The luminal aspect of EGJ was identified and secured under intraoperative EGD during the procedure. Total operative time was 310 minutes. Estimated blood loss was 150 ml. The pathological report showed gastrointestinal stromal tumor size 8.5x6.0x4.5 cm. Mitotic rate was 10/10 in high-power-field, no lymphovascular invasion and tumor necrosis. The margin was uninvolved by tumor. DOG1 and CD117 were positive. This patient did not have complications after surgery. The follow up time was 14 months without any tumor recurrence or metastasis.

Conclusion The resection of large gastric GIST located near EGJ is feasible and safe in oncologic outcome by laparoscopic partial gastric resection with intracorporeal manual suturing.
Duodenal ulcer bleeding, stop bleeding with histoacryl injection

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Histoacryl glue (N-butyl-2-cyanoacrylate) has well-established utility in the endoscopic management of gastrointestinal variceal bleeding. The role of Histoacryl glue in non-variceal bleeding is less clear, and there are few articles describing its use in this setting. A 45-year-old Thai female, with history of diabetic mellitus and hypertension presented with hematemesis 1 days PTA. There were no history of acid peptic disease, non-steroid anti-inflammatory drugs intake, chronic liver disease, or antiplatelet or anticoagulant drugs. He arrived at emergency room with mild pallor and tachycardia, and an important hematemesis. His laboratory exams were: hemoglobin 8.3 g/dL, Hematocrit 25.7%, Platelet count 117,000. Other hematological and biochemical investigations were within normal limits. After resuscitation therapy with fluid, plasma and blood infusion, he underwent an esophagastroduodenoscopy (EGDS) that revealed an multiple duodenal ulcers with oozing of bleeding (Forrest class.Ib). After rinsing and aspiration, it is identified the source of bleeding, with no signs of local inflammation, or peptic lesions like. We performed an epinephrine injection and hemoclips but failed to stop bleeding due to hard mucosal lesion. After that we injected histoacryl. Bleeding duodenal ulcers were stopped. 3 days later, He had hematemesis, he underwent an esophagastroduodenoscopy (EGDS) again that revealed disappear of previous multiple duodenal ulcers and new active bleeding duodenal ulcer (Forrest class.Ia). We performed an epinephrine injection, hemoclips, APC and histoacryl injection. Therefore, bleeding duodenal ulcer were stopped.
Colorectal disease

Single-Incision versus Conventional Laparoscopic Appendectomy- gloves ports technique

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Purpose: To compare two laparoscopic approaches to treating appendicitis, to evaluate postoperative pain, complications, and time to full recovery. Laparoscopic surgery has become the standard for treating appendicitis. The cosmetic benefits of using single-incision laparoscopy are well known, but its operation time, complications, and time to recovery have not been as well documented.

Materials and Methods: A group of consecutive patients with appendicitis selected either conventional laparoscopy (CLA; n=712) performed in the usual manner through 3 incisions, or single-incision laparoscopic appendectomy (SILA, n=231). During SILA, the single port was prepared with gloves ports technique and for a better view of the operation.

Results: 8% patients in the CLA group had postsurgical complications, compared to 7.1% in the SILS group (P=0.01). SILS group members also needed significantly less time before they could return to oral feeding than did those in the CLA group (median time: 12 hours vs. 22 hours, respectively; P<0.001). Multivariate logistic regression analysis showed that the patients with diffuse abdominal pain and perforated appendix had high risk of complications and delayed recovery.

Conclusions: In addition to its cosmetic advantages, use of SILA led to rapid recovery, and no increase in postsurgical pain or complications. The transparent single port improved the efficiency of the operation.
Hand-assisted versus laparoscopic restorative proctocolectomy for ulcerative colitis

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**Background:** Restorative proctocolectomy (RP) is an established surgical treatment for ulcerative colitis (UC). Recent reports have showed that laparoscopic restorative proctocolectomy (Lap-RP) had more cosmetic advantages compared to open surgery or hand-assisted laparoscopic restorative proctocolectomy (HALS-RP).

**Aim:** The aim of this study was to evaluate the short-term results of Lap-RP compared with HALS-RP for UC.

**Methods:** A retrospective study was conducted using a prospectively maintained database to compare a consecutive series of 19 patients who underwent Lap-RP with 30 patients who underwent HALS-RP from January 2001 to August 2018 in our institute. Patient characteristics, perioperative parameters, and the surgical outcomes were assessed. Mann-Whitney U and Fisher exact tests were used for statistical analysis.

**Results:** There were no statistically significant differences of clinical backgrounds between the two groups; gender (68.4 vs.56.7 % males; p=0.55), age at UC onset (median 28 vs. 25 years) (p=0.22), age at colectomy (median 35 vs.33 years) (p = 0.44), total colitis / left sided colitis: 66.7%/33.3% vs.78.9%/21.1% (p = 0.52). Severe/moderate/mild: 3.3%/70%/26.7% vs 5.3%/68.4/26.3% (p = 0.95). We had no conversions to open surgery. No mortality was found in this study. The amount of median blood loss and the incidence of surgical site infection (SSI) was significantly lower in the Lap-RP group (215 vs. 294.5 ml; p=0.0042, 0 vs. 26.7%; p=0.014, respectively). The median operative time was significantly longer (542 vs. 459.5 minutes; p=0.03). The other parameters were comparable in the two groups as follows; median post-operative hospital stay (21 vs. 20 days; p=0.85), and morbidity (≥Clavien-Dindo grade III) (15.8% vs.13.3%, p=0.81). Conclusions: Lap-RP for UC was favorable outcome in the blood loss and SSI, although the operative time was problem to overcome in the future.
Arrangements of port alignment in robotic rectal resections.

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Backgrounds: Robotic rectal resection was approved by the government health insurance in Japan since April 2018. In our hospital, we introduced a da Vinci Xi system (Intuitive Surgical) last year for rectal cancer patient. Sometimes port alignments needed to be arranged according to the patients’ conditions.

Methods: We retrospectively reviewed our cases of robotic rectal resection focusing on variations of port alignment.

Results: During a period from July 2018 to April 2019, 19 cases of robotic rectal resection were performed. All patients had rectal cancer (2 cases of high anterior resection, 13 cases of low anterior resection, 3 cases of abdominoperineal resection (APR), 1 case of Hartmann’s procedure). 3 cases had received preoperative chemoradiotherapy (CRT); 1.8/f, 50.1Gy, 80mg of tegafur gimeracil oteracil potassium. The basic alignment of the ports were #1 arm in left upper abdomen, #2 in the umbilicus, #3 in between #2 and #4 ports, and #4 in the right lower abdomen. The ports were placed in a straight line facing obliquely to the transverse pelvic line. The assistant port was placed in right hypochondrial lesion. When exudate was expected on pelvic dissection, especially in post-CRT patients, we put a soft suction tube in the pelvis from additional port in the left upper abdomen or through a silicone-cover placed on a ring retractor in a 3cm- supraumbilical wound, in which a #2 port was placed. In a case that a colostomy had been created for obstructive diseases before the rectal resection, the port-site for #1 arm was shifted lateral to the colostomy. In a case which needed splenic flexure mobilization, an additional robotic port was placed in the left lower abdomen to give an access to a #4 arm.

Conclusion: By making arrangement in the alignment of the ports, robotic surgery could be successfully performed in the cases of rectal cancers with various limitations.
Silicone disc-assisted transanal total mesorectal excision: A novel technique for optimizing the surgical field

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**Background** Transanal total mesorectal excision (taTME) has emerged as a minimally invasive technique for lower rectal cancer. However, as dissection proceeds cephalad during posterior dissection, suspended rectum can block the surgical view. This can cause technical difficulty, specifically in cases involving obesity and large tumors. Silicone Disc® (Hakko Co. Ltd.) is a silicone rubber membrane encircled by a shape-memory polymer, which has been reported to secure the intra-abdominal operative field during laparoscopic surgeries. In the present study, we performed taTME using a Silicone disc® to obtain adequate surgical visualization.

**Patients and Methods** Four patients (two men and two women) with rectal cancer underwent silicone disc-assisted taTME with a two-team approach. Of the four patients, one was obese, two carried large and invasive tumors that required posterior pelvic exenteration, and one had severe intra-abdominal adhesions, which required abdominoperineal resection. After achieving adequate pneumorectum, full-thickness circumferential incision of the rectum was made. During the posterior dissection, we inserted Silicone Disc® into the presacral space to create adequate space in the mesorectum. Subsequently, an anterior dissection was performed. Dissection was carefully extended to the lateral sides of the rectum. Finally, in coordination with the abdominal team, the rectum was excised.

**Results** During the transanal approach, we were able to obtain an optimal surgical view with Silicone Disc® in a timely fashion, before the area of dissection was met by the abdominal team at the level of sacral promontory. Median operating time was 430.5 minutes (187-457), intraoperative blood loss was 169 g (30-314), and there were no intraoperative complications. Complete excision and negative circumferential resection margins were achieved in all cases. There was no postoperative mortality, and one case presented with postoperative morbidity (Grade 2).

**Conclusions** Silicone Disc®-assisted taTME is a novel and feasible technique for securing the surgical field during a transanal approach.
Recurrent pain abdomen post Appendectomy: Stump Appendicitis

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Acute appendicitis is the commonest surgical operation and is a major bulk of the surgery performed in the emergency room. The common complications of appendectomy are wound infection, pelvic abscess and adhesive bowel obstruction but stump appendicitis is also a rare clinical presentation. We clinicians do not consider stump appendicitis as a differential diagnosis when evaluating a patient with right lower abdomen pain who has undergone appendectomy in the past. Here, a 35 year female with stump appendicitis is described, with a previous history of appendectomy. Acute appendicitis is the commonest surgical operation and appendectomy forms a major bulk of the emergency surgery performed in the emergency room. Although stump appendicitis is a complication of appendectomy, it’s rare; while wound infection, pelvic abscess and adhesive bowel obstruction are more commonly seen among others. We clinicians do not consider stump appendicitis as a differential diagnosis when evaluating a patient with right lower abdomen pain who has undergone appendectomy in the past. Here, a 35-year female with stump appendicitis is described, with a previous history of appendectomy.
Safety and feasibility of Laparoscopic Intervention for Acute Appendicitis in elderly patients at a regional core hospital in Tokyo; A single center retrospective study.

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Introduction: Acute appendicitis is one of the most common disease for emergency surgery and it occurs more often in children and young adults than in elderly patients. This study was aimed to determine whether laparoscopic appendectomy is equally feasible for elderly patients compared with younger patients.

Material and methods: This was a single center retrospective study of 443 patients with acute appendicitis who underwent appendectomy from January 2015 to December 2018. Patients characteristics, operative quality and post-operative hospital stay were evaluated.

Result: During the study period, 443 patients underwent appendectomy. Twenty-four patients (5.5%) were over 75-year-old. Laparoscopic appendectomy was performed in 15 patients (eLA group, 62.5%). Compared with 9 patients (eOA group) who underwent open appendectomy, median age was younger (80 vs 88, respectively, p=0.018). Although ASA-PS had tendency to higher in eOA group, significant difference was not detected (p=0.153). Blood loss (3ml vs 28ml, respectively, p<0.05) and post-operative hospital stay (6 days vs 11days, respectively, p<0.05) were better in eLA group. Furthermore, compared with patients under 75-year-old who underwent laparoscopic appendectomy (yLA group), there was not significant difference in operation time (94min vs 85.5min, respectively, p=0.645) and blood loss (3ml vs 3ml, respectively, p=0.915). However, post-operative stay was longer in eLA group than yLA group (6 days vs 4 days, respectively, p<0.05). Post-operative readmission had no significant difference between laparoscopic and open appendectomy.

Conclusion: Laparoscopic appendectomy for elderly patients was equally safe and feasible compared with conventional open appendectomy.
**Measurement For Anastomotic Leakage After Laparoscopic Low Anterior Resection**

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**Aim:** We have three measurements for anastomotic leakage (AL) after laparoscopic low anterior resection (LAR): transanal drain for decompression of the anastomosis part, the reinforcement suture of the anastomosis part and the active mobilization of splenic flexure for relaxation of the anastomosis part, and indocyanine green fluorescence imaging for blood flow evaluation of the anastomosis part. The aim of this study is to examine the efficacy of these measurements.

**Methods:** 218 patients underwent LAR from 2011 to 2018 in our hospital. We divide into two groups: the early term group (group E) is 109 cases before April 2015 without three measurements and the late term group (group L) is 109 cases after May 2015 with three measurements. We compared two groups retrospectively.

**Results:** The rate of patients with BMI $\geq 25$ kg/m$^2$ in group L and group E were 30.3% and 16.2%, respectively (p=0.01). Operation times of group L and group E were 191.3 min and 137 min, respectively (p<0.01). Blood loss of group L and group E were 18.7 g and 6.4 g, respectively (p=0.04). The rate of using 25mm Stapler of group L and group E were 31.1% and 6.4%, respectively (p<0.01). The size of group L and group E were 4.3 cm and 3.6 cm, respectively (p=0.01). On the other hand, the rate of AL of group L and group E were 12.8% and 24.8%, respectively (p=0.02).

**Conclusion:** Although group L had higher BMI, longer operation time, and larger tumor size than group E, we were able to reduce AL. Theses results suggest that our three measurements is effective.
ROBOTIC SURGERY FOR RECTAL CANCER AT BINH DAN HOSPITAL: THE EARLY RESULTS

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Introduction: Binh Dan hospital started to use robotics in colorectal cancer surgery in November 2016. Our aim was evaluated the safety of robotic surgery in management of rectal cancer.

Materials and methods: Prospective case series study: 66 rectal cancer cases were operated by robotic da Vinci Surgical System (Si version) from November 2016 to July 2019 at Binh Dan hospital.

Results: Men/Women ratio: 2.09. Average age: 61 yrs (23-85). Treatment: 8 cases of anterior resection, 35 cases of low anterior resection, 7 cases of ultra-low anterior resection, 16 cases of abdominal perineal resection. Post-operative pathology staging: stage I: 2 cases (3.03%), stage IIA: 9 cases (13.64%), stage IIIB: 35 cases (53.03%), stage IIIB: 16 cases (24.24%), stage IIIC: 3 cases (4.55%), stage IVA: 1 case (1.51%). Intra-operative complications: one case of hemorrhage. Post-operative, there were 12 cases of wound infection, 1 case of urine retention, 1 case of ileus, 3 suspected case of anastomotic leak with internal treatment. Average length of stay after the operation is 9 days (6-16).

Conclusion: The use of robotic surgery in rectal cancer treatment is a safe and feasible procedure.
Evaluation of intestinal blood flow with ICG fluorescence imaging to prevent anastomotic leakage after low anterior resection for rectal cancer

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**Purpose** Anastomosis leakage is a severe complication after low anterior resection of rectal cancer. Insufficient blood flow of anastomosis is major cause of anastomosis leakage. ICG fluorescence imaging can visualize blood flow of fresh organ intra-operatively. The aim of this study is to evaluate the usefulness of ICG fluorescence imaging for blood flow evaluation in rectal surgery.

**Method** The total of 20 patients who underwent laparoscopic low anterior resection of rectal cancer between December 2017 and August 2018 were examined for intestinal blood flow. After resection of rectum, the intestinal anastomotic line was visually marked, then 7.5mg of ICG was injected and the intestinal tract was imaged. When the contrast was poor, we performed additional resection.

**Result** One of twenty patients (5.0%) had anastomotic leakage. The median of time until contrast appearance by ICG fluorescence imaging was 25.2 seconds. We confirmed contrast defect in 6 patients and performed additional resection.

**Conclusion** The ICG fluorescence imaging is useful for evaluating the blood flow, which may lead to a decrease in incidence of anastomotic leakage. Prospective evaluation on more cases must be necessary to know the preventive effect for anastomotic leakage with ICG fluorescence imaging.
Results of the totally laparoscopic colectomy using Natural orifice specimen extraction (NOSE) & intracorporal anastomosis

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Introduction: For further minimum laparoscopic invasive surgery, we were introduced natural orifice specimen extraction (NOSE) for colorectal cancer.

Material and method: Two NOSE method were indicated, Trans-anal specimen extraction (TASE) and trans-vaginal specimen extraction (TVSE). Serosal invasion and massive lymphnode metastasis were omitted, tumor size was below 4 cm in TASE and 5cm in TVSE. BMI was below 21 in TASE and 25 in TVSE.

Surgical technique: TASE: After TME and lymph node dissection, the oral and anal side colon was transected by linear staypler. Anal side intestine was washed out by colonoscopy with irrigation system, the anal side stump was opened. The specimen was caught and removed by loop instrument via colonoscopy transanally. Anvil head was inserted into the abdominal cavity via anus, anal side colon was closed by linear staypler. After purse-string suture of the oral side colon was done using end-PSI instilment, anvil head was inserted to the oral stump, the anastomosis was performed by double stapling technique (DST). TVSE: First, the posterior wall of the vagina was dissected by energy device, wound retractor was inserted to vagina. Sometime wound retractor was covered by its specific cap, laparoscopic forceps or linear stapler for anastomosis were inserted via trans-vaginally assistant port. After TVSE was done, intestines were reconstructed by functional end to end anastomosis (FEEA) with linear staplers. Results: TASE was indicated in 88 patients and TVSE in 67 patients. DST was attempted 62 in TASE, 15 in TVSE. FEEA was attempted 26 in TASE, 50 in TVSE. Average operation times was 235 min in TASE, 267 min in TVSE. Pathological stage was 0:I:II:IIIa:IIIb=6:49:15:12:4 in TASE and 0:I:II:IIIa:IIIb:IV=2:29:19:9:3:1 in TVSE. Major complication and recurrence related to NOSE specifically were not occurred.

Conclusion: This method was feasible for minimum invasive surgery, the patients got the best cosmetic satisfaction.
A Monk with unusual ileocecal mass

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Unusual mass in cecum with vascular malformation is rare but is clinically important because of the possibility of massive bleeding. We encountered a case of unusual ileocecal mass with vascular malformation which was removed successfully using minimally invasive surgery.

INTRODUCTION Abnormal mass can occur anywhere in the gastrointestinal tract. Because of the possibility of massive bleeding they are related with vascular malformation. Although a variety of clinical presentations exist, massive bleeding and obstruction are most commonly encountered. Recent advances in colonoscopic techniques have led to successful endoscopic resection in selected cases, but most large lesions have been treated surgically.

CASE REPORT • 18 years old monk from highland was presented with Mass In RIF. • Had history of Smear positive TB in 2015 and took anti-TB for 8 months. • Done colonoscopy at GI unit on 17.5.2019 – colonoscopy NAD up-to splenic flexure, cannot assessed beyond this. • Done CT (abdomen) on 31.5.2019 – Colonic mass ?FB ?Stones in terminal ileum, Gall Stone. • Requested 2nd opinion on CT but Radiologist can’t give 2nd opinion because of long interval and suggested to do 2nd time CT or Ba meal follow through. • 2nd time Colonoscopy on 5.7.2019 – Chronic inflammation at IC valve (?TB, ? Crohn’s ) • Biopsy – active enteritis, biopsy from pseudopolyps at IC valve. • GI clinic on 23.7.2019 – decided to do Right hemicolecetomy. • Proceeded to Laparoscopic Right Hemicolecetomy and ileo-colic anastomosis on 2.8.2019. • Intraoperative findings were growth present at ileo-caecal junction and adhered to omentum with numerous dilated blood vessels. Mesenteric Lymph nodes (++) . Multiple FB likely seeds in terminal ileum. • Histopathological report came back with Compatible with vascular malformation and enteritis. • Reactive follicular hyperplasia in all 7 accompanying lymph nodes.

CONCLUSION Although these lesions are rare, a better understanding of these lesions should help to obtain a definite diagnosis and devise an appropriate treatment plan.
Laparoscopic versus open resection for transverse colon cancer: Short-term and long-term outcomes.

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BACKGROUND: Previous randomized controlled trials demonstrated similar oncological outcomes between laparoscopic surgery (LS) and open surgery (OS) for colon cancer, except for cases involving transverse colon cancer. The aim of this study was to confirm the oncological safety and advantages of the short-term results of LS for transverse colon cancer in comparison with OS.

METHODS: We performed a retrospective analysis of consecutive patients undergoing LS or OS for histologically proven adenocarcinoma of the transverse colon.

RESULTS: A total of 101 patients were included in this study: 34 LS and 71 OS. Median operating time was similar in the two groups. Median blood loss was significantly higher in the OS group. There was no conversion to OS. The incidence and severity of 30-day postoperative complications and mortality rates were similar in the two groups. The median hospital stay was significantly shorter in the LS group. The number of lymph nodes harvested was similar in the two groups. Five-year overall survival rates were similar in the LR and OR groups (Stage II: 88.0 vs. 80.2 %, p = 0.27, Stage III: 83.3 vs. 71.4 %, p = 0.71, respectively). Five-year disease-free survival rates were similar in the LR and OR groups (Stage II: 88.3 vs. 69.1 %, p = 0.12, Stage III: 71.4 vs. 67.0 %, p = 0.84, respectively).

CONCLUSIONS: LS of transverse colon cancer is feasible and safe, with similar early short-term outcomes when compared to OS. Larger prospective comparative studies with long-term follow-up are needed to assess the oncological equivalence of the two approaches.
Four cases of laparoscopic surgery for the resection of rectal GISTs after neoadjuvant chemotherapy

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Rectal Gastrointestinal Stromal Tumor (GIST) occurs in the gastrointestinal tract and mesentry but is relatively rare, accounting for 5-10% of all gastrointestinal GISTs. Rectal GIST can be difficult to remove due to surrounding infiltration and due to the importance of preserving the anus. Clinical trials using neoadjuvant chemotherapy (NAC) with imatinib mesylate (IM) for GISTs are ongoing, but no conclusion has been reached concerning its effects. We examined four patients diagnosed with rectal GIST between April 2010 and August 2019 who underwent surgery after NAC treatment. The four patients consisted of 1 male and 3 females (mean age of 61 years: 43-77 years) all of whom had a tumor in the lower rectum (2-8 cm from the anal verge). The patients were administered of IM preoperatively a median 4.5 months (1-6 months). Prior to chemotherapy, the mean maximum diameter of the tumor was 63.7mm (45-73mm) and tumor shrinkage averaged 68% (64-71%). One case of laparoscopic low anterior resection and 3 cases of inter-sphincteric resection were performed (1 case was combined with transanal minimally invasive surgery). In two of the cases, the posterior vagina wall was resected, and in one case, the left levator muscle was partially resected. The average surgical duration was 288 minutes (241-393 minutes) and the average postoperative hospital stay was 20 days (15-25 days). In all cases, resection was possible without damage to the internal capsule and anus could be preserved. The four patients experienced no recurrence during the mean postoperative observation period 27.5 months (5-75 months). NAC for GIST had a tumor reducing effect, and laparoscopic radical surgery was possible even if there was infiltration into surrounding tissues. In addition, this procedure contributes to the preservation of anal function and reduced the required surgical procedures. Therefore, these results show that NAC treatment with IM is useful in treating GISTs.
A Rare case of colo-colic intussusception in a young adult secondary to colorectal malignancy

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Intussusception refers to the telescoping of a segment of bowel into the lumen of an adjacent segment. While paediatric intussusception is common and generally idiopathic, adult intussusception is remarkably rare and is usually attributable to a pathologic nidus. Exceedingly rare is the occurrence of colo-colic intussusception in younger adults. A 39 year-old female presents to the Emergency Department (ED) with a 6-month background of worsening intermittent left lower quadrant abdominal pain associated with nausea, loss of appetite, irregular small volume bowel motions with the presence of mucus, and unexplained weight loss of 14kg over a 4 month period. Subacute abdominal pains and obstructive symptoms are common to colo-colic intussusception. Laboratory investigation on presentation found only mild microcytic anaemia. Computed Tomography (CT) found a non-obstructive distal transverse colon area of intussusception highly concerning for carcinoma, no radiological signs of metastases, though some prominent 5mm lymph nodes adjacent to the area were reported. The classical radiological target sign could be appreciated on CT. Inpatient admission from ED was followed shortly by emergency Right hemicolecotomy that returned on histology as colo-colic intussusception secondary to a large primary non-metastatic colorectal carcinoma. CT has been found to be the most accurate imaging modality in identifying intussusception. The case was a highly classical and clear demonstration of the radiological ‘Target sign’ (also referred to as the doughnut sign or bull’s eye sign) wherein the intestinal intussusception appears on CT slices perpendicular to the direction of the affected section of lumen as concentric alternating echogenic and hypo-echogenic bands, representing the bowel mucosa/muscularis layers and submucosal layer respectively.
Extra-pulmonary intra-abdominal Tuberculosis: A rare differential diagnosis in acute clinical appendicitis presentation

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Idiopathic primary granulomatous appendicitis is very rare and is a diagnosis of exclusion, however there are many infectious and noninfectious aiotiologies for secondary granulomatous appendicitis. Closteridium difficile and Yersinia infection are the main causes in western coutries, however tuberculosis and parasitic infestations are the main culprits in more tropical regions. An otherwise healthy 32 year-old female Filipino national who immigrated to Australia presented to the emergency department (ED) with a 2 day history of worsening lower abdominal pain with associated nausea and loss of appetite. The patient was afebrile, haemodynamically stable, and had a generally tender lower abdomen that was not peritonitic. Vaginal examination was normal. The patient noted that several of her cousins had passed due to complications of tuberculosis. Laboratory investigation found a normal WCC and CRP of 9.3. Abdominal computed tomography (CT) scan showed a thickened appendix and moderate intraabdominal free fluid within the right para-colic gutter. The patient was admitted and placed on triple antibiotic therapy. Emergency exploratory laparoscopy found diffuse millary nodular lesions covering all surfaces of viscera and peritoneum with occasional caseous nodular lesions on the small bowel, samples were collected, some straw-coloured free fluid was sampled and washed out, and the appendix, which appeared erythematous and thickened, was removed. Uneventful postoperative recovery was followed by ongoing infectious diseases specialty follow-up upon discharge. Cultures of sampled fibrous hyalinised inflamed granulomas returned as positive for fully susceptible mycobacterium tuberculosis. Histology of the appendix described non-necrotising granulomas with concomitant subacute appendicitis to be present with surrounding peritoneal tissue showing foci of granulomatous inflammation. Symptoms resolved post-operatively as expected and the patient was treated with antimicrobial therapy (Isoniazid, Rifampicin, Ethambutol, Pyrazinamide, and Pyridoxin). Tuberculosis is a rare but pertinent differential to be considered if appendicitis patient's express a history of foriegn travel and tuborculosis exposure.
Evaluation of the yield of sigmoidoscopy procedures carried out for left colonic symptoms at a tertiary care centre in South Asia

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Introduction Although, colonoscopy is the ideal investigation for evaluation of the colon it is associated with a higher cost and greater patient discomfort. Therefore, flexible sigmoidoscopy is sometimes used as an alternative. This study was aimed to evaluate the use of flexible sigmoidoscopy as the main investigation for “left sided” colorectal symptoms.

Method A retrospective analysis of the sigmoidoscopy reports were done at the Colombo University Surgical Unit of National Hospital of Sri Lanka from February 2006 to May 2015. Reports (n=1816) of patients who had a sigmoidoscopy as the primary investigation for left colonic symptoms were retrieved from a standardized computer database and analysed.

Results The majority were males (N=986, 54.3%; mean age=48.7±SD16.1 years). The majority were aged above 40 years (61.5%). The most common indication was rectal bleeding (N= 969, 53.4%). Other main indications were altered bowel habits (14.3%) and abdominal pain(13.9%). The splenic flexure was intubated in 24.8% (n=450) and the descending colon in 32.7%(n=594). The bowel preparation has been inadequate in (N=67, 3.7%) procedures. The procedure was abandoned in 8 (0.4%) procedures and the most common reason was patient discomfort(n=4). Around 39% were normal studies. Hemorrhoids were the commonest finding (N=812, 44.7%). Other significant findings were benign polyps (4%), inflammatory changes (3.5%), diverticulae (1.1%) and malignant lesions (2%). Of those aged 40 years or less, the significant findings included, inflammatory lesions (4%), polyps (2.4%) and malignant lesions (1.1%). Whereas in those aged more than 40 years, the significant findings were benign polyps (4.7%), inflammatory changes (3.1%) and malignant lesions (2.5%).

Conclusion Based on the findings and (7.4%) and (9.9%) of the patients aged 40 or less and above 40 years respectively would need a colonoscopy for further evaluation of the right colon and arrive at a better diagnosis. Therefore, sigmoidoscopy may be a cost-effective initial investigation prior to selective colonoscopy in patients with left-sided colonic symptoms.
Comparison of the quality of colonoscopy performed by consultants and senior trainees at a tertiary care hospital in South Asia

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**Introduction** The endoscopist should be skillful enough to perform high quality colonoscopy with minimal patient discomfort and complications. In this study, we compared the quality of colonoscopy performed by consultants and senior residents (SR).

**Method** A total of 1950 patients who underwent an initial colonoscopy from Feb 2006-July 2018 at the University Surgical Unit of the National Hospital of Sri Lanka were assessed. The reports were maintained in a standardized computerized database which recorded clinical details, procedural details and findings.

**Results** Of the 1950 procedures, 53% (n=1033) were done by senior residents (SRs) and 37.6% (n=733) by consultants. Caecal intubation was achieved in 90.2% (n=932) done by SRs and 93% (n=682) by consultants (p=0.4). Complication rates for SRs was 4.1% (n=42) which mainly included excessive pain (n=13) and bradycardia (n=9); for consultants was 1.09% (n=8) which mainly included excessive pain (n=3). Inadequate bowel preparation of 7.2% (n=74) and 4.5% (n=33) was present in procedures done by SRs and consultants respectively. Procedure was abandoned by SRs in 10% (n=104) mainly due to inadequate bowel preparation (n=54) and patient discomfort (n=26); by consultants in 4.9% (n=36) mainly due to inadequate bowel preparation (n=23). Polyps detection rate (PDR) was 10.5% (n=108) and 7.9% (n=58) for SRs and consultants respectively (p=0.5887). Polypectomy was done in 50% (n=54) by SRs and 46.6% (n=27) by consultants. The retrieval rate of the polyp was 51/54 and 24/27 respectively. The adenoma detection rate (ADR) could not be reported due to the lack of pathological data.

**Conclusion** Majority of the procedures were done by SRs. The PDR were higher in SRs. This maybe because of the higher proportion of difficult colonoscopies being done by consultants. However, the rate of complications were less among consultants. Better reporting using objective quality measures like ADR should be incorporated in the database. Further, multicenter analyses are required to standardize the quality in colonoscopy in the local setting.
Evaluation of the quality of colonoscopy procedures at a tertiary care centre in South Asia

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**Introduction** Colonoscopy is a method of visualizing and sampling the colon which is also used to perform therapeutic interventions. We evaluated the quality of screening colonoscopy procedures in a tertiary care setting in South Asia.

**Method** A retrospective analysis of the reports of colonoscopy procedures carried out at the University Surgical Unit of the National Hospital of Sri Lanka from February 2006 to July 2018 is presented. 1949 reports were analysed which had no previous diagnosis. The reports were maintained in a standardized computerized database which recorded clinical details, procedural details and findings.

**Results** The majority were males (51.1%) with a mean age of 53.7(SD:29) years. The common indications were alteration of bowel habits (27.7%), lower abdominal pain (17.3%), rectal bleeding (16.7%) and (34.8%) had no documented indication. Caecal intubation was achieved in 91.4% and terminal ileum was visualized in 74.4%. Procedure was abandoned in 7.9% (n=153). Commonest reasons included poor bowel preparation (n=84,55%), patient discomfort (n=34,22.2%) and difficult negotiation (n=8,5.2%). Correct documentation was seen in the majority in relation to proper indication (66.5%), sedation (90.7%), bowel preparation (88.6%) and findings (99%). Bowel preparation was adequate in (82.4%). Common complications encountered were pain (0.8%) and bradycardia (0.6%). Technical difficulties were present in (0.9%). The majority were normal studies(56.3%). Common findings included polyps (9.4%), hemorrhoids (4.9%), diverticulae (4.4%), malignant looking growths (2.7%) and ulcers (2.2%). Polypectomy was attempted in (n=90) and was successful in (n=88,97.8%). Polyp retrieval was successful in 91.1% (n=82).

**Conclusion** Proper quality standards need to be improved in terms of documentation. Routine quality control measures with specific standards are needed especially in resource limited settings.
Cecal Diverticulitis - A Mimicker of Acute Appendicitis

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**Introduction:** Cecal diverticulitis is an uncommon condition with an incidence of 0.04-2.1%, affecting more often people of Asian descent. Its signs and symptoms can be virtually identical to those of acute appendicitis.

**Case Report:** A 27 year-old-female presented with a chief complaint of abdominal pain. The pain was sudden in onset and was located to the right lower quadrant. This was not associated with nausea and vomiting. Her body temperature was 38.3 C. Physical examination revealed direct and rebound tenderness in the right lower quadrant. White blood cell count was 17.3. CT scan showed a soft tissue focus with a central calcific density adjacent to the anterior aspect of the cecum with associated perilesional mesenteric fat stranding. There was also thickening of the right paracolic fascia. Patient was scheduled for laparoscopic appendectomy. During laparoscopy, the appendix was normal-looking and a 4 x 3 cm inflamed mass was seen on the anterior wall of the cecum. Neither abscess formation nor perforation were noted. Lysis of adhesions and incidental appendectomy were performed. The patient had an uneventful recovery.

**Discussion:** Cecal diverticulitis is a condition frequently misdiagnosed as acute appendicitis. It can be managed conservatively or surgically. Antibiotic therapy is sufficient when the patient is diagnosed with cecal diverticulitis non-operatively. When the diagnosis is made intra-operatively and when there is no evidence of perforation, an incidental appendectomy may be done and the diverticulitis is managed by antibiotic therapy.

**Conclusion:** Cecal diverticulitis should be included as part of the differential diagnoses of right-sided acute abdomen. The condition usually mimics acute appendicitis, however, when diagnosed non-operatively, antibiotic therapy alone is the management of choice.
Clinical study of management of malignant large bowel obstruction

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Background Malignant large bowel obstruction is the challenging disease for the surgeons as well as the patients. The purpose of this study was to review the management of malignant large bowel obstruction in Yangon General Hospital (YGH) and New Yangon General Hospital (NYGH), Myanmar.

Method Hospital based prospective study was conducted in YGH and NYGH between 1st January 2015 to 31st December 2015.

Results In 70 patients, malignant large bowel obstruction was presented in the elderly patients (61-70 years) and male and female are equally distributed. For proximal large bowel obstruction, the commonest site was caecum and commonly treated with right hemicolecctionomy. For distal obstruction, rectum was the commonest site and the commonest treatment was two-staged procedure.

Conclusion Depending on the age, site of tumor, presenting symptoms and co-morbid diseases, the management options were varied. Awareness of colorectal cancer was also lacked behind in comparing with other developed countries.
Clinical differences of young population underwent laparoscopic cholecystectomy

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**Introduction:** Laparoscopic cholecystectomy (LC) in young population is relatively uncommon, despite being one of the most common surgical procedures in adults. Although clinical characteristic of adult patients with gallbladder (GB) disease is well established, scanty information have been for youth. In the present study, we aimed to comprehensively review the young population underwent LC compared to older population.

**Methods:** A total 2,115 patients who received LC for GB stones were retrospectively analyzed. The patients were categorized into two clinical groups according to the age of patients: (young (<24) group and the elder group). We compared two groups according to its clinical characteristics.

**Results:** In univariate analysis, significant factors between two groups were found in the concomitant of choledocholithiasis and American Society of Anesthesiologists score I/II. By multivariate analysis, the concomitant of choledocholithiasis (OR 1.152, 95% CI, 0.663 – 2.001, p<0.001) were independent factors between young group and the elder group.

**Conclusions:** In our study, young population with gallstone disease had more prevalence of choledocholithiasis. Therefore, young patients with gallstone disease require special attention for choledocholithiasis.
**Pediatric Cholecystectomy for Gallstone Disease**

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**PURPOSE:** Gallstones are being increasingly diagnosed in pediatric patients. The purpose of this study was to describe the characteristics of pediatric patients who underwent cholecystectomy because of symptomatic gallstone disease unrelated to hemolytic disorder.

**METHODS:** We reviewed cases that underwent cholecystectomy in pediatric patients (<18 years of age) between May 2005 and December 2015.

**RESULTS:** Of the 20 pediatric patients, one was excluded because cholecystectomy was performed due to gall stones caused by anemia. The 19 subjects comprised 9 males (47.3%) and 10 females (52.7%). The mean age was 14.9 years (range, 5-18) and 66.7% of patients were < 12 years of age. Mean body weight was 65.0 kg (range, 13.9-93.3), and mean body mass index was 21.7 kg/m² (range, 12.3-35.1), with 26.37% of patients being overweight. All 19 patients underwent laparoscopic cholecystectomy. There were no postoperative complications or deaths. Significantly more overweight patients had cholesterol stones (5/5 vs 7/14, p=0.036) and were classified as complicated disease (3/5 vs. 1/14, p=0.037).

**CONCLUSION:** The more frequent occurrence of complications, such as choledocholithiasis or gallstone pancreatitis, in overweight patients indicates the need for more careful evaluation and management in these patients. Although it is difficult to suspect symptomatic gallstones in pediatric patients who presented with abdominal pain because the symptom is rarely clear-cut, pediatricians and surgeons should have a high suspicion for gallstone disease.
Validation of association cystic duct fibrosis and surgical difficulty in laparoscopic cholecystectomy

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Introduction The level of surgical difficulty laparoscopic cholecystectomy might be predictable on the basis of factors including preoperative imaging and severity of cholecystitis. Tokyo Guidelines 2018 (TG 18) and Parkland grading scale are representative method in cholecystitis. In addition, we scored cystic duct fibrosis grade as 0 to 3. The purpose of this study is validation of association cystic duct fibrosis and surgical difficulty in laparoscopic cholecystectomy.

Method Between July 2018 and November 2018, 165 cases of laparoscopic cholecystectomy were retrospectively reviewed in single center. Demographics, pre-operative laboratory data, operation time, complications, hospital stay and severity grade of cholecystitis were evaluated in the patients. In addition, we evaluated the association among TG 18, Parkland grading scale, and cystic fibrosis score.

Results Cystic duct fibrosis score is associated with operative time (p<0.001), pre-operative WBC (p<0.001), pre-operative platelet (p<0.037), pre-operative total bilirubin (p<0.004), pre-operative HS-CRP (p<0.001), CVS time (p<0.004), estimated blood loss (p<0.001). Cystic duct fibrosis score is correlated with TG 18 and Parkland grading scale also (p<0.001)

Conclusion Cystic duct fibrosis score is able to be an indicator of severity of cholecystitis and predict the surgical difficulty and outcomes in laparoscopic cholecystectomy
Long umbilicus-to-cystic duct distance may be an important factor predicting procedural difficulties during single port laparoscopic cholecystectomy

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Introduction: Essentially single port laparoscopic cholecystectomy (SPLC) is more challenging than conventional (multiport) laparoscopic cholecystectomy because of crashing between instruments, limited working space and a steep learning curve. In SPLC, the degree of difficulty of procedure may increase when the umbilicus-to-cystic duct distance is longer than usual. We aimed to assess the correlation between umbilicus-to-cystic duct distance and the degree of difficulty of procedure.

Methods: 460 consecutive patients who underwent SPLC at our hospital were included in this study from 2014 to 2019. The umbilicus-to-cystic duct distance (UCD) was measured indirectly using preoperative CT scan. Factors representing operative difficulty including operative time, estimated blood loss (EBL), hospital stay and postoperative complications were analyzed between the long UCD group and short UCD group.

Results: Mean UCD was 213 (187–248) mm in all SPLC patients, and long UCD group (>220mm, n= 116) showed longer operative time (73.3±33.7 min vs 65.2±22.5 min, p <0.01) than short UCD group (≤220mm, n=344). However, hospital stay was not different in both groups. Multivariate linear regression analysis, including BMI and height, which were previously reported to have a correlation with longer operative time in SPLC, showed that UCD is an independent predictive factor for prolonged operative duration. However, BMI and height were not independent predictive factors.

Conclusions: A longer UCD may be an important factor in predicting procedural difficulties when performing SPLC. Therefore, those patients with longer UCD should be carefully approached and procedural challenges anticipated.
Diagnosis and Treatment for a Patient with Low and Posterior Insertion of Cystic Duct and Mirizzi Syndrome Csendes Type III by Computed Tomography, Intraoperative Cholangiography, Choledochoscopy, and Single-incision Laparoscopic Transfistulous Bile Duct Exploration

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**Introduction** Mirizzi syndrome (MS), a benign common hepatic duct obstruction around cystocholedochal junction caused by gallstone disease, is a major challenge in the era of laparoscopic biliary surgery. It has been claimed that a higher preoperative diagnosis rate was related to a better outcome. But in most case series, the preoperative diagnosis of this rare disease was less than 50 percent.

**Case Report** A 37-year-old male patient presented with epigastric pain for one week and two days of jaundice. He has a history of hypertension with medication control and gallstone without regular follow-up. A diagnosis of MS McSherry type II was suspected according to the preoperative echography and computed tomography. Low and posterior insertion of cystic duct and Mirizzi syndrome Csendes type III was confirmed by the intraoperative cholangiography and choledochoscopy during a single-incision laparoscopic surgery. The impacted bile duct stone was successfully retrieved by transfistulous choledochoscopic basketing via an infundibulotomy and the gallbladder remnant was closed by suturing. Partial cholecystectomy was completed subsequently. The operative time was 254 mins and the estimated blood loss was 10 ml. The patient was discharged three days after the surgery uneventfully. No stone recurrence or biliary stricture occurred during the subsequent outpatient department follow-op.

**Conclusion** High suspicion of MS in jaundiced patients with big middle bile duct stone(s) and thin distal common bile duct is critical to a good surgical outcome. Single-incision laparoscopic transfistulous bile duct exploration is feasible for selected patients with this difficult disease.
Laparoscopic radiofrequency ablation is a better alternative treatment to laparoscopic wedge resection of the liver for hepatocellular carcinoma patients with advanced liver cirrhosis.

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**Background:** Hepatocellular carcinoma (HCC) can be treated with laparoscopic radiofrequency ablation (LRFA), which is generally more accurate and accessible procedure than percutaneous radiofrequency ablation (PRFA). And the oncologic outcome of LRFA is comparable to the other modalities of treatment for HCC, like as PRFA and TACE. However, there was no study to compare the benefits of LRFA over laparoscopic wedge resection of the liver (LWR) in HCC patients with advanced cirrhosis [CTP score - B].

**Aims:** This study aimed to compare the efficacy of LRFA and LWR for HCC treatment.

**Methods:** Patients who underwent LRFA or LWR as an initial treatment modality between April 2005 and April 2017 were enrolled in the study. The overall and recurrence-free survival rates were examined for each patient. Additionally, propensity score matching was performed for the two groups.

**Results:** The baseline characteristics of patients in the LRFA and LWR groups showed several minor differences. Multivariate analysis showed that the RFA method was not a critical determinant of recurrence-free or overall survival (p=0.069 and p=0.406). Among patients who underwent LRFA as the initial treatment modality, there was no significant effect of the RFA method on survival. Multivariate analysis showed that LRFA could be one of the strongest factors contributing to improving overall survival in HCC patients (hazard ratio: 0.108, p=0.040). Furthermore, our data were shown that LRFA limited multiple intrahepatic recurrences and prevented a marginal recurrence.

**Conclusions:** LRFA appears to be superior to LWR and can help reduce morbidity and mortality in HCC patients. Also, LRFA is a feasible treatment for HCC on advanced cirrhosis as a bridge to liver transplantation.
Multidisciplinary Management in Primary ALK Positive Anaplastic Large Cell Lymphoma of Pancreas: A Case Report

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Malignant lymphomas seldom arise primarily in the pancreas, constituting less than 0.7% of all pancreatic malignancies. Here we present a 47-year-old female diagnosed with anaplastic large cell lymphoma (ALCL) appearing as a primary tumor of the pancreas head without peripancreatic lymph nodes involvement. After complete resection of the tumor (laparoscopic Whipple's operation), the diagnosis of ALCL was confirmed by ancillary testing. Immunostaining with CD30 (Ki-1) and anaplastic lymphoma kinase (ALK) protein were diffuse positivity in nucleus, nucleolus and cytoplasm. Vysis LSI ALK break apart FISH probe documented nuc ish (ALKx1-2)(5'ALK sep 3'ALKx1)[32/50]/(ALKx2)[8/50]. The patient then had progressive growth of lesions in right chin and left back that was refractory to 4 cycles of Cyclophosphamide, Doxorubicin, Vincristine, and Prednisone (CHOP) chemotherapy. Brentuximab vedotin (intravenous 1.8 mg/kg) administration achieved complete response. Currently, three years after diagnosis, the patient had PET/CT proved free of tumor. Our case suggests that surgery not only allows confirmation of diagnosis but also for treatment policy. Chemotherapy and target therapy following with stem cell transplantation remain the standard of treatment in high risk patient. Advances in understanding the pathogenesis of pancreatic anaplastic large cell lymphomas is necessary.
Is early laparoscopic cholecystectomy feasible for Grade III severe cholecystitis?

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**Introduction:** In Tokyo guideline 2018 (TG18), which is surgical management of acute cholecystitis by Japanese Society of Hepato-Biliary-Pancreatic Surgery, indications of early laparoscopic cholecystectomy (LC) were extended with some conditions to Grade III severe cholecystitis. Our department has been actively trying to perform early surgery for acute cholecystitis. For Grade III severe cholecystitis, we have performed early LC if the general condition allows. This study examined the feasibility for early LC for Grade III severe cholecystitis by comparing the outcome of surgery for Grade I/II cholecystitis.

**Methods:** We defined the early LC as LC within 72 hours of admission. Early LC was performed in 116 patients with acute cholecystitis for 3 years. Data were collected retrospectively. We investigated the surgical factors and postoperative complications.

**Results:** The overall subjects were 116 cases (male: female=83: 33), average age 63.7 years (22-94), and severity grade of cholecystitis (Grade I/II: Grade III=109: 7). Intraoperative factors included operation time (Grade I/II=77:136 min), amount of bleeding (63 ml: 175), and conversion rates (4 cases (3.7%): 0(0)). The postoperative course was complications (7 cases (6.4%): 1 (14.3)), and postoperative hospital stay (6.4 days: 11.2).

**Conclusion:** Early surgery for acute cholecystitis in our hospital has generally been successful. Although it is difficult to compare directly cases of Grade III with Grade I/II because of the difference in the number of cases, it could be said that early LC for severe cholecystitis has a long operation time, a large amount of bleeding, and difficulty in operation. The postoperative outcomes suggested high rate of complications; therefore, we need to pay careful attention to postoperative management. However, it is considered that early LC is allowed by appropriately evaluating the preoperative general condition, and performing a highly skilled operator.
Genome-wide transcriptional analysis reveals the landscape of Alternative Splicing in hepatocellular carcinoma and their prognostic significance

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**Introduction** Increasing evidence revealed that the role of aberrant splicing in hepatocellular carcinoma (HCC) is beyond our expectation, but seriously neglected in previous studies. Comprehensive analysis of alternative splicing (AS) and its underlying biological and clinical relevance in HCC is lacking.

**Methods** In this study, RNA-Seq data and corresponding clinical information of HCC patients were obtained from the TCGA. SpliceSeq was used to determine the transcriptional splicing patterns and calculate the Percent Spliced In (PSI) value. Then, according to the PSI value of AS events in different patients, a series of bioinformatics methods were performed to identify the Differently expressed AS events (DEAS), reveal the potential regulatory relationship, and investigate the correlation between DEAS and patients' clinicopathologic feature.

**Results** 25934 AS events originate from 8795 genes were screened with high reliability, among which 263 AS events were identified as DEAS. The parent gene of these DEAS formed an intricate network, which involved in the regulation of liver metabolism and cancer-related pathway. In HCC, 36 splicing factors participated in the dysregulation of DEAS. 100 DEAS events were identified to be correlated with overall survival, and 71 DEAS events were found to be correlated with disease-free survival. Stratifying HCC patient according to DEAS revealed four clusters with distinct survival patterns.

**Conclusion** Significant variation of AS occurred during the HCC initiation and maintenance, and these variations are likely to be vital for both biological processes and prognosis. Our identified HCC-related AS events and constructed splicing networks are valuable in deciphering the underlying role of AS in HCC.
Simultaneous Single-Incision Minimally Invasive Surgery of Synchronous Colorectal Cancer with Liver Metastases.

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**Purpose** To evaluate the perioperative and oncological outcomes of simultaneous single-incision laparoscopic or robotic surgery of synchronous colorectal cancer with liver metastases.

**Methods** 5 patients with simultaneous liver and colorectal resection for synchronous liver metastases were enrolled with the single-port laparoscopic or robotic operations. A 4-cm skin incision was made, and a three-port access system was used. Operative and peri-operative data were retrospectively evaluated.

**Results** The median operation time was 447 mins, with the median blood loss 120 ml. The hospital stay was 9 days. There was no surgical mortality or morbidity. During the 3 years follow-up, 2 patients had recurrence.

**Conclusions** Simultaneous single-incision laparoscopic can be safely performed for synchronous colorectal cancer with liver metastases with shorter hospital stay and acceptable short-term oncological outcome.
A pancreatic neuroendocrine tumor which secretes vasoactive intestinal peptide, also known as VIPoma, is a rare functioning neuroendocrine tumor that occurs with a frequency of 1 case per 10,000,000 population per year. This tumor stimulates fluid and electrolyte secretion in the gut lumen, resulting in secretory diarrhoea, usually more than 700 cc per day and hypokalaemia. The diagnosis was serum vasoactive intestinal polypeptide (VIP) concentration is more than 75 pg/mL with the evidence of pancreatic neuroendocrine neoplasm. We report a case of 59-year-old Thai female presented with chronic watery diarrhoea and weight loss for three months. Her serum biochemistry showed hypokalaemia. CT whole abdomen showed a well-defined enhancing isodense mass at the pancreatic body, sized about 3.4 x 3.0 x 2.7 centimetres without pancreatic duct dilatation. EUS FNA was performed and the result was compatible with neuroendocrine tumor. Immunohistochemical staining showed chromogranin A- and synaptophysin-positive tumor cells. She was admitted for aggressive fluid resuscitation. Octreotide was the main medical treatment and she was scheduled for laparoscopic distal pancreatectomy with splenectomy. The patient position is Lithotomy position. The 10-mm camera balloon port was inserted at infra-umbilical location. Another 12-mm and three of 5-mm were inserted as additional working trocars. Liver and stomach were retracted with Nathanson liver retractor. Lower border of neck of pancreas was dissected. Intra-operative ultrasound was applied for tumor identification. Splenic vessels were clipped and cut. Distal pancreatic transection was performed by Endostapler device. Tumor was removed via extended infra-umbilical incision. The procedure was completed in 220 minutes with minimal blood loss and no major intraoperative or postoperative complications. She was admitted for 5 days after the operation and discharge from the hospital with stable condition. The pathological result was well-differentiated neuroendocrine tumor. On 6 months follow up, her symptoms and CT scan had resolved without recurrence.
Clinical outcomes of laparoscopic radiofrequency ablation in treatment of hepatic tumor underwent percutaneous radiofrequency ablation

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Purpose: The value of percutaneous radiofrequency ablation (RFA) for hepatic tumors has been well documented. The majority of RFA for hepatic tumors could be achieved extracorporeally, which is either guided by sonography or computer tomography. The relative dangerous zones, such as segment VII, VIII and adjacent to major vessel, were left to laparoscopic (LAP-RFA). The aim of this study was to discuss the safety, efficacy and technique issue of LAP-RFA to treat hepatic tumor underwent extracorporeal RFA.

Materials and Methods: From 2014 to 2018, 13 patients who underwent LAP-RFA are included in the study. Once the pneumoperitoneum is created, the trocar (LAGIS) is inserted. The 3-D image system (MedicalTek) is electively used. RFA is performed under the laparoscopy inspection.

Results: 10 cases are primary hepatocellular carcinoma and 3 cases are metastatic adenocarcinoma. The numbers of hepatic segmental distributions are as follows: 2 patients of segment II, 2 patients of segment IV, 3 patients of segment VI, 1 patient of segment VII and 5 patients of segment VIII. The technical success rate was 90% and 13 patients had no complications. 6 patients received nucleation of hepatic tumors and RFA at the same operation. The pathological reports showed residual viable tumors in 5 patients. No mortality. The primary effectiveness rate 1 month after the procedure was 100%.

Conclusion: Percutaneous RFA in difficult position (Segment II, IVb, VI, VII, VIII) tends to have incomplete ablation. Base on the biopsy reports (5 of 6 patients have residual viable tumor), incomplete ablation may be because of heat conduction (the viable cells located in the peripheral zone of tumor). LAP-RFA is a safe and effective treatment for hepatic tumors, giving a promising choice to the patients who are unsuitable and incompletely treated for percutaneous RFA. The adhesion due to pervious percutaneous RFA was not an obstacle to LAP-RFA.
Laparoscopic pancreaticoduodenectomy (LPD) is an extremely challenging surgery. First described in 1994, LPD has been gaining a favorable position in the majority of pancreatic surgery. Now, LPD is worldwide accepted. A literature search was conducted in PubMed, and only papers written in English containing more than 26 publications of LPD were selected. Papers in distal and robotic pancreatic procedure were not included in the review of a total of 222 LPD publications. The total number of patients analyzed was 1,082 from 25 articles and the largest series. Six of these studies came from the United States, 1 from France, 5 from South Korea, and 1 from India, 2 from Japan, 5 from China, 1 from Italy, 1 Germany, 2 from UK. The overall pancreatic fistula rate was 20.5%. The overall conversion rate was 10.4%. LPD seems to be a valid alternative to the standard open approach with similar technical and oncological results. LPD is a safe procedure, providing many of the advantages typically associated with laparoscopic procedures. We expect this operation to continue to gain in popularity as well as be offered in increasingly more complex cases. In future studies, it will be beneficial to look further at the oncologic outcome data of LPD including survival.
Laparoscopic major surgery in obese patients with hepato-biliary and pancreatic diseases

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**Introduction:** Laparoscopic major surgery for hepato-biliary pancreatic disease is feasible but difficult and should be performed only by surgeons experienced in both open and laparoscopic surgery. Especially, in case of obese patients, laparoscopic major hepatectomy or pancreatectomy remains challenging because of patient’s factor, including limited field of view, narrow intra-abdominal space, and difficulties in control of graspers, as well as technical factors.

**Methods:** We present cases of obese patients treated by laparoscopic major surgery for hepato-biliary and pancreatic diseases.

**Results:** Case 1 is a 17-year-old male patient with a hepatocellular adenoma treated by pure laparoscopic right hemihepatectomy using liver hanging maneuver and the ventral approach. His body mass index was 40.1 kg/m². Because of large amount of visceral fat, it was not possible to perform the retrohepatic dissection sufficiently at the initial stage of surgery. After some progress of parenchymal transection, additional retrohepatic dissection was performed. Then, a nelaton catheter was inserted in a cranial to caudal fashion for liver hanging maneuver. Operation time was 490 minutes and blood loss was 450 ml. There were no postoperative morbidities and he discharged at postoperative 11 days.

Case 2 is a 27-year-old female patient with a solid pseudopapillary tumor of the pancreas treated by laparoscopic spleen-preserving distal pancreatectomy with segmental resection of the splenic artery vein (Warshaw technique). Her body mass index was 41.3 kg/m². Follow up CT scan showed no evidence of splenic infarction, but, fluid collection around the pancreatic cut surface on the 5th postoperative day. She underwent percutaneous drainage insertion for fluid collection and was discharged on the 10th postoperative day.

**Conclusion:** Laparoscopic major surgery in hepato-biliary and pancreatic division is feasible and safe even though an obese patient. More clinical experience is required to address the advantages, limitations, and reproducibility of this technique.
The safety of omitting prophylactic abdominal drainage after laparoscopic liver resection: Retrospective analysis of 100 consecutive cases

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**Aim:** Whether prophylactic abdominal drainage after laparoscopic liver resection (LLR) is necessary remains unclear. This study aimed to evaluate the safety of omitting prophylactic abdominal drainage after LLR.

**Materials and Methods:** A retrospective analysis of 100 consecutive patients who underwent LLR at Osaka Rosai Hospital from April 2011 to November 2018 was performed. During this period, prophylactic abdominal drainage was routinely omitted during LLR without biliary anastomosis. The primary endpoint was the frequency of additional abdominal drainage. The secondary endpoint was the rate of postoperative complications.

**Results:** Ninety-six patients (96%) underwent partial resection or lateral segmentectomy, and 89 patients (89%) were Child-Pugh grade A. The median operative time was 102 (range, 31-274) minutes. The median blood loss was minimal (range, 0-280 ml), and blood transfusion was performed for one patient (1%). One case (1%) was converted to open surgery. Additional abdominal drainage was required for one patient (1%) with an intraabdominal abscess. Postoperative complications were seen in 5 patients (5%). High-grade complications (≥ grade III according to the Clavien-Dindo classification) were seen in two patients (2%). There were no cases of reoperation or perioperative death. The median postoperative hospital stay was 8 (range, 4-65) days.

**Conclusions:** Prophylactic abdominal drainage could be safely omitted for selected patients and operative procedures.
Introduction Central pancreatectomy has been shown to have a role in managing benign and low-grade malignant tumours of the neck of the pancreas. With much controversy, this operation has been traditionally performed as an open procedure here in Australia. However, with the emergence of the benefits of laparoscopic surgery, this case series explores the feasibility, safety and outcomes of performing laparoscopic central pancreatectomy at a major metropolitan hospital in Victoria, Australia.

Methods A retrospective audit of all patients who underwent a laparoscopic central pancreatectomy performed between 2015-2018 by a single Australian hepato-pancreato-biliary surgeon. All patients were followed up for a minimum of six months.

Results 4 patients were identified. Median age was 65 years old. 75% were females. Mean length of stay was 9.25 days. Three patients underwent the operation for mid-body/neck of pancreas neuroendocrine tumours (WHO grades 1 to 2) and one for benign unilocular cyst. Average operation duration and blood loss were 383 minutes and 375mls respectively. All patients were commenced on clear fluids day one post-operatively and on average, patients were tolerating full ward diet by day five. Post-operatively, one patient had an unremarkable recovery. One patient had intraabdominal collection requiring percutaneous drainage due to a pancreatic fistula. One patient had pseudomembranous colitis post-operatively. One patient represented 11 days post-op with haematemesis secondary to a splenic artery pseudoaneurysm which was managed with angio-embolization. There were no mortalities.

Conclusion Preliminary data shows that laparoscopic central pancreatectomy is a safe and feasible option in Australia. Adverse outcomes requiring further intervention were identified, however the sample size is small. Further research comparing laparoscopic and open techniques are warranted in the Australian setting.
Laparoscopic bile duct excision – an early Australian experience

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Introduction Laparoscopic excision of bile duct in adult patients is infrequent in Australia. While bile duct excisions are performed laparoscopically in a handful of centres worldwide, in Australia it is mostly performed as an open procedure. This case series aims to assess feasibility, safety and outcomes of such a procedure at a major metropolitan centre in Victoria, Australia.

Methods A retrospective audit of all patients who underwent laparoscopic bile duct excisions between 2015-2018 by a single Australian hepato-pancreato-biliary surgeon. All patients were followed up for a minimum of six months.

Results Five patients underwent laparoscopic bile duct resection with Roux-en-Y hepaticojejunostomy reconstruction. Most were female patients (80%) with a median age of 58 years. Four patients underwent the procedure for removal of a type 1 choledochal cyst and a single case was for recurrent CBD stones. Mean duration of operation was 330 minutes and average blood loss was 180ml. One case was converted to open due to technical difficulty with intraabdominal fat. Mean length of stay was 7.6 days. All patients were started on fluid diet from day one post-operative and on average tolerated full ward diet by day three. Four patients made uneventful recovery. There was no post-operative wound or intraabdominal infection at six months follow up. One patient had post-operative haematemesis from a hepatic artery pseudoaneurysm which was subsequently angio-embolised. All patients were alive and well at six months outpatient review.

Conclusion Early data shows laparoscopic bile duct resection is a feasible option in Australia. It is generally safe, however, there is one serious complication requiring further intervention in this series. Further research in the Australian setting is indicated to compare the long-term outcomes between these techniques.
Safety and feasibility of laparoscopic liver section of HCC with previous abdominal surgery

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Introduction Laparoscopic hepatectomy (LH) is still a technical challenge for patients with previous abdominal surgery (AS). The purpose of this study is to assess the safety and feasibility of LH for HCC patients with history of AS in the initial developing period of LH.

Methods The retrospective study was enrolled the patients who were newly diagnosed HCC received LH from January 2013 to June 2019. Demographic characteristics, perioperative variables and surgical complications were prospectively collected.

Results Fifty-eight patients were reviewed with 14 in AS group and 44 in non-AS group. The median age was slightly higher in AS group (72 vs. 65, p=0.019). No significant difference were showed in preoperative liver damage status (MELD-Na score 8.4 vs. 9.2, p=0.493), IWATE score (5.6 vs. 5.6, p=0.974), the mean operative time (381.7 vs. 259.8 minutes, p=0.055), intraoperative blood loss (517 vs. 449 mL, p=0.538), transfusion rate (7.1 vs. 9.1%, p=0.821) and duration of parenchyma transection (109 vs. 108.6 minutes, p=0.992) between AS and non-AS groups. The mean non-parenchyma-transection time was prolonged to 122 minutes in AS group (273 vs. 151 minutes, p=0.002) without increasing postoperative complications (42% vs. 31.8%, p=0.449) and postoperative hospital stay (7.9 vs. 7.4 days, p=0.667)

Conclusion In this retrospective study, history of previous abdominal operation lead to longer non-parenchyma-transection time to 122 minutes in average but not parenchyma transection time. The surgical complications and postoperative hospital stay were not increasing. Laparoscopic hepatectomy for HCC for the patients with history of abdominal operation is a safety and feasible choice.
Laparoscopic versus open hepatectomy for HCC: a comparative study in a single center of eastern Taiwan

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Introduction The safety and advantages of laparoscopic operation was well-known but specific outcomes for hepatectomy in hepatocellular carcinoma (HCC) patients were still unclear in developing period. The aim of this study was to compare perioperative outcomes between laparoscopic hepatectomy (LH) and open hepatectomy (OH) for HCC patients.

Methods The retrospective study was enrolled the patients who were newly diagnosed HCC under liver resection during January 2013 to June 2019 in Hualien Tzu Chi General Hospital, a tertiary referral center in eastern Taiwan. Detailed surgical procedures of LH and OH were analyzed. Demographic characteristics, perioperative variables, and follow-up outcomes were collected.

Results One hundred and fifty patients were reviewed, and 92 patients were in OH group and 58 patients were in LH group. The median total length of hospital stay and post-operative hospital stay is less in LH group (10 vs 15 days, p<0.001 and 7 vs 10 days, p<0.001). No significant differences were found in preoperative liver damage (Child-Pugh and MELD-Na score), postoperative surgical complications, two-year disease-free and overall survival (67% vs 66.8%, p=0.947 and 80.4% vs 84.6%, p=0.828) between LH and OH groups. In LH group showed shorter median operative time (217 vs 259 min, p=0.043), fewer blood loss (200 vs 370 mL, p=0.014), shorter duration of Pringle maneuver (58 vs 76 min, p=0.049) and less drainage tube placement (80.7% vs 94.6%, p=0.013).

Conclusion In our retrospective study, LH group showed shorter operative time and duration of Pringle maneuver, less blood loss and drainage tube placement, and improved the length of stay compared with OH group without compromised two-year disease-free and overall survival. Laparoscopic hepatectomy is feasible and safe treatment for the HCC patients in our developing period.
Epigastrium is an appropriate location for first additional port during single port cholecystectomy for acute cholecystitis

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**Introduction**: Single-incision laparoscopic cholecystectomy (SILC) has become increasingly popular. Regarding the difficulties of SILC for complicated cholecystitis, additional trocar insertion was sometimes required. However, the appropriate location for that is not well studied. The usefulness of first additional port insertion at epigastrium is assessed in this study.

**Methods**: Since March 2018, of eighty eight patients who tried SILC for acute cholecystitis, additional ports insertions were needed in forty two patients. The first port was inserted at the epigastrium and the second at right lateral subcostal area if required. Drainage catheter was positioned through epigastrium port site. Surgical outcomes were evaluated in those patients.

**Results**: One additional port was inserted in 35 patients and two additional ports were used in 7 patients. The mean operation time was 75 minutes and median hospital stay was five days. There was no open conversion. No postoperative complicated fluid collection was detected. There was one complication of bile leakage (Clavien Dindo classification grade IIIa) and the leaked bile was well detected on drainage catheter.

**Conclusion**: Epigastrium was adequate location for first additional port during SILC for complicated cholecystitis securing a good surgical view of operative field and proper drainage.
Gallstone ileus due to cholecystogastric fistula: a brief report and review literature

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Case Report: Gallstone ileus due to cholecystogastric fistula: a brief report and review literature

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Abstract:

Background: Gallstone ileus is a rare complication of cholelithiasis accounting for 1%-4% of defined as intestinal obstruction due to impaction of one or more gallstones within the gastrointestinal tract. Cholecystogastric fistula itself is a rare fistulous tract formation, which one it results from the gradual erosion of the approximated and chronically inflamed wall of the gall bladder and stomach.

Case Description: A 39-year-old female with gallstone ileus due to cholecystogastric fistula, which we manage with one stage procedure (enterolithotomy, cholecystectomy and fistula closure) and patient discharged on day 10 with good condition.

Conclusion: This case report has highlighted that gallstone ileus is a rare case. Computed tomography has proven to be the most accurate diagnostic modality. And the best treatment for patients with good general condition and adequately stabilized preoperative is one stage surgical procedure (cholecystectomy and pair of fistula)

Key Word: Gallstone Ileus, Cholecystogastric Fistula, One Stage Procedure

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Single incision laparoscopic cholecystectomy: Lessons learned from 1300 consecutive patients in a single center

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Background. Single incision laparoscopic cholecystectomy (SILC) is a considerable option in benign gallbladder surgery. We have developed Konyang Standard Method (KSM) for SILC and gradually innovated KSM. We report the outcomes of our high-volume data of SILC.

Methods. We retrospectively reviewed the preoperative characteristics and surgical outcomes of 1300 consecutive patients who underwent SILC at a single institution between April 2010 and July 2019. Initially 3-channel SILC with KSM was changed to 4-channel SILC using a modified technique with a snake retractor for exposure of Calot triangle; we called this a modified KSM (mKSM). After that, we have used a commercial 4-channel (Glove) port for simplicity (C-mKSM).

Results. The patients included 745 women and 568 men (mean age, 51.4 years). The most common preoperative diagnosis was chronic cholecystitis (n=453, 34.5%). The mean operative time and postoperative hospital stay were 51.83 minutes and 2.55 days, respectively. Overall complication rate was 4.0%. Conversion rate to conventional laparoscopic cholecystectomy and open cholecystectomy were 1.7% and 0.1%, respectively. The operative time, intraoperative blood loss, conversion rate, postoperative complication, and postoperative hospital stays were significantly improved in phase 3 period (C-mKSM).

Conclusion. SILC can be a safe and feasible treatment for benign gallbladder disease. In our experience, the use of the mKSM with a commercial 4-channel port was most effective surgical method of SILC.

Keywords. Single-incision, Laparoscopy, Cholecystectomy
The safety and feasibility of single incision laparoscopic cholecystectomy for acute cholecystitis: Comparison by Tokyo guideline 18 severity grading

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**Background.** Single incision in laparoscopic cholecystectomy (SILC) is a considerable option in benign gallbladder surgery. However, the safety and feasibility of SILC in acute cholecystitis has not been confirmed. We report our surgical outcomes of SILC in acute cholecystitis.

**Methods.** Total of 422 patients who underwent SILC for acute cholecystitis between April 2010 and July 2019 in single institution were retrospectively reviewed the preoperative characteristics and surgical outcomes. Patients were classified according to the Tokyo Guidelines for Acute Cholecystitis 2018 (TG18).

**Results.** The patients included 214 women and 208 men (mean age, 54.0 years). The mean operative time and postoperative hospital stay were 62.9 minutes and 2.83 days, respectively. Overall complication rate was 7.2%. Conversion rate to conventional laparoscopic cholecystectomy and open cholecystectomy were 4.8% and 0.2%, respectively. The grade II and III group had higher conversion rate (14.0 vs 1.3%, p<0.001), higher postoperative complication rate (12.4 vs 2.9%, p=0.001), larger blood loss (29.64 vs 16.17mL, p=0.013), longer operation time (61.78 vs 54.92 mins, p=0.001) and longer postoperative hospital stays (3.51 vs 2.42 days, p<0.001).

**Conclusion.** In our experience, SILC can be a safe and feasible treatment for acute cholecystitis. However, in case of grade II or III acute cholecystitis according to TG18, SILC should be selected carefully.

**Keywords.** Single-incision, Laparoscopy, Cholecystectomy, Acute cholecystitis
Direct cholangioscopy: Is it relevant? An early single institutional center experiences in Malaysia

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Direct visualization of the biliary system (cholangioscopy) has been made possible since past 30 years. It potentially offers significant procedural and clinical advantages over conventional ERCP and its benefit had been well documented in numerous publications though it has not been widely adopted due to cost and limitation of available device. Thus here in, we shared our single institutional center in Malaysia, early experiences of cholangioscopy usage, using Spyglass system@ Boston Scientific for numerous indications. Demographic data, indication, no of intervention and the outcome had been analyzed
Single port laparoscopic surgery for HCC in minor hepatectomy; is it feasible method?

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Introduction: Since the introduction of laparoscopic surgery, laparoscopic surgery has been attempted in various fields. However, in liver resection, because of the technically difficult, only a small number of retrospective studies have been reported for single port laparoscopic procedures. The purpose of this study was to investigate the surgical safety and outcome of single port laparoscopic procedure in minor hepatectomy for HCC.

Material and method: We retrospectively reviewed the medical records of 199 patients who underwent minor hepatectomy for HCC from January 2009 and April 2018. We divided the surgical technique into two groups; single port laparoscopic hepatectomy (SPLH) and open hepatectomy (OH). A minor hepatectomy is defined as removing one in which 2 or fewer Couinaud segments. The same criteria as laparoscopic or open surgery were applied.

Result: Of the 195 patients, 82 patients underwent SPLH and 113 patients underwent OH. The basic characteristics of patient between two groups were almost the same (table 1). There was statistically significant decrease in operation time, blood loss, pRBC transfusion, hospitalized day, enteral feeding day and post operative complication (table 2). In multivariate analysis of Cox regression, risk factor for recurrence were transfusion and SPLH, and survival risk factors were MVI and recurrence. Survival curve also showed low survival rate for SPLH (p=0.05).

Discussion: This study shows that SPLH is superior to surgical outcome except recurrence, However, it was inferior to OH in terms of overall survival and recurrence.
Laparoscopic partial splenectomy for splenic cyst

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Splenic cyst was an uncommon condition. Most of cyst was a simple cyst and do not need surgery. In symptomatic cases, surgery is required. Laparoscopic partial splenectomy is alternative procedure, aiming to reduce long term risk associated with splenectomy such as overwhelming post-splenectomy infection (OPSI). Presenting case is a 48 years old woman. She suffered from pain at left costal margin that was aggravated by breathing. Ultrasound and MRI showed of thick wall cystic mass size 5 cm at lower pole of spleen. Antibiotics therapy was given for 2 weeks, but symptoms was not improved. Laparoscopic partial splenectomy was conducted. Procedure was done in 45 degree right lateral position with 4 trocars. Mobilization of splenic flexure of colon and lower pole of the spleen was done first. Vessels to lower pole of spleen were divided selectively. Splenic artery was identified and clamped with endobulldog for proximal control. Parenchymal transection was done 1 cm below the demarcation line. There was bleeding from vessels in side parenchyma near the hilum. Temporary control was made with gauze packing. Human gelatin-thrombin matrix sealant was applied and could achieved effective hemostasis. Drain was placed and there was no postoperative bleeding. Patient could be discharged on postoperative day 5.
Letting Go of the Past: Laparoscopic Completion Cholecystectomy for Residual Gallbladder Pouch

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**Introduction:** Subtotal cholecystectomy is an acceptable method to manage cases of acute cholecystitis. The incidence of residual gall bladder stone after cholecystectomy is less than 2.5%. Asymptomatic patients with stones in the residual gallbladder pouch are usually observed for any symptoms, the surgical approach is reserved for symptomatic patients. The residual gallbladder used to be approached using an open surgical technique, but now laparoscopic re-cholecystectomy is one of the surgical options. This case presentation narrates our experience in the management of a residual gallbladder.

**Case Presentation, Methods and Results:** A 32 yr old male who underwent laparoscopic subtotal cholecystectomy 5 years ago for an acute calculous cholecystitis. Patient reported recurrence of discomfort at the epigastric and right upper quadrant with no associated jaundice and fever. Work-up revealed normal liver enzymes, but there were findings of a 1.5 cms hyperechoic structure with posterior shadowing at the previous area of the gallbladder. Patient was then scheduled for diagnostic laparoscopy with possible re-cholecystectomy. The procedures were completed after 2 hours and 30 minutes and, with no intraoperative complications. Post-op sectioning of the residual gallbladder pouch, showed two stones measuring 0.8 cm and 1.5 cms. The patient was started on regular diet post-operatively and was eventually discharged the following day in the afternoon.

**Conclusion:** Presence of persistent abdominal pain years after subtotal cholecystectomy may indicate a possible acute inflammation of the residual pouch. A simple ultrasonographic imaging can be used to confirm the diagnosis, but MRI may also give additional information in ruling out presence of other biliary stones or pathology. Due to progress in laparoscopic technique and equipment, the laparoscopic approach is an effective tool in removing residual gallbladders.
Fifty thousand Hepatobiliary surgeries, disease and surgical technique scenario. “ELSA-OP making the difference” at SNM Hospital Leh. Ladakh India

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Over last eighteen years, fifty thousand hepatobiliary surgical procedures were performed by single operating surgeon at a district Hospital of Indian state. Procedures include Cholecystectomies Open and Laparoscopic, Common bile duct explorations, Choledochoduodenostomies, Choledochal cyst excisions, Hepaticojejunostomies. Latest development in this institution is Laparoscopic Surgical procedures.. Since the inception of ELSA-OP Laparoscopic Surgical training Course, its mission “Asia through the scope” 2012 onwards successfully changed the scenario of Laparoscopic Surgical technique adoption in this part of the world and is progressing steady. It has evolved as an academic venture of excellence with organizing ELSA-OP Laparoscopic Surgical Skill Training Course and Operative workshop every year under the banner of ELSA-OP and local stakeholders. As of today all the surgeons working at SNM Hospital Leh are well trained and perform Laparoscopic Surgeries regularly. We are committed to the motto “Together we learn and Progress”
Intra-operative stapler malfunction and how to overcome it
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Method: A 20-year-old lady with BMI 45, underwent LSG. A 12mm supraumbilical camera port was fashioned with two working ports in the right(5mm) and left(12mm) hypochondrium region. Nathanson liver retractor was used to retract the left lobe of liver via epigastric port. A 38F bougie was placed inside the stomach for gastric tube calibration. Stapler firing commenced at 5cm away from pylorus after omentum has been taken down from greater curvature of stomach. Stapling was performed using idriveTM Ultra Powered Stapling System with Endo GIATM with Tri-StaplerTM Technology, black reload cartridges. Upon the second stapler firing, prior to retraction of stapler blade, the blue signal light of the iDriveTM system came on and the stapling device is stuck to the stomach within patient’s abdominal cavity.

Results With advice from Medtronic vendor, we changed the iDriveTM portable battery system, but that did not help. Knowing that there will be a small twisting motion with recalibration of a new iDriveTM headset, we went ahead to detach the cartridge from the headset. Upon re-calibration, the stapler reload proceeded to complete the cutting motion and jaws opened up. Careful inspection of stapler line did not reveal any stapler malformation. Surgery was completed without any other incidents. Air leak test at the end of surgery with endoscopy did not reveal any leak. Knowledge of troubleshooting stapler malfunction is an important aspect a surgeon should know of. Backup plans for this case included re-stapling the affected stomach, suture reinforcement, change to smaller size bougie and reinforce, or last resort in the presence of stenosis conversion to roux-en-y gastric bypass.

Conclusion Stapler malfunction or misfiring can be a dreadful, but maneagable complication. Surgeons who perform LSG needs to know how to troubleshoot and what are his options available.
Sleeve gastrectomy vs Roux-en-Y gastric bypass: a comparison in non-superobese patients

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Background Laparoscopic sleeve gastrectomy (LSG) is currently most performed bariatric procedure worldwide. Most of studies showed laparoscopic Roux-en-Y gastric bypass (LRYGB) provided superior results to LSG in superobese patients but many studies showed that LSG provide comparable result to laparoscopic LRYGB in non-superobese group.

Objectives To compare short- to mid-term results between LSG and LRYGB and to do subgroup analysis between non-superobese and superobese patients’ group.

Methods A retrospective analysis of prospectively collected data from patients underwent primary bariatric procedures in King Chulalongkorn Memorial Hospital who have been followed up for >3 years. The outcomes were the percentage of excess weight loss (%EWL) and the percentage of success rate.

Results From June 2008 to May 2015, 228 patients were included. 119 LSG and 109 LRYGB were done. LRYGB showed 71.1, 70.8 and 66.1 %EWL at 12-, 24- and 60-month period while LSG showed 54.3, 60.1 and 46.9 %EWL respectively. In subgroup analysis of non-superobese patients, LRYGB showed 73.8, 72.34 and 64.2 %EWL while LSG showed 64.5, 67.5 and 45.4 %EWL at 12-, 24- and 60-month period respectively. The success rate after LRYGB were 88.5, 81.3 and 65.0% while LSG were 54.0, 60.6 and 42.9% at 12-, 24- and 60-month period. Non-superobese subgroup analysis showed 94.8, 78.6 and 64.3% success after LRYGB and 71.4, 64.0 and 38.5% success after LSG respectively.

Conclusions LRYGB seems to provide more favorable bariatric outcomes than LSG in non-superobese patients group. However, study in larger number of patients or prospective randomized study should be done in the future to address this issue.
Laparoscopic sleeve gastrectomy outcomes: What we have learned?

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Background Laparoscopic sleeve gastrectomy (LSG) is becoming one of the most commonly performed bariatric procedure. The efficacy of this procedure and also predictors for success should be determined.

Objectives To evaluate efficiency of LSG in weight loss, success rate and incidence of weight regain after initial success and to determine preoperative predictors that may relate to favorable results.

Methods A retrospective study was conducted on morbidly obese patients who underwent LSG in King Chulalongkorn Memorial Hospital (KCMH) between June 2008 and May 2015. All the patients were followed-up for at least 3 years after the procedure. The bariatric outcomes were focused include the percent of excess weight loss (%EWL) and weight regaining pattern. We defined success of the procedure at 50% EWL at evaluate time and weight regain as more than 10 kg increase after 24 months. All postoperative complications were recorded.

Results There are 120 patients underwent LSG as primary bariatric procedure in KCMH during study period. %EWL was increased to maximum point at 24 months period then continued in plateau. Trend of %EWL increasing was significantly better in non-superobese patient group (BMI <50) in 24 months period (mean %EWL = 67.51) and continued until 60 months (mean %EWL = 60.35). Maximum success rate was 59.72% at 24 months and decreased to 41.48% at 60 months. Weight regain rate after 24 months was 17.4%. There were 7 patients underwent additional laparoscopic Roux-en-Y gastric bypass. Early postoperative complications included 3 patients with postoperative bleeding and one leakage. One patient experienced functional obstruction as late complication and another had incisional hernia.

Conclusions LSG provides fair bariatric outcomes within medium-term follow-up period with low complication rate. Superobese patients with BMI >50 may not suitable for LSG due to higher chance of inadequate bariatric results.
Management of post RYGB abdominal pain- Report of our experience and literature review

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Background Abdominal pain post-bypass surgery has a 25-33% prevalence rate. IH is the most common cause of small bowel obstruction (SBO) for post bariatric patients and requires timely diagnosis before sequelae of gangrene or ischaemia. Few studies have studied the true prevalence and impact of abdominal pain in post bypass patients. Current accepted practice involve blood and radiological imaging to identify a likely aetiology and if both negative, to consider early diagnostic laparoscopy. Our experience is in line with the current accepted standard of practice. We document our experience with 6 patients presenting with non-specific complaints of abdominal pain post bypass and propose a suggested algorithm to the diagnostic workup and subsequent management of such patients.

Methods We conducted an audit of 6 patients who underwent diagnostic laparoscopy post RYGB between 2016-2019 for complains of abdominal pain.

Results 6 patients presented with complaints of non-specific abdominal pain from Jan 2016 to July 2019, average of 26 months post bypass surgery. All patients had antecolic, retrogastric roux en Y gastric bypass surgery with closure of mesenteric and Peterson defects during index surgery. All patients had symptoms of abdominal tenderness, 2/6 patients had nausea. 3/6 patients had positive radiological findings: bowel dilatation (1/3), closed loop obstruction (1/3), volvulus (1/3). All patients underwent diagnostic laparoscopy, 1 had conversion to exploratory laparotomy in view of gangrenous bowel. Diagnostic laparoscopy revealed internal hernia (5/6) and adhesions (1/3).

Conclusion Abdominal pain is a non-specific complaint that should be regarded seriously in the post gastric bypass population. Given the potential life-threatening causes such as herniation, detailed history, physical exam combined with directed investigations should be conducted. The threshold for diagnostic laparoscopy should be low, even if symptoms have improved or radiological imaging does not prove IH, due to the possibility of IH and small bowel compromise.
Single-port laparoscopic sleeve gastrectomy

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Background: Single-port laparoscopic sleeve gastrectomy (SPSG) is not widely performed in East Asian countries such as South Korea, Japan, and China although preoperative mean body mass index (BMI) of patients in East Asia is not as high as Western countries.

Objectives: The aim of this study was to report early surgical outcomes and weight loss results of SPSG in a single tertiary medical center in South Korea.

Methods: Data from consecutive patients who underwent SPSG between September 2015 and April 2018 were retrospectively analyzed. Patients with more than 1-year follow-up were included in the final analysis.

Results: A total of 41 patients underwent SPSG during the study period. Mean BMI was 40.18 ± 13.5 kg/m² and mean operating time was 132 ± 43.5 minutes. Completion of the procedure did not require the Introduction of an extra port. Postoperative surgical morbidity rate was 12.2%, of which there were no staple line leakage or stricture. Incisional hernia of umbilicus occurred in 1 patient (2.4%), and gastroesophageal reflux symptoms developed in 5 patients (12.2%). Post-operative bleeding occurred in 1 patient managed conservatively and recovered without surgical intervention. Mean excess weight loss was 91.6 ± 48.9% after 1 year.

Conclusion: SPSG can be performed with equivalent early surgical outcomes and weight loss compared to conventional laparoscopic sleeve gastrectomy. Prospective comparative studies are necessary to assess the potential benefits of this minimally-invasive approach.
Reduce Postoperative pain after laparoscopic sleeve gastrectomy: Case Report

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Generally, bariatric surgery is mainly performed by laparoscopic operation. Pain management optimization is important to improve the patients' outcome. This case had not used pain control drugs post-operation. Maybe due to we had used new analgesic drug and new single-port. We had more than 10 patients received laparoscopic sleeve gastrectomy between 2015 and 2019. We had used 5 wound method to do bariatric surgery before. We had used sigle port to do other surgery like appendicitis or cholecystitis. In our experience, single port can reduce wound number and relieved post operation wound pain. Dinalbuphine sebacate (DNS) and sold under the brand name Naldebain, is a non-controlled opioid analgesic which is used as a 7-day long-acting injection. In our experience, patients had used patient-controlled analgesia (PCA) or opioid analgesic drugs for pain management. Patient had complained inconvenience and still wound pain. Naldebain had used in the treatment of moderate to severe postoperative pain and it was effective and safe. Good analgesia drugs and less port-sites can reduce the postoperative pain after laparoscopic sleeve gastrectomy. Bariatric surgeries including sleeve gastrectomy, gastric banding, and gastric bypass can be used this combination to improve patient’s comfort.
Impact of Bariatric Surgery for Morbidly Obese Patients with Type 2 Diabetes Mellitus in South District of Thailand

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Introduction: Obesity can lead to a number of serious and potentially life-threatening conditions include type 2 diabetes mellitus, coronary heart disease, depression and strokes, and linked to death. Bariatric surgery is an effective treatment for overweight type 2 diabetes mellitus patients proved by many studies and is in ADA guideline also. Since 2015, Bariatric center Vachira Phuket hospital has debuted as only one public bariatric center in South district of Thailand. We serve the people in South district which have prevalence of obesity for 11% of the country. This is the study conducted to verify the impact of bariatric surgery on obese patients with diabetes in South district of Thailand.

Method: We conducted retrospective-cohort study with sample of 17 Thai diabetic patients with mean body mass index (BMI) of 44.49 kg/m2 and a mean age of 42.35 underwent laparoscopic sleeve gastrectomy or laparoscopic Roux-en-Y gastric bypass between 2015 and 2017. Impact on diabetic mellitus treatment and BMI were followed 1 year after procedure.

Result: The mean BMI decreased to 30.57 at 1 year with a mean excess weight loss of 74%. For the impact on diabetes mellitus, There showed complete remission (HbA1C < 6.0, FBS < 100 mg/dl) in 11 patients (64.7%), partial remission (HbA1C 6-6.5%, FBS 100-125 mg/dL) in 5 patients (29.4%) and one can reduce the medication but not remission (5.8%).

Discussion and conclusion: The result from our bariatric center can help treat obese patient with diabetes mellitus like in other country (rate of diabetic remission about 30-50%) but the sample size may be small. In Thailand, the bariatric procedure is difficult to access causes by lack of surgeon, understanding and knowledge. We hope that our work will help support and make confident for Thailand public health.
Results after metabolic surgery in Psychiatric Manifestations and Comorbidity in Obese Patients and Animal models

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Background: Obesity is one of the major challenges for public health in the 21st century. And the present studies indicate that obesity and psychiatric disorders share common risk factors and pathological mechanisms. It is believed that to eliminate these risk factors will be beneficial to the psychological condition and improve quality of life in obese in obese population. In Taiwan, there is no well-conducted clinical study to systematically investigate the role of obesity and its treatment on psychiatric comorbidity. The aim of this study is to evaluate the prevalence and severity of comorbid psychiatric disorder among obese patients. This study will also show the possible association between psychopathology and treatment in a prospective research.

Methods: In the planned longitudinal study, obese participants were enrolled from the outpatient departments in Taiwan to assess their demographic information and psychiatric conditions. A baseline and follow-up assessments at the one, three, and six months after bariatric surgery or medical intervention were performed to evaluate the outcomes of body mass index (BMI) changes, the severity of comorbid psychopathologies and quality of life. In the animal study, we establish diet-induced obese model, and then induced stress with unexpected chronic mild stress (UCMS). In order to confirm the relationship between obesity and psychiatric disorders, the animal behavior was determined before and after bariatric surgeries.

Results: The results show that psychiatric comorbidity and quality of life has a positive correlation with significant weight loss after bariatric surgery intervention. Furthermore, this study will provide the best available information on the prevalence of psychiatric disorders and their relationship to severity of obesity. The bariatric surgery also shows beneficial results to psychiatric disorders in animal model. In addition, this longitudinal study will further provide prospective data about the intervention effects on comorbid psychopathology in Taiwanese obese population.
Acute Pancreatitis after Laparoscopic Sleeve Gastrectomy: A case series

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**Background:** Laparoscopic sleeve gastrectomy (LSG) has become one of the most commonly performed surgical procedure for morbid obesity patients worldwide, and the trend is increasing. As one of surgical procedure, LSG also has complications such as bleeding, surgical site infection and leakage. Recently, acute pancreatitis (AP) is also reported as one of fearsome complication after bariatric surgery with incidence rate of 0.17-1.04% depended on following time and type of procedure.

**Case report:** We present a series of four cases of acute pancreatitis after LSG that occurred within a one month after surgery. The data was collected from bariatric center in Vachira Phuket hospital, Thailand, which has performed 392 cases of LSG between Jan 2015 to Aug 2019. All cases had symptoms of nausea and vomiting but only one had epigastric pain.

**Discussion:** There is no previous study report the incidence of AP after LSG in Asian patients. But the incidence in our center (1.02% in 1 month period) seem high when compared to nationwide study in USA that occurred only 0.21% in 6 months period.

**Conclusion:** AP after LSG can develop as an early post-operative complication and can present without epigastric pain. Awareness of the complication is crucial and help physicians manage patients properly.
Preoperative Weight Loss Makes Surgical Procedure Easier Compared to Control study. Experience from Bariatric and Metabolic Surgery Center in Vachira Phuket Hospital, Thailand

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Background: Preoperative acute weight loss before surgery has been proposed as a predictive factor for improved patient compliance and the degree of excess weight loss achieved after surgery. In the present study, we sought to determine the effect of preoperative acute weight loss on operative and postoperative outcomes.

Methods: A retrospective review of super-morbid obese patients (BMI more than 50 kg/m2) who underwent Bariatric Surgery at Bariatric and Metabolic Surgery Center at Vachira Phuket Hospital was undertaken from October 2016 until August 2019, patients were divided in to group I : patients who were admitted for acute weight loss preoperatively and group II, those who were not.

Results: Group I (n= 26) average BMI is 63.56 +/- 7.07 kg/m2 (50.01 - 79.71). Group II (n= 39) average BMI is 53.30 +/- 3.07 kg/m2 (50.04 - 59.3) and both groups had similar demographics and co-morbid conditions, Group I lost 13.4 kg (+/- 9.19 kg)(7.7% of body weight within 14.3 days (+/- 10.9 days) before surgery. Operative time was shorter in group I compared to group II (112.07 +/- 41.3 vs 88.93 +/- 26.58 min; p=0.05) Both group had the same rate of postoperative complication and the same weight loss at 1 year follow-up (%Excess weight loss = 60.5 vs 60.0%)(group 1 n=17, group II n=9)

Conclusion: Preoperative acute weight loss before bariatric surgery associated with shorter operative times in super morbid obesity patient.
Retrograde Jejuno-jejunal Intussusception Two Years After Roux-en-Y Gastric Bypass: A Case Report

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The demand and popularity of bariatric surgery is increasing worldwide due to an epidemic of obesity and its related comorbidities like diabetes and hypertension. Roux-en-Y gastric bypass (RYGB) patients are at potential risk of developing small bowel obstruction secondary to adhesion bands, internal hernias, kinks, strictures and volvulus. Intussusception is a rare long-term complication after Roux-en-Y gastric bypass seen in patients with drastic weight loss. The etiology is unknown though most people consider dysmotility as a causative mechanism. Computed tomography (CT) imaging must be obtained early to identify the potential cause of bowel obstruction. We report a case of retrograde jejuno-jejunal intussusception in a 66-year-old lady two years following a laparoscopic RYGB.
Recurrence Small Bowel Obstruction in a patient after Laparoscopic Gastric Bypass Surgery

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Introduction: With increasing number of laparoscopic Roux-en-Y gastric bypass being performed, surgeons have to deal with several post-operative complications. One of the most dreaded complications of laparoscopic Roux-en-Y gastric bypass (LRYGB) is mechanical small bowel obstruction (SBO). The objective of this presentation is to increase the awareness of health care providers to mechanical SBO in post LRYGB patients and stress on the importance of early diagnosis and management of this potentially catastrophic complication.

Case A 54-year-old lady of LRYGB five years ago, reported with acute upper abdominal pain. Examination revealed mild abdominal distention, epigastric tenderness with sluggish bowel sounds. Contrast-enhanced computed tomography (CECT) abdomen was suggestive of rotation of small bowel mesentery with venous congestion. Patient was taken up for diagnostic laparoscopy. There was a right to left herniation of small bowel loops through the Peterson defect and was congested and dusky in appearance. Internal hernia was reduced, which restored the bowel color. The mesenteric defect was closed with sutures. Patient had an uneventful post-operative recovery. She presented to ED again a day after discharge with abdominal distention, nausea and vomiting. She had tachycardia, distended abdomen with absent bowel sounds. CECT abdomen was suggestive of mid-small bowel obstruction and she was again taken up for emergency diagnostic laparoscopy. Intra-operatively, small bowel loops were found to be grossly dilated. An omental band was found to be the cause for small bowel obstruction which was excised and bowel decompressed. She had a satisfactory post-operative recovery.

Conclusion: With an increasing number of LRYGB being performed, surgeons encounter an increasing number of post-operative complications which warrants re-exploration. It is of paramount importance to have a high index of clinical suspicion and surgical exploration should be considered, even with negative imaging studies, as the consequences of missing the diagnosis can be catastrophic.
Gastroesophageal Reflux Disease Symptoms after Laparoscopic Sleeve Gastrectomy in Morbidly Obese Thai Patient

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Introduction: Gastroesophageal Reflux Disease (GERD) is common in morbidly obese patients. It is well established that Laparoscopic Roux-en-Y Gastric Bypass (LRYGB) produces improvement in GERD symptoms. Laparoscopic Sleeve Gastrectomy (LSG) has become popular in recent years. However, less was known regarding effect on GERD symptoms after LSG. This study compares GERD symptoms after both bariatric procedures.

Methods: A retrospective analysis was performed on 197 patients who underwent Bariatric Surgery in our center. Patients were matched for BMI 40-60 and interviewed by phone for GERD symptoms. Patients scored GERD symptoms on severity scale from 0 to 3. Outcome measures were postoperative GERD symptoms and percentage of excess weight loss (%EWL).

Results: Eighty-nine patients underwent LSG and 108 patients underwent LRYGB. Prior to operation, patients with GERD symptoms were no statistically significant difference (42.7% in LRYGB and 45.4% in LSG, p=0.79). No hiatal hernia was detected in all patients. There was no significant difference in postoperative GERD symptom’s change including complete resolution, improvement, progression and new-onset of GERD symptoms (p=0.49). No postoperative stricture was detected in all patients. There was no significant difference in postoperative GERD symptom’s change including complete resolution, improvement, progression and new-onset of GERD symptoms (p=0.49). At 12 months of follow-up, %EWL was no statistically significant difference.

Conclusion: Laparoscopic Sleeve Gastrectomy is comparable with Laparoscopic Roux-en-Y Gastric Bypass in term of success weight loss and relieving Gastroesophageal Reflux Disease symptoms. However, experience in progression or new onset of GERD symptoms is similarly reported in both procedures. Further randomized studies with objective measurement of Gastroesophageal Reflux symptoms are needed.
Nutrient Deficiencies after Laparoscopic Bariatric Surgery

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**Introduction:** Laparoscopic Roux-en-Y Gastric Bypass (LRYGB) was the preferred bariatric procedure in terms of weight loss and remission of co-morbidities, however nutrient deficiencies were common. Laparoscopic Sleeve Gastrectomy (LSG) was increasing in popularity with remarkable effectiveness and less nutrient deficiencies. We determine the amount of pre-operative nutrient deficiencies in morbidly obese patients and compare nutritional status during the first post-operative year between LRYGB and LSG.

**Methods:** One hundred and seventy-seven patients underwent Bariatric procedures in our center were assigned to a standardized follow-up program. Data of interest were pre-operative nutrient status, percent of excess weight loss (%EWL) at 1 year and nutrient deficiencies during the first post-operative year. Deficiencies were supplemented when found and excluded from the analysis.

**Results:** One hundred and fifty morbidly obese patients with completion of blood withdrawal pre-operatively and during the first post-operative year were included in the study (64 LRYGB and 78 LSG). Pre-operative nutrient deficiencies were found in 29 patients including 2 iron deficiency and 28 vitamin D deficiency. Post-operative nutrient deficiencies had no significant difference between both groups (45.1% in LRYGB vs 39.1%, p=0.629) with significantly higher %EWL at 1 year in LRYGB (71.9% in LRYGB vs 53.1%, p<0.001). Subgroup analysis of iron, folate, vitamin B12 and vitamin D deficiencies showed no significant difference between both groups, however %EWL at 1 year were also significantly higher in LRYGB (p<0.001).

**Conclusion:** Nutrient deficiencies in morbidly obese patients are common in Thai Population that should be concerned and supplemented before undergoing bariatric procedures. Nutrient deficiencies after Laparoscopic Roux-en-Y Gastric bypass occur frequently but are comparable with those of Laparoscopic Sleeve Gastrectomy, however significant weight loss at 1-year follow-up is preferable in Laparoscopic Roux-en-Y Gastric Bypass.
AIMS: Transoral endoscopic thyroidectomy by a vestibular approach (TOETVA) is a novel technique for thyroid cancer operation. Compared to other endoscopic approaches including transaxillar or bilateral axillo-breast approach, it requires substantial dissection to reach the thyroid and provides the shortest access to the target organ. The aim of this study was to report on our initial experiences with transoral endoscopic thyroidectomy by a vestibular approach with endoscopic retractor for the management of thyroid carcinoma.

METHODS: From September 2016 to October 2017, 70 patients with thyroid cancer underwent TOETVA. We used a three-port technique through the oral vestibule with endoscopic retractor, and thyroidectomy with central compartment dissection was performed endoscopically using conventional laparoscopic instruments and an ultrasonic device.

RESULTS: All patients had papillary thyroid carcinoma. Less than total or total thyroidectomy with ipsilateral central compartment node dissection was performed (67 vs. 3). The mean operation time was 96.5 min (range, 56-213 min). The average number of lymph nodes resected was 2.6 (range, 1-12). Three patients experienced a transient hoarseness, which was resolved within 3 months. Most of the patients could return home within 3 days after surgery.

CONCLUSION: TOETVA is safe and feasible and provides an excellent cosmetic outcome.
**Abnormal Tissue Implantation after Endoscopic Thyroidectomy: a systemic review**

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**Aims:** Although needle tract implantation of thyroid carcinoma after fine needle aspiration cytology has been occasionally reported, implantation of thyroid tumor tissue after thyroidectomy is extremely rare. The aim of this study was to review the literature about soft tissue implantation of thyroid tissue after endoscopic thyroidectomy.

**Methods:** We searched PubMed for published articles describing soft tissue implantation after endoscopic thyroidectomy. Cases on the references of previously published reports were included. There was no language limitation. A total of 7 cases were included.

**Results:** All cases were female patients and mean age at first operation was 28.1 years. Duration from first operation to finding implantation was 29.7 months. Mean size of tumor was 3.4 cm. Five were benign and 2 were carcinoma in first operation, but 2 cases of benign tumor were diagnosed as malignant in implantation tissues. All 7 cases underwent endoscopic thyroidectomy via breast approach and 6 cases were performed with CO2 gas insufflation. All 7 cases showed multiple implantation legions.

**Conclusion:** To reduce such complications, it is necessary to strictly limit the indications for endoscopic surgery and every effort should be made to perform an en bloc resection without rupture of the tumor.
A huge alpha-fetoprotein producing suprarenal tumor

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This 68-year-old male has been informed with a huge left suprarenal mass during healthy examination without discomfort. He has a past medical history of hepatitis C infection. The laboratory data are mostly within normal limit except elevated AFP level (134.75 ng/ml). The abdominal computed tomography reveals a 11cm left suprarenal tumor without adjacent organ or vessel invasion, nor any hepatic tumors. Laparoscopic left adrenal gland and retroperitoneal tumor excision has been performed with minimal blood loss. He has been discharged one week later uneventfully. The pathologic report reveals a 11.5cm and 320gram tumor with elastic consistency. It shows solid sheet, nest to thick trabecular growth patterns of neoplastic cells with markedly pleomorphism, hyperchromatic nuclei nuclei, eosinophilic cytoplasm and mitotic figures. One small area of residual normal adrenal gland is present. The immunohistochemical stain shows positive Hep-par-1, glypican-3, and arginase-1, along with negative CK, TTF-1, inhibin, calretinin, synaptophysin, chromogranin-A, S-100, Melan-A. The Ki-67 proliferative index measures about 30%. In all, carcinoma with hepatoid differentiation is impressed. After surgery, his serum AFP level drops to 13.56 ng/ml. Adjuvant chemotherapy with CEP regimen (cyclophosphamide, epirubicin and cisplatin) has been given and he is generally well one-year after surgery. Hepatoid carcinoma represents extrahepatic neoplasms with hepatocellular carcinoma features by morphology and immunohistochemistry, usually with elevated circulating alpha-fetoprotein (AFP) level in elderly people. It occurs in gonadal yolk sac or non-germ cell origin primary sites, such as esophagus, colon, lung, gallbladder, adrenal gland, kidney, urinary bladder, ovary, uterus, and testicle. First adrenal hepatoid carcinoma was described in 1994 in Japan. Patients with hepatoid adenocarcinoma may have a mean survival time of 12 months. Pancreas hepatoid carcinoma was reported with a mean survival time of 35 months. Due to rarity of adrenal hepatoid carcinoma, there is no estimated survival time for reference.
Laparoscopic Adrenalectomy - How big is too large

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Objectives Large tumour size had been considered a relative contraindication to laparoscopic approach but its definition has been variable. At 4cm or above (≥4cm), there is higher likelihood of malignancy and some suggested less favourable outcome. This study aims to clarify the outcomes of adrenalectomies in association to size of the lesion and surgical approach.

Methods This is a retrospective cohort analysis of consecutive patients who received adrenalectomies between Jan 2013 and Feb 2019. Clinical and pathological data were collected and the perioperative outcomes of patients between those with tumours >4cm and <4cm were compared.

Results 172 patients received 177 adrenalectomies in the study period with 31 patients excluded from analysis, having simultaneous major operation. Of the remaining patients, the mean tumour dimension was 4.06+/−3.38 cm with 22 patients had open surgery directly due to size (Mean 9.9cm) and laparoscopic adrenalectomies were performed for 124 lesions with a mean tumour dimension of 3.07+/−1.80 cm. Mean operating time was 123.26+/−55.19 minutes. Median blood loss was 10ml. Median post-operative length of stay (pLOS) was 3days. There were no 30 day mortality and 4 conversions to open procedure and 3 other morbidities. Comparing the outcomes between patients with tumour <4cm (n=93) or ≥4cm (n=53), those with tumour >4cm are more likely to have direct open surgery (39.6% vs 1.1%, P<0.001) longer operating time (+43min, 95%CI: +22.8-63.4min, p<0.001), and pLOS (4vs3days, p=0.008) but there was no statistical significant difference in median blood loss (p=0.217), conversion rate (p=0.936) and complication rate (0.599). However, it is observed that all these differences are statistically insignificant if we only include lesions up to 6cm.

Conclusions Larger adrenal lesions (>6cm) is associated with longer operating times, more blood loss and longer hospital stay. Laparoscopic adrenalectomy can be successfully performed with good outcomes up to lesions of 6cm.
Pre- and peri-op management of laparoscopic adrenalectomy for phaeochromocytoma

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Introduction Phaeochromocytomas are rare catecholamine-producing tumours which are a dangerous but treatable cause of hypertension. Surgical removal of phaeochromocytomas require a pre- and peri-op preparations to ensure a successful and safe operation.

Background We present a 45-year old lady who, with a background of hypertension, was found to have a large right adrenal mass while being investigated for abdominal bloatedness. The patient underwent extensive workup of the adrenal mass to reveal a large phaeochromocytoma, measuring 10x7.8x7cm. The radionuclide scan showed no other foci of malignancy, neither did the patient did not appear to have acquired this adrenal mass as part of a hereditary clinical syndrome, as about 10% of phaeochromocytomas are. The patient was subsequently counselled for laparoscopic adrenalectomy. In partnership with an endocrinologist, the patient was prepared for surgery with pre-medications up to 2 weeks prior and required admission to the hospital the day prior to surgery for pre-hydration. Peri-op, she required invasive blood pressure monitoring, infusions of vasodilators and other standby medications for fine blood pressure control, especially during the operation. The diagnosis of phaeochromocytoma was confirmed with histology. And on subsequent follow-up, the patient was normotensive and no longer required her anti-hypertensive medications.

Conclusion Laparoscopic removal of large phaeochromocytomas is possible, requiring coordination between the surgical team, the endocrinologist and anaesthetic team to adequately prepare the patient pre-op and maintain haemodynamic stability peri-operatively.
Use of a novel sponge device for laparoscopic surgery in a general hospital

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Background: According to the health care statistics in Japan, there are approximately seventy-three hundred general hospitals nationwide and 70% of these hospitals have less than two hundred beds. In Japanese health care, centers of excellence have not been established and many general surgeries are performed at each general hospital. Therefore, it’s necessary to keep technical quality and safety among few operations. We make a report of utility of a new sponge device to perform easier and safer laparoscopic procedures.

Novel device: Securea (Hogy medical co., Japan) is a polyurethane sponge device for laparoscopic surgery. This device with a radiopaque string can be used as a versatile tool; atraumatic lifting or retraction of any organs, blunt dissections, placement as a spacer between tissues, cleaning the surgical area, and control of bleeding. It’s easy to handle and take in and out via a 10mm trocar. In particular, Securea allows the surgeon easier aspiration of intra-abdominal fluid without suctioning of the omentum or intestine and safe efficient control hemorrhage as a gentle compression tool without adhering tissues.

Procedure: Usually Securea is inserted in the abdominal cavity at the initial stage of operations. It can be used as a retractor, a spacer, and a compressor to clean and keep dry the surgical field at various situations throughout the operation without exchange of new one. Securea can be also handled easier by not-skilled surgical assistant.

Conclusions: We demonstrate utility of the new versatile sponge device. This device allows easier and safer laparoscopic procedures without any special preparation in general hospitals.
TAPP plus: A new innovation to reduced operative time and immediate post-operative pain.

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Introduction Conventional laparoscopic transabdominal preperitoneal inguinal hernia repair (TAPP) is a commonly performed procedure for inguinal repair. We proposed a new improvised technique called TAPP plus which is a procedure that reduces the operative time and provide immediate post operative pain

Methods TAPP plus provides safer and effective pain outcome when compared to conventional TAPP. We report a case series of a pilot study of 10 patients with initial TAPP plus treatment in our center. 120 ml of diluted ropivacaine with epinephrine solution were infiltrated without carbon dioxide gas into the preperitoneal space through a transabdominal needle before TAPP. This is a prelude to RCT of TAPP plus vs TAPP.

Conclusion TAPP plus has a short learning curve for the junior specialists compared to conventional TAPP. It does reduce operative time and immediate post procedural pain.
A novel laparoscopic near infrared fluorescence spectrum system is useful for intraoperative photodynamic diagnosis of peritoneal dissemination in pancreatic cancer

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Introduction: Accurate diagnosis of peritoneal dissemination is essential to select therapeutic strategy for patients with pancreatic cancer (PC), and laparoscopic intraoperative diagnosis is useful for performing less invasive surgery. Photodynamic diagnosis using 5-aminolebulinic acid (5-ALA-PDD) could improve accuracy in gastrointestinal cancer diagnosis, but there was difficult to detect weak fluorescence. The purpose of this study is to improve detection of weak fluorescence using laparoscopic spectrophotometer (SP).

Methods: PDD was performed serial dilution of protoporphyrin IX, and the detectability was compared with Fluorescent light (FL) and SP. 5-ALA-PDD was performed PC cell lines (Mia-Paca2, Panc-1, PK-1 and KLM-1). A murine peritoneal disseminated nodule model was established by intraperitoneal injection of PK-1 cells. After 3 weeks, 5-ALA was administered intraperitoneally, and 5-ALA-PDD was performed laparoscopically 2 h post administration. Laparoscopic observations were made with white light (WL), FL and SP, then compared to pathological testing results.

Results: SP could detect weaker fluorescence of the dilution compared with FL. SP could detect a spectrograph of PpIX in multiple cell lines. In a mouse model, the detection rate was 62%, 78% and 90% by WL, FL and SP. To make a comparison in FL-negative peritonea between the pathologically metastasis and non-metastasis, the SP intensity of metastatic peritoneum specimens were significantly higher (P<0.010).

Conclusions: Measuring the fluorescent spectrum with this laparoscopic SP makes it possible to detect the fluorescence of 5-ALA, which is hard to determine macroscopically.
Making Laparoscopic Wounds Better with Zinc

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Title: Making Laparoscopic Wounds Better, Application of Zinc Based Wound Wash and Gel to Improve Wound Outcome. Laparoscopic surgery is well known for producing great cosmetic results. We wanted to find out if using Zinc based wound wash and gek would improve the outcome of wounds. We randomized 2 groups of patients who underwent laparoscopic appendisectomy using a standard 3 port approach. Each group consisted of 42 patients (N= 84) and One group was managed post op in the usual manner. The other group was managed with soluble Zinc Based wound solution (Zinc 8%), we scored the wounds on a scale of 1-3 with 1 good and 3 being best.

Results:- The patients in the Zinc group had 95% of a score of 3 compared to 52% in the control group. Besides this we also had 3 patients with wound infection in the control but none in the zinc confirming our belief that zinc not only acts as a wound enhancer but also as an antiseptic.

Discussion:- Post operative wound care with zinc enhances the outcome of wounds in laparoscopic patients.
**Single-incision robotic gasless transaxillary thyroidectomy: initial experience of a single surgeon**

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**Purpose:** We reviewed our initial experience with single-incision robotic gasless transaxillary thyroidectomy by a single surgeon who had little experience of endoscopic transaxillary thyroidectomy.

**Method:** Retrospective review of 28 consecutive single incision robotic gasless transaxillary thyroidectomy performed from December 2014 to September 2017. All patients were women. There were 5 cases of total thyroidectomy and 23 cases of less than total thyroidectomy.

**Result:** Mean age was 39.3 years (18-55), and mean body mass index (BMI) was 22.7±2.7 kg/m² (18.4-29.6). 26 patients were papillary thyroid carcinoma, 1 patient was follicular thyroid carcinoma and 1 patient was nodular hyperplasia. Mean tumor size was 0.82±0.67 cm (0.2-3.8) and mean retrieved lymph nodes were 6.5±4.8 (2-21) Mean operation time was 166.4±43.9 minutes (110-290). The mean operative time for patients with a BMI of 25 or greater and less than 25 were 197.0±41.8 and 159.8±42.3 minutes, respectively. There was no conversion to open and postoperative bleeding. There was 1 case of transient hoarseness and she was recovered after 4 months.

**Conclusion:** The operation times gradually decreased, In patients with a BMI of 25 or greater, the operation time was longer. In the initial setting, patient selection may be helpful to perform robotic thyroidectomy.
WhatsApp: An effective communication tool within clinical teams

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**Background:** Temporal discontinuity of healthcare communication places risk to patient safety. This study aimed to evaluate whether the WhatsApp com service improved delivery of patient care on an acute general surgical unit at a peripheral hospital

**Methods:** A retrospective analysis was conducted of the electronic encrypted communication between the acute surgical team members. All ASU team members (n=10) used WhatsApp for their communication for 26 weeks. All communication threads were captured, response times were considered, and clinical information was examined.

**Results:** The last 2000 logged communication events were analysed to look at communication patterns within the team. The residents and interns had logged the most activity with patient updates. The consultants issued most of the clinical information and instructions to the team, followed very closely by registrars. Interns felt communication with the consultants was easily achievable in an expedient manner. A total of 436 media links and documents were exchanged during these communications (which included clinical photographs, imaging, pathology, and relevant links to publications relevant to the patients of the team).

**Conclusions:** WhatsApp represents an easily accessible, efficient, and easy to use communication tool for an acute surgical unit. This trial lays a foundation for quality improvement and innovations in communication amongst clinical team members utilising the live easily accessible communication afforded by smartphones.
Introduction: Endoscopic ultrasound guided biliary drainage (EUS-BD) is a useful method after failed ERCP yet need expertise in performing the procedure. Hands on model for EUS-BD training has been developed to improve trainee’s skill but previous models required fluoroscopy and included ex-vivo animal organs. We reported an all-synthetic interventional EUS training model (TAGE-1) and now a newer model (TAGE-2) has been developed.

Aims & Methods: This study aims to evaluate TAGE-2 model during the hands on workshop. We developed a non-fluoroscopy, all-artificial model for EUS-BD which included both hepaticogastrostomy (HGS) and choledochoduodenostomy (CDS). We launched TAGE-2 in two international EUS hands on workshops and gave a questionnaire to the participants. 10 aspects of EUS-BD was assessed scored from 1.0 (poor) to 4.0 (excellent) by both the expert (> 300 experiences of EUS FNA) and the trainee during the workshop. The trainees were divided into a beginner (< 50 cases of EUS) and an experienced (≥50 cases of EUS FNA).

Results: The evaluation scores for EUS guided HGS and CDS are shown in table 1. Almost all items were graded as good to excellent, especially for the needle visibility, guidewire manipulation and stent deployment. However, the puncture sensation in EUS-CDS and contrast visibility in EUS-HGS are still graded fair to good by the experienced and the expert, respectively.

Conclusion: We developed a non-fluoroscopic, all-artificial model for EUS BD training which provided good training hands on for therapeutic EUS, especially for the steps and maneuverability of the instruments.

Key word: endoscopic ultrasound, biliary drainage, training model
One-Stop solution for an unpalpable lung tumor, Marking, Resection and Confirmation of the surgical margin at the Hybrid operating room (OS-MaRCH)

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There is a high demand for methods to locate, resect impalpable tumors such as ground-glass opacity (GGO) lesions or small tumors and to confirm their surgical margins reliably and rapidly during video-assisted thoracic surgery. We developed a technique to solve those problems and named it OS-MaRCH (One-Stop Marking, Resection and Confirmation of a tumor at the Hybrid operating room) method. The tumors are located under CT scan after marking on the lung surface with endoscopic surgical clips and are resected. Then resected specimens are inflated and scanned with the CT so that their surgical margins are confirmed. We performed OS-MaRCH method on 29 cases (23 GGOs and six non-GGO lesions) from October 2016 to May 2019, and could locate all these lesions. Two cases needed additional partial resection following CT scan of the resected lung, due to not containing the lesion in one case, and to insufficient surgical margin in another case. We performed lobectomy at a later day in one case of a tumor with 38mm-depth from the visceral pleura, that was proved impossible to be excised by wedge resection. On the other hand, both the surgical and pathological margins were secured in the other 28 cases. OS-MaRCH is a useful method to resecting impalpable lesions and small tumors of the lung. It has great merits on detecting lesions and confirming margins at one operation in one day, although it has some demerits that it demands special resources, longer surgical time and limitation of patients’ body position.
Schwannomas are benign tumors derived from the peripheral nerve sheath. Intra-abdominal schwannoma is extremely rare. We report in a 54-year-old Thai male with benign schwannoma (2x2.4 cm) in the lesser sac, which we removed under laparoscopic resection. A 54-year-old male was admitted to our hospital because of obstructive jaundice. Computed tomography revealed a common bile duct stone that causing upstream dilatation of the common bile duct and a 2.4 cm enhancing hypodense nodule located in the lesser sac, anteriorly to the pancreatic head. After the common bile duct stone was endoscopically removed, the patient underwent laparoscopic cholecystectomy with laparoscopic resection of the tumor. Histologically, the resected tumor was diagnosed as a benign schwannoma. The patient was discharged from the hospital on the third postoperative day without complication. The aim of this report is to recognize the possibility of schwannomas in the differential diagnosis of intra-abdominal tumor. A laparoscopic surgical technique is very useful and feasible for diagnosis and treatment of the benign tumor in the lesser sac such as schwannoma with fast post-operative recovery and excellent cosmetic outcome.
Laparoscopic surgery is feasible for selected case of lower gastrointestinal perforation; a case report of perforated Meckel’s diverticulitis.

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Lower gastrointestinal perforation is usually treated by open surgery, because many of them have peritonitis with fecal contamination in which laparoscopic surgery is difficult and not safe. Although small intestinal perforation is a form of lower gastrointestinal perforation, it usually treated simple small bowel resection and anastomosis. If we would get the localization preoperatively, laparoscopic approach should be reasonable. Case report: 36-year old male was ambulanced our emergency department with severe abdominal pain. He had been felt intermittent abdominal pain and nausea a couple of days before admission. The pain had changed continuous and exacerbated for two hours. His vital signs were as followed (BP;149/87, HR;96/min, RR;20/min, Temp.39.6℃). On physical examination, his abdomen was rigid and apparently rebound tenderness was observed in entire abdomen. Enhanced CT showed a short segment of wall thickening small bowel in the pelvic space. Lower gastrointestinal perforation; especially small intestine was most like, but the etiology was unknown. We choose SILS (single incision laparoscopic surgery) approach and found a perforated Meckel’s diverticula inflammatory adheted on the pelvic wall. The adhesion was released laparoscopically, and the Meckel’s diverticula was resected using liner stapler. It took several days to the patient start to take meals because of postoperative ileus. He discharged ten days after surgery without further complication.
Cecal fistula caused by swallowing various forms of magnetic foreign bodies in a Child

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Purpose Foreign body ingestion is a common emergency that can cause a major cause of accidental injury to children especially in infants. Magnets swallowed with time difference are attracted to each other across the bowel wall, and the intestines undergo necrosis due to pressure. This causes perforation, fistula formation, and obstruction in intestine. Complications of various cases resulting from swallowing multiple magnetic foreign bodies are well known. However, we report this very special case of magnetic swallowing to arouse alertness once again and to assist in diagnosis.

Methods A 8-year-old girl presented to emergency department with 3 months history of right lower quadrant pain underwent chest-abdominal radiography and abdominopelvic computed tomography (CT).

Results The abdominal radiograph and CT shown key ringed radio-opaque foreign body in the cecum. Further questioning to the parents and the patient was conducted, but the contents of the swallowed foreign body could not be confirmed. We expected natural passage because the foreign material was located in the cecum past the ileocecal valve. Abdominal radiographs were checked daily for 3 days, but the position of the foreign material did not change at all. She underwent a laparoscopic exploration which confirmed the intraperitoneal complications and mobilized the ascending colon to expose the cecum through a single port site for surgery. Observing the inside of the cecum lumen revealed fistulae between two parts of cecal wall and foreign bodies turned out to various forms of magnetics. The fistula tract were removed and defected cecal wall was oversewn.

Conclusion If a child has a metallic foreign object that is fixed in the intestine in sequential abdominal radiography, it may be necessary to verify whether the shape is caused by various types of magnets. In this case, operation is suggested as soon as possible to avoid serious complications.
Frequency of Surgical Site Infection in a Patient undergoing surgery in a public sector hospital of a lower middle-income country

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**Background:** Nowadays delayed wound healing is mainly caused by surgical site infections (SSIs), leading to an increase in medical expenses. Post-operative surgical site infections are a leading cause of morbidity. This study aims to highlight the harmful effects of surgical antibiotic prophylaxis (SAP), which may decrease the overall infection rate but is leading to increased risk of antibiotic-resistant infections. The objective was to find out the frequency of surgical wound site infection and antibiotic resistance.

**Methodology:** The study was conducted in a tertiary care hospital of Lahore. We did a Cross-sectional descriptive survey between “July 2018 to December 2018.” A total of 850 major operative procedures were performed. 178 patients reported with SSI and culture reports of these patients was done. Out of 178 patients, 150 SSI were confirmed on culture reports. Data was analyzed on SPSS version 25.0.

**Results:** A total of 850 major operative procedures were performed, which included 336 emergency and 514 elective procedures. 178 patients reported with SSI and culture reports of these patients was done. Out of 178 patients, 150 SSI were confirmed on culture reports, resulting in an incidence of 17.64%. The sex distribution showed 90 women (60%) and 60 men (40%). In this study, 90% of patients with SSI had at least one underlying health condition, which included diabetes, hypertension, and cardiovascular disease. The frequency of diabetes mellitus among SSI patients was 54/150 (36%). A total of 10 different bacterial pathogens were found. Staphylococcus aureus was the most common Pathogen followed by Escherichia coli and klebsiella.

**Conclusion:** Surgical Site infections help to monitor the quality of the hospital. Patients with comorbid conditions have an increased chance of surgical site infections. Constant wound surveillance is essential.
Laparoscopic surgery to remove broken needles due to acupuncture for back pain from the retroperitoneal space

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Introduction Complications caused by broken acupuncture needles have been usually minor. Here, we report a patient who underwent laparoscopic surgery to remove broken needles from the retroperitoneal space.

Case presentation A 27-year-old woman had an acupuncture therapy for back pain about 1 year ago. After that procedure, the patient continued to complain of back pain. On abdominal CT, the linear metallic foreign body appeared at the right retroperitoneal space just medial aspect of right adrenal gland with penetration of crus of diaphragm. We decided to approach the laparoscopic approach. After mobilization of right adrenal gland, we exfoliated the retroperitoneal tissue. The broken needle was bedded in the psoas minor muscle. The patient had an uneventful postoperative course and was discharged on the fourth postoperative day.

Discussion Recently, laparoscopic equipment has evolved to provide better visualization and meticulous handling. Laparoscopic intervention in our case of retrieving a broken needle from the retroperitoneal space, demonstrates an application of minimally invasive surgery. It is a safe and effective approach to deal with retroperitoneal situation.
Laparoscopic surgery certification system promotes operative safety of the surgical residents

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**Introduction:** Although patient safety is paramount, education of surgical residents is also our mission. To cope with this issue, we have established a laparoscopic surgery certification system that provides step-by-step surgical training according to resident level. The purpose of this study is to evaluate safety of surgery performed by surgical residents who have completed the laparoscopic surgery certification system.

**Method:** There were 23 laparoscopic cholecystectomy (LC) cases performed by first-year residents (Group A) and 91 LC cases performed by mid-career surgeons (5-10 years career as a surgeon) (Group B). We compared data of the following items: Patient demographics (age, gender, BMI, cholecystitis, history of laparotomy, antithrombotic therapy, PTGBD placement), surgical outcomes (operation time, blood loss, drain placement, C-Tube placement, postoperative complication rate, and hospital stay after surgery).

**Results:** There was no significant difference between the two groups in terms of patient age (66 vs. 60, p = 0.079), gender (M/F; 10/13 vs. 53/38 p = 0.203), BMI (24.1 vs. 24.3 p = 0.831), history of laparotomy (35 vs. 26% p = 0.443), presence of cholecystitis (61% vs. 57% p = 0.816), history of antithrombotic treatment (17 vs. 18% p = 1.000), PTGBD placement (13% vs. 29% p = 0.181). In terms of surgical outcomes, surgical time (134 vs. 147 min p = 0.148), blood loss (13g vs. 32g, p = 0.390), C-tube placement rate (17% vs. 18%, p = 0.662), postoperative complications (8% vs. 3%, p = 0.264) and postoperative hospital stay (6 vs. 11 days, p = 0.287) were similar between groups. The drainage rate was significantly higher in group B (43% vs. 75%, p = 0.004).

**Conclusion:** LC outcomes of the first-year surgical resident were not inferior in safety compared to mid-career surgeons. We consider the laparoscopic certification system to be an effective educational system for surgical residents.
3-Dimensional Endoscopic Single Incision Nipple Sparing Mastectomy, With Immediate Reconstruction Using Gel implant: Preliminary experience

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BACKGROUND: A novel technique for breast cancer surgery was introduced. 3D (3 dimensional) endoscope was using during single incision nipple-sparing mastectomy (NSM), and immediate reconstruction with gel implant was also performed under the guidance of 3D endoscope.

METHODS: The patient was placed in supine position with upper limb above head and secured. A 4cm single incision was made over the axilla. Sentinel LN biopsy was performed first and sent for intra-operative frozen section examination. Tumescent solution was injected subcutaneously into the whole breast to minimize bleeding. The boundaries of the breast were marked with a mixture of sterile gel and blue dye. Dissection of a working space about 3-5cm was done before placement of the single port. C02 insufflation with pressure at 8mmHg was maintained. 3D endoscope was used, and the dissection was started with superficial skin dissection. Sub-nipple biopsy was performed and sent for frozen section analysis. Thereafter, peripheral dissection was performed to reach the boundaries previously marked by blue dye. Specimen was removed in entirely after completion of mastectomy. Submuscular pocked dissection was also performed under 3D endoscopic guidance for immediate implant reconstruction. No drain was placed in this surgery.

RESULTS: No skin or nipple areolar complex (NAC) necrosis was noted after the surgery. This procedure leaved one single well-hidden wound in the axilla, and the shape of breast was also maintained with satisfying cosmetic outcome.

CONCLUSIONS: 3D single-axillary-incision endoscopic technique for nipple-sparing mastectomy (NSM) was a safe procedure with low morbidity and associated with high aesthetic outcome and patient satisfaction.
Laparoscopic treatment of psoas abscess; a report of the case

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The psoas muscle is anatomically located in the retroperitoneal space, and surgical approach is difficult when psoas abscess is present. It can be divided into primary and secondary depending on the cause of the psoas abscess. If there is no clear cause or pathway of infection, it is classified as primary, and classification of cases with definite cause and route of infection such as gastrointestinal diseases, genitourinary diseases, trauma, tuberculous spondylitis or pyogenic spondylitis is secondary. Staphylococcus aureus is the most common cause of primary psoas abscess. It is developed in the same conditions as intravenous abusers and immune deficient patients. In the case of secondary psoas abscess, the primary infection should be treated simultaneously with drainage of the abscess. In recent years, treatment with antibiotics and drainage is the main treatment for psoas abscess. We experienced a case of psoas abscess treated with laparoscopic drainage surgery with antibiotics. We report this case with a review of the literature. A 41-year-old man who was being treated with tuberculosis complained of right flank pain. Computed tomography scan revealed psoas abscess, and the patient underwent percutaneous drainage catheter insertion. However, the abscess was not drained, and follow-up CT scan showed no improvement of the abscess. The patient underwent a laparoscopic drainage operation, and the pus of the abscess was removed and drained successfully by laparoscopic surgery.
A case of linea alba hernia repaired by Laparoscopic transabdominal preperitoneal approach (TAPP)

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A 47-year-old man with upper abdominal subcutaneous mass was diagnosed as having linea alba hernia by contrast computed tomography (CT). CT showed 3 ×2.5 cm hernia orifice with protrusion of the greater omentum. We repaired this hernia with a preperitoneal mesh by transabdominal preteritoneal approach (TAPP). Postoperative course was uneventfull. He is free from recurrence for 3months. Almost of all laparoscopic surgery for linea alba hernias have involved a intraperitoneal onlay mesh (IPOM method). However, intestinal perforation and obstruction have been reported as late complications. So we had operation by TAPP with reference to surgery for abdominal incisional hernia. This operative method was considered safety and minimally invasive.
Laparoscopic approach in blunt traumatic diaphragmatic injury

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INTRODUCTION – Most of the blunt thoracoabdominal injury patients always have multiple organ injuries. Plan of definite treatment depends on the preoperative diagnosis. In isolating diaphragmatic traumatic injury without others organ injury laparoscopic approach is helpful, decrease a length of hospital stay as well as decrease a wound complication. Authors describe the laparoscopic treatment of the patient who had rupture of a diaphragm from blunt trauma in an emergency setting.

METHODS AND PROCEDURES – A 56 years old man presented with motor vehicle accident and mechanism of injury was blunt thoracoabdominal injury. He complains about chest tightness and tachycardia. Complete evaluation and CT scan ware performed. Stomach was herniated to the left chest and diaphragmatic ruptured was found neither others great vessels nor solid organs injury. The laparoscopic approach was desired and left diaphragm was repair by non-absorbable sutured without intraoperative complication.

RESULTS – The patient has been discharged 4 days post-operative with full recovery. Chest x-ray was taken before discharge, in out-patient department 2 weeks as well as 6 months after discharge which shown no diaphragmatic herniation.

CONCLUSION(S) – Laparoscopic approach in isolated traumatic ruptured diaphragm patients is safe and should be considered.
Delta neutrophil index and symptomatic time are effective factors for predicting perforated appendicitis

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**Background:** Appendicitis is a common intra-abdominal inflammatory disease, and morbidity increases with age when perforation occurs. However, because not all patients require emergency surgery, there have been numerous studies on factors for predicting perforated appendicitis. In this study, we aimed to confirm whether the delta neutrophil index (DNI) and the time from symptom onset to surgery are effective predictors for perforated appendicitis in different age groups.

**Methods:** This was a retrospective study conducted on 542 appendicitis patients who underwent surgery at Kangdong Sacred Heart Hospital. The simple group consisted of 431 subjects, and the perforation group consisted of 111 subjects.

**Results:** Multiple logistic regression analyses demonstrated that age, neutrophil percentage, DNI, C-reactive protein (CRP), and symptomatic time were significant predictors of perforation. Analysis of the receiver-operating characteristic curve showed DNI as the most reliable predictive value. In the analyses according to age, the perforation rate was higher in the >65-year-age group; these patients also had a higher DNI, CRP, and symptomatic time. In the DNI analysis using ROC (Receiver Operating Characteristics), the area under the curve was higher in the >65-year-age group than in other age groups. In addition, the cut-off values were determined and perforation occurred significantly in the group with a DNI value of 2.1 or higher and a symptomatic time of 33 h or longer.

**Conclusions:** DNI is effective in predicting perforation in appendicitis compared with other inflammatory factors. Furthermore, the simultaneous measurement of symptomatic time and DNI is helpful in predicting perforation and determining whether emergency surgery is necessary.
Guiding interns and navigating better experiences

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Introduction The mandatory surgical term a core rotation to fulfill the requirements of medical registration in Australia. Intern satisfaction in surgery remains contentious. Low intern satisfaction levels are reported with surgical rotations, decreased teaching and mentorship, diminished contact with registrars and long working hours. Identifying areas that need mentorship and improving satisfaction can enhance the experience and improve patient outcomes.

Methods Interns rotating through a surgical term at a Brisbane Hospital were surveyed and undertook performance appraisal. Identified domains in an intern guide provided to the intern were: patient assessment-related; communication-related; documentation-related; and procedural-tasks formed the basis of a learning plan for the intern. Post intervention surveys assessed whether these identified domains had improved (self-reported confidence and preparedness). Objective supervisor feedback was compared to the data.

Results Twenty-eight interns rotating through a surgical rotation received an intern guide and a structured performance appraisal. Individual learning objectives were identified and a performance plan was developed. Interns identified preoperative patient assessment, handover and referrals, fluid/anti-coagulation management, and communication with patient/families as areas of need. The identified learning needs received direct mentorship and facilitated access to opportunities. The post-intervention surveys demonstrated improved self-confidence and observation surveys demonstrated better performance.

Conclusions Interns rotating through a surgical rotation have specific work-readiness requirements relating to the discipline. The learning experience currently varies as a result of many factors, such as supervision, experience, confidence and department expectations. The use of an intern guide and performance appraisal has the potential to identify key domains and structure a plan to address them leads to improved learning opportunity, confidence with performance and satisfaction for the intern.
Endoscopic technologies in child urology

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The use of endoscopic technologies in pediatric urology the most appropriate, since they meet the basic modern principles. **Methods.** From 2010 to 2019, 256 patients (boys-57%, girls-43%) underwent endoscopic methods of surgery: vesicoureteral reflux (VUR) in 49 cases, obstructive megaureter in 44 patients, congenital hydronephrosis - 43, ureterocele - 16, posterior urethral valve - 5, bladder polyp - 3. The endoscopic method of correcting VUR was performed by endocollagenoplasty. Endosurgical treatment of obstructive megaureter included: retrograde catheterization of the ureter, followed by the installation of a “low” transurethral ureteral stent. Treatment of hydronephrosis included: retrograde catheterization of the pelvis with an ultrasound-guided conductor followed by the installation of a transurethral polyurethane ureteral stent in two “pig tails”. Endosurgical treatment for ureterocele was performed by transurethral dissection. With valves of the back of the urethra, the treatment method included: transurethral resection of the valve of the back of the urethra with resectoscope. Polyps of the bladder was carried out in the form of transurethral resection and coagulation. It follows that the introduction of endoscopic treatment methods into pediatric urological practice has shown their high efficiency, low invasiveness, reduced postoperative complications, reduced hospital stay, and the possibility of repeated endoscopic and surgical interventions.
Transoesophageal Echocardiographic Assessment Of cardiac function during Laparoscopic Surgeries at high altitude

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**Introduction**: Laparoscopic surgeries are associated with various physiologic changes in the cardiovascular system (CVS) at different stages of surgery i.e. induction of anesthesia, pneumoperitoneum, hypercarbia, and after desufflation. The transesophageal echocardiography can be done to understand the various physiological changes in CVS without interfering the surgery. Till now, no study was done to assess CVS physiological changes during laparoscopic surgeries at high altitude. We hereby describe our experience in 3 cases.

**Methods**: We measured vitals and various echocardiographic parameters at different time intervals i.e. baseline, just before pneumoperitoneum, after 5mm Hg pressure, 10mm Hg pressure, 14mm Hg pressure, 20 min after 14mm Hg pressure and after desufflation.

**Cases**: Case 1 – A 60 male patient underwent Laparoscopic hernioplasty with mesh repair. On examination, the left ventricular and right ventricular systolic function remains the same throughout the procedure. However, the LVOT VTI and cardiac output decreases after insufflations and later become normal. The left ventricular diastolic function becomes worse after pneumoperitoneum. However, it becomes normal after 20 min of pneumoperitoneum. The pulmonary acceleration time which indicative pulmonary artery hypertension gradually decreases after pneumoperitoneum.

Case 2 – A 42/F patient underwent Laparoscopic hysterectomy. On TEE examination the left ventricular and right ventricular systolic function remains the same throughout the procedure with a slight decrease in LVEF at the beginning of insufflation. However, the LVOT VTI and cardiac output increase after insufflations. The pulmonary acceleration time similar to the 1st case gradually decreases after pneumoperitoneum.

Case 3 - A 29/F patient underwent Laparoscopic Cholecystectomy. On TEE examination similar to case 1 the left ventricular and right ventricular systolic function remains the same throughout the procedure. However, the LVOT VTI and cardiac output decrease after insufflations. The pulmonary acceleration time similar to 1st and 2nd case gradually decreases after pneumoperitoneum.
**Discussion:** In our cases, we observed a decrease in LVOT VTI and cardiac output in case 1 and 3 may be due to a decrease in venous return after pneumoperitoneum. However, LVOT VTI and cardiac output increases in case 2 in spite of pneumoperitoneum may be due to the extreme degree of Trendelenburg position. In all the 3 cases we observed a decrease in PAAT value may be due to an increase in CO2 inside the body after pneumoperitoneum.

**Abbreviation**
TEE – Tran esophageal echocardiography
LVOT- Left ventricular out flow tract
VTI- Velocity time integral
LVEF- Left ventricular ejection fraction
PAAT- Pulmonary artery acceleration time
Does emergency general surgery model affect staff satisfaction, training and working hours?

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Background: Few studies have assessed the relationship between emergency general surgery (EGS) model and staff satisfaction, operative experience or safe working hours. The Royal Australasian College of Surgeons recommends maximum on-call frequency of one-in-four for surgeons and registrars.

Objectives: To assess the relationship between EGS structure and work satisfaction, operative exposure and working hours in Australian public hospitals.

Methods: An observational study was conducted of all medium- to major-sized Australian public hospitals offering emergency general surgery. At each, an on-call registrar and senior surgeon were invited to participate. Primary outcomes were staff satisfaction and registrar-reported operative exposure. Secondary outcomes were working hours.

Results: One hundred and nineteen of 120 (99%) eligible hospitals were enrolled. Compared with Traditional structures, Hybrid or Acute Surgical Unit (ASU) models were associated with greater surgeon and registrar satisfaction on quantitative (p=0.012) and qualitative (p=0.039) measures. Registrar-reported operating was unaffected by EGS model. Longest duration on-call was higher amongst Traditional structures for both registrars (mean 22 vs. 15 hours; p=0.0003) and senior surgeons (mean 59 vs. 41 hours; p=0.020). On-call frequency greater than one-in-four was more common in Traditional structures for registrars (51% vs. 28%; p=0.012) but not consultants (6% vs. 0%; p=0.09). Average hours per day off-duty was obtained for registrars only, and was lower in Traditional structures (13 vs. 15 hours; p=0.00006).

Conclusion: Hybrid or ASU model utilisation was associated with higher surgeon and registrar satisfaction than Traditional structures, without sacrificing registrar operative experience. While average maximum duration on-call exceeded hazardous thresholds for surgeons across all EGS models, Traditional structures were more frequently associated with unsafe working hours for registrars.
Minimal Invasive Surgery and Precision Medicine in a Case of Retroperitoneal Lymphangioleiomyomatosis Mimicking Lymphoma: A Case Report

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Lymphangioleiomyomatosis (LAM) is a condition that affects the lungs, the kidneys, and the lymphatic system. It is found almost exclusively in women. While LAM is predominantly a lung disorder, we report a case of retroperitoneal LAM in a 63-year-old female patient presenting with chronic diarrhea for 5 months refractory to medical control and with incidental finding of paraaortic and retroperitoneal lymph nodes enlargement with unknown origin. Diagnostic laparoscopy and wide paraaortic lymph node sampling was done under indocyanine green fluorescence imaging to avoid vessel injury. LAM was pathologically proved. Chylus ascites through surgical drainage was identified a week postoperatively. Owing to the adequate amount and good quality surgical specimen, somatic TSC2 mutations (E1573fs*3, R1459*) were detected. Reducing amount of chylus ascites was observed 2 months after mTOR inhibitor treatment, which eventually fully recovered. The gold standard for the diagnosis of LAM is a tissue biopsy of involved lymphatics or lung. Somatic TSC2 mutations have been detected in 59% of lung LAM. The prospective Phase 3 EXIST-2 trial in patients with sporadic LAM reported response rates of 42% and 0% for patients treated with everolimus and placebo respectively. In this case, radiographic findings can mimic malignancies, such as lymphoma. Laparoscopic lymph node biopsy is a valuable tool in these situations of diagnostic dilemma. The clinical application of mTOR inhibitors in TSC has provided a good example of precision medicine in retroperitoneal lymphadenopathy associated chylus ascites. Clearly, careful clinical and molecular studies of LAM are still needed to improve treatment and outcome of the disease.
Retroperitoneal Undifferentiated Pleomorphic Sarcoma and the Role of Laparoscopic Resection

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Introduction Undifferentiated pleomorphic sarcoma (UPS) is a rare and aggressive subtype of sarcoma. However, there is limited data regarding the role of laparoscopic resection of primary retroperitoneal sarcomas. The aim of this present study is to report the first case of retroperitoneal UPS managed with laparoscopic resection and to review the literature about the safety, feasibility, and outcomes of laparoscopic management for retroperitoneal sarcomas.

Case A 75-year-old, male with a 7.8 x 8.2 x 7.8cm retroperitoneal soft tissue mass at the left posterior-inferior para-renal space was noted on abdominal CT-scan. Chest CT-scan was unremarkable. UTZ-guided core need biopsy showed a mesenchymal tumor in origin. Immunohistochemical staining were reactive to Vimentin and CD117 thus a GIST was initially considered. The patient underwent laparoscopic tumor resection in supine position under general anesthesia using a 4-port technique. Grossly, the tumor measured 14 x 12.5 x 8.5 cm. Final biopsy showed an undifferentiated pleomorphic sarcoma. Post-operative course was uneventful. However, the patient succumbed to pulmonary metastases after 3 months.

Discussion After a literature search in PUBMED, a total of 14 cases of retroperitoneal sarcomas successfully managed with laparoscopic resection were reviewed. There were 3 males and 11 females with a mean age of 58. The most common type was well-differentiated liposarcoma. The largest tumor size resected was 19cm. Resection was feasible with 3 ports. Majority reported the use of specimen bag for extraction. There were no immediate post-operative complications except for one case of ileus. Patients were disease free at a median follow-up of 15 months except for one case who developed a port-site recurrence despite using specimen container for retrieval.

Conclusion UPS is an aggressive subtype of sarcoma. Laparoscopic resection is feasible with very low morbidity and can be safely done (without compromising oncologic margins) for primary retroperitoneal sarcomas even in large tumors.

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Laparoscopic surgery for internal hernia through defect of mesosalpinx: a very rare cause of intestinal obstruction

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Introduction Internal hernia through the defect of mesosalpinx is a very rare cause of intestinal obstruction. Timely diagnosis and treatment were also challenging. We reported successful management of this rare hernia by minimally invasive surgery.

Method Retrospective review of the medical record, imaging, and laparoscopic findings.

Result 62-year-old Canadian woman suffered from persistent abdominal pain for five days and was transferred for definitive care. She was previously treated as terminal ileitis without improvement. Episodic lower abdominal pain without peritoneal sign was experienced during initial evaluation. Small intestinal obstruction was suggested by subsequent CT scan of the whole abdomen. No other intraperitoneal lesion was demonstrated. Diagnostic laparoscopy was performed. Entrapped loop of small bowel was discovered and released from an oval defect in left mesosalpinx. The defect was successfully closed by surgical clips. The recovery was uneventful.

Conclusion Internal hernia through defect of mesosalpinx, a very rare cause of small bowel obstruction, can be diagnosed by laparoscopy and successfully managed by minimally invasive surgery in uncomplicated case.
King Chulalongkorn Memorial Hospital provides services for patients with multiple surgical operations, including the urinary system. According to the service data from November 1, 2018 - January 31, 2019, there are 28 patients with Benign prostatic hyperplasia (BPH), and undergoing prostate surgery using TUR-P. Found that after the surgery, there was a re-operation within 24 hours and 2 patients leaving the operating room, returning to the ward at 7.14% due to the color of the urine in the urine bag is thick blood. When analyzing with the nursing processes, it is found that the assessment of blood loss after surgery differs in each profession, especially in the first 2 hours after surgery. Because there is no specific assessment tool, assessed using sight and predictions. And the forwarding of blood loss assessment data is unclear between the operating room, recovery room, and ward, causing delay and prevention management and correction of blood loss. Until causing to have to be re-operated. Therefore, we have developed guidelines for nursing practice by using the Hematuria Grading Scale as a benchmark for evaluating postoperative blood loss in all prostate surgeries by TUR-P, makes it able to be resolved in a timely manner. Resulting in the re-operation 24 hours after surgery reduced from 7.14 percent to 0 percent.
Application of Classical Philosophy in Modern Day Surgical Training with the Use of Art.

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**Introduction** Minimally Invasive Surgery is both a science and an art. Although art is not elicited fully in this field, it can be realized through incorporation of miniature art exercises like painting, origami, cross-stitching, bonsai making, and many more for the purpose of unlimited potentials in laparoscopic skills training.

**Methodology and Outcome** The concept behind the application of art in surgery goes back from the review of Philosophical Aristotelian and Thomistic idea about human abilities in learning skills and the aesthetic or art experience. Their message is that we learn and act on what we learn due to the desire of beauty in art. Through art, we translate knowledge and experience into action whose endpoint is to create things that make us happy. This art experience translates how it could be useful in skills training since the passion and desire motivate the will of the surgeon to train more and be a better surgeon.
An innovative technique for extracorporeal knotting in endoscopic surgery.

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AIMS & OBJECTIVE To introduce an innovative technique of extracorporeal knotting using routine & minimal instruments.

METHODS Extracorporeal knotting during Appendicular stump or cystic duct stump tying can be done using just Maryland grasper instead of Knot pusher. After the Modified Roeder’s extracorporeal knot was prepared it was held at the knot with Maryland and introduced through the 5 or 10 mm (via reducer) port. Once the loop position was fixed knot was tied by pushing it by Maryland grasper so as to tighten it in place.

RESULTS This method of tying extracorporeal knots for Appendicular stump or cystic duct stump was done with Maryland grasper in more than 500 cases since 2009. Maryland grasper is a very common & regularly used instrument in laparoscopy. Using it for additional purpose of extracorporeal knotting can save on one more instrument (Knot pusher) which actually has only one use. Also handling Maryland is usually easy & a routine affair for laparoscopic surgeons so to use it for extracorporeal knotting can be easier.

CONCLUSION The use of Maryland is as convenient as knot pusher for extracorporeal knotting. As a laparoscopic surgeon uses Maryland grasper more often, he or she can be more comfortable using it for extracorporeal knotting. It also reduces the need to have an extra instrument to be used only for that specific purpose saving on extra expenditures.
Different Roles of Indocyanine Green (ICG) Fluorescence in Laparoscopic Surgery

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Background: Indocyanine green (ICG) fluorescence is one of the major developments in laparoscopic video imaging. It gives added information on visualized tissue structures during surgery, making dissection more accurate and helping make safe intraoperative decisions.

Objective: To demonstrate the various uses of indocyanine green fluorescence in different laparoscopic surgeries.

Materials & Method: ICG fluorescence-guided laparoscopic procedures were performed: laparoscopic cholecystectomy, laparoscopic left adrenalectomy, endoscopic thyroidectomy, and laparoscopic subtotal colectomy. For laparoscopic cholecystectomy and left adrenalectomy; patients were given ICG IV preoperatively to visualize the extrahepatic biliary structures and the left adrenal gland, respectively. All the patients were given ICG IV intraoperatively to generally visualize their respective tissue vascularities. Specialized laparoscopic fluorescence imaging system was utilized.

Results: Fluorescent illumination of the left adrenal gland in the laparoscopic adrenalectomy and extrahepatic biliary tree in the laparoscopic cholecystectomy were noted, making their respective dissections more accurate and guided. After giving another dose of ICG intraoperatively, cystic artery and left adrenal vein were vividly identified. In endoscopic thyroidectomy, fluorescence of left inferior thyroid blood vessel was noted, giving the confidence that it was not recurrent laryngeal nerve. In subtotal colectomy, fluorescence of the bowel ends being anastomosed was noted, giving an objective basis that the anastomosed bowel ends were viable. All the patients tolerated the procedure well, with no note of complications and hypersensitivity reaction to ICG immediately and on follow-up.

Conclusion: ICG fluorescence guidance in laparoscopic surgery is simple to do. This technique further enhanced the visualization of tissue structures making the dissection more accurate, and made vascular localization and identification easier. ICG fluorescence-guided laparoscopic surgery may improve safety in our patients.
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