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ABSTRACTS PRESENTATIONS

1564—AMAZING TECHNOLOGIES

ENDOSCOPIC DUODENO-CHOLEDOCHOSTOMY

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Introduction: The obstruction of the distal part of the common bile duct in most cases is eliminated by endoscopic transpapillary interventions. However, in up to 10% of cases transpapillary drainage of biliary tree is unsuccessful for various reasons. Percutaneous transhepatic drainage of biliary ducts and open surgical interventions in biliary tract obstruction have their own disadvantages.
Aim: Creation of bile offtake into the duodenum with minimally invasive methods in case of common bile duct distal part obstruction and failure of endoscopic transpapillary drainage.
Materials and Methods: The anatomical relationships between the duodenum and the common bile duct in its distal parts, ranging from the retroduodenal part to the Oddi sphincter, have been studied. Also, the possibility of passing light through the walls of the common bile duct and duodenum by a light source introduced into the lumen of the common bile duct is also experimentally determined.
Results: The gap between the wall of the duodenum and the common bile duct has no free spaces ranging from 6.1 ± 0.2 mm from the sphincter of Oddi. The length of the conditional line between the lumens is from 7.1 ± 0.2 mm at a distance of 60 mm from the Odd sphincter to 4.7 ± 0.1 mm at a distance of 30 mm from the sphincter of Oddi. On a site up to 40 mm from the sphincter of Oddi, the common bile duct and duodenum are in immediate proximity to each other without voids, which is predispose for the formation of a connection between the lumen of the duodenum and the common bile duct. The light source from the common bile duct is visualized from the lumen of the duodenum with varying intensity up to 50 mm from the sphincter of Oddi. To connect the duodenal lumens and the common bile duct, endoscopic retroduodenal light-oriented duodenocholeoodogostomy was developed and introduced.
Conclusions: The results of the endoscopic light-oriented duodenocholedochostomy statistically do not differ from the endoscopic transpapillary drainage of common bile duct. Statistically significant better results were found in comparison with open bilioenteric anastomosis in all investigated parameters.
Key statement: Endoscopic light-oriented duodeno-choledochostomy can be successfully applied in cases of obstruction the distal part of the common bile duct.

1567—AMAZING TECHNOLOGIES

TRANSILLUMINATION RECTOSCOPE FOR MINIMALLY INVASIVE RECTAL CANCER SURGERY

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Rectoscope that by means of transillumination and by incorporating a radial mobile light source, allows the surgeon to decide with better accuracy the distal resection margin in MIS rectal cancer surgery.

Unmet need: The transection of the distal rectum in MIS (minimally invasive surgery) rectal cancer surgery is challenging.

We must ensure a clear but close distal margin, which is oncologically safe and spares healthy rectum from being removed.

After neoadjuvant therapy, there might be an important clinical and pathological regression in the rectal tumor. This can make it difficult for the surgeon to identify the distal aspect of the rectal tumor. In MIS we lack the great majority of the tactile information we have in traditional surgery, making it even more difficult to decide the rectal transection site in rectal cancer surgery.

This is why we developed this device, to assist the surgeon in deciding a clear but close distal resection margin in rectal cancer MIS surgery.

Description and essential characteristics: Traditional rectoscopes have a light source that is parallel to the long axis of the rectoscope.

In the case of our new device, the light source is placed perpendicular (radial) to the longest axis of the rectoscope which is made of a translucent material and therefore this light source is visible in the rectal surface through transillumination.

This light source is mobile along the longest axis of the rectoscope, in a channel separated from the main stem of the rectoscope. This permits the light source to be moved withouth loosing the pneumorectum needed to visualize inside the rectum

This mechanism enables the assistant to place, under direct visualization, the light source at a given distance from the tumor. This distance will be the distal resection margin decided by the surgeon. The transillumination of the rectum by this mobile light source will enable the surgeon to perform the transection at the this chosen point, therefore allowing a precise distal margin, tailored to each patient.

Competitive advantages: The main advantages of the rectoscope are as follows:

- Allows the surgeon to optimize the visualization of the rectum and precisely determine the point where the resection of the rectum should be done, if necessary.
- This increased accuracy allows, in turn, a safe reduction of the distal resection margin. Thus shorter length of rectum is removed possibly allowing better defecatory patient functionality and less risk of dehiscence.
- At the same time, this will facilitate a total elimination of tumor tissue, minimizing the risk of tumoral transection and, therefore, tumor persistence or recurrence.

Current stage of development: A first prototype was developed by the research team (Hospital La Paz surgeons and UpDevices and MaqLAB (Carlos III Univerisity) engineers). This first prototype was tested in porcine model and iterated. The definitive prototype was manufactured by 3D printing by Tekniker 4. The final prototype will be tested and validated by a team of surgeons at La Paz University Hospital, Madrid, Spain. Clinical trial assessing safety and feasibility is due to start in April 2020.

Current state of intellectual property

Spanish patent P201630551, granted in August 2018.

International patent application PCT/ES2017/070249.

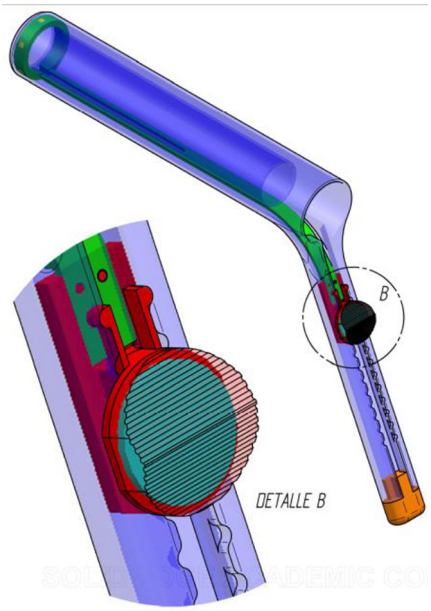

Fig. 1 Prototype of the rectoscope with a mobile light source in the longest axis of the rectoscope

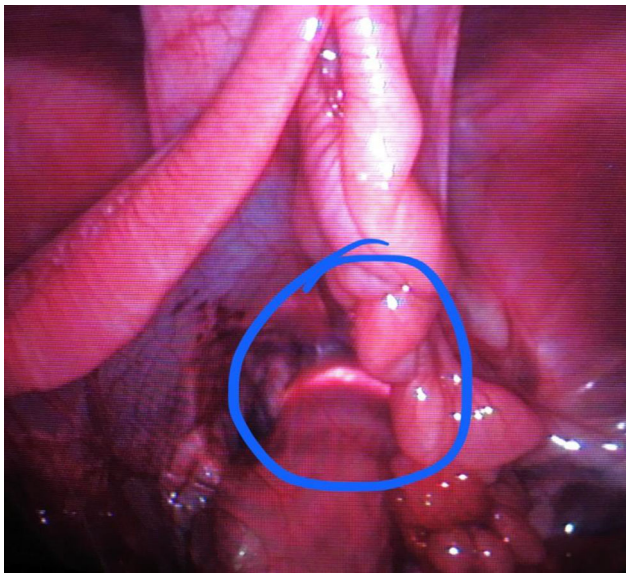

Fig. 2 Porcine model. Rectum of the pig with the visible light transilluminating from the rectoscope. This is will be the transection point given the distal resection margin decided by the surgeon

1573—AMAZING TECHNOLOGIES

SIMULTANEOUS LAPAROSCOPIC RECTO-UTERO-COLPOPEXY FOR PROLAPSES OF RECTUM, UTERUS AND VESICOCELE WITH ONE MESH SHAPED JAPANESE SHRINE GATE "TORII"

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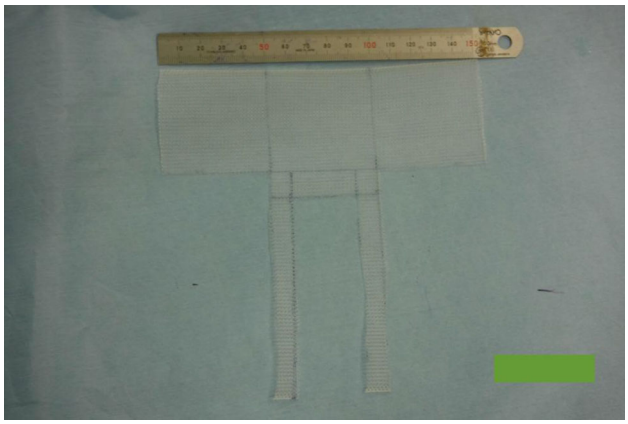
Objective: The methods of rectopexy for rectal prolapse, uteropexy or colpopexy for uterine prolapse or vesicocele have been operated respectively, synchronously or asynchronously at each department of surgery, gynecology or urology. We devised a new amazing technique of simultaneous laparoscopic recto-utero-colpopexy for combined rectal prolapse, uterine prolapse and visicocele with one mesh shaped Japanese shrine gate "Torii" ⛩.

Methods: We used BARD polypropylene mesh. The mesh was shaped Japanese shrine gate "Torii" ⛩ (Fig. 1). (1) Rctopexy: After dissection and pilling up rectum to cranial, horizontal part of 15 cm length was wrapped loosely around dissected rectum, central vertical part of 6 cm length was fixed to ventral rectum with EndoUniversal stapler (Covidien), and both short side of 5 cm length was fixed to sacrum with CapSure (BARD). (2) Ureropexy: Firstly, both vertical arms of 15 cm length was penetrated bottom of mesometrium from dorsal to ventral carefully. Then, dorsal uterine cervix and body were sutured to ventral wall of the mesh with 3–0 Ethibond (Ethicon). (3) Colpopexy: After opening vesico-uterine pouch and dissecting of vesicovaginal space, both vertical arms were cut 11 cm length, crossed and fixed to anterior wall of vagina with EndoUniversal stapler (Covidien) (Fig. 2). At last, opening of vesico-uterine pouch was sutured with 3–0 Opepolix (Alfresa Pharma).



Preliminary Results: Patient was 66-year-old female diagnosed total rectal prolapse combined with uterine prolapse and suspected vesicocele by computed tomography. She was operated by above method of operative time 296 min and blood loss 5 grams. There was no intraoperative accident and no postoperative morbidity. Meal was started on 1st. postoperative day and discharged on 7th postoperative day. There was not any recurrence at one month follow up. Laxative has been subscribed for preoperative constipation, fecal incontinence was disappeared and urinary incontinence was improved. Postoperative anal contractive force of 0.5 was same as preoperative one of 0.5.

Conclusions: We devised amazing technique of simultaneous laparoscopic recto-utero-colpopexy for prolapses of rectum, uterus and vesicocele with one mesh shaped Japanese shrine gate "Torii" ⛩. Three disease states could be treated by this one operation.

1580—AMAZING TECHNOLOGIES

CLINICAL CASE OF TREATMENT OF A PATIENT WITH AN ACQUIRED DIVERTICULUM OF THE PHARYNGOESOPHAGEAL JUNCTION PREVIOUSLY OPERATED ON THE NECK

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Introduction: Treatment patients with diverticulums of the pharyngoesophageal junction is an open and actual problem. The main method of radical treatment in Russia is resection or intussuscertion of the diverticulum into the esophagus with myotomy of the lower portion of the cricofaringeal muscle.

Aims: Show an effective method for the surgical treatment of diverticulums of the pharyngoesophageal junction if open surgery technically very difficult.

Methods: Woman, born in 1977, with an acquired diverticulum of the pharyngoesophageal junction, probably of traction genesis. In the anamnesis: anterior decompression for a left-sided herniated disc CV-CVI with subsequent repeated open surgery to remove the interbody implant that migrated into the retropharyngeal space. In connection with pronounced cicatrical changes in the soft tissues of the neck, open surgery is associated with severe technical difficulties and high surgical risk. A decision was made to conduct an operation—transoral esophagostomy with endoscopic control.

Features of Surgery: After examining the diverticulum with an endoscope, a spur of diverticulum was stitched with ENDO STITCH, then crossed between ligatures with ENDO GIA. As a result of the operation, the diverticulum cavity was combined with the esophagus cavity.

Results: As a result of the operation, it was possible to combine the cavity of diverticulum with the esophagus. The operation lasted 15 min. During the control endoscopic examination of the esophagus, wall defects were not detected.

Conclusion: Transoral esophagostomy of the diverticulum is an effective, minimally invasive, low-traumatic technique. This technique can be used in treatment of patients with diverticulums of the pharyngoesophageal junction who previously operated on the neck.

1581—AMAZING TECHNOLOGIES

COMPARISON OF THREE-DIMENSIONAL ENDOVISION SYSTEM VERSUS ULTRA-HIGH DEFINITION 4 K ENDOVISION SYSTEM DURING LAPAROSCOPIC HELLER'S CARDIOMYOTOMY

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Introduction: Newer generation three-dimensional (3D) endovision system and ultra-high definition (4 K) endovision system are the latest technological advancements in laparoscopic surgery. There is limited evidence comparing effectiveness of these technologies in advanced laparoscopic procedures.

Methods: This was an open labeled randomized pilot study. Thirty selected patients of achalasia cardia were randomized. Laparoscopic Heller's cardiomyotomy with antireflux procedure were performed using 3D Endovision system and 4 K Endovision system. Primary objective was operative time. Secondary objectives were mental task load assessment using SURG-TLX scale and surgeon satisfaction score.

Results: Patients in both the groups were comparable on demographic, clinical, radiological and endoscopic features. Single surgeon performed the procedures. The mean operative time in 3D group was 124.7 ± 33.5 min and in 4 K group was 143.3 ± 32.5 min ($p = 0.135$). Hiatal dissection was significantly faster in 3D (22.1 ± 6.6 mint Vs 30.7 ± 11.4 min, $p = 0.017$). Time for myotomy and antireflux procedure although were faster in 3D but did not reach statistical significance.

Mental task load assessment showed significantly lower mental demand, physical demand and task complexity in 3D Group compared to 4 K group. ($p = 0.027$,0.007 and 0.026 respectively).

Surgeon satisfaction scores were comparable between the two groups.

Conclusion: 3D endovision system may have advantage over 4 K endovison system in advanced laparoscopic procedures.

1582—AMAZING TECHNOLOGIES

INNOVATION AND THE USE OF ARTIFICIAL INTELLIGENCE IN HEALTHCARE

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The way artificial intelligence has been absorbed into the medical industry is an amazing initiative to facilitate comprehensive care to the patient. We stand at thresholds of medical discoveries for diagnostic and therapeutic interventions that can transform the way we understand healthcare. Not only does it have the potential for just an improved patient care but with a greater insight we can also understand the way of our existence, human intelligence and cognition. Probably we are on a journey to unravel what the historians call myths of our previous cultural heritages and mysteries that are yet unexplored.

Here, to begin with a more realistic approach towards artificial intelligence and healthcare, a web based direct reporting of xrays with tuberculosis and other infectious diseases such as Covid19, i would like to bring to light an simple and accessible application that can used from the remotest of areas to the latest and more advanced tertiary hospitals. This model based on neural networks is a step to map the body systems for general and surgical use and in years to come would directly benefit people in the world.

It is also imperative to imbibe the works our past researchers and incorporate them into today's technology. Hence, not only should artificial intelligence focus on physical benefits such as in form of greater precision surgery but also be able to precisely describe the state of the mind i.e. cognitive abilities and intelligence. Thereby, we are also working on concepts that would enable us to generate algorithms which would determine change in cognition for patients in intensive care units and comatose as described by the papers published in India and the sites that are being developed by us at present such as www.healthintels.com.

1585—AMAZING TECHNOLOGIES

LEARNING CURVE OF SURGICAL NOVICES USING THE SINGLE PORT PLATFORM SYMPHONX: MINIMIZING OR TRAUMA TO ONLY ONE 15 MM INCISION

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Background: Minimally invasive single port surgery is often associated with large incisions up to 2–3 cm, complicated handling due to the lack of triangulation, and instrument crossing. Aim of this prospective study was to report how novices without any laparoscopic experience dealing with the symphonX single-port platform including an examination of the learning curves in comparison to the conventional laparoscopic technique.

Methods: As the first European site after FDA and CE-mark approval, the new device has been introduced to our academic center.

A set of 5 laparoscopic skill tests (Rope Pass, Papercut, Peg Transfer, Recapping, needle thread) were performed with 3 repetitions. Medical students performed all tests with both conventional laparoscopic instruments and the new platform. Time and errors were recorded.

Results: A total of 114 surgical novices (61 females) with a median age of 23 years completed the study. All students were able to perform the skill tests with both conventional and single port laparoscopic systems.

There was no significant difference in the learning curve and error rate for each skill test. In some tests, there was e tendency of a lower error rate using the SymphonX platform.

Conclusion: This is the first study with the commercially available symphonX platform for abdominal laparoscopic surgery used by novices. The learning curve of surgical novices using the new surgical platform SymphonX is comparable to standard laparoscopy in this large series. The error rate is promising.

1588—AMAZING TECHNOLOGIES

ROBOT-ASSISTED RFA OF THE LIVER. INTAOPERATIVE NAVIGATION

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At the previous stage of our work, we showed that the use of collaborative robots is justified in the field of radiofrequency ablation in the abdominal area. A multicriteria comparison of a surgeon and a robot was performed during the RFA procedure on a phantom.

As a continuation of our work, we improved several elements of the robotic system prototype by integrating an automated ultrasonic needle localization system based on a vision system with stereotactic navigation. Mobility of the abdominal zone phantom has also been added, since the previous phantom did not imitate the conditions of a real operation, including various sources of patient movement. The new modular phantom is explicitly designed for ultrasound imaging and is able to simulate respiratory movements of the patient.

The purpose of the experimental study is to create a methodology for automated intraoperative navigation under the control of ultrasound and stereophotogrammetry for robot-assisted RFA.

1606—AMAZING TECHNOLOGIES

COMPARISON OF 3D ENDOVISION SYSTEM VERSUS ULTRA-HIGH DEFINITION 4 K ENDOVISION SYSTEM IN LAPAROSCOPIC CHOLECYSTECTOMY -AN OPEN LABELED RANDOMIZED STUDY

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Introduction: Video Laparoscopic cholecystectomy since its introduction has been accepted worldwide.Lack of depth perception has always been the Achille's heel of 2D laparoscopic system and 3D endovision systems were introduced to overcome it. Ex-vivo and clinical studies have shown 3D systems provide better outcome than 2D with potential to improve the learning curve, and reduce the operating time and error rate. Recently Ultra High-definition 4 K has added to the innovations in laparoscopy because it produces double the resolution of HD which is expected to give additional non-binocular depth cues. Benefits of 4 K technology over 3D are not clear as of now; Only one RCT has been published till date comparing 3D and 4 K endovision systems.
Methodology: A total of 60 patients were selected and randomized to1:1 allocation ratio by computerized Random generator.Laparoscopic cholecystectomy was done in 30 patients with 3D Endovision system and other 30 using 4 K Endovision system.Primary objective was total operative time. Secondary objectives were mental task load assessment using SURG-TLX scale and surgeon satisfaction score.Data was analyzed using Stata Corp. 2015 and represented as number or Mean ± SD/Median as appropriate. Baseline categorical variables were compared using Chi square test. Continuous variables were assessed for normality using Shapiro-Wilks test. Variable which followed normal distribution were analyzed using t test for independent samples and variables. Stereovision test was done for all four participating consultants before the study.
Results: This study was done in tertiary care Centre between March 2018 till January 2020. Patients in both groups were comparable in terms of demographic distribution and intra-operative grading of difficulty. There were no conversion to open procedure on either group and there was no difference in intra operative events such as stone/bile spillage. Mean total operative time in 3D Group was 52.7 ± 19 compared to 56.2 ± 20 min in 4 K Group which were comparable and did not show any statistically significant difference (p value = 0.501) sub group analysis in terms of time taken for Calot's dissection, gallbladder mobilization and removal of gallbladder was also comparable between two groups. There were no Major Intra-operative complications in either group. Mean blood loss was 45.4 and 45.5 ml in 3D and 4 K group respectively.The Analysis of Mental Task load assessment with SURG TLX Scale and Surgeon satisfaction score were comparable between the two groups.Mean post-op stay was 1.06 ± 0.24 and 1.2 ± 0.47 days in 3D and 4 K group respectively. Superficial SSI was seen in 3 patients in 4 K group (p value = 0.076).
Conclusion: Three-dimensional 3D high definition endovision system is comparable to ultra-high definition 4 K endovision system in Laparoscopic cholecystectomy. However it does not provide any advantage over 4 K.

1612—AMAZING TECHNOLOGIES

INTRAOPERATIVE RECURRENT LARYNGEAL NERVE MONITORING DURING THORACOSCOPIC ESOPHAGECTOMY

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Background: Postoperative recurrent laryngeal nerve palsy affects postoperative course in esophageal cancer surgery. Vocal cord palsy causes hoarseness or aspiration pneumonia in some cases. We report the outcome of our contrivance of lymphadenectomy around the recurrent laryngeal nerve using the nerve function monitoring method.
Patients and methods: Seventeen patients who underwent thoracoscopic esophagectomy from 2017 to 2018 in Tohoku Medical and Pharmaceutical University Hospital was reviewed according to their medical record. NIM response 3.0 and EMG endotracheal tube (Medtronics ™) as the neural stimulation monitoring devices were used. In this study, we newly created and dedicated an extension device to be incorporated between the nerve stimulation electrode and the handpiece to introduce the toracoscopic surgery. The presence or absence of vocal cord palsy was determined using laryngeal fiberscope on postoperative day 1.
Results: We could identify right and left recurrent laryngeal nerves by this neural electrical stimulation device. Adverse events due to the intraoperative nerve monitoring were not observed. The sensitivity of this monitoring method was 93.8%. The specificity of it was 100%. The incidence of vocal cord paralysis of right side was 0%, and the paralysis of left side was 5.8%. The average duration of thoracic procedure was 247 ± 36 min, average blood loss of it was 32 ± 16 g. The average number of dissected lymph node was 46 ± 19.
Discussion: It was possible to evaluate the recurrent laryngeal nerve function by using intraoperative nerve monitoring method. It was thought that the device helps to identify recurrent laryngeal nerves. The incidence of recurrent nerve palsy was low rate compared to previous reports. The dedicated extension tool has improved the ergonomics of the nerve stimulator. Although the protective surgical procedure is also important for preservation of nerve function, it was thought that the intraoperative nerve monitoring method in the thoracoscopic esophagectomy improved the surgical technique and educational effect of the surgical procedure.

1617—AMAZING TECHNOLOGIES

A NEW PLATAFORM FOR GASLESS ENDOSURGERY

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Objectives: To create and develop a new platform for gasless laparoscopy and test the effectiveness of the device for diaphragmatic herniorrhaphy in an ex vivo dog model.
Methods: The multidirectional traction platform for gasless endosurgery was developed in a partnership project between the UFSM (Brazil), CCMIJU (Spain) and CNPq (Brazil). The device is assembled in three parts (Figure). The first part (Figure -blue) is a movable base with a fixation component to attach the device to the surgical table. Additionally, it has two rods, a vertical and a horizontal one, which are articulated by means two gripping clamps and ball-joints at its ends. The second component (Figure—green) is a three-piece component: a central piece and two lateral ones. These components are connected by ball-joints for articulation. The third component (Figure—red) is used for holding haemostats, which are used to hold the tacking sutures for lifting the abdominal wall. The equipment was tested for clinical viability in 10 defrosted dog cadavers (8 beagles and 2 greyhounds). The device was tested for abdominal lifting in gasless laparoscopic repair of composed diaphragmatic hernias. Hernias were closed either by intracorporeal suture (GS; n = 5) or one central suture together with a polypropylene mesh graft (GM; n = 5). Surgical stages were divided into T1 (from primary port access to 3rd port placement); T2 (defect production); T3 (diaphragmatic reconstruction). Total surgical time (TT) was also recorded.
Results: The invention received a utility model patent by the Spanish Patent and Trademark Office (ES 1228214 Y). Subsequently, it was registered on the Brazilian National Institute of Intellectual Property (INPI), (BR 1020190134739). The device is already licensed for manufacturing by the Bhiosupply Company (Esteio, RS, Brazil). The diaphragmatic defect was successfully produced and closer in all cadavers. To close the defect, 7.0 ± 0.7 cross pattern sutures were required in the GS group and 15.2 ± 1.9 hernia staples and one intracorporeal suture were used in the GM group. T3 was longer (p = 0.0076) in GS (50.00 ± 16.46 min.) than in GM (23.24 ± 5.25 min.). TT was 87.22 ± 19.23 min in GS and 66.45 ± 6.38 min in GM (p = 0,0547).
Conclusions: The abdominal lifting platform (ES 1228214 Y) is suitable for gasless endosurgery. Appropriate intrabdominal space was achieved for diaphragmatic herniorrhaphy in the dog cadaver model. Both suture and mesh graft techniques for diaphragmatic herniorrhaphy can be performed along with the use of the new abdominal lifting device. This invention has potential for further clinical use as an alternative to pneumoperitoneum laparoscopic procedures.

1620—AMAZING TECHNOLOGIES

IMPROVEMENT OF COGNITIVE PERFORMANCE OF SURGEONS THROUGH AN EEG SYSTEM

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The electroencephalography (EEG) is a technique for measuring neurophysiological activity through five main frequency bands: Delta (0–4 Hz), Theta (4–7 Hz), Alpha (8–12 Hz), Beta (12–30 Hz), Gamma (> 30 Hz). Some brain patterns in EEG, specifically the superior Alpha, are positively related to the cognitive performance. In fact, it has been shown that the neuro-cognitive training of such pattern could improve the cognitive performance of professionals.

The Versatile EEG 16 channels system (Fig. 1), and the High Performance Elevvo software, from the BitBrain Company would be used to improve the cognitive performance of surgeons. This is based on the performance of programs for neurophysiological and neurocognitive evaluations pre- and post- automated training sessions. Specifically, the evaluation sessions (40 min) consists of neurophysiological recordings (evoked potentials, time–frequency maps) at rest and during the performance of standard cognitive tests (mental rotation, Sternberg) to assess cognitive functions (working memory, processing speed, attention). In training sessions (30 min, 5–10 sessions, 2–3 sessions/week), participants perform several repetitions of a simple task to activate specific brain patterns related to cognitive performance.

After this neuro-cognitive training, surgeons are expected to improve their professional performance, which would be checked with the performance of surgical tasks pre- and post- cognitive intervention.

1623—AMAZING TECHNOLOGIES

EVALUATION OF A ROBOTIC EMULATOR LAPAROSCOPIC INSTRUMENT

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Aims: To present a new articulated instrument for laparoscopic surgery and to analyze the surgeon's learning curve in terms of surgical performance and workload.
Methods: A novel Robotic Emulator laparoscopic grasper (Innovative Medical Mannheim, Mannheim, Germany) is presented in this study. This instrument has 5 mm incisive diameter and a 90-degrees articulated tip with a full 360-degree rotation. The movements of the instrument tip are controlled using the thimbles on the instrument handle. Six novice laparoscopic surgeons (< 10 laparoscopic procedures performed) participated in the trials, five right-handed surgeons and one left-handed surgeon. They performed two basic laparoscopic training tasks on a box trainer, an eye-hand coordination task and a transfer task. For the eye-hand coordination task, participants were asked to grasp three colored objects from one side of the pegboard with their closest hand, transfer the object mid-air to their opposite hand, and place the object on a peg on the other side of the pegboard. Once all three objects have been transferred, the process was reversed. For the transfer task, participants were asked to transfer a straight needle through a circuit of rings, distributed in different orientations and positions. The needle was driven through the rings using the dominant hand and with the support of the non-dominant hand. All participants performed the tasks using the novel instrument with their dominant hand and a conventional laparoscopic grasper with their non-dominant hand. In order to analyze the learning curve, participants repeated both tasks five times. The execution time and the number of errors in each repetition were evaluated. In addition, surgeons' workload was assessed in the first and last repetition by means of Surgery Task Load Index (SURG-TLX), which is a subjective questionnaire based on six dimensions defined as mental demands, physical demands, temporal demands, task complexity, situational stress, and distractions.
Results: After the training period with the new instrument, surgeons significantly reduced the execution time of both training tasks (439.7 ± 140.173 s vs 318.5 ± 146.162 s; $p < 0.01$) and significantly improved the number of errors (9.5 ± 2.273 errors vs 5.0 ± 2.905 errors; $p < 0.05$). Specifically, surgical performance during the object transfer task was improved from the first to the last repeat, significantly reducing execution time (562.0 ± 64.338 s vs 413.8 ± 148.093 s; $p < 0.05$). Regarding workload, surgeons experienced a significant improvement after the training period both in the temporal demand (13.8 ± 3.962 vs 7.2 ± 3.898; $p < 0.05$) and in the stress level (14.4 ± 3.577 vs 8.6 ± 3.911; $p < 0.05$) during the performance of the laparoscopic training tasks.
Conclusions: This work presents a new design of laparoscopic instruments, which emulates the movements of a surgical robot and provides high versatility to work easily in areas of difficult access. The results of this study show a positive learning curve in terms of the quality of surgical performance, as well as the workload experienced by the surgeon during the laparoscopic practice.

1624—AMAZING TECHNOLOGIES

EVALUATION OF EFFICACY OF THE PLASMAJET SURGICAL DEVICE IN PELVIC LAPAROSCOPIC SURGERY

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The aim of this study is to disclose our initial experience using kinetic energy (PlasmaJet Surgery SystemTM) during fine dissection, cutting and coagulation maneuvers in a preclinical trial during laparoscopic colonic surgery, laparoscopic vascular dissection and gynecological laparoscopic procedures in ovine experimental model. We will assess under controlled situations the surgical specifications of this novel system: (1) Kinetic Dissection: gauging the creation of clean and dry tissue planes during difficult dissection (2) Microlayer Vaporization: reviewing the efficacy of layer by layer dissection and, (3) Surface Sealing: by means of the examination of the sealing and coagulation of small vessels. We will analyze the feasibility and safety of the different surgical activities paying particular attention in thermal effects during surgery compared with other commercially available systems.

1627—AMAZING TECHNOLOGIES

STANDARDISED TECHNIQUE FOR LAPAROSCOPIC ANTERIOR RESECTION USING MONOPOLAR HOOK DIATHERMY. AN ILLUSTRATED VIDEO FOR TRAINING COLORECTAL SURGEONS

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Introduction: Laparoscopic surgery allows us to record the procedure, which subsequently allows review not only for our own learning but to produce a valuable resource for education and training. We present a standardised approach to performing a laparoscopic anterior resection with focus on hook diathermy for the total mesorectal excision.
Method: The video illustrates a laparoscopic low anterior resection performed on a 68-year old female patient with a low rectal cancer. We have divided the procedure into its key steps, which include: patient position, port placement and anatomical exposure, medial to lateral dissection and vessels control, lateral and splenic flexure mobilisation, TME and division and anastomosis of the rectum. The procedure was performed using hook diathermy. We have included animated graphics highlighting key regional anatomy.
Results: The procedure was completed laparoscopically with no blood loss. Length of stay was 5 days. The final histology was a R0 excision of a moderately differentiated adenocarcinoma of rectum; pT3, pN1b, L1, V1, Pn0 and the lymph node yield was 37.
Conclusion: The monopolar diathermy hook allows a precise dissection, which also helps produce clear images for the purposes of training.

1632—AMAZING TECHNOLOGIES

TECHNICAL ENHANCEMENT OF SURGICAL TRAINING AND STANDARDIZATION OPPORTUNITIES

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In the last years, technological progress of the surgical learning is seen through the e-learning training Methods: Projects such as EASIER continue to offer more efficient solutions for acquiring technical and non-technical abilities. This is happening in an environment where direct access to the patient is more and more limited due to reducing working time, due to increasing patient demands, due to increasing risks for patient security and due to malpractices impact.

The EASIER consortium strives for equilibrium between 3 distinct partner roles: partner with wide surgical and interventional experience, background in learning theory and pedagogical modelling and technological expertise.

After a first step of pedagogical profile definition, user needs have been identified and a Learning Management System has been developed, which will use Moodle as a platform, offering unlimited access for interested parties. In this way, residents can access the same type of training facilities 24/7, without being required to be located in an operating room.

3 case studies have been chosen (Lumbar Puncture, Laparoscopic cholecystectomy, Knee arthroscopy) for an internal validation process, followed by improving the platform parameters and eventually going through an external validation on large groups of residents from participating partner countries.

The results of this external validation and the feedback from the public interacting with the platform will represents essential contributions in defining the final parameters of a virtual training platform that will offer to residents alternatives to the traditional training model.

1633—AMAZING TECHNOLOGIES

THE VIDEO ASSISTED OPEN SURGERY WITH ORBEYETM EXOSCOPE: THE BEGINNING OF A NEW ERA IN GENERAL SURGERY

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Introduction: Recently an Exoscope, high-definition video telescope operating monitor system to perform microsurgery has been proposed an alternative to the operating microscope. The advantages of the Exoscope compared with the operative microscope are the deep depth-of-field and wide field of view. However, the system provides 2D views. Thus, the operators are required to develop eye-hand coordination for microsurgical procedures.

In order to overcomes some of the previous limitations, a new ultra-high definition 3D-surgical exoscope, the ORBEYE TM, has been developed and spreadly in some surgical specialities.

As best of our knowledge, we present the first experience of the use of ORBEYE TM exoscope in general surgery worldwide.

Materials and Methods: Before ethical committee approval, during February 2020, a consecutive series of patients have undergone to surgical procedure using ORBEYE TM at Department of General and Minimal invasive Oncological surgery of School of Medicine University Federico II of Naples. All data from patients were recorded in a prospectively maintained computer database. All patients were informed about the use of ORBEYE during the procedure. ORBEYE TM was used in all procedure for dedicated steps that needed a magnification of view. At the end of each procedures it has been asked to all surgeon which take part to the procedure if during the use of ORBEYE if have experienced nausea or eyestrain.

Results: We used the ORBEYE TM in some steps of the following procedures: during DCP for superior mesenteric vessels dissection from the pancreas, for hepatico-jejunal and pancreatico-jejunal anastomosis; during SG and TG for the D2 lymphectomy; during the paraortic mass for the dissection from the aorta; for all the thoracotomic step during an Ivor-Lewis procedure.

No intra-operative complications have been recorded. One patient died for heart failure attack. No hospital readmission has been found. All surgeon involved in the procedure does not experienced nausea of eyestrain.

Conclusion: At the best of our knowledge, this is the first report worldwide of general surgery procedures using the ORBEYE^{TM} surgical Exoscope. In our experience it is a highly ergonomic technology with high-resolution 4 k-3D optical system that allow surgeons to perform safe and precise surgery, ensuring a good depth of view without losing the tactile feedback. Moreover, it could improve the training of other surgeons such as laparoscopic surgery has done, and could be the bridge that could allow the passage from open to laparoscopic surgery for many surgeons which does not have the adequate training in mininvasive surgery.

1634—AMAZING TECHNOLOGIES

TECHNIQUES AND TECHNOLOGIES IN THE TRAINING OF SURGEONS IN ULTRASOUND; THREE YEARS OF EXPERIENCE OF THE EAES US COURSE

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Despite the general controversies surrounding the usefulness of surgeons' training in ultrasound, two aspects lead us to believe, after three years, that the Technology Commission's initiative to promote a training program dedicated to ultrasound applications has been an inspired decision. The first aspect is our conviction that gestures such as US Guided Punctures or Guided Procedure, Intraoperative ultrasound or post surgical follow up are advantages for us, for the patient, for the system. The second reason for encouragement is generated by the growing interest in this program: Surgeons of different ages, coming from New Zealand or Panama have followed this program in Frankfurt, London, Seville, Bucharest.

This program creates multiple challenges for the course team. The main coordinates of the efficiency of this course are: The multi-modular approach (with attractive offers at the basic level but also at the advanced level), the emphasis placed on Hands on (the course material can be offered in advance) a wide range of equipment involved in the program, from classic ultrasounds to new, miniature, wireless models, with real-time image processing and remote transmission capabilities. Hands on support environments range from real patients to biological tissue preparations, live laboratory animals, different phantoms solutions.

Starting from the enthusiastic atmosphere of the beginning, the course team wants to involve participants in the program as well as surgeons with ultrasound experience in developing a library of ultrasound cases useful in training in this field.

1165—BARIATRICS—Endoluminal

IMPACT OF THE PRESENCE OF GASTRIC BALLOON ON THE GASTRIC WALL AND GASTRIC MUCOSA

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Introduction: Endoscopic intragastric balloon (IGB) placement is one of the methods of morbid obesity treatment. Currently, the number of performed bariatric procedures is increasing annually. Some of the extremely obese patients are qualified for a two-step treatment, IGB as a preparation stage before surgery. The recommended period for maintaining IGB is 6 months. It causes weight loss and inflammatory response of the gastric wall and mucosa. These changes may affect the course of surgical treatment.

Aim: The objective was to analyze the impact of a gastric balloon on the stomach wall, with particular emphasis on pathomorphological assessment and the inflammatory infiltration degree.

Methods: We have retrospectively reviewed 30 patients with morbid obesity. 16 patients (11 male, 5 female) with BMI > 55 kg/m2 were qualified for a two-stage treatment, IGB placement, followed by laparoscopic sleeve gastrectomy (LSG). The control group consisted of 14 patients who underwent LSG without previous IGB. Excised stomach parts were examined. The microscopic structure of the stomach wall and inflammatory process of the gastric mucosa were analyzed, results in both groups were compared.

Results: Patients were treated with the IGB for an average of 205 days.The average weight loss in the study group was 23.8 kg, in the control group 12.3 kg. There was a statistically significant difference in the gastric wall structure between groups. The thickness of muscularis-mucosa after IGB was greater in the fundus, the body and the antrum than without IGB and were 3, 3.76 and 3.98 mm and 2.03, 2.06, 2.98 mm respectively. In both groups, low-grade chronic gastritis was observed. No atrophic lesions of the mucosa were found, intestinal metaplasia was found in 1 patient. Greater foveolar hyperplasia and submucosal fibrosis were observed in the study group.

Discussion: The results confirm greater preoperative weight loss in the intervention group than in the control group. IGB placement was correlated with foveolar hyperplasias, submucosal fibrosis and muscle layer thickening. However, it does not affect the development of chronic gastritis. Our observations may influence the clinical treatment, however, determining the clinical usefulness of these data requires further research.

1412—BARIATRICS—Laparoscopic

CONCURRENT TREATMENT OF A BOCHDALEK HERNIA AND MORBID OBESITY

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Background: Bochdalek hernias are rare congenital defects usually detected and treated during infancy. Presentation at adult age is extremely rare but may lead to respiratory or digestive symptoms. Surgical repair is usually recommended and a mesh is often required.

The use of a synthetic mesh concurrent with bariatric operations is controversial, due the risk of mesh infection.

Clinical case: We present the case of a 28 years-old female patient with a BMI of 40. For the last 3 months she complained of abdominal and left sided thoracic pain, nausea and post-prandial vomiting with severe heartburn. She suffered weight loss from 116 to 95 kg and on physical examination there was an absence of respiratory sounds on the lower-half of the left hemi-thorax.

A CT scan revealed a postero-lateral left diaphragmatic hernia containing much of the stomach, transverse colon, greater omentum, tail of the pancreas and retroperitoneal fat. She was proposed for a laparoscopic repair of the hernia and sleeve gastrectomy.

We performed the surgery via an anterior approach, reducing the hernia contents, suturing the diaphragm and reinforcing with a double-sided synthetic mesh. The sleeve gastrectomy was performed over a calibration tube.

The post-operative period was uneventful with hospital discharge on POD 5. The patient is asymptomatic, with active weight loss and the post-operative CT scan reveals a normal anatomy of the left thorax and abdomen.

Conclusion: Minimally invasive treatment of morbid obesity and large diaphragmatic hernias is an attractive approach and can be safely performed in selected patients.

1636—BARIATRICS—Laparoscopic

UNDO OMEGA LOOP GASTRIC BYPASS BECAUSE OF EPIGASTRIC PAIN, DUMPING AND EXTREME WEIGTH LOSS

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Objectives: We present a 28-year-old female patient who had undergone a laparoscopic omega loop gastric bypass because of a BMI of 36 associated with sleep apnea. One year ago, she underwent a laparoscopic exploration because of extreme weight loss due to chronic epigastric pain and dysphagia. A detorsion of the gastroenterostomy and fixation to the remnant stomach was performed with initial favorable results.

Unfortunately, severe dumping (objectified by an OGTT) developed and was successfully treated with acarbose. Patient takes Proton Pomp Inhibitors and smokes daily.

Recently, she presented at the emergency department with severe epigastric pain and a clear request to undo the omega loop gastric bypass. At that moment she had a BMI of 17 and a mild hypoproteinemia.

Methods: In the video we describe the laparoscopic approach for an undo omega loop gastric bypass. At the level of the gastroenterostomy an ulcer was identified during dissection. The pouch was stapled proximally to the gastroenterostomy. A partial small bowel resection at the level of the former gastroenterostomy took place. Continuity was restored by performing a linear stapled side-to-side anastomosis. The pouch was reattached to the remnant stomach by a fully manual anastomosis.

Results: There was an uneventful postoperative course with no leakage and good passage on upper GI series. She could be discharged after five days. Acarbose treatment could be stopped. One month postoperatively she gained 4 kilograms and has a BMI of 19. The pain has disappeared and there is still some sense of restriction.

Conclusion: In patients who present with persistent epigastric pain, cachexia and dumping after an omega loop gastric bypass, an undo procedure can be considered. The presence of a peptic ulcer at the level of the gastroenterostomy can be the reason of pain in these patients.

22—BARIATRICS—Laparoscopic

SASI BYPASS AS A REVISION SURGERY FOR SLEEVE GASTRECTOMY NON RESPONDERS:2 YEARS FOLLOW UP

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Introduction: Single Anastomosis Sleeve Ileal Bypass(SASI)is a Novel Metabolic/Bariatric Surgery operation based on Santoro's bipartition operation.It can be offered for patients with weight regain after Sleeve gastrectomy.

Abstract: Sleeve gastrectomy (SG)is a commonly performed bariatric procedure.Weight regain following SG is a significant issue.Yet,the understanding of this phenomenon is still unclear.Rates of regain ranged from 5.7% at 2 years to 75.6% at 6 years.SASI bypass was an option for some candidates having SG done 2 years back and failed to achieve the required weight loss or having weight regain.In SASI bypass,Resleeve gastrectomy of the dilated gastric pouch is done followed by plication of the stapler line then creating a Bipartition channel doing a side to side gastro-ileal anastomosis.

The aim of this study is to report the clinical results and the outcomes of SASI bypass as a therapeutic option for patients with weight regain after SG.

Methods: We conducted a retrospective study for 75 morbidly obese patients having history of SG done more than 2 years back and failed to achieve and/or to maintain the required BMI.

Exclusion criteria:Patients with history of Bypass Bariatric Surgery and patients with documented psychological instability or intolerability for regular follow up .

Procedure was done at Sidra Hospital in kuwait from February 2017 to November 2019.

Using 5 ports,Resleeve Gastrectomy was performed over36 fr bougie tube starting 6 cm above the pylorus then gastro-ileal anastomosis (side to side)was performed 6 cm above the pyloric ring to an ileal loop counted 300 cm from the ileocaecal valve.

Data was collected from the patients including:Weight loss progress,laboratory full results.

Discussion and Results: During the study period: 75 morbidly obese patients with a mean BMI of 44 $\pm$ 6 kg/m^2 were evaluated.- %EWL (excess weight loss)reached 64% at two years-Diabetes was cured in the known diabetic patients (type2) within 6 months,

Follow up laboratory results were normal in 88% of patients (all were kept on regular vitamins and proteins supplementation for 2 years).

Three patients had hiatal hernia that was repaired during the procedure and two patients had asymptomatic gall stones that was discovered during the routine preoperative work up for whom Laparoscopic cholecystectomy was done at same cession before starting the SASI procedure.

Conclusion: SASI Bypass is a promising operation that offers a good weight loss for morbidly obese patients having weight regain after SG.

28—BARIATRICS—Laparoscopic

LAPAROSCOPIC SLEEVE GASTRECTOMY FOR ENDOSCOPIC SLEEVE GASTROPLASTY NON RESPONDER

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Endoscopic Sleeve Gastroplasty(ESG)is an endoscopic minimally invasive weight loss procedure based on full thickness endoscopic suturing using Apollo's Overstitch device.In ESG procedure a series of sutures are placed through the gastric wall reducing the stomach volume by 80%creating a restrictive endoscopic sleeve.

Our case is a 32 years old lady with a BMI 40 kg/m^2 had a history of ESG on 1/2018, presented to our clinic with stationary weight following loosing only five kgs during the first month after the procedure.

Following full preoperative assessment including dietary history and psychiatric assessment the patient was counseled for Laparoscopic Sleeve Gastrectomy (LSG).

Preoperative gastroscope was done to rule out any gastric inflammations and to confirm that all endoscopic stitches are away from the expected 36fr boujie tube.LSG was done smoothly using 5 reloads(2 black and 3 green)with staple line plication using vicryl 2/0 sutures and omental patching.

Postoperative recovery was smooth.

Weight loss was satisfactory, BMI reached 29.3 at 11 months post LSG.

Conclusion: ESG can be reversed easily to LSG for procedure non responders.

134—BARIATRICS—Laparoscopic

LAPAROSCOPIC GASTROJEJUNOSTOMY RESECTION AND REANASTOMOSIS FOR REFRACTORY MARGINAL ULCER AFTER ROUX-EN-Y GASTRIC BYPASS

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Aims: Description of the laparoscopic approach for refractory late marginal ulcer of the gastrojejunostomy after Roux-en-Y gastric bypass for morbid obesity.

Methods: Video presentation of the surgical approach for a chronic gastric bypass complication in an adult patient. Previous surgery technical details, current illness, diagnostic tests and clinical course after medical treatment are also described.

Results: Laparoscopic approach with 5 ports placed according to our usual approach for bariatric surgery. The gastrojejunostomy is exposed and the adhesions to the left liver are divided. The alimentary limb is checked and measured. The gastrojejunostomy is dissected from the gastric remnant to which is intimately adhered. The penetrating posterior marginal ulcer is opened during the dissection. Transection of the alimentary limb 10 cm from the gastrojejunostomy.is performed, facilitating the exposure of the posterior aspect of the gastric pouch. Alternating blunt and sharp dissection allow separation of the gastric pouch from the gastric remnant. Dissection of the lesser curvature of the pouch is completed up to the point where healthy-looking gastric wall is encountered. Gastrojejunostomy resection is completed under endoscopic control, with an Echelon Flex^{TM} Endopath stapler. A single layer end-to-end gastrojejunostomy is performed, using interrupted 3–0 Vycril stitches.

Early postoperative upper GI series shows correct contrast progression with no leaks. The patient had en uneventful recovery and is asymptomatic one year after surgery.

Conclusions: Marginal ulcer after Roux-en-Y gastric bypass for morbid obesity is a serious complication that usually occurs during the first year after surgery. However, as in our patient, late presentations have been described. Diagnostic work-up should include upper GI series, endoscopy, Helicobacter pylori testing and gastrin levels. Chronic NSAIDs use and tobacco smoking must be avoided after diagnosis. The medical treatment is the first-line therapy in non-complicated cases. If it fails, surgery should be considered. Controversy still exists regarding the best surgical option. We consider that in apparently idiopathic cases, gastrojejunostomy resection and reanastomosis is the simplest option, avoiding the morbidity related with other additional procedures such as vagotomy and/or remnant gastrectomy.

215—BARIATRICS—Laparoscopic

LAPAROSCOPIC CONVERSION OF VERTICAL BANDED GASTROPLASTY, GASTRIC PLICATION AND GASTRIC BAND INTO SLEEVE GASTRECTOMY: COMPARING THE THREE TECHNIQUES

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Introduction: Laparoscopic Sleeve Gastrectomy (LSG) has earned great acceptance over the last 10 years as a single-stage bariatric procedure, becoming the most performed bariatric operation worldwide. Nowadays, metabolic surgeons have to increasingly deal with patients that have already undergone one or more bariatric surgeries, but are not satisfied with the results or suffer from complications. LSG as revision surgery presents good results in terms of weight loss, but it can be quite challenging, even for experienced bariatric surgeons. To this context, we demonstrate in this video three interesting cases of laparoscopic conversion of Vertical Banded Gastroplasty (VBG), Gastric Plication (GP) and Gastric Band (GB) to LSG with the key procedural steps compared and discussed.

Methods: Three cases are presented. The first patient is a diabetic 40-year-old man (BMI: 48) who underwent VBG 10 years ago, losing initially 30% of the excess weight (EW) and regained most of it. The second patient is also a diabetic man of 38 years (BMI: 38.5) who underwent GP in 2013, lost almost half of his EW initially, but regained it and reached a BMI of 41. The third patient was a 42-year-old female (BMI: 42) who underwent GB in 2014, lost 30% of her EW, removed it in 2016 because of epigastric pain and dysphagia and regained all of it.

Results: All patients had an uneventful postoperative period after conversion to LSG, without any complication recorded, and were discharged 3 days after the operation. The first patient lost 65% of his EW in 18 months, the second one 45% in 6 months and the third 50% at 12 months follow-up. No long-term complications were observed.

Conclusions: Laparoscopic conversion from previous bariatric operations to LSG in cases of insufficient weight loss or persisting complications is feasible and presents promising weight loss outcomes. However, these revision operations tend to present a higher level of difficulty. Individualization of the technique according to previous operation and patient's characteristics can be quite useful in order to accomplish a safe and effective laparoscopic approach.

309—BARIATRICS—Laparoscopic

VIDEO: MODIFIED NISSEN FUNDOPLICATION FOR DUMPING SYNDROME AFTER GASTRIC BYPASS

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Aims: Dumping syndrome after gastric bypass is a well-known but rare occurrence. It's frequency is reported to be between 0.02 and 11%. This syndrome can occur months to years after the procedure and it is mostly due to a too rapid passage of nutrients from the stomach to the small intestine.

In patients with severe and persistent dumping syndrome medical treatment is advisable and sometimes necessary. A change in the dietary regimen with the use of a high fiber, protein diet and low simple carbohydrates together with small frequent meals is shown to be effective. Small series and few case reports described the successful use of medications such as acarbose, nifedipine, somatostatin, and diazoxside. In few extreme cases surgery is needed, mostly with the need of sacrificing the gastric-bypass. We propose a case in which we successfully managed dumping syndrome after gastric bypass with the use of a Nissen fundoplication.

Methods: A 34 year-old female healthy patient underwent in 2013 a laparoscopic gastric bypass achieving a total weight loss of 47 kg (BMI 38.1–21.0 kg/m^2). The patient developed severe and invaliding late dumping syndrome after few years. The needed dietary measurements were, together with the use of Octreotide Acetate, successfully undertaken with improvement of her condition. Together with the dumping syndrome a weight regain of 21.5 kg (BMI 29 kg/m^2) was reported.

The patient came to our attention in 2019 with the active request of stopping the therapy with Octreotide Acetate in order to be able to undergo a wished pregnancy.

The performed upper GI series showed a prominent pouch at the level of the gastro-jejunal anastomosis and accelerated passage of contrast. No sign of fistula were shown. Upper GI-endoscopy showed no gastric mucosa at the level of the esophageal-jejunal anastomosis.

A modified Nissen fundoplication with cruroplasty was performed with the intent of slowing down the rapid passage of the bolus and improve symptoms.

Results: Following surgery, the patient had a fast postoperative recovery with dismissal on the second postoperative day and no complications. Somatostatin could be interrupted immediately after the procedure. 6 weeks after surgery the patient is in good general conditions, the dumping syndrome remains under control with diet and without the use of Octeotride.

Conclusion: The alternative use of the anti-reflux technique, Nissen fundoplication, after gastric bypass, in the treatment of dumping syndrome is, to our experience, safe and efficacious in well-selected patients.

469—BARIATRICS—Laparoscopic

SINGLE-STAGE LAPAROSCOPIC ADJUSTABLE GASTRIC BAND REMOVAL AND SLEEVE GASTRECTOMY

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Background: Revision procedures after Laparoscopic Adjustable Gastric Band placement are often necessary in cases of severe band-related complications, inadequate weight loss or weight regain. Inflammation and foreign body reaction make the procedure of band removal technically demanding.

Introduction: Laparoscopic Adjustable Gastric Band (LAGB) related complications often require revision procedures with band removal and/or conversion to Laparoscopic Sleeve Gastrectomy (LSG) or Roux-en-Y Gastric By-pass (RYGB). The optimal method of revision remains controversial. Single-stage removal and LSG or RYGB seems to be safe and efficient, while others suggest a two-stage approach.

Objectives: We present our 5-year experience from May 2014 to April 2019 concerning simultaneous LAGB removal and LSG.

Methods: All patients underwent preoperative endoscopy and barium swallow, with no sign of stomach perforation, erosion or severe band slippage. We emphasize on a case of a 41-year-old male, who had undergone two operations of gastric band placement. The first band had developed slippage, while the second one infection without erosion. However, a successful single-stage definitive LAGB removal and LSG was achieved.

Results: No severe postoperative complications were mentioned, while no conversion to open surgery was required. Mean weight loss in the first year was 70% of the excess weight.

Conclusion: Simultaneous laparoscopic gastric band removal and sleeve gastrectomy for morbid obesity seems to be safe and efficient, especially in cases of absence of gastric erosion.

471—BARIATRICS—Laparoscopic

LAPAROSCOPIC SLEEVE GASTRECTOMY AFTER ADJUSTABLE GASTRIC BAND REMOVAL AND GASTRIC PLICATION

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Background: Revision procedures after Laparoscopic Adjustable Gastric Band placement and Laparoscopic Greater Curvature Plication are often necessary in cases of inadequate weight loss or weight regain. Inflammation and foreign body reaction make the revision procedure technically demanding.

Introduction: Laparoscopic Greater Curvature Plication (LGCP) and Laparoscopic Adjustable Gastric Band (LAGB) related complications often require revision procedures with band removal and/or conversion to Laparoscopic Sleeve Gastrectomy (LSG) or Roux-en-Y Gastric By-pass (RYGB). The optimal method of revision remains controversial.

Objectives: We present our 4-year experience from May 2014 to April 2019 concerning Laparoscopic Adjustable Gastric Banding (LAGB) removal, Laparoscopic Greater Curvature Plication (LGCP) and laparoscopic sleeve gastrectomy (LSG).

Methods: We present the case of a 45 year old woman who underwent LSG after LAGB removal and LGCP. The patient underwent preoperative endoscopy and barium swallow, with no sign of stomach perforation or erosion. We emphasize that the patient, had undergone three operations of gastric band placement, gastric band removal and gastric plication before sleeve gastrectomy. However, a successful LSG was achieved.

Results: No severe postoperative complications were mentioned.

Conclusion: Weight loss in the first year was 70% of the excess weight. Sleeve gastrectomy after gastric band removal and gastric plication, for morbid obesity seems to be safe and efficient, especially in cases of absence of gastric erosion.

479—BARIATRICS—Laparoscopic

LAPAROSCOPIC MANAGEMENT OF IATROGENIC DIVERTICULUM AT GASTROESOPHAGEAL JUNCTION DURING CONVERSION OF SLEEVE GASTRECTOMY TO MINI GASTRIC BYPASS

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Introduction: Conversion to Roux-en-Y Gastric Bypass and One-Anastomosis Gastric Bypass (OAGB) after Laparoscopic Sleeve Gastrectomy (LSG) are common treatment options for inadequate weight loss, weight regain and complications, such as stenosis and severe gastroesophageal reflux disease (GERD). However, the simultaneous presence of an iatrogenic gastric diverticulum at the gastroesophageal junction (GEJ) is rare and although laparoscopic resection is the usual treatment in symptomatic gastric diverticulum patients, in the case of previous LSG the altered tissue perfusion should be taken under consideration.

Methods: A 55-year-old female patient (BMI: 42), with GERD non-responsive to conservative treatment, presented to our department. The patient underwent LSG in 2015, which led to a 55% excess weight loss (EWL) over the first 18 months, followed by gradual regain of half of it during the following 2 years. The patient had been previously submitted to Laparoscopic Gastric Band in 2008, but the Band was removed 3 months later because of dysphagia. The upper endoscopy revealed grade B esophagitis and the existence of a big diverticulum at GEJ, also confirmed by CT scan. The patient underwent OAGB, during which it was revealed that the gastric diverticulum was an iatrogenic outpouching at the level of GEJ, resulting from a "zig-zag" staple line. In order to reduce the possibility of a postoperative leak, instead of removing it with a linear cutting/stapling device, a modified partial anterior fundoplication was performed.

Results: The postoperative period was uneventful and the patient was discharged on postoperative day 3. EWL was 40% at the 6-month follow-up and the patient remains free of GERD symptoms. The new upper endoscopy showed normal esophagus without signs of inflammation.

Conclusions: Iatrogenic gastric diverticulum after a bariatric operation is a rare finding. Its management during a laparoscopic conversion to another bariatric operation can be challenging and the risk of postoperative leak should be considered.

495—BARIATRICS—Laparoscopic

MIGRATION OF THE SUBCUTANEOUS PORT OF GASTRIC BAND UNDER THE POSTERIOR LAYER OF RECTUS SHEATH: A UNIQUE INTRAOPERATIVE FINDING

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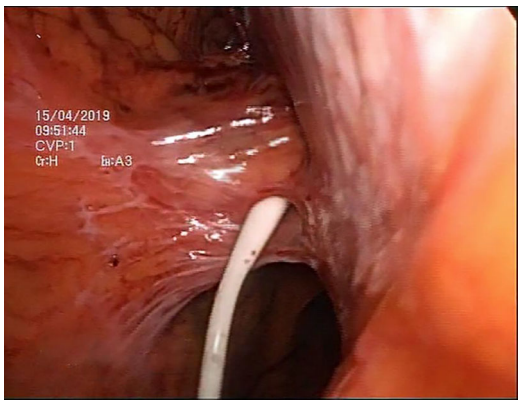
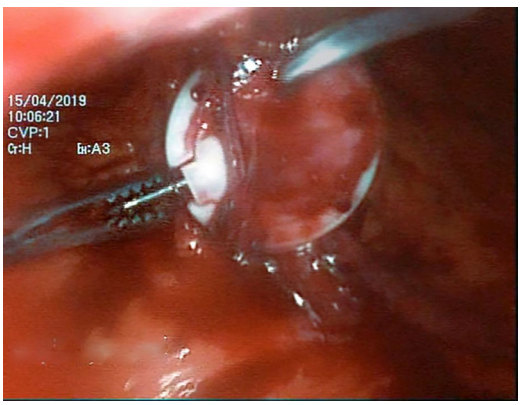
Introduction: Band migration is one of the most common complications after Gastric banding, occurring in up to 11% of patients within the first 2 postoperative years. However, migration of the reservoir port under the rectus abdominis muscle is quite rare and to our knowledge it has not been previously reported.

Methods: We present the case of a 60-year-old female patient who underwent Laparoscopic Gastric Band (GB) in 2009 with a BMI of 40, losing 80% of the excess weight, and abdominoplasty in 2014. The patient presented to our clinic complaining for dysphagia and epigastric pain and asked for GB removal. Removal of the GB was uneventful, but the subcutaneous port was not palpable and the open surgical exploration failed to reveal it. Then laparoscopic exploration of the abdominal cavity was performed and the subcutaneous port was found at the left hypochondrium (Fig. 1), between the posterior layer of rectus sheath and the peritoneum, and was removed laparoscopically (Fig. 2).





Results: The patient was discharged 24 h after surgery without any remarkable event during her postoperative stay. At the 6-month postoperative follow-up she remains asymptomatic. Interestingly, she was not informed about any replacement of the reservoir port during the abdominoplasty.

Conclusions: Careful preoperative physical examination is mandatory, even in routine laparoscopic operations such as GB removal, especially in patients that have undergone additional surgical procedures, including plastic surgery.

519—BARIATRICS—Laparoscopic

TREACHEROUS CONDITIONS DURING LAPAROSCOPIC SLEEVE GASTRECTOMY: SITUS INVERSUS

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Aims: The number of obesity surgeries performing today is increasing. While bariatric surgery can offer many benefits, all forms of weight-loss surgery are major procedures that can pose serious risks and side effects. The qualification to the surgery should be considered individually. In our work, we present the importance of preoperative preparation, for patient safety and the selection of appropriate surgical tactics.

Methods This is a case report of a 37-year-old obese woman, with situs inversus, who underwent a laparoscopic sleeve gastrectomy (LSG).

Results: A 37-year-old obese (BMI = 55 kg/m^2—super obesity) woman with a recognised Kartagener's syndrome (situs inversus totalis, symptoms of primary ciliary dyskinesia) and other comorbidities, has been qualified for the bariatric surgery. She had a gastric balloon implantation in the past for the duration of six months resulting in an inconsiderable weight loss. Patient was scheduled for LSG. The operation lasted 70 min and was uneventful. Patient followed Enhanced Recovery After Surgery (ERAS) protocol and was discharged on the first postoperative day. She was followed up for one year with 38,4% excess weight loss (BMI = 42).

In the literature review, we found 29 articles on various bariatric procedures in patients with partial or complete situs inversus. There were described 33 operations with 2 (6.06%) major complications (reservoir port infection resulting in gastric band removal after laparoscopic adjusted gastric banding procedure and a leak after LSG). In one case situs inversus have not been recognised before the surgery and was diagnosed intraoperatively.

Conclusion: Bariatric surgery in a patient with situs inversus is a safe treatment of obesity. Accurate preoperative assessment, allowing appropriate modification of the surgical approach, is of great importance.

566—BARIATRICS—Laparoscopic

LATE, CHRONIC AND RECURRENT GASTRO-CUTANEOUS FISTULA AFTER SLEEVE GASTRECTOMY: LAPAROSCOPIC CONVERSION TO TOTAL GASTRECTOMY

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Introduction: Leak after sleeve gastrectomy(SG)represents at the present the most fearest complication in bariatric surgery. Treatment remains on the hand of group experience in absence of proper and approved guidelines.

Case: S.F. a 44 y old patient was submitted to SG with BMI of 44 kg/m2 in February 2016. The p.o. course was uneventful and the patient participated to the scheduled follow-up. At 6 months he develop a leak (class II C, late) that was treated conservatively (EN, Stent and drainage) and solved in 3 months. After 21 months he was readmitted with gastro-cutaneous fistula (November 2018,recurrent fistula). After several conservative treatment (stent, internal drainage, clips, NE, glue) the patients was treated laparoscopically with conversion in total gastrectomy and R-n-Y reconstruction.

Results: The operative time was 250 min and the p.o. course uneventful. The patients was discharge in p.o. day 7 after x-ray control.

Conclusion: Despite it remain a rare complications, leak after SG could start late (Sixth month), recurre (even after 21 months) and require a very complex salvage surgery.

688—BARIATRICS—Laparoscopic

TRANSHIATAL SLEEVE'S GASTRECTOMY MIGRATION AND GERD: CONVERSION TO R-EN-Y GASTRIC BYPASS IS THE BEST OPTION

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Background: Transhiatal sleeve's migration, with consecutive gastroesophageal reflux disease (GERD) is an underdiagnosed complication that leads to revisional surgery. Case report: A 45 years old, morbid obese female patient with BMI 39,6 kg/m^2, asymptomatic type II hiatal hernia, esophagitis grade A and symptomatic gallstones, underwent laparoscopic sleeve gastrectomy with concomitant posterior cruroplasty and cholecystectomy in June 2011. Nadir was obtained in 2013 (BMI 23). From 2013 she started to complain symptomatic GERD, initially treated conservatory. In January 2019 transhiatal sleeve's migration was identified on X-ray contrast study. Due to persistent GERD and sleeve's migration the patient was submitted to re-do surgery. We present the video of conversion to laparoscopic R-en-Y gastric bypass LRYGB, associated with reinforced cruroplasty with biosynthetic, absorbable mesh.

Results: postoperative period was uneventful, with improvement of GERD symptoms after 12 months follow up and no recurrence of the migration.

Conclusion: laparoscopic conversion to RYGB is feasible and useful for LSG complications.

750—BARIATRICS—Laparoscopic

IMPACT OF BARIATRIC SURGERY ON POLYCYSTIC OVARIAN DISEASE (PCOS) IN INDIAN POPULATION

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Background: Bariatric surgery is an effective treatment modality for morbidly obese with good sustained weight loss and resolution of comorbidities but there is limited data on its impact on polycystic ovarian disease (PCOS), especially in Indian population.

Objective: To study impact of bariatric surgery in women with PCOS in terms of clinical, hormonal and radiological aspects of polycystic ovarian syndrome.

Methods: A prospective observational study of 50 women who underwent bariatric surgery at our tertiary care centre. PCOS was diagnosed using Rotterdam criteria. Evaluation of anthropometric data, menstrual cyclicity as well as markers of hyperandrogenism were done pre operatively and at 3.6 and 1 year follow up.

Results: Eighteen (36%) women were diagnosed to have PCOS and an additional 8 women (16%) had irregular cycles pre operatively. % EWL at 3 months (n = 14), 6 months (n = 14) and 1 year (n = 11) follow up was 31%, 49% and 63% respectively among PCOS women. All patients regained their normal menstrual cycle at 3 months of follow up. Hirsuitism resolved completely among 44% i.e. 5/11 with decline in median hirsuitism score from 11 to 9 at 1 year follow up. Mean serum testosterone decreased from 0.83 ± 0.38 ng/ml preoperatively to 0.42 ± 0.25 ng/ml at 1 year follow up ($p < 0.01$) whereas changes in levels of serum LH and FSH were not significant. 77% females (14/18) had polycystic ovaries preoperatively on USG out of which 55% (i.e. 4/7) showed complete resolution at 1 year follow up. Metabolic syndrome completely resolved at 1 year follow up.

Conclusion: PCOS is frequently associated with morbid obesity in premenopausal women and these patients have an increased risk of Metabolic Syndrome which completely resolve after bariatric surgery. Bariatric surgery results in an effective and sustained weight loss with improvement in clinical, hormonal and radiological parameters associated with PCOS.

757—BARIATRICS—Laparoscopic

A PROSPECTIVE, RANDOMISED CONTROLLED STUDY TO COMPARE ANTRAL RESECTION VERSUS ANTRAL PRESERVATION DURING LAPAROSCOPIC SLEEVE GASTRECTOMY

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Background: Laparoscopic sleeve gastrectomy (LSG) is the most commonly performed bariatric surgery worldwide and there are various controversies regarding LSG like size of bougie used, length of pylorus, need for reinforcement of staple line and many others. This study will deal primarily with one of the debatable issue of LSG i.e. antrum resection versus antrum preservation effects on weight loss.

Objective: To assess percentage excess weight loss (%EWL), gastric emptying, GERD symptoms, residual sleeve volume and complications like bleeding, leak and weight regain post LSG in Antrum resecting(AR) and Antral preservation (AP) groups.

Methods: From June 2018 to November 2019, 96 morbidly obese patients who underwent LSG were randomized into two groups, Antral preserving-LSG i.e. gastric division starts $\geq$ 5 cm from pylorus and Antral resecting-LSG i.e. gastric division starts $\leq$ 2 cm from pylorus with 46 patients in AP and 44 in AR group. Follow up was conducted at 3, 6 and 12 months to observe %EWL, GERD symptoms, OSA symptoms, resolution of co-morbidities, post-op complications. UGIE, scintigraphy and CT volumetry is being done at 12 months post operatively.

Results: On immediate post op assessment both the groups were comparable on basis of pre-op parameters like age, sex, height, weight, BMI. Mean operative time was found to be more in AR (98.97 min) than AP (84.22 min). At 3, 6 and 12 months follow up mean %EWL was found to be higher in AR group compared to AP group. Post-op complication and resolution of comorbidities were similar in both the groups. Gastric emptying increased in both the groups at 1 yr follow up.

Conclusion: AR-LSG results in more % EWL but at the cost of slightly increased risk of GERD. Findings will be confirmed on completion of study.

791—BARIATRICS—Laparoscopic

COMBINATION OF A SINGLE INCISION AND MINILAPAROSCOPIC ACCESS FOR LAPAROSCOPIC SLEEVE GASTRECTOMY

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Aims: Single-incision endoscopic surgery [SIES] can be challenging in patients with obesity. However, adding one additional 3 mm minilaparoscopic instrument can simplify the steps of the procedure. SIES procedures can potentially decreased postoperative pain, and in selected patients can provide good cosmetic results. This video presents a case of minilaparoscopic assistance during SIES sleeve gastrectomy.
Methods: Local anesthesia was used before incision. 2.6 cm skin and fascial incision was performed through the umbilicus site, 4 channel reusable port was placed, with two 5 mm cannulas and two 10 mm cannulas.
Left liver lobe was elevated with 1.0 transfascial suture. 3 mm minilaparoscopic instrument was placed in left flank of the abdomen and held by assistant surgeon on a patients left.

50 cm elongated straight 5.5 mm optics was used to avoid clash with the surgeons hands, and French position for a patient was used. Main surgeon was between the legs and camera assistant on the right side of the patient. All instruments were reusable.

Mobilization of the greater curvature, posterior wall and the angle of His was performed, starting 3 sm from the pylorus, and to esophagogastric junction with both crura exposure.

We use reinforced 60 mm stapler with flex to perform gastric sleeve on a 36 fr calibrating boogie. Resected gastric part was removed throughout the port placement site.

Trocar site was closed with polydioxanone running suture. No sutures were put on minilaparoscopic instrument access site.
Results: Patient BMI was 42,3. No signs of hiatal hernia.
Procedure time was 170 min, blood loss was 35 cc, no nasogastric tube or drain was placed.

Postoperative pain control only with nonsteroidal anti-inflammatory drugs.

Liquid diet was started on the p.o. day 1. Patient was discharged on p.o. day 3.
Conclusion: Combination of SIES with a minilaparoscopic assistance can improve intraoperative control of the operation field and potentially decrease intraoperative complications.

800—BARIATRICS—Laparoscopic

ACUTE PANCREATITIS AS AN EARLY POSTOPERATIVE COMPLICATION OF LAPAROSCOPIC SLEEVE GASTRECTOMY

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Aim: Laparoscopic Sleeve Gastrectomy is one of the most common bariatric procedures in the world. The incidence of complications is around 1–2%. The most common complications observed in the early postoperative period include bleeding and leakage of the stapler line. Acute postoperative pancreatitis is a very rare early complication of laparoscopic sleeve gastrectomy. Only a few cases of the presented complication are described in the literature.
Methods: A 55 year old patient with history of atrial hypertension, nicotinism, a huge incisional abdominal hernia and after thoracic aortic stent-graft placement was operated due to morbid obesity (BMI 49,4 kg/m2). The patient underwent a laparoscopic sleeve gastrectomy. After surgery, the patient did not comply with medical recommendations, he secretly smoked cigarettes and drank coffee with grounds. On the second day after surgery, the patient reported nausea, vomiting, and severe epigastric pain. Laboratory tests showed elevated serum level of amylase, lipase, c-reactive protein, fibrinogen and leucocytosis. In fluoroscopy of the upper gastrointestinal tract, stapler line leakage in the angle of Hiss was excluded. CAT scan showed features of acute pancreatitis and abdominal aortic dissection. Acute pancreatitis was diagnosed and pharmacological treatment was initiated. Seven days after the surgery, the patient had symptoms of respiratory failure and continued treatment in the Intensive Care Unit.
Result: Despite rapid diagnostics and implemented treatment, no successful therapeutic effect was obtained. The patient died on the 31st day after surgery.
Conclusion: Undisciplined patient behaviour in the early postoperative period combined with additional loads such as hypertension, generalized atherosclerosis, and type 2 diabetes are poor prognostic factors after bariatric procedures.

807—BARIATRICS—Laparoscopic

THROMBOSIS OF THE LIVER PORTAL VESSELS AND BRAIN SINUSES AS A COMPLICATION OF LAPAROSCOPIC SLEEVE GASTRECTOMY

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Aim: Obesity is one of the factors that increases the risk of venous thrombosis. Surgery, reduced patient activity in the early postoperative period, and co-morbidities (e.g. lower limb vein insufficiency) further increase the risk of thrombosis in the bariatric patient population. Current guidelines indicate the need for anticoagulant prophylaxis in all patients undergoing bariatric surgery. Prevention methods can be divided into pharmacological (LMWH) and mechanical (intermittent pneumatic pressure, compression stockings). The authors of the publication emphasize the increased effectiveness of prevention when both methods are used simultaneously.
Method A 53-year-old patient with a history of hypertension underwent a laparoscopic sleeve gastrectomy due to morbid obesity (BMI 50.2 kg/m^2). In the perioperative period, pharmacological (nadroparin) and mechanical antithrombotic prophylaxis methods were used. On the second day after surgery, the patient was discharged home with a recommendation of continuation of thromboprophylaxis (nadroparin) for a period of 10 days. Two weeks after surgery, the patient was hospitalized again due to severe epigastric pain. Biochemical tests showed increased levels of D-Dimers, fibrinogen, CRP and glucose as well as leukocytosis. CAT scan of the abdomen showed portal vein thrombosis. The patient was treated with a therapeutic dose of enoxyparin. The patient was discharged home with recommendations to continue anticoagulation therapy with dabigatran. After a month, the patient was hospitalized again due to symptoms of high gastrointestinal obstruction. Gastrodoudenoscopy showed no pathological stenoses. 4 days after discharge, the patient was re-hospitalized due to recurrence of pain. During hospitalization, neurological symptoms were observed. CAT scan of the head showed cerebral sinus thrombosis. The cerebrospinal fluid test result ruled out infection of the central nervous system. Due to respiratory failure, treatment in the Intensive Care Unit was continued.
Result: Further pharmacological and rehabilitation treatment in hospital conditions was continued.
Conclusion: Super obesity and a large waist circumference are high risk factors for thrombosis.

872—BARIATRICS—Laparoscopic

VIDEO: SHORTENING AND PLICATION OF THE ENTERO-ENTEROSTOMY AFTER AN INTUSSUSCEPTION, A SURGICAL OPTION?

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Aims: Intussusception after gastric-bypass is a rare but underreported condition. Diagnosis is difficult and symptoms can be vague and misleading. When identified, it can often require a surgical exploration for the reduction of the invagination and if needed, bowel resection in the presence of intestinal necrosis. When recurrence is present imbrication of the entero-enterostomy anastomosis (EE) may be a more effective means of treatment. In this video we show how plication of the EE is a valid option for the treatment of recurrent invagination.
Methods: A 29 year-old female healthy patient underwent in 2012 a laparoscopic gastric bypass. No short- or long- term complications were recorded and the patient could achieve weight loss of 42 kg (BMI 44.9–27.7 kg/m^2).
In January 2019 the patient was admitted in another center because of severe and acute abdominal pain at the level of the left flank. On admissal a CT-scan was performed, showing signs of an intestinal invagination.

The patient was hospitalised and conservatively treated for one week with spontaneous resolution of the invagination, confirmed with imaging before dismissal.

After dismissal, persistent vague abdominal pain and constipation brought the patient to our attention. Seen three-months long complaints we decide to admit the patient to undergo a laparoscopic exploration.

Exploration confirmed the presence of bowel invagination at the level of the enteroenterostomy for which we performed a shortening with plication of the bowels. The anastomosis was narrowed with the use of a mechanical stapler device together with alignment stitches.
Results: Following surgery, the patient was dismissed without complications on day one postoperative. Follow-up at 4 months and at 10 months showed good clinical results with complete resolution of the abdominal symptomatology.
Conclusion: Surgical shortening combined with plication of the EE is a valid alternative for the treatment of recurrent enteric invaginations.

1128—BARIATRICS—Laparoscopic

SALVAGE SEROMYOTOMY FOR PERSISTENT DYSPHAGIA AFTER SLEEVE AND ROUX-EN-Y GASTRIC BYPASS

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Aims: Different complications and challenges are often faced after bariatric procedures. Stenosis of the sleeve gastrectomy (SG) is relatively rare and scarcely mentioned in the literature. We present a case of functional stenosis after conversion of a narrow gastric sleeve to open roux-en-Y gastric bypass (RNYGB).

The available conservative and surgical treatments were preoperatively discussed with the patient and our team. Considering the persistent dysphagia, the operative history, and the current BMI, it was opted for a Laparoscopic Seromyotomy.

Methods: A 50-year-old female with a BMI of 23 kg/m^2 underwent a laparoscopic SG in 2011. Due to increasing GERD symptoms and weight regain open RNYGB was performed in 2017.

In 2018 the patient developed gradual dysphagia to fluids, nausea, and vomiting. Endoscopic stenting of the narrowed gastric pouch improved symptomatology, but symptoms recurred after stent removal.

Upper GI-series demonstrated a long narrow passage of fluid contrast through the stomach with stasis in the esophagus. Endoscopy showed a diverticulum above the cardia.

Results: Peroperatively findings showed a long narrow gastric pouch with herniation in the cranial part. An extended Seromyotomy at the level of pouch was performed.

Postoperative period occurred without complication, the patient started a fluid diet on the second postoperative day. An upper GI-series was performed were no signs of narrowing or leakage were shown. Patient was discharged on the third postoperative day. Follow-up after ** showed no dysphagia, nausea or vomiting.

Conclusion: Laparoscopic Seromyotomy of the gastric pouch can be effective for the treatment of functional stenosis after multiple bariatric surgical procedures.

1136—BARIATRICS—Laparoscopic

MORBID OBESITY AND GERD B

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Aims: Gastroesophageal reflux after Sleeve gastrectomy (SG) is a growing point of attention in the field of bariatric surgery. The percentage of patients suffering from symptomatic reflux after an SG is estimated to be between 10 and 20%. Few recently published studies showed good clinical and endoscopic results in patients undergoing Nissen Sleeve gastrectomy. [1–2].

We present a case video of an obese patient with reflux grade B undergoing a laparoscopic Nissen-Sleeve gastrectomy.

Methods: A 43 year old male patient with a BMI of 36 kg/m^2 came to our attention with medical history of hypertension, sleep apnea and gastroesophageal reflux grade B. Complaints of reflux were under control with therapy with a proton-pump inhibitor.

Endoscopy showed a small diaphragmatic hernia and gastroesophageal reflux grade B. Biopsies for Helycobacter Pylori were negative. After endocrinologic and psychologic screening the patient was enlisted for surgery. A Sleeve gastrectomy combined with a Nissen procedure was performed laparoscopically.

Results: The patient was dismissed without complications. Follow-up at 14 months showed a loss weight of 30 kg (BMI 27.7 kg/m^2). The Proton-pump inhibitor could be stopped postoperatively. The patient had no more complaints of reflux.

Conclusion: Despite being a novel procedure, laparoscopic Nissen Sleeve gastrectomy, is a valid and technically feasible intervention for obese patients with gastroesophageal reflux disease.

1173—BARIATRICS—Laparoscopic

FLUORESCENCE ANGIOGRAPHY DURING LAPAROSCOPIC SLEEVE GASTRECTOMY: COULD BE HELPFUL TO EVALUATE RISK OF LEAK?

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Introduction: Sleeve gastrectomy is the most performed operation in bariatric surgery, showing good early outcome. The most frequent post-operative complication is gastric leak with an incidence of 0.5–6%, reported in the literature.

The purpose of this study is to present our experience with the use of the indocyanine green fluorescence (IGF) in laparoscopic sleeve gastrectomy. It could be useful in predicting the risk of gastric leak, evaluating tissue perfusion and performing vascular mapping during laparoscopic surgery.

Materials and Methods: We used a high-definition camera system equipped with a specific filter for detection of the near-infrared fluorescence immediately after infusion of an indocyanine green solution. We retrospectively identified 32 patients underwent laparoscopic sleeve gastrectomy between October 2018 to November 2019.

Results: After dissection of the greater curve sleeve, we perform a first infusion of the 2.5 mg of indocyanine green solution in a peripheral vein to evaluate the gastric perfusion by the full visualization of the blood supply in the gastric fundus.

After the completion of gastrectomy, performed using a linear articulated stapler, a second dose of supplementary 2.5 mg of solution is injected to ensure that all the pertinent blood vessels were preserved to preventing ischemia related leaks. A regular perfusion was observed along the entire gastric sleeve; we especially verified the optimal perfusion of the esophago-gastric junction. Neither clinical leak nor other complications occurred postoperatively.

Conclusions: IGF allows to obtain a real-time image of tissue perfusion and vascularization, so IGF could be helpful to prevent gastric leak. This could play not only a prognostic role, identifying which patients have an increased risk of leak formation, but also a therapeutic indication, because the ischemic area could be reinforced with sealants, omental patches or overcoat.

1192—BARIATRICS—Laparoscopic

TRANSHIATAL SLEEVE GASTRECTOMY MIGRATION AND GERD: REINFORCED HIATAL HERNIA REPAIR AND CONVERSION TO R-Y GASTRIC BYPASS FOR CARDIAC METAPLASIA

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Background: Postsleeve gastroesophageal reflux disease GERD, complicated with Barrett esophagus was reported with contradictorily incidence. Transhiatal sleeve migration, with consecutive GERD is probably misdiagnosed after LSG.

Methods: A 26 years old, morbid obese female patient with BMI 51 kg/m2, non-complicated Hill I hiatal hernia, was operated by LSG and reinforced cruroplasty in 2013. She reached nadir in 2015 (BMI 25.7). From 2017 she complained from symptomatic GERD not responding to medical treatment, confirmed by pHmetry. In 2019 evidence of migration on contrast X-ray study and esophagitis grade C, with cardiac metaplasia without goblet cells was shown.

Results: we present the video of conversion to laparoscopic R-en-Y gastric bypass LRYGB, associated with reduction of the hiatal hernia and reinforced cruroplasty with biosynthetic, absorbable mesh, with marked improvement of GERD symptoms after reoperation.

Conclusion: laparoscopic conversion from LSG to RYGB is feasible and is only accepted treatment for complicated GERD after LSG.

1258—BARIATRICS—Laparoscopic

WEIGH REGAIN AFTER DISTALISATION OF A GASTRIC BYPASS: CASE PRESENTATION AND VIDEO

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Aim: When weight regain occurs despite adequate restriction, the way to go is augmenting the malabsorption. Different types of distalization are described with either lengthening the alimentary or the biliopancreatic limb. In this case we chose to convert a distalization type Brolin to a Sugerman to aid in further weight loss.

Methods: A 43-year-old female patient came to our attention with weight regain after distalization. Her primary gastric bypass was performed in 2008 (135 kg, BMI 47.3) with a good weight loss of 50 kg. In 2013 a Brolin-type distalization was performed because of weight regain (105 kg, BMI 36.8). Following lengths were measured: Alimentary limb 7 m, biliopancreatic (BP) limb 50 cm and common 1m20. After this procedure she lost only 5 kg. A few years later she regained weight again (110 kg, BMI 37.7) despite a daily calorie intake of only 1187 kcal and a barium swallow that shows a small gastric pouch.

The preoperative assessment suggest a good restriction with low calorie intake. The procedure of choice therefore ended up being a re-distalization to further diminish the absorption capacity.

In this video we present the different steps in a conversion of Brolin to Sugarman distalization.

Results: No complications occurred and the patient had a satisfying weight loss one year postoperatively (100 kg, BMI 34.8). Defecation increased to eight times daily (before five times). A good follow-up with check-up of the vitamins was provided and substitution therapy was prescribed.

Conclusion: Among the different types of distalization, converting a distalization type Brolin to a Sugerman can aid in further weight loss.

1345—BARIATRICS—Laparoscopic

SUCCESSFUL MANAGEMENT OF LEAKAGE AFTER LAPAROSCOPIC SLEEVE GASTRECTOMY

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Proximal part of suture line is the most common site of leakage after laparoscopic sleeve gastrectomy. It's usually caused by distal stenosis which results in gastric emptying impairment leading to increased intraluminal pressure.

We present a case of 43 year old female patient with BMI of 54.2 who underwent sleeve gastrectomy procedure. Patient was discharged 2 days later after the uneventful hospitalization. Readmitted due to vomiting, nausea and general weakness after 16 days. In blood test inflammatory markers were elevated, CT scan showed air bubbles near the upper end of the staple-line on the stomach. Patient was re-operated. During the operation leakage test with methylene blue was performed and no leakage was noticed. The area was flushed with saline and surgical drain was placed near the leakage. After the procedure patient was treated conservatively with broad-spectrum antibiotics and para-enteral nutrition was introduced. Gastrografin swallow-test showed narrowing in the middle of stomach length and contrast retention in the proximal part. Small leakage of gastric juice and bile was noticed in the drain 2 days after reoperation. Eventually patient condition normalized and she was discharged after 3 weeks of hospitalization. She has been under follow-up for 4 months till now.

Management of leakage after sleeve gastrectomy should be individualized according to clinical presentation.

1348—BARIATRICS—Laparoscopic

CASE REPORT: ANASTOMOTIC STRICTURE 4 WEEKS AFTER MINI GASTRIC PROCEDURE TREATED SUCCESSFULLY WITH CONVERSION TO GASTRIC BYPASS PROCEDURE

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Gastrojejunal stricture is one of the complications after laparoscopic mini gastric bypass—one anastomosis gastric bypass (MGB-OAGB) and Roux-en-Y gastric bypass (RYGB).

We hereby present a case of 42 year old female patient with initial BMI of 50,2 who was treated for obesity with one anastomosis gastric bypass procedure.

After 4 weeks of flawless follow up the patient was readmitted due to the symptoms of acute upper GI obstruction. Barium swallow test revealed an anastomotic stricture. The patient was treated surgically with re-do procedure converting the MGB-OAGB procedure to gastric bypass with good results.

Not only the good vascularity of the pouch which wasn't the issue at that case is important for the process of tissue healing but also the original width of the distal part of the pouch as well as the width of the anastomosis seem to be crucial in linear stapler technique to avoid such a complication after MGB-OAGB procedure.

1375—BARIATRICS—Laparoscopic

QUALITY OF LIFE AFTER BARIATRIC SURGERY: A RANDOMIZED PROSPECTIVE STUDY COMPARING LAPAROSCOPIC SLEEVE GASTRECTOMY VS. ROUX-EN-Y GASTRIC BYPASS

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Aims: Bariatric surgery has proven to be the most effective treatment for morbid obesity. However, there are complications that appear after surgery: reflux disease, vomiting, pain, dysphagia and other abdominal symptoms that can affect the postoperative patient's quality of life. This study was designed to assess the changes in the quality of life (QoL) after bariatric surgery, comparing laparoscopic sleeve gastrectomy (SG) to Roux-en-Y gastric bypass (GB).

Methods: 44 patients were randomly placed in two groups (SG and GB). QoL and gastroesophageal reflux disease (GERD) was evaluated via multiple tests: Reflux Disease Questionnaire (RDQ), Gastrointestinal Impact Scale (GIS) and Spontaneous Belch Questionnaire (SBQ) before surgery, and one and six months after surgery.

Results: There was significant improvement of the QoL regarding the test scores before and after surgery, without differences between the groups. The SBQ showed the same.

Results: One month after surgery, The RDQ mean score was 21 (SD 10.02) for SG, while for BG it was 23.5 (SD 10.99) ($p = 0.23$). The SBQ mean score was: GS 14.86 (SD 7.4) vs. BG 11.35 (SD 20) ($p < 0.05$). Six months after surgery, the RDQ mean score was 18.63 (SD7.4) for GS vs. BG 18 (SD 7.02) ($p = 0.43$); the SBQ mean score for SG was 13.82 (SD 8.68) vs. BG 10.2 (SD 9.31) ($p < 0.05$).

Conclusion: Both techniques greatly improve patients' quality of life. Patients who were in the SG group have a higher rate of belching disorders than those from the BG group. However, there were no differences between techniques with regards to GERD.

1399—BARIATRICS—Laparoscopic

EARLY COMPLICATIONS AFTER LAPAROSCOPIC SLEEVE GASTRECTOMY WITH STAPLE LINE OVERSEWING VERSUS NO REINFORCMENT

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Early complications after laparoscopic sleeve gastrectomy with staple line oversewing versus no reinforcement.

Aim: Various staple line reinforcment techniques have been adopted to decrase the incidence of early complications after laparoscopic sleeve gastrectomy (LSG). The aim of this study was to analyse the complications rate after LSG with staple line oversewing versus no reinforcement.

Methods: This was a single center restrospective analysis of a group of 382 patients operated on between 2008 and 2018 who underwent LSG. LSG with oversewing of the staple line was performed in 133 patients and without oversewing in 249 patients. The analysis focused on operative issues, perioperative complications and lenght of hospital stay.

Results: The mean body mass index (BMI) was 45.2 (33.5–59.5) and 45.37 (33.4–79.2) kg/m2 in oversewing and no oversewing groups respectively. Serious comlications requiring reoperations included gastric leak in 6/133 patients and bleeding in 2/133 patients in oversewing group and leak in 3/249 patients and bleeding in 3/249 patients in no-oversewing group respectively. Length of hospital stay did not differ between groups.

Conclusion: Staple line left without oversewing during LSG did not increase the risk of bleeding or staple line leak.

1607—BARIATRICS—Laparoscopic

TO STUDY THE EFFECT OF BARIATRIC SURGERY ON URINARY INCONTINENCE

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Introduction: Weight loss surgery has positive impact on various comorbidities. Impact of bariatric surgery on urinary incontinence is an under reported area.

Objectives: To study the impact of bariatric surgery on urinary incontinence in patients undergoing bariatric surgery and also to note the prevalence of urinary incontinence in morbidly obese patients.

Design: ingle institution prospective cohort study.

Setting: All participants are patients undergoing bariatric surgery in a single center, operated by a single experienced surgeon. Patients with prior urinary tract surgery, patients on chronic drugs causing or exacerbating urinary incontinence,patients with psychiatric issues and inability to give consent were excluded.

Methodology: Patients undergoing bariatric surgery between June 2018 to June 2019 (n = 138) were screened using the International Consultation on Incontinence Questionnaire-Urinary Incontinence-Short Form (ICIQ-UI-SF) questionnaire. Those patients found to have urinary incontinence were identified and followed up at 3 month, 6 month and 1 year post surgery and the questionnaire was applied at each follow up. Also number of pads changed per day was recorded. In follow up weight loss, comorbidity resolution and improvement were also studied.

Results: Out of 138 patients screened 41 (M = 2, F = 39) patients had urinary incontinence. 13 patients completed 1 year follow up. Urinary incontinence had resolved in 11 patients (84.6%) and 2 patients did not show any improvement in scores. Of the 39 patients who have reached 6 month follow-up urinary incontinence had resolved in 26 (66.6%), 10 patients (25.6%) showed improvement in incontinence scores and 3 patients did not show improvement. 41 patients have finished 3 month follow up during which resolution of incontinence seen in 7 patients (17%) and 31 patients (75.6%) showed improvement in incontinence scores and 3 patients did not show any improvement.

Conclusions: Bariatric surgery has a positive impact on urinary incontinence and sustained resolution of urinary incontinence can be achieved in majority of the patients undergoing bariatric surgery. There is definite correlation with weight loss achieved.

606—BARIATRICS—Physiology

IS SLEEVE GASTRECTOMY RESPONSIBLE FOR GASTROESOPHAGEAL REFLUX DISEASE? PRELIMINARY RESULTS OF A PILOT STUDY

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Aims: The aim of the study is to evaluate the evolution of gastroesophageal reflux disease (GERD) in obese patients undergoing bariatric surgery.

Methods: The presence of GERD was evaluated preoperatively by Health Related Quality of Life (HRQL) questionnaire, upper GI endoscopy, 24 h-pH-manometry at the distal electrode, esophagram. Patients with mild or no GERD underwent laparoscopic sleeve gastrectomy (LSG) and patients with moderate-severe GERD underwent laparoscopic gastric bypass (LGB). Endoscopy, 24 h-pH-manometry, esophagram and HRQL questionnaire were repeated 12 months after surgery.

Results: From July 2017 to November 2019, 20 patients accepted to be enrolled in the study. Fourteen patients underwent LSG. Mean preoperative HRQL score was 6.7 (range 0–38). At pH-manometry, mean percentage acid reflux time in orthostatism was 2.7 (range 0.2–9.6) and in clinostatism 2.2 (range 0–20.1). Mean DeMeester score was 12.8 (range 0.4–78.9). Six patients underwent LGB, none presenting with signs of esophagitis at preoperative endoscopy. Mean preoperative HRQL score was 5.8 (range 0–18). At pH-manometry, mean percentage acid reflux time in orthostatism was 23.1 (range 4.3–84.8) and in clinostatism 34.8 (range 0–95.2), with mean DeMeester score of 155.6 (range 18.1–416). Twelve months after surgery, mean postoperative questionnaire score was 3 (0–12) in 9 LSG patients and 0.5 (0–1) in 2 LGB patients. In LSG patients, mean percentage acid reflux time in orthostatism at pH-manometry was 7.2 (range 0.3–25.7), in clinostatism 2.7 (range 0.3–11.2) and mean DeMeester score was 25.6 (13.7–108.7). In LGB patients, mean percentage acid reflux time in orthostatism at pH-manometry was 1.7 (range 0.3–3.2), in clinostatism 0.1 (range 0–0.2) and mean DeMeester score was 4.6 (1.8–7.5).

Conclusions: Twelve months after surgery, LSG caused significant worsening or de novo GERD, as evaluated by 24 h-pH-manometry and HRQL questionnaire. Based on preoperative pH-manometry, the indications for surgery were more correctly identified in all patients who underwent LGB. A negative preoperative endoscopy does not exclude a diagnosis of GERD, which is objectively proven only by 24 h-pH-manometry. A larger sample size is required to draw more definitive conclusions.

1169—BARIATRICS—Physiology

EFFECT OF BARIATRIC SURGERY IN REDUCTION OF VISCERAL ABDOMINAL FAT, MEASURED BY ULTRASOUND

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Introduction: Obesity has become the most common metabolic disease. Being overweight is related to the incidence of several comorbidities including type 2 diabetes mellitus, cardiovascular disease Non-alcoholic fatty liver disease (NAFLD) and certain type of cancer. There is an urgent need for a better understanding and management of obesity and obesity- associated diseases.

Abdominal ultrasound (US) has an important role in the preoperative assessment of bariatric patients. The evaluation of not-known liver disease can be easily performed by US. Visceral fat (VF) plays a major role in the development of metabolic syndrome associated with obesity and it can be measured by US. The most common findings, during preoperative US in obese patients, are fatty liver, hepatomegaly and visceral fat accumulation. There is evidence on how weight loss following bariatric surgery is related to reduction in liver size and visceral abdominal fat in obese patients.

The aim of the study was to evaluate the changes after bariatric surgery in fatty liver disease and visceral fat by US.

Materials and Methods: Forty obese patients were scheduled for laparoscopic sleeve gastrectomy (LSG). US was performed preoperatively and during the follow-up, to evaluate: hepatomegaly and visceral fat accumulation. Data collected, pre and post bariatric surgery were: body mass index (BMI), total weight loss (TWL), excess weight loss (EWL), liver function test. Follow-up was performed at 1, 3 and 6 months.

Results: After LSG, all patients showed a significant TWL that was related with decreased in BMI and with visceral fat reduction. There was no difference, after surgery, in liver function tests and liver dimension.

Conclusion: Evaluation of visceral fat can be easily performed by abdominal US. Obese patients, undergoing bariatric surgery, shown significant decreases in visceral abdominal fat at 6 months. These data demonstrate that bariatric surgery is helpful in the management of metabolic syndrome by reduction of visceral fat.

1395—BARIATRICS—Physiology

DIABETES IMPROVEMENT AND RESOLUTION FOLLOWING LAPAROSCOPIC SLEEVE GASTRECTOMY VERSUS SLEEVE GASTRECTOMY WITH LOOP BIPARTITION

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Introduction: The prevalence of type 2 diabetes is growing internationally. Obesity is an independent risk factor for development of type 2 diabetes mellitus (DM) and other metabolic disorders.

The aim of this study was to compare the effectiveness of laparoscopic sleeve gastrectomy (LSG) with new surgical procedure: sleeve gastrectomy with loop bipartition (LSG + LB).

Methods: 39 obese patients with DM type 2 were divided in two groups: I group (22 patients) consisted from 12 women and 10 men age 37–68 years, mean body mass index (BMI) was 48.2 ± 7.4 kg/m^2. LSG was performed in all patients of the I group. II group (17 patients) consisted from 10 women and 7 men, age 36–70 years, mean BMY was 53.7 ± 8.3 kg/m^2. LSG + LB was performed in all patients of the II group. These was no statistically significant difference between two groups in demographic, BMY, and comorbidities. Excess weight loss percentage (%EWL), the total weight loss percentage (%TWL) and diabetes improvement were analyzed.

Results: There were no serious complications and mortality in the both groups. After 18 months the patients of the II group lost more %TWL and %EWL and the difference was statistically significant ($p < 0.05$). %EWL in the I group was 66.4 ± 8.3%, in the patients of the II group − 82.7 ± 10.4% ($p < 0.05$). Resolution of DM type 2 was in 12 (54,5%) patients from the I group and in 13 (76,5%) from the II group ($p < 0.01$).

Conclusion: Sleeve gastrectomy with loop bipartition is more effective than LSG in the treatment of DM type 2 associated with obesity.

944—BARIATRICS—Robotics

LAPAROSCOPIC VERSUS ROBOTIC- ASSISTED RYGB : A EXPERIENCE CENTER OF EXCELLENCE FOR THE EAC-BC

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Background: In 1994, Wittgrove performed the 1st RYGB by minimally invasive surgery this break throw allowed to performed procedures with less surgical trauma and inflammatory response in obesity patients recent introduction of robotic platforms in order to achieve better outcomes. METHODS: We divide the groups in three according to the technique Laparoscopic (LRYGB), Robotic Da Vinci (RRYGB-S) Da Vinci Xi (RRYGB-Xi). 224 patients in LRYGB group, 134 in RRYGB-S group and 137 in RRYGB-Xi.

Results: During the study period, 495 patients underwent a RYGB, 45,2% by laparoscopy and 54,7% robotic,134 RRYGB-S, 137 RRYGB-Xi. 71.1% were females demographic data were comparable. The mean operative time in the robotic group (S/Xi) was 153.7 ± 28 and 151.2 ± 32 respectively. They were significantly higher than that in the laparoscopic group 135.4 ± 23 min. Intraoperative complication leak was higher in the RRYGB-S with 8.2% p = 0.001. Length of hospital stay was longer in Robotic group, mainly in RRYGB-S with 4.3 ± 11 days without statistical significance. 30 days post procedure intervention were more common in the RRYGB-S group 11.9%, gastrojejunostomy leakage 7.5%, jejunojejunostomy leakage 1.4%, intrabdominal bleeding 0.7% and other reasons 2.2%. RRYGB-Xi group the incidence of reintervention was 2.2% the majority with intrabdominal bleeding 1.5%. The incidence of reintervention in the laparoscopic group was 2.2%. Mortality 0%. The complications rate was higher in the RRYGB-S group 14.2%,RRYGB-Xi group had 2.2%, and the LRYGB group had 12.5% p = 0.001.Anastomotic strictures did not differ among the series. We found not significant differences one year the % TWL, at two year FU we found a difference among the groups with lower %TWL in the RRYGB-Xi group 25.24 ± 14.54. p = 0.001. The ΔBMI, kg/m2 at 1 year was 15.66 ± 4.01 for the LRYGB, 14.19 ± 3.68 for the RRYGB-S and 16.14 ± 8.57 for RRYGB-Xi. p = 0.011 The ΔBMI, kg/m2 at 2 years was 16.09 ± 4.57, 13.88 ± 3.00, 10.75 ± 5.72 for the LRYGB, RRYGB-S and RRYGB-Xi group respectively with $p < 0.001$. Reoperation and weight regain was significant lower in the RRYGB-Xi with statistical significance.

Conclusion: The present study reflects the experience in robotic bariatric surgery compared to laparoscopic and differences among the two robotic platforms, lead us to the conclusion that complication could have been related to the learning curve.The patients that received the robotic approach with Xi system had lower complications than the laparoscopic group, with a lower 2 year ΔBMI, kg/m2 and 2 year % TWL.

1204—COLORECTAL—Benign

TAMIS SUBMUCOSAL DISSECTION OF A RECURRENT LESION LOCATED IN THE RECTO-SIGMOID JUNCTION. A GOOD ALTERNATIVE FOR DIFFICULT AND SELECTED CASES

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TAMIS resection is a good alternative for the treatment of benign and early malignant rectal tumors, allowing for a full thickness resection with good oncological results.
Event though one of the advantages of this approach is the possibility to perform a full thickness resection, TAMIS surgery also allows us to perform a partial or submucosal dissection when needed, thus providing the potential to do a in-bloc resection avoiding the possible complications of a full thickness resection in some difficult and selected cases such as lesions arising over the rectosigmoid junction, anterior lesions in female patients etc.
We present the cases of a high risk patient with portal hypertension and liver cirrhosis with a previous endoscopic piece-meal resection of a posterior lesion at the level of the rectosigmoid junction with pathological analysis of an Adenocarcinoma arising on an adenoma. Postoperative endoscopy showed the presence of a remaining adenomatous tissue over a scar tissue at the rectosigmoid junction. Biopsies showed the presence of a low grade dysplasia adenoma.
We decided to perform a TAMIS approach of the lesion but a submucosal resection was chosen due to the presence of a low grade dysplasia adenoma in a high risk patient, due to the previous comorbidity as well as the possibility to have an intraperitoneal entry for it was a high lesion.
First, elevation of the adenoma was done with the aim of a solution of gelafundin and serum. Then a partial thickness, submucosal en-bloc resection of the lesion was performed.
TAMIS submucosal resection is a good and safe alternative for selected cases when a full thickness resection may be associated with a higher risk of complications.

25—COLORECTAL—Benign

ENDOANAL ENDOCOPIS SURGERY (TAMIS) HOW WE MAKE

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82 HTA patient, ischemic DLP Cardiòpata, atrial flutter, Sintrom, which enters per rectorràgies Hb of 14.4.
FCN: 45–50 mm lateral extension polyp, superficial without erosions, rectal localization at 10 cm from the anal verge, presents a low depression in inferior zone, AP: Adenoma. MRi Tumor 28 mm locate in right quadrants, the lesion lower verge is located at 12 cm from the anal verge, and 80 mm from the puborectal muscle. The tumor is under peritoneal reflexion. The tumour has no areas of hyper intensity (= 50%) that suggest mucinous adenocarcinoma.
With these clinic and radiologic findings we decide elective transanal endoscopic surgery (TAMIS).
Present the video of how make this technique in our team, I also show some tips and tricks of device collocation and the endoscopic view of the procedure.

94—COLORECTAL—Benign

DIVERTICULAR DISEASE IN THE YOUNG AGE GROUP: CLINICAL COURSE AND MANAGEMENT

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Introduction: Diverticular disease is a common disease which is classically described in the elderly. However, recently its incidence in young patients under 50 years is being reported more frequently. Diverticular disease has a wide spectrum of presentations ranging from asymptomatic diverticulosis to severe life-threatening forms including abscesses, fistulae, perforation or bleeding. Classically, the diverticular disease in the young was considered a more virulent form with a higher recurrence rate necessitating more surgical interventions than in the elder, However, this old notion has been recently challenged. The aim is to study the clinical course of diverticular disease in the young age group < 50 years to evaluate the differences related to the predisposing risk factors, presentation, severity, complications, recurrence rate, and the way of management.
Methods: A retrospective study of the patients admitted with diverticular disease in King Hamad University Hospital from 2016 to 2019. Patients were divided into two groups; group I (Young, < 50) and group II (Old, ≥ 5). A comparison was held between the two groups according to the proposed risk factors, predictors of severity, the clinical, and the way of management. Different variables were analyzed using the appropriate statistical tests. Statistical significance was taken as $p < 0.05$.
Results: 134 patients were included; 76 (56.7%) males and 58 (43.3%) females. The median age was 59.5 (Min.–Max.) (25–89), Mean $\pm$ SD.58.2 $\pm$ 13.5. 115 (85.8%) patients presented with diverticulitis and 19 (14.2%) with diverticular bleeding. There was male predominance in the young group, $p = 0.006$. The old group showed a higher prevalence of DM, HTN and dyslipidemia, $p = < 0.001$ for all. Moreover, the old group showed lower haemoglobin and vitamin D levels with higher steroids intake, $p = < 0.001$, 0.001 and 0.004 respectively.
There was no significant difference related to disease severity, management setting, antibiotics prescription, guided drainage, laparoscopic lavage or the need for surgery. However, recurrence was significantly higher in the young group, $p = 0.046$.
Conclusion: Diverticular disease in the young age group under 50 is more predominant in males with a higher rate of recurrence. However, it is not a severe form of the disease and can be managed the same way as in the elderly.

113—COLORECTAL—Benign

ENDOSCOPIC RESECTION OF COLORECTAL GRANULAR CELL TUMORS: A REPORT OF 3 CASES

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Aims: Granular cell tumor (GCT) is a rare soft tissue tumor that occurs at any site of the body. It often occurs in oral cavity, skin, subcutaneous tissue, but it is uncommon in the gastrointestinal tract. It is found incidentally during endoscopic examination, and appears as solitary, small submucosal nodule. Most GCTs are asymptomatic and are usually benign. Of the gastrointestinal tract, esophagus and stomach is common site, but colorectum is rare. The aim of this paper was to report and discuss the safety of endoscopic resection in patients with colorectal granular cell tumors
Methods: The patients selected in this studywere 3 patients with colorectal GCT diagnosed by endoscopic mucosal resection using a submucosal injection technique of epinephrine-saline mixture.
Results: Case 1. A 60-year-old male visited our clinic with a history of abdominal discomfort and anal bleeding. Colonoscopic examination revealed a yellowish polypoid lesion with intact mucosa, about 5 mm in diameter, in the ascending colon. An endoscopic mucosal resection using a submucosal injection technique of epinephrine-saline mixture was performed without any complications. Histological examination revealed a submucosal tumor composed of round tumor cells with abundant eosinophilic fine granular cytoplasm. The resected tumor was diagnosed as a GCT. Case 2. A 53-year-old male with anal bleeding underwent a colonoscopy. Endoscopic examination revealed a hard, yellowish submucosal tumor, about 5 mm in diameter, in the rectum. An endoscopic mucosal resection using a submucosal injection technique was performed without complication. On histological examination, the resected tumor was diagnosed as a GCT. Case 3. A 67-year-old male underwent a colonoscopic examination as post-polypectomy surveillance. A yellowish sessile lesion, about 4 mm in diameter, was found in the cecum. An endoscopic mucosal resection after submucosal injection was performed without complication. The pathologic findings of resected tumor were consistent with GCT.
Conclusions: Endoscopic resection is considered to be a safe and useful method for diagnosis and treatment of colorectal GCT. Colonoscopists should consider the possibility of GCT in the differential diagnosis of yellowish submucosal tumors of the colon and rectum.

141—COLORECTAL—Benign

AN OBSERVATIONAL STUDY, IDENTIFYING, MEASURING AND QUANTIFYING THE INTERFERENCE OF INTRAOPERATIVE DISTRACTIONS WITHIN THE OPERATING THEATRE

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Aims: Modern surgical research has broadened to include an interest into the investigation of surgical workflow. Rigorous analysis of the surgical process has a particular focus on distractions. Operating theatres are inherently full of distractions, many not pertinent to the surgical process. Distractions have the potential to increase surgeon stress, operative time and complications. Our study aims to objectively identify, classify and quantify distractions during the surgical process.
Method: 46 general surgical procedures were observed within a tertiary Irish hospital between June 2019-October 2019. An established observational tool was used to apply a structured observation to all operations. Additionally, a nine-point ordinal behaviourally anchor scoring scale was used to assign an interference level to each distraction.
Results: Total operative observation time was 4605 min (mean = 100.11 min, Std. Deviation 45.6 min). Overall, 855 intraoperative distractions were coded. On average, 18.58 distractions were coded per operation (Std. Deviation 6.649; range 5–34), with 11.14 distractions occurring per hour. Entering/exiting (n = 380, 42.88%) and case-irrelevant-communication (n = 251, 28.32%) occurred most frequently. Disruption rate was highest within the first (n = 275, 32%) and fourth operative quartiles (n = 342, 41%). Highest interference rates where observed from equipment issue and procedural interruptions. Anaesthetists initiated CIC more frequently (2.72 per operation), compared to nurses (1.57) and surgeons (1.17).
Conclusion(s): Our results confirm that distractions are prevalent within the operating theatre. Distractions contribute to significant interferences of surgical workflow. Steps can be taken to reduce overall prevalence and interference level by drawing upon a systems based perspective. However due to the ubiquitous nature of distractions surgeons may need to develop skills to help them resume interrupted primary tasks so to negated the effects distraction have on surgical outcomes.

308—COLORECTAL—Benign

LAPAROENTEROSCOPY FOR POLYPECTOMY: A HYBRID TECHNIQUE

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Small bowel polyps, although rare have been presenting in emergencies as intussuceptions. More often than not requiring an extensive bowel resection & repeat explorations in the future if all the polyps are not tackled in the index encounter. This video depicts our ingenious method of employing the use of rigid laparoscopes and conventional instruments to tackle the polyps.

Patients with small bowel polyposis presenting as an acute intestinal obstruction were taken for an emergency exploratory lapratomy and our hybrid technique of laparoenteroscopy was used to deal with the polyps.

The video demonstrates and highlights how conventional laparoscopic instruments can be used to tackle all the polyps in the index surgery, which are widely available in all the centres worldwide. The technicalities and the methods of this unique approach have been described.

422—COLORECTAL—Benign

TRANSANAL MINIMAL INVASIVE SURGERY: HOW WE DO IT

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Transanal minimal invasive experience (TAMIS) is a technique gaining wider acceptance due to technological improvements. There is an increasing incidence of colorectal cancer, especially in younger population, the middle rectal cancer being one of the most challenging situations, where, after neoadjuvant treatment, the surgeon has to do a correct oncological resection in a difficult pelvis with the intention to preserve the sphincter. TaTME is a very promising technique, that allows the achievement of this purpose, but with a learning curve that starts with TAMIS.

We present our experience with TAMIS, with a focus on the problems we had to tackle. The type of anal port, the placement of trocars, the insuflation were all steps with tips and tricks we had to learn. We did "full thickness" resections and the gap closure was sometimes difficult. The cases we operated were middle rectal polyps deemed as unresectable by endoscopy and one middle rectal cancer with complete response after neoadjuvant treatment. Our series of patients was successful and without complications.

The conclusion is that approaching rectal cancer by transanal minimal invasive approach requires TAMIS as an initial and mandatory step, in order to overcome the technical difficulties associated with this particular type of approach.

524—COLORECTAL—Benign

LAPAROSCOPIC LADD'S PROCEDURE FOR INTESTINAL MALROTATION IN AN ADULT

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Backgrounds: Intestinal malrotation is relatively common in children. Intestinal malrotation is found to be 1 in 500 including asymptomatic and 1 in 5000–20,000 in the case of symptomatic, with 80% occurring within one month after birth. Adult onset is rare and is said to be about 0.2–0.5%. We performed laparoscopic Ladd's procedure for intestinal malrotation in an adult.

Cases: A 40-year-old female who had abdominal pain presented to our hospital. She had been followed up in the department of internal medicine because of intestinal malrotation and midgut volvulus since her teenage years. She had sometimes become a bowel obstruction and had been treated conservatively. At this time, she had a bowel obstruction and did not improve conservatively. So, she was introduced to our department.

Surgical Procedure: We performed laparoscopic surgery via 3 ports. The abdominal findings showed intestinal malrotation of "incomplete rotation type". The Ladd's band was present cross the duodenum, which was cut off. and the duodenum was moved from the retroperitoneum. Next, the adhesion between the duodenum and the cecum is peeled off. Superior mesenteric artery (SMA) and Superior mesenteric vein (SMV) were exposed. Then we were confirming that the root of mesentery and its torsion was released. Finally, the appendectomy and cholecystectomy were performed. There was no problem with the postoperative course and bowel obstruction was not occurred.

Discussion: In this case, surgery was performed under a laparoscope, but there was a report that the recurrence rate of intestinal volvulus was higher than in open surgery. We thought that the reason was an insufficient exposure of the root of SMA/SMV. Laparoscopic Ladd's procedure is not only to cut off the Ladd's band, but also to expose the mesenteric root of SMA/SMV fully.

Conclusion: We performed successfully laparoscopic Ladd's procedure for intestinal malrotation in adult.

548—COLORECTAL—Benign

MANAGEMENT OF DOLICHOCOLON: A CASE SERIES

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Introduction: Dolichocolon is an anatomic type of colon characterized by a long, winding and redundant colon, firstly described by Kienboeck in 1912. Typical symptoms are abdominal pain, abdominal distension and constipation, but a wide range of symptoms and signs can be represented: recurrent abdominal pain, dyspepsia, bowel obstruction, volvulus. Diagnostic tools are: x-ray barium enema, phase-contrast abdominal CT, endoscopy. Moreover, x-ray examination of colonic peristalsis by radiological markers can be useful in selected cases. The most frequent affected site is the left colon, particularly descending colon/sigma, leading to volvulus. It can be treated by endoscopy initially.

Case Series: We report our last experience: five patients observed from 1 July 2019 to 31 October 2019. Four patients were characterized by an enormous dolichosigma and one patient presented a right dolichocolon (cecum and trasversum colon deeply in the pelvis!). Patients data: 3 men and 2 women (M/F = 1,5/1); mean age 67.5 years old (range: 40–86 years): all patients suffered with severe constipation and recurrent abdominal pain. Conservative treatment (fiber diet, laxative drug, prokinetic therapy) was unsuccessful in all cases. They often were admitted in hospital to abdominal pain and distension management. One patient was treated by laparoscopic adhesions' removal five years ago.

Results: All patients needed laparoscopic colonic resection: two patients were treated by Hartmann resection because recurrent volvulus after various endoscopic attempts; two patients were treated by left colonic resection and colon-rectum Knight-Griffen anastomosis, protected by ileostomy; one patient underwent right colon resection.

One postoperative complication: one anastomotic bleeding after right colon resection with consequent re-operation for haemostasis. Two ileostomies were closed with no complications in a period between 4 and 6 post-discharge weeks.. No Hartmann conversions because patients'age (both 86 years old) and satisfying colostomy management by care-givers.

Conclusions: Dolichocolon is not a rare condition and usually diet modification and laxative therapy are adequate to control symptoms. In several cases we observe very severe constipation and consequently surgical treatment becomes a valid therapeutic option. Laparoscopic approach is feasible in all ages, it is safe and effective: we obtain better postoperative pain control, hospital stay reduction and earlier return to daily activities.

549—COLORECTAL—Benign

RIGHT RETROPERITONEAL ABSCESS OR RECURRENT APPENDICITIS?

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We present a case of a 26th years old patient referred to our emergency department with shooting pain localized in right iliac fossa.

The patient underwent laparoscopic appendectomy four moths before in another hospital. After the operation, in postoperative day 7th a CT scan demonstrated an abscess located in right iliac fossa and a pig tail drainage was positioned under adiological guide. The patient was discharged after 6 days.

The patient described ongoing discomfort, pain and fever.

After four months he was admitted to another hospital in emergency department and a ct scan was performed. The abscess was still described in right iliac fossa.

After the ct scan the patient was referred to our hospital and scheduled for a diagnostic laparoscopy.

The video shows the presence of a voluminous, chronic abscess in right iliac fossa involving the cecum, from the abscending colon to the hepatic flexure and strong adhesions with the gerota fascia. A difficult ileo-colic mobilization was obtained and two hem-o-locks were revealed inside the abscess cavity. The inflammatory disease was substained by a still present residual appendix.

At this point the hem-o-locks were removed and a completion laparoscopic appendectomy was performed, two drainages were positioned inside the abscess cavity and in pelvis.

The patient was discharged in postoperative day five in good condition without pain in right iliac fossa.

637—COLORECTAL—Benign

NEUTROPHIL TO LYMPHOCYTE RATIO A PROMISING PROGNOSTIC MARKER TO ASSESS DISEASE SEVERITY AND PREDICT LENGTH OF STAY FOR ACUTE DIVERTICULITIS

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Aims: Although computed tomography (CT) has an important role in evaluating the severity of diverticulitis no biomarker predicts severity and accurately differentiates uncomplicated from complicated diverticulitis. Neutrophil-to-lymphocyte ratio (NLR) is a novel biomarker that has been recently studied in diverticulitis. The aim of our study was to assess the accuracy of biomarkers, including NLR, in predicting complicated diverticulitis and length of hospital stay (LOS).

Methods: A single centre retrospective study of consecutive patients admitted with a provisional diagnosis acute diverticulitis to an emergency department (ED) of a regional Irish hospital, between January 2018 and December 2018 was preformed. A database was constructed from patient notes and electronic patient records. NLR, C-reactive protein (CRP) levels, bilirubin, albumin and LOS where examined. Median levels were compared using the Mann–Whitney U-test. Diagnostic accuracy of each biomarker was assessed using receiver operating characteristic curve analysis, with optimal cut-off points determined by Youden's Index (J). Correlations were assessed using Pearson's correlation coefficient (r).

Results: A total of 141 patients with a mean age of 61.6 years were identified. 14.89% had a diagnosis of diverticulosis, 61.7% diverticulitis, and 11.34% diverticulitis complicated by perforation and abscess. The mean NLR value was higher in the perforation (11.39, Standard Deviation (SD): 1.71) and abscess (8.73, SD: 5.47) groups compared to uncomplicated diverticulitis (5.10, SD: 2.73) and diverticulosis groups (2.61, SD: 7.42). Higher mean CRP (123 mg/l vs. 77.8, $p = 0.003$) and lower albumin (34.7 g/l vs. 37.2, $p = 0.009$) was seen in complicated diverticulitis. LOS was higher in the complicated group compared to uncomplicated group (6.84 vs. 3.88 days, $p = 0.005$). NLR ($r = 0.458$, $p < 0.001$) and CRP ($r = 0.282$, $p > 0.001$) had a positive correlational with LOS. NLR had the greatest accuracy of the biomarkers in predicting complicated diverticulitis with an area under the curve of 0.76 ($p < 0.0001$). The optimal cut off for the NLR was > 7.75 (Youden's index = 0.52).

Conclusion(s): NLR, CRP and albumin levels on admission to ED predicted the presence of complicated diverticulitis and a longer LOS. NLR is a useful adjunct to CT in stratifying patients with diverticulitis and this simple available laboratory biomarker can be implemented into clinical practice to optimise patient outcomes.

639—COLORECTAL—Benign

SAFETY AND EFFECTIVENESS OF HEMORRHOIDAL ARTERY LIGATION USING THE HAL-RAR TECHNIQUE FOR HEMORRHOIDAL DISEASE

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Introduction: Hemorrhoidal disease is the most common disease of the anal canal and 1/3 of the general population experience symptoms. A wide variety of methods has been proposed for treatment, with excisional hemorrhoidectomy remaining the gold standard. Over the last decades, transanal hemorrhoidal artery ligation (HAL) is gaining popularity and combined with recto anal repair (RAR) can achieve very good results. The aim of the study is to assess the safety and effectiveness of HAL-RAR technique in patients with hemorrhoidal disease.

Methods: Retrospective study from January 2010 to November 2019 of patients who underwent HAL-RAR technique for hemorrhoidal disease. Demographic data, degree of hemorrhoidal disease, length of hospital stay, postoperative pain evaluated using the visual analogue scale (VAS), complications and recurrence were recorded. Patients were followed-up at postoperative day 1 and 8, and at 1 and 6 months.

Results: A total of 105 patients (60 men, 45 women) with grade II hemorrhoids resistant to conservative treatment, grade III and IV underwent HAL-RAR technique. Median age was 49 (range, 20–86) years. Two patients with hemorrhoid thrombosis underwent emergency surgery with additional excision of the thrombosed hemorrhoid. Median length of hospital stay was 2.23 (range, 1–13) days. The vast majority of patients reported mild pain on the 1st postoperative day. Patients with additional excision of a hemorrhoid experienced medium pain with symptoms of tenesmus. A gradual decrease of this sensation was observed till the 8th postoperative day. One month after surgery the patients didn't report any pain.

Complication rate was 7.61%: two patients presented urinary retention, 3 dyschezia, 2 bleeding (they were treated conservatively) and 1 necrosis of a hemorrhoid which was treated by performing an additional hemorrhoidectomy. The 84.76% of patients confirmed complete resolution of symptoms after one month. In six months, two patients reported mild symptoms and seven patients presented recurrence of the hemorrhoidal disease and underwent additional surgery.

Conclusion: HAL-RAR technique is a safe and effective minimal invasive operative technique related to a high percentage of success, and low complication and recurrence rates. Long term follow up is lacking and would better establish the results of this technique.

702—COLORECTAL—Benign

MANAGEMENT AND EVOLUTION OF ACUTE DIVERTICULITIS WITH PERICOLIC FREE GAS (ADIFAS): A PROTOCOL FOR A MULTICENTRE OBSERVATIONAL STUDY

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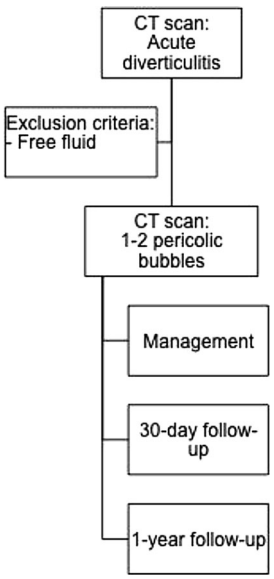
Project awarded at 'EAES Research Talent Academy 2019'.

Aim: The severity of diverticulitis is usually graded with the use of modified Hinchey Criteria. However, there is a condition often seen in the CT scan that is not included in this classification itself; 1–2 pericolic bubbles but no free air or fluid into the abdomen or above the liver. Outcome in these patients remains unknow. We aim to analyse the treatment that these patients and their evolution over the first year after the diagnosis in order to predict the disease related outcome.

Methods: The study is set up as a retrospective multicentre observational study. Inclusion criteria are Patients over 18 years old, Diagnosed of acute diverticulitis with a CT scan reported as 1–2 pericolic bubbles. Exclusion criteria: (1) CT scan showing free distant bubbles in the abdomen. (2) CT scan showing free fluid.

Accepting an alpha risk of 0.05 and a beta risk of 0.2 in a two-sided test, 137 subjects are necessary in the observed group to recognize a difference in morbidity greater than or equal to 10%. A proportion in the reference group has been estimated to be 20%. It has been anticipated a drop-out rate of 0%.

Primary outcome is 30-day morbidity and mortality. Secondary outcomes include malignancy and 1 year morbidity including recurrences and ongoing disease. Data will be collected in an online repository. The CT scans will be reviewed by 2 experienced independent radiologists. The management of these patients at the moment of the diagnosis will be recorded, as well as their evolution over the first year during the outpatient clinics. Figure 1 represents the study flow chart.



Results: Data will be collected in an online secure and protected repository (Castor edc). The planned study period is 2 years (01/01/2020–31/12/2021).

CT scans will be reviewed by 2 experienced radiologists. Every other CT scan performed during the follow-up will be reviewed by the same radiologists.

The management of these patients at the moment of the diagnosis will be recorded, as well as their evolution over the first year during the outpatient clinics.

Conclusions: This study protocol is a new approach to an unknown entity in diverticulitis. We are convince that the outcomes are clinically relevant to patients and interesting for all physicians treating diverticulitis.

841—COLORECTAL—Benign

EMERGENCY LAPAROSCOPIC HARTMAN'S PROCEDURE FOR PERFORATED DIVERTICULITIS- A VIDEO VIGNETTE

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It is generally accepted that acute diverticulitis complicated by small paracolic abscess can be treated with antibiotics only. However, some patients fail on conservative management and it has been shown that up to 25% of hospitalisations for acute diverticulitis require surgical intervention. Open Hartman's procedure is the commonest surgery performed in this setting however the same operation can be performed laparoscopically in experienced hands.

Here we present a case of a 54-year-old male who failed conservative management for complicated acute left colonic diverticulitis. As percutaneous drainage was not possible in this case, the patient proceeded to laparoscopic Hartman's procedure. In our video we show the key intraoperative steps.

Early post-operative recovery was complicated by intra-abdominal collection which was successfully managed conservatively. The patient underwent laparoscopic reversal of his stoma 6 months after the initial operation.

This case demonstrates that laparoscopic sigmoid colectomy in an emergency setting is feasible in patients who are hemodynamically stable and able to tolerate laparoscopy. Minimal invasive surgery can achieve less trauma and is associated with decreased systemic inflammatory response. It can improve the post-op recovery in terms of reduced rates of pneumonia, earlier resumption of bowel function and lower pain levels, which in turn allow earlier mobilisation. In addition, laparoscopic surgery results in less adhesions compared to open approach, making further laparoscopic surgery possible and relatively easy.

1001—COLORECTAL—Benign

ENDOSCOPIC DETORSION IN THE TREATMENT OF VOLVULUS

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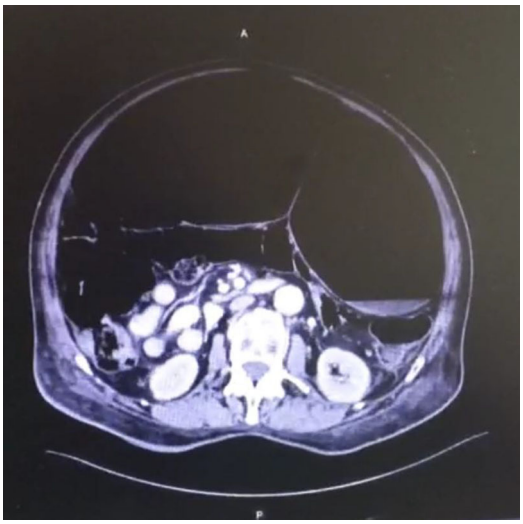
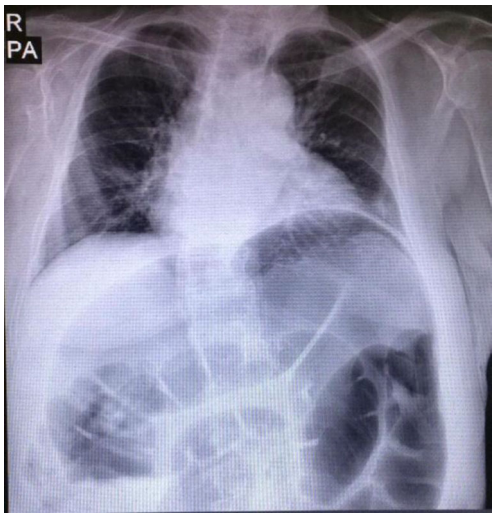
Aims: Volvulus is the development of mechanical intestinal obstruction due to any GIS torsion. Although it is frequently seen in the sigmoid colon or cecum, it can rarely involve the stomach, gallbladder and other segments of the colon. In recent years, the incidence of small intestinal volvulus has increased due to increased bariatric surgical applications. Early decompression is life-saving in this condition, which can otherwise rapidly lead to ischemia, necrosis and perforation. Colonic detorsion can be performed by surgical and endoscopic methods especially in sigmoid volvulus (Figs. 1, 2). Endoscopic detorsion (ED) is useful because it causes regression of symptoms such as distension, nausea, vomiting and respiratory distress. Although ED has high rates of recurrence, it provides relief to the patient before surgical treatment and prevents the development of ischemic colmplications. In addition, ED alone has a therapeutic role in patients with a high surgical risk or who do not wish to undergo surgery. Our aim is to present the results of patients who underwent ED and surgical treatment due to volvulus between 2013 and 2019.

Methods: Demographic data, endoscopic detorsion success rates, surgical outcomes and data of patients treated without surgery who were admitted with colonic volvulus between 2013 and 2019 were retrospectively analyzed.

Results: Sixty-seven patients underwent 79 endoscopic detorsion procedures. Endoscopic detorsion was performed once in 48 patients, twice in eight patients and three times in five patients. 28 patients underwent surgical treatment after ED, and 33 patients underwent nonoperative follow-up because the patient did not want surgical procedures. Anterior resection was performed mostly in the operated patients and a stoma was created in 8 patients. ED was successful in 69 procedures (87.3%). The recurrence rate of ED was 22.6%. Fifty-four percent of the patients were treated non-surgically using only ED. There were no complications or mortality during the ED procedure.

Conclusion: The treatment of volvulus is surgical. ED is a minimally invasive method that can quickly correct ischemic complications before surgery and is an alternative treatment method for patients who do not want surgical treatment.





1003—COLORECTAL—Benign

SELECTION AND DEVICE OF OPERATIVE PROCEDURE FOR RECTAL PROLAPSE ACCORDING TO GENERAL STATUS, PROLAPSED LENGTH AND COMBINED POP

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Aim: In our facility, anesthesia and operative procedure for rectal prolapse were selected and devised by general status, prolapsed length from anal verge and combined pelvic organ prolapse (POP). We defined complete rectal prolapse as length 3 cm $\leqq$ and incomplete rectal prolapse (mucosal prolapse) as length < 3 cm.

Methods: 1st.choice for complete rectal prolapse was trans abdominal rectopexy; (1) general anesthesia and pneumoperitoneum possible → laparoscopic rectopexy, (2) general anesthesia possible/pneumoperitoneum impossible → open rectopexy, (3) general anesthesia impossible → lumber anesthesia, open rectopexy. Our modified (m-) Ripstein method (T-shaped BARD mesh was made longer horizontal and vertical length than original to avoid rectal stenosis) was selected to whom combined POP (rectocele, uterine prolapse and vesicocele). Our re-modified (re-m-) Wells method (rectangular BARD mesh was wrapped posterior 4/5 circumference to be fixed at ventral rectum) was selected to whom uncombined POP or male. Laparoscopic ventral rectopexy (LVR) was selected to whom of 3–5 cm prolapsed length or rectocele only. Mesh was fixed to sacrum with AbsorbaTackTM (Medtronics) or CapSureTM (BARD) and fixed to rectum with Endo UniversalTM Stapler (Medrtonics) or 3–0 ETHIBOND EXCELTM (Johnson & Johnson) suturing. 2nd.choice for complete rectal prolapse impossible of trans abdominal surgery and all incomplete rectal prolapse were trans anal surgeries under genal/lumber/local anesthesia; (1) Gant Miwa-Thiersch (G-M-T), (2) Delorme method, (2) mucosal resection.

Results: 154 cases of rectal prolapse were operated from February 2007 to December 2019. 1st.choice of trans abdominal rectopexies were 126 cases (81.8%) including m-Ripstein 63, m-Wells 25, re-m-Wells 33 and LVR 5 cases. Anesthesia/approaches were selected general anesthesia/laparoscopic 108 cases (70.1%), general anesthesia/open 11 cases (7.1%) and lumber anesthesia/open 7 cases (4.5%). Trans anal surgeries were 28 cases (18.2%) including G-M-T 8, Delorme 17 and mucosal resection 3??? cases. Anesthesia were selected general 2, lumber 19 and local 7 cases. Pre/post-operative fecal incontinence 33/15% ($p < 0.05$) in m-Ripstein group, 16/0% ($p < 0.05$) in m-Wells group, 68/24% ($p < 0.001$) in re-m-Wells group, pre/post-operative urinary incontinence 37/15% ($p < 0.05$) in re-m-Wells group and pre/post-operative constipation 82/35% ($p < 0.05$) in Delorme group were improved significantly. Recurrence rate were 0% in m-Ripstein group, 8% (n = 2 of complete prolapse) in m-Wells group, 6.1% (n = 2 of incomplete prolapse) in re-m-Wells group, 0% in LVR group, 12.5% (n = 1 of complete prolapse) in G-M-T group, 23.5% (n = 4, complete 3, incomplete 1) in Delorme group and 0% in mucosal resection group.

Conclusions: We showed selection and device of optimal operative procedure for rectal prolapse according to general status, prolapsed length and combined POP, and obtained good outcomes.

1104—COLORECTAL—Benign

SUCCESSFUL MINILAPAROSCOPIC RECTOPEXY FOR PATIENTS WITH RECTAL PROLAPSE

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

Methods: From Janualy of 2014 to September of 2018, 9 consecutive patients were assigned to undergo laparoscopic rectopexy. We also had 9 cases of transperineal procedure during the same period of study at our hospital. We conducted to study our modified technique using reusable metallic trocar (ENDOTIPTM, 3.3, 6 mm in diameter, KARL STORZ GmbH & Co. KG, Tuttlingen, Germany) as a working port, and VERSAPORTTM, 5 mm in diameter, COVIDIEN, INC., Mansfield, MA, USA, XCELTM, 5 mm in diameter, ETHICON ENDO-SURGERY, INC., Pittsburgh, PA, USA) as a camera port. Straight-type grasping forceps and dissecting forceps (3.3 mm in diameter) were used through the left lower abdominal quadrant port with the triangular co-axial setup. GYNEMESHTM (ETHICON ENDO-SURGERY, INC., Pittsburgh, PA, USA) was used in minilaparoscopic surgery group.

Results: Clinical records of 9 cases of transperineal rectopexy (From January of 2014 to September of 2018) were analyzed retrospectively in background factors, operative time and length of hospital stay. Of them, we had 9 cases with modified laparoscopic surgery (male3, female 6, average age of 76.3, range 59–90) as was 83.2 (m2, f 7), 75–92 in the control group. The average operative time in the modified group was 402.2 min (212–860), significantly longer than that of 38.5 (20–55) in the control group. The median hospital stay in the modified group was 8.0 days (6–21), same as that of 7.0(3–21) in the control group. Postoperative complications were not observed in all modified laparoscopic surgery group with mesh repair.

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

1125—COLORECTAL—Benign

A CRITICAL VIEW OF SAFETY FOR LAPAROSCOPIC APPENDICECTOMY: THE ISSUE OF STUMP APPENDICITIS

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Case: We present a case of a 27-year-old gentleman who presented to our hospital. He underwent a laparoscopic appendectomy six months previously. His surgery was complicated by a post-operative collection which was drained under CT guidance. He had no past medical history and was on no regular medication. He presented with a one day history of right iliac fossa (RIF) pain. The pain was constant, dull in nature and was progressively getting worse. It was associated with anorexia, nausea and two episodes of vomiting. He denied rigors, diarrhoea, constipation or urinary tract symptoms. On examination, he was febrile (39 °C), his abdomen was soft but tender in the RIF with guarding. His laboratory investigations were significant for a C-reactive protein level of 32 mg/L and a white cell count of 14x109/L. The differential included a post operative collection. He underwent a CT scan of his abdomen and pelvis.

The CT scan showed a thickened oedematous wall of the inferior pole of the cecum along with an appendicular stump which was acutely inflamed (Fig. 1). The patient underwent laparoscopy in which an acutely inflamed appendicular stump was seen (Fig. 2). It was successfully resected. The patient recovered well and was discharged home on post-operative day 2. He has reported no further complications at his 3-month review clinic.

Discussion: Stump appendicitis continues to pose a diagnostic dilemma both for surgeons and emergency department clinicians. We quickly remove acute appendicitis from our differential diagnosis list in patients presenting with RIF pain when we learn they have had previous appendectomy. The temporal relationship between index appendectomy and onset of stump appendicitis is hugely variable ranging from weeks to years which further complicates matters. This led Subramanian et al. to propose a critical view of safety (CVS) for appendectomy similar to that famously developed by Strasberg et al. in 1995 for laparoscopic cholecystectomyii. This CVS for appendectomy centres on correctly identifying the appendicular-cecal junction and thus the appendicular base. The CVS is achieved when the taenia libera is seen clearly on the surface of the cecum running into the base of the appendix with the appendix elevated and displaced inferiorly and the terminal ileum in the foreground at laparoscopy. In this position, the mesoappendix can then be divided appropriately and the base clearly identified.

Conclusions: We can aim to limit the risk of stump appendicitis by encouraging surgeons to adopt the CVS for appendectomy suggested by Subramanian et al.

1154—COLORECTAL—Benign

FACTORS PREDICTING SUCCESSFUL OUTCOME IN PERCUTANEOUS DRAINAGE OF DIVERTICULAR ABSCESSES

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Introduction: Percutaneous CT-guided drainage is a therapeuthic option, alternative to open or laparoscopic surgery in patients with acute diverticulitis and pelvic abscess. Nevertheless, after a temporary clinical recovery, surgery might still be necessary, resulting in the failure of the percutaneous approach. The aim of this study is to determine predictors of success in the percutaneous interventional technique.
Methods: All the patients with acute diverticulitis admitted for observation in the period 1/01/2014–31/12/2018 were enrolled in the study. All of them underwent clinical examination, laboratory tests and contrast-enhanced abdominal CT, and were then grouped according to WSES (World Society of Emergency Surgery) 2016 classification. All patients with pelvic abscess (WSES 2A) underwent percutaneous CT-guided drainage. Among the latter, two patient subgroupings were identified based on whether or not they had needed surgery within 30 days after the procedure. Finally, the personal, clinical, biohumoral and radiological features of the two groups were compared.
Results: In the study period, 240 patients with acute diverticulitis and pelvic abscess presented to the Emergency Unit of Careggi University Hospital, Florence, for surgical evaluation. 55 patients underwent percutaneous abscess drainage and 33 of them needed surgical intervention within 30 days. Indications to surgical intervention were: abscess persistence (n = 11), progression to diffuse peritonitis (n = 7), worsening sepsis (n = 4), bleeding (n = 1) and colic stenosis with obstruction (n = 10). Patients who did not need surgery were found to have a significantly lower mean CRP (C-reactive protein) and lower mean abscess size. In particular, two cut-off values predicting successful outcome after non-operative management were identified: CRP < 170 mg/L and abscess size < 7 cm. No differences were found regarding epidemiologic, anthropometric and clinical features.
Conclusions: Interventional percutaneous drainage may be unsuccessful in patients with acute diverticulitis and pelvic abscess. In particular, high levels of CRP and larger sized abscesses have been found to be predictors of failure leading to a delayed surgical intervention. Direct surgical treatment might be the primary therapeutic option in the management of these cases. Probably the current WSES is not the most comprehensive classification to best identify the patients who really might benefit from the interventional percutaneous drainage. Nevertheless non-operative management could be a valid therapeutic option in high risk patients.

1164—COLORECTAL—Benign

LAPAROSCOPIC TREATMENT OF PERFORATED SIGMOID DIVERTICULITIS WITH REAL TIME INTRAOPERATIVE LEFT URETERAL ICG DETECTION

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Introduction: the authors report a clinical case operated for sigmoid diverticulitis complicated by perforation involving left peritoneum, left ovary and uterus.
Clinical Case: a 69 years old woman was admitted for increasing abdominal pain and fever. Contrast enhanced CT scan revealed a perforated sigmoid diverticulitis involving uterus and left ovary.
The patient was scheduled for left hemicolectomy with laparoscopic approach. Before surgery started, a 6-F ureteral catheter was inserted into the left ureteral orifice. Twenty-five milligrams of ICG was dissolved in 10-mL of sterile water and injected through the open catheter. The same procedure was repeated on the opposite side.
After the pneumoperitoneum a sigmoid complicated diverticultis with involvement of the left pelvic peritoneum with left ovary was confirmed.
During the course of surgery, the NIR light on the camera was used to excite ICG molecules and the ureter fluoresced green being visible throughout the entire case.
A laparoscopic left hemicolectomy with transanal anastomosis was performed, and the ICG fluorescence was used to assess anastomotic perfusion.
Results: operative time was 178 min, the patient was discharged on postoperative day 6th. Pathological report confirmed a complicated sigmoid diverticulitis.
Conclusion: Intraureteral injection of ICG and visualization under NIR light allows real-time delineation of the ureter. This technology can be helpful to prevent iatrogenic ureteral injury during pelvic surgery.

1248—COLORECTAL—Benign

SURGICAL EXCISION OF LARGE RETRORECTAL TUMOR USING TRANSANAL MINIMALLY INVASIVE SURGERY

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Introduction: Retrorectal tumors are a rare entity. Surgical excision is the treatment of choice, classically using an abdominal or a posterior approach, or a combination of both.
Methods: Transanal minimally invasive surgery (TAMIS) is a new surgical approach to treat these lesions. We report a case of a large retrorectal tumor operated via TAMIS.
Case Report: A 38-year-old woman was incidentally diagnosed with a retrorectal tumor in sterility tests. The patient had rectal discomfort and perineal pain. Digital rectal examination identified a solid, but soft mass in the lower rectum, located at 4 cm from the anal verge and without invasion of the rectal mucosa. Abdominal examination did not show any irregularity. No abnormalities were found in blood or serum tests. Pelvic magnetic resonance imaging (MRI) detected a large retrorectal multilocular cystic lesion, well delimited, measuring 7.2 cm, located above the levator ani muscle of the left side and in contact with the coccyx.
The patient underwent transanal resection of the tumor, performing a proctotomy, closed after the extraction of the lesion in a single layer with a running suture. Postoperative was without morbidity and the patient was discharged on the 2nd day after surgery. The pathology showed the tumor was an epidermoid cyst.
Discussion: TAMIS for retrorectal tumors is an alternative approach to classical procedures, technically feasible and safe for selected cases. It allows for complete excision of these lesions with a very low perioperative morbidity rate.
If TAMIS is considered, a complete preoperative evaluation is necessary to avoid approaching malignant masses, due to the possibility of tumor seeding or spreading.
In the literature, the recommendations of this technique are for tumor sizes of 3–4 cm and tumors located below S3. With this case report we demonstrate that it is feasible to use this approach to operate larger tumors.

1252—COLORECTAL—Benign

LAPAROSCOPIC VENTRAL RECTOPEXY (LVR) FOR RECTAL PROLAPSE (D'HOORE TECHNIQUE)

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Aims: Ideal technique for total rectal prolapse surgical treatment is debated. LVR has been proposed on this point, with the main advantage of absence of mesorectal posterior or lateral dissection, in order to avoid autonomic nerve damage and prevent postoperative constipation, that is the principal adverse event of posterior rectopexy. LVR had nevertheless a limited diffusion. This video presents surgical technique of LVR in a case of total rectal prolapse.
Methods: A 51 years old woman presented with a total rectal prolapse of 6 cm., evolving from 2 years. She had good general conditions and no associated significant comorbidities. She had a preoperative study with colonoscopy, anorectal echography, defeco-MRI, anorectal manometry. She had a normal continence and a moderate constipation. A moderate descending perineum (3,5 cm) was showed by MRI. No symptoms or instrumental data in favour of obstructed defecation syndrome were found.
Results: Patient was installed in a modified lithotomy position with both arms along the body, and catheterized. A 12° Trendelemburg position was obtained. The surgeon was on the patient's right side, the assistant on the left. Small bowel was retracted out of the pelvis. Uterus was suspended using a transparietal suture. First, a wide douglassectomy was performed, with incision of anterior peritoneum at the level of posterior vaginal cul-de sac. Posteriorly, the peritoneum on the anterior rectal wall was excised. The recto-vaginal septum was dissected until the elevators level. Thereafter, a peritoneal incision was made over the sacral promontory. A retroperitoneal tunnel was created, in order to put a 14 cm long–8 cm wide polypropylene prothesis. This was sutured to the anterior rectal wall with six 4/0 polypropylene stitches. On the other side, it was fixed on the promontory by 2 Pro-tacks and two polypropylene stitches. Peritoneum was closed by barbed continuous suture. Postoperative period was uneventful.
Conclusions: LVR for surgical treatment of total rectal prolapse is more complex than posterior rectopexy or transanal techniques, but allow a limited dissection, that seems to have less consequences on postoperative constipation. In selected candidates it seems to be a good option, with limited long term complications (e.g. band erosions).

1409—COLORECTAL—Benign

EMERGENCY LAPAROSCOPIC VERSUS OPEN RESECTION FOR ACUTE LEFT SIDED COLONIC DIVERTICULITIS

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Introduction: For complicated diverticulitis generally surgical resection of the affected bowel segment is required; this can be performed through conventional open or laparoscopic surgery techniques. Minimally invasive laparoscopic surgery offers an alternative approach to open surgery. Objectives: To evaluate the effectiveness of laparoscopic surgical resection with primary anastomosis in emergency setting for individuals with acute left sided colonic diverticulitis, provided performed by laparoscopic surgeons with important experience in emergency surgery. Patients and methods We included patients of the emergency department between 2014 and 2018, 296 patients underwent emergency colorectal surgery. Of these, 77 for acute left sided colonic diverticulitis. The median age ranged from 32 to 91 years. According to WSES classification, 5 patients presenting with Hinchey stage I, 22 with Hinchey II (11 Hinchey IIa; 11 Hinchey IIb), 23 with Hinchey III and 13 with Hinchey IV. Moreover, 11 patients presenting with a stenosis and 2 with a diverticular hemorrhage.Surgical procedures performed include: 44 surgical resection and anastomosis with or without stoma (22 with diverting stoma and 22 without stoma), 20 Hartmann resection, 8 peritoneal lavage and drainage, 4 total colectomy and 1 colostomy without resection.The 44 surgical resection and anastomosis include 15 emergency laparoscopic surgical resections and 29 open surgical resection.Types of outcome measures: operative and postoperative time, post operative major complications (reoperation rate for anastomotic leaks and intra-abdominal abscess) and minor complications (wound infection, prolonged postoperative ileus). Results Patients undergoing surgical resection and anastomosis showed better outcomes than Hartmann resections.Low-quality evidence suggests that operating time was longer in the laparoscopic surgery group than in the open surgery group.
High-quality evidence suggests a significant increase in postoperative time in the open surgery group than laparoscopic group.Open surgery group reports 6 post operative major complications and 10 minor complications.Laparoscopic surgery group reports 1 reoperation for anastomotic leak and 3 post operative minor complications. Conclusions Treatment of acute left sided colonic diverticulitis can be performed through conventional open or laparoscopic surgery techniques.

Currently results from the present study indicate that evidence to support or refute the safety and effectiveness of laparoscopic surgery versus open surgical resection for treatment of patients with acute diverticular disease is not yet proven but has already made significant results in terms of postoperative time, and a possible lower rate of post operative major complications in selected patients.Emergency laparoscopic resection for the treatment of perforated diverticulitis is feasible in selected patients provided they are handled by experienced hands.

1492—COLORECTAL—Benign

AN UNUSUAL CAUSE OF BOWEL OBSTRUCTION

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Introduction: Tuberculosis is one of the top ten causes of death globally. Extrapulmonary tuberculosis (EPTB) occurs in about 20% of tuberculosis while abdominal tuberculosis constitutes about 10% of EPTB. Abdominal tuberculosis continues to be common in the developing world, though there is also increase in the incidence of TB in developed countries due to increasing prevalence of immunocompromised individuals from acquired immunodeficiency syndrome (AIDS) infection, immigrant's population and deteriorating social conditions.

Case Report: We report the case of a 25 year old Indian gentleman who has been living in Ireland for five years and presented to the emergency department with a 2 week history of generalised abdominal pain and vomiting, associated with night sweats and weight loss of 10 kg over 4 months. He had no medical or surgical history but family history revealed that his father had tuberculosis 16 years ago. Physical examination revealed abdominal distension, diffuse tenderness and guarding with increased bowel sounds. Blood tests showed a WCC 13 x 109/L, CRP of 90 mg/L and lactate of 3 mmol/L.
Plain abdominal radiograph showed dilated loops of small bowel and computed tomography confirmed small bowel obstruction, with matted bowel loops, extensive irregular mural thickening, moderate volume ascites, omental thickening and nodular peritoneal deposits. Diagnostic laparoscopy showed widespread peritoneal, omental and small bowel white plaque deposits. Extensive adhesions to the anterior abdominal wall were divided, biopsies were taken from the omental and peritoneal deposits and ascitic fluid sample was sent for culture, Zeihl-Neilson stain and cytology. The patient recovered well postoperatively.

Confirming the diagnosis was challenging. Although Mantoux test returned positive, this was not sufficient to diagnose current TB infection. ZN staining showed no acid-fast bacilli on microscopy and microbiological cultures failed to grow mycobacteria.

Histological examination of biopsy samples however, did reveal widespread caseating granulomas, characteristic of TB. Nucleic acid amplification testing (NAAT) using PCR was subsequently performed on ascitic fluid samples and was positive for Mycobacterium tuberculosis.

Chest radiographs showed no signs of pulmonary involvement. Public Health were notified and concurrent HIV testing returned negative. Anti-TB quadruple therapy was commenced for minimum of six months, with liver, renal and ophthalmology baseline assessments performed.

Conclusion: Traditional methods of TB diagnosis are based on sputum samples and are highly likely to be negative in EPTB. When abdominal TB is suspected, it is recommended to use histological diagnosis and start empiric therapy if there is a high clinical suspicion of infection. Abdominal tuberculosis should be considered as a differential of causes of intestinal obstruction even in developed countries.

1539—COLORECTAL—Benign

DIVERTICULAR DISEASE IN THE YOUNG AGE GROUP: CLINICAL COURSE AND MANAGEMENT

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Introduction: Diverticular disease is a common disease which is classically described in the elderly. However, recently its incidence in young patients under 50 years is being reported more frequently. Diverticular disease has a wide spectrum of presentations ranging from asymptomatic diverticulosis to severe life-threatening forms including abscesses, fistulae, perforation or bleeding. Classically, the diverticular disease in the young was considered a more virulent form with a higher recurrence rate necessitating more surgical interventions than in the elder, However, this old notion has been recently challenged. The aim is to study the clinical course of diverticular disease in the young age group < 50 years to evaluate the differences related to the predisposing risk factors, presentation, severity, complications, recurrence rate, and the way of management.
Methods: A retrospective study of the patients admitted with diverticular disease in King Hamad University Hospital from 2016 to 2019. Patients were divided into 2 groups; group I (Young, < 50) and group II (Old, ≥ 5). A comparison was held between the two groups according to the proposed risk factors, predictors of severity, the clinical, and the way of management. Different variables were analyzed using the appropriate statistical tests. Statistical significance was taken as $p < 0.05$.
Results: 134 patients were included; 76 (56.7%) males and 58 (43.3%) females. The median age was 59.5 (Min.–Max.) (25–89), Mean $\pm$ SD.58.2 $\pm$ 13.5. 115 (85.8%) patients presented with diverticulitis and 19 (14.2%) with diverticular bleeding. There was male predominance in the young group, $p = 0.006$. The old group showed a higher prevalence of DM, HTN and dyslipidemia, $p = < 0.001$ for all. Moreover, the old group showed lower haemoglobin and vitamin D levels with higher steroids intake, $p = < 0.001$, 0.001 and 0.004 respectively.
There was no significant difference related to disease severity, management setting, antibiotics prescription, guided drainage, laparoscopic lavage or the need for surgery. However, recurrence was significantly higher in the young group, $p = 0.046$.
Conclusion: Diverticular disease in the young age group under 50 is more predominant in males with a higher rate of recurrence. However, it is not a severe form of the disease and can be managed the same way as in the elderly.

905—COLORECTAL—IBD

LAPAROSCOPIC TATME PROCTOCOLECTOMY: HOW TO OPERATE IN TISSUE PLANES

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Laparoscopic proctocolectomy is considered difficult due to extensive dissection, difficulties in handling mobilized colon and difficulties in pelvic dissection of the rectum. There are many techniques and approaches to this procedure that differ in the order of operation steps as well as in the operative technique. Recently, TaTME approach has been proposed and is now gaining momentum in colorectal surgery.

This is an instructional video based on a case of 72-year-old male patient with severe ulcerative colitis since 1990. In endoscopic follow-up multifocal dysplasia has been diagnosed. We present our approach to TaTME laparoscopic proctocolectomy. The video is accompanied by graphic presentation and animations to show and help to understand the most important anatomical landmarks during the resection phase. Due to the potential risk of cancer, formal oncological resection was performed. For the dissection of the colon we prefer using laparoscopic hook with monopolar cautery which allows for excellent identification of tissue planes. Proctectomy was performed using TaTME technique in mesorectal plane. Finally, mucosectomy of anal canal was performed. The patient was not scheduled for J-pouch due to severe malnutrition and poor anal sphincter function.

The entire procedure took 310 min. and there was literally no blood loss during the procedure. Postoperative course was uncomplicated, and the patient was discharged home on 4 POD.

765—COLORECTAL—Malignant

LAPAROSCOPIC REDO ANTERIOR RESECTION FOR RECTAL CANCER FOR ANASTOMOTIC RECURRENCE

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Aim: The reported incidence rates of regional recurrence for colorectal cancer after oncologic resection ranged between 5 and 19%. Locoregional recurrence occurs in the anastomotic site, the remnant colon, the peritoneal surface (nodal or soft tissue), or the retroperitoneum. As reported in the literature, in colorectal cancers, mucinous differentiation, lymphovascular invasion and anastomotic leakage are independent risk factors for anastomotic recurrence. We present a case of colorectal anastomotic recurrence treated laparoscopically.
Case Presentation: We present the case of an 86 year-old female patient. In 2014, the patient underwent a laparoscopic left colectomy for a Haggitt level 4 sigmoid polyp. The definitive histologic features showed a T2N0M0 mucinous adenocarcinoma. During the postoperative follow-up, 46 months after the left colectomy, an anastomotic recurrence was found. The patient underwent a laparoscopic colorectal resection for anastomotic recurrence. The operative time was 220 min. The patient was discharged on postoperative day 6. No complications occurred intraoperatively and postoperatively.
Conclusion: Despite the technically demanding procedure a redo anterior resection for rectal cancer recurrence may be possible and safe, but it should be demandend only in centers with high volume of colorectal procedure and high skilled surgeons.

1015—COLORECTAL—Malignant

NEOADJUVANT RADIOTHERAPY AND LAPAROSCOPIC SELECTIVE LATERAL PELVIC LYMPH NODE DISSECTION: OUR STRATEGY FOR ADVANCED LOW RECTAL CANCER

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Background: In general, rectal cancer surgery is technically demanding due to requirement of manipulation in narrow pelvic cavity. The pelvic cavity is too narrow to be able to see clearly when the open surgery is performed. With the recent development of laparoscopy, especially 3D laparoscopy, the optimal visualization has been so Laparoscopic Surgery was introduced to rectal cancer.
There is different in the treatment of low advanced rectal cancer between the Western countries and Japan. The standard treatment for advanced low rectal cancer in Westrn Countries are Neoadujvant Radiotherapy (NART) followed by Total Mesorectal Exicision (TME). Recently, it was shown that lateral pelvic recurrence after NART was the major cause of local recurrence by some reports. We thought that it was not enough NART and followed TME in case lateral pelvic lymph node (LPLN) metasatasis, so our stetoragy of advanced lower rectal cancer was NART and followed by laproscopic TME when LPLN metastasis was suspected, laparoscopic LPLN dissection (LPLD) was perfomed. We investigate safety and feasibility of our strategy.We have been performed neoadjuvant radiotherapy (NART) for clinical Stage II or III low rectal cancer since 2010. LPLD is selectively performed only for the side of a swollen lymph node defined as 7 mm or larger in long axis. LPLD with en-bloc resection of internal iliac vessels or pelvic plexus is preoperatively planned in a tailor-made manner according to imaging studies. All procedures are performed laparoscopically.
Patients and Methods: From April 2010 to December 2015, 161 patients with advanced low rectal cancer underwent curative surgery after NART. Long-course NART (45 Gy) is generally selected, however short-course NART(25 Gy) is chosen depending on individual circumstances. LPLD was performed even for the patients whose LPLN was decreased after long-course CRT. We performed using 5 port and a 10 mm flexible scope. We investigated 161 patients divided into 2 groups, enlarged LPLN(Enlarged Group) and non-enlareged LPLN(Non-Enlarged Group), respectively.
Results: There was no open conversion. Enlarged Group was 63 patients and LPLD was performed for 61 patients. Non-enlarged group was 98 patients. Median operative time was 466 and 312 min, Median blood loss was 72.5 ml and 50 ml respectively. Pathological stages of Enlarged Group included 3 ypStage0, 13 StageI, 18 ypStageII, 29 ypStageIII. LPLN metastasis was pathologically proven in 18 patients.Pathological stages of Non-Enlarged Group included 7 ypStage0, 30 StageI, 39 ypStageII, 22 ypStageIII.
Postoperative complications greater than Clavien-Dindo grade III of Enlarged Group was 3 patients 5%, Non- enlarged group was 2 patients 1.9%.

Recurrence was detected in 34 patients (21.1%). Overall local recurrence of Enlarged Group and Non-Enlarged Group was detected in 9 cases (5.6%) and 3 cases (3.1%).
Conclusion: Our treatment strategy for low rectal.

1067—COLORECTAL—Malignant

OUR EXPERIENCES OF LAPAROSCOPIC LATERALL PELVIC LYMPH NODE DISSECTION WITH TRANSANAL APPROACH

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Introduction: Lateral pelvic lymph node (LPLN) metastases are found in advanced primary rectal cancers. Although preoperative chemoradiotherapy (CRT) is a standard treatment for locally advanced rectal cancer in Eastern countries, some studies have demonstrated that CRT followed by total mesorectal excision (TME) might not be sufficient. LPLN dissection (LPLND) for LPLN metastases is a treatment option and an essential surgical technique for colorectal surgeons. However, LPLN metastases usually occur at the bottom of the lateral pelvis along the internal iliac vessels beside urinary bladder. Therefore, laparoscopic LPLND is a technically complex and challenging procedure, especially in obese patients with narrow pelvises. We have experienced LPLN dissection (LPLND) with transanal approach. It is thought to be very useful and available procedure.
Method: LPLND started after excion of rectal cancer, and per abdominal cavity and anus concurrently. By anal approach: At first, adipose tissue was dissected along pelvic wall to external external iliac vein. Obturate nerve was reserved and vessels were resected en toute to the goal. Secondly, adipose tissue was dissected along outside of pelvic plexus and outside of urinary bladder. This point is like to metastasize and to be difficult to dissect from above. By abdominal approach: Adipose tissue between common iliac vessels and hypogastric nerve was dissected. Furthermore, the adipose tissue between internal vessels and pelvic plexus was dissected inferiorly. And we went through to anal part. Secondly, adipose tissue between external vessels and internal ones was dissected. It was easy to go through to anal parts.
Result: We performed 16 cases of LPLN dissection (LPLND) with transanal approach since March 2018. The operation time was median 6 h.and 50 min. and 70% shorter than one way dissection. We can't reveal long term result of this procedure. But we think it make LPLND easy and available.

24—COLORECTAL—Malignant

TA-TME IN RECTAL CANCER, INITIAL EXPERIENCE IN A LOCAL HOSPITAL

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Transanal surgery has historically been conditioned to a very complex devices and limited to a few groups of very dedicated Proctologists, the appearance of new devices and, above all, new indications in rectal malignant pathology has made this surgical access to be positioned first line of surgical literature. We present our initial experience in the treatment of Rectal Cancer by Trans Anal Total Mesorectal Excision (TA-TME) with a laparoscopic and transanal synchronous embroidery.

Objective: Prospectively assess the feasibility of performing a TA-TME surgery program with the material limitations of a regional hospital.

Materials and Methods: Since February 2017, ACCESS Database has included consecutively all cancer surgeries located in the distal 2 thirds of the rectum and that are not tributaries of transanal local resection. And from April 2018 they are also registered in the European LOREC registry.

We have 1 integrated HD equipment in the operating room, a full HD mobile device, and we incorporate a continuous flow insufflator.

Results: To date, we have performed 20 procedures, 12 men, eight women with an average anal margin distance of 7.3 cm (2.5–14), 18 mechanical anastomoses with 33 mm Hemorrhoidal EEA, 1 of them coloanal, one with EEA 31 and we performed 2 manual coloanal anastomoses, a single extraction by Phansteel the rest anal extraccion. All of them have received adjuvant Qt and Rt and have had a Protective Ileostomy 1 not closed due to local pelvic problems 1 pending closure. The average stay was 7.5 (3–44). No local recurrence.

We value prior staging and definitive anatomy as well as complications of which 2 suture dehiscence and 2 stenosis stand out in the resolution phase at this time.

Conclusions: The TA-TME is a complex technique but acceptable by a team with a good laparoscopic baggage, the technique of local resection must be previously initiated by endoanal techniques to later combine both techniques, we believe that it is not necessary to have such complex equipment as at certain times was suggested, although it might be appreciated to have it, the first indications seem to suggest the same oncological validity, it facilitates very low anastomosis especially in man, indicated for the two distal thirds of the rectum.

104—COLORECTAL—Malignant

ROBOT-ASSISTED RIGHT COLECTOMY WITH COMPLETE MESOCOLIC EXCISION (CME)

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Background: Laparoscopic colon surgery in alternative to open surgery. has shown to offer evidence of benefit. During right colectomy complete mesocolic excision (CME) has been shown to provide superior nodal yield, prospecting better oncological outcomes, compared to non-CME surgery. Robotic has shown utility especially for rectal cancer treatment. We have a large experience in robotic colorectal cancer, nad it was used for right colectomy too, its major advantage was for CME and associated diseases treatment as synchronous liver metastasis.

Methods and Results: From 1-10-2013 to 1-10-2018, 96 robot-assisted right colectomies were performed in our Surgical Unit for adenocarcinoma as elective surgery; 28 (29%) using a CME technique. Males were 44; mean age in the CME group was 67.5 years. The difference about mean operative time, hospital stay, and Clavien-Dindo complication rate in the 2 groups was not statistically significant. Surgical specimen quality and nodal harvesting were significantly higher in CME-group (24 nodes vs 16).

Videoclip: The video shows the main steps of a robot-assisted right colectomy focusing on the superior mesenteric vessels lymph-nodes dissection—complete mesocolic excision (CME) with central vascular ligation; using the two recent robot device Si and Xi.

Conclusions: The results of our retrospective study demonstrates that the Robot-assisted CME procedure is a safe, valid, and feasible surgical method. The high costs of the robotic surgery probably justify its use for selected challenging cases: CME, obese patients, associated surgeries (e.g. liver resections).

181—COLORECTAL—Malignant

THE SHORT AND LONG-TERM OUTCOMES OF LAPAROSCOPIC SURGERY FOR CT4B COLORECTAL CANCER COMBINED WITH MULTIVISCERAL RESECTION

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Background: The aim of this study was to evaluate short- and long-term results after laparoscopic resection of colorectal cancer combined with multivisceral resection for advanced cT4b cancer.

Patients and Methods: 2600 patients underwent laparoscopic surgery for colorectal cancer between March 1994 and November 2019. Among them 99 patients who received concomitant multivisceral resection for cT4b colorectal cancer (SI/AI) were included in the present study. Patients with distant metastasis were excluded from the study.

Results: The mean age of the patients was 64.9 ± 12.8 years. The patients are comprised of 57 males and 42 females. The mean BMI was 20.9 ± 3.5. The lesion was located in the colon in 76 patients (76.7%) and in the rectum in 23 patients (23.2%). According to the pathological stages 49 patients were classified into pStage II (49.4%), and 48 patients were classified into pStage III (48.4%). Depth of cancer was pT3 (SS/A) in 30, pT4a (SE) in 15, and pT4b (SI/AI) in 53. The actual invasion rate (pT4b/cT4b) was 53.5%. The combined resected organs were the abdominal wall in 27 patients, bladder in 20, uterus/vagina in 12, small intestine in 11, prostate gland/vas deferens/seminal vesicle in nine, duodenum in six, colon/rectum in six, ovary in three, and other organs in five. The median operative time was 265 min (range 109–606) and the median intraoperative blood loss was 100 ml (range 5–2280). Postoperative complications occurred in eight patients (ileus in 4, anastomotic leakage in 3, and pelvic abscess in 1). The median postoperative observation period was 72 months (range7–295). Local recurrence occurred in 3patients (3.2%). The five-year overall survival rate was 69.0% and the five-year disease-free survival rate was 57.0%.

Conclusion: Laparoscopic resection of advanced colorectal cancer combined with multivisceral resection for cT4b colorectal cancer could be warranted.

200—COLORECTAL—Malignant

TECHNICAL CONSIDERATIONS DEPENDING ON THE LEVEL OF VASCULAR LIGATION IN LAPAROSCOPIC RECTAL RESECTION

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Aim: In addition to ischemia, there is also anastomotic tension is proven to be a risk factor for anastomotic leakage. HT vascular ligation is accepted as a rule, in attempt to achieve tension-free anastomosis. LT is a preferred option, based on the more accurate preservation of proximal intestinal segment microperfusion and lower risk of damage to the hypogastric plexus. The aim is evaluation of comparative indicators in high tie (HT) and low tie (LT) laparoscopic rectal resections.
Methods: A prospective nonrandomized comparative cohort study of patients in our department with cancer of the rectum in clinical stage I-III, operated by in laparoscopic approach over a 4-year period.
Results: For the period 2014–2019, a number of 169 laparoscopic surgeries have been done for rectal cancer. Patients were divided into two groups - group A with HT vascular ligation (69%) and group B with LT(31%), without randomization, based on the operators' expertise. Anastomotic leaks were 3.8% in group A and 3.0% in group B ($p < 0.05$).
Conclusion: HT vascular ligation attempts to achieve tension-free anastomosis and more harvested lymph nodes. However, LT is a preferred option, based on the absencs of significant evidence for a difference in specific oncological survival and more accurate preservation of proximal intestinal segment microperfusion in order to prevent anastomotic insufficiency, also for its lower risk of damage to the hypogastric plexus. Splenic flexure mobilization provides elongation of the proximal intestinal segment, but has no proven effect on anastomotic leakage incidence. It increases surgical duration and is in fact necessary in under 30% of the cases. At the present moment there is no precise data whether LT has an advantage in terms of prevention of autonomic nervous and urogenital dysfunction. New prospective randomized and highly evidential studies are needed in order to standardize the procedures in specific clinical situations.

294—COLORECTAL—Malignant

LAPAROSCOPIC COMPLETE MESOCOLIC EXCISION FOR TREATMENT OF RIGHT COLON CANCER: SHORT-TERM RESULTS OF A SINGLE CENTER

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Background: Colonic cancer requires a more radical treatment in order to improve oncological outcomes. Laparoscopic complete mesocolic excision (CME) associated to right colectomy sets as a possible answer to more oncological radicality in colorectal surgery, compared to conventional laparoscopic right colectomy.
Methods: From January 2012 to November 2019, 106 patients who underwent laparoscopic right colectomy with stage I–IV right- sided colon cancer at General Surgery Unit of "I.R.C.C.S. Ospedale Maggiore Policlinico" of Milan were enrolled in this case–control study. Patients were divided into two groups: 36 subjects underwent CME (CME group) and 70 subjects underwent a conventional right colectomy (non-CME group). The number of lymph nodes and the surgical safety were considered as primary end-points of this study.
Results: There was no significant difference between the two groups (CME and non-CME) in terms of surgical safety (post-operative complications, mortality and hospital stay). The mean number of harvested lymph nodes was 26.61 for non-CME group and 33.57 for CME group ($p = 0.0067$).
Conclusion: Laparoscopic CME is associated with an increased number of lymph nodes compared to conventional laparoscopic right colectomy and shows an acceptable safety profile in terms of morbidity and mortality. Although we have to wait until long-term results and more randomized trials are needed, the implementation of this technique and a standardization in treatment might result in a better outcome for patients with right-sided colonic cancer.

324—COLORECTAL—Malignant

TRANSANAL MINIMALLY INVASIVE SURGERY (TAMIS) FOR RECTAL NEOPLASMS: EXPERIENCE, CLINICAL AND FUNCTIONAL OUTCOMES FROM AN ACADEMIC COLORECTAL UNIT

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Aims: Transanal Minimally Invasive Surgery (TAMIS) is a safe, ergonomically superior and efficient method in treating early cancer and benign lesions of the rectum. We assessed the outcomes of TAMIS at our centre.
Methods: Prospectively collected data on 25 patients who underwent TAMIS over a 5-year period (2014–2019) were reviewed. Morbidity, recurrences and ability to implement and integrate this technique were assessed. Preoperative and postoperative anorectal function was evaluated with clinical symptoms-targeted questions and the Cleveland Clinic Incontinence Score (CCIS).
Results: All 25 TAMIS procedures were successful. All patients were operated at lithotomy position with the GelPOINT® Path TRANSANAL ACCESS PLATFORM (Applied Medical) being inserted transanally. The average lesion situated at 7 cm (range: 4–12) from the anal verge, the average tumor size was 3.8 cm (2–6), the mean duration of surgery was 75 min (30–150), the average length of stay was 2 days (1–6), and the R0 negative resection margin rate was 100%. Indications in our series included 15 villous adenomas, 4 T1 cancers, 2 T2 cancers (post-radiation), 1 neuroendocrine tumor and 1 gastrointestinal tumor. A hybrid TAMIS-conventional transanal technique was performed in one circumferential lesion that was managed by a wide mucosal sleeve resection and recto-rectal anastomosis. In 5 cases the mucosal defect closure was completed under direct vision. Short-term complications included inability to suture the mucosal defect in one case and one postoperative bleeding that required control by re-TAMIS. Low anterior resection was required in one case at long term. No recurrences occurred at a median follow-up of 2.5 years. Five patients had a CCIS of 2–4 (mild incontinence) at 6 weeks and 12 patients complained of reversible fecal urgency. At 3 months postoperatively all patients had a completely restored or the usual preoperative status of function.
Conclusions: TAMIS proved to be an efficient and safe procedure for the treatment of selected patients with rectal lesions. It was uneventfully integrated in our routine colorectal practice. Outcomes from our centre are comparable with those reported in the literature.

381—COLORECTAL—Malignant

LAPAROSCOPIC "EN-BLOC" RESECTION OF SPLENIC FLEXURE, GREATER CURVATURE OF THE STOMACH, TAIL OF THE PANCREAS AND SPLEEN FOR T4 COLONIC CANCER

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Aims: This video shows our technique to perform "en-bloc" laparoscopic resection of locally advanced colon cancer of the left flexure, with perfusion control using indocyanine green fluorescence angiography.
Methods: The patient is a 67-years-old man with positive fecal occult blood test after several months of constipation and weight loss. The colonoscopy showed the presence of a stenotic lesion of the left colonic flexure. Histopatological examination confirmed the suspicion of adenocarcinoma. Thoracic and abdominal CT scan with contrast and virtual colonoscopy revealed the presence of 8x7cm colonic lesion infiltrating the tail of the pancreas and the posterior wall of the stomach with enlargement of pericolic lymph nodes and suspected peritoneal carcinomatosis. No distant metastases were reported. Pre-operative staging was cT4N1M0.
The patient was scheduled for a diagnostic laparoscopy with possible en-bloc resection.
The patient was placed in 30 degrees right lateral position. Five trocars were placed and the diagnostic laparoscopy did not show peritoneal carcinomatosis. The inferior mesenteric vein was identified and medio-lateral dissection of the splenic flexure was performed following Toldt's fascia. After transverse colon resection, splenic vessels behind the pancreas were identified and clipped, and the tail of the pancreas was divided using a linear stapler. Subsequently the resection of descending colon was performed using a linear stapler and the mobilization of the spleen was completed. Greater curvature of the stomach was resected using multiple cartridges of a linear stapler. After perfusion control of colonic stumps with indocyanine green fluorescence angiography, latero-lateral anastomosis was performed.
The specimen was extracted through a Pfannenstiel incision with an endobag.
Results: The postoperative course was uneventful and the patient was discharged on postoperative day 7.
Histopathological examination showed colonic adenocarcinoma infiltrating pancreas and stomach, without methastasis in the 45 lymph nodes harvested. The postoperative staging was pT4bN0(0/45)M0.
Conclusion: Laparoscopic approach to locally advanced colonic tumors with "en-bloc" resection of adjacent organs is a safe and feasible procedure.

392—COLORECTAL—Malignant

SURGICAL OUTCOME AND PROBLEMS FOR TATME PROCEDURE

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Background: TaTME following short-course chemoradiotherapy using hyper-fractionation method (SCRT; 25 Gy/10 fraction/5 days + S-1 or Xeloda) is performed for resectable locally advanced lower rectal cancer (more T3 or N1). The patient underwent radical surgery after one month of SCRT. For more locally advanced lower rectal cancer (T4 or N2), induction chemotherapy is performed before SCRT. For patients with poor efficacy of chemotherapy, we also do normal 25 fraction 45 Gy radiotherapy.
Methods: We have performed 26 TaTME cases. Before one team preceded with the anal operation and shifted to the abdominal procedure, now it is done with two teams which give them the advantage of a good visual field from both sides when there is difficulty identifying the right dissecting layer. TaTME is very useful in cases such as a large tumor, obesity, and a narrow pelvis. Furthermore, when it is difficult to identify the dissecting layer by scarring after CRT, it is more possible to control the CRM/DRM of cancer.
Results: 20 cases of ISR, 3 cases of APR, 2 cases of LAR, 1 case of TPE were performed, and in 12 of these cases lateral LN dissection was also performed (one side 5, both sides 7). Local recurrences were 5 cases (19%), higher than all recurrence rates (7.1%). At the same time 1 lateral lymph node (no lateral lymph node dissection), 1 multiple lung, 1 multiple liver, 1 paraaortic lateral lymph metastasis occurred Locations of primary lesion were posterior side or circular tumor. There was 1 perforation during TaTME, and insufficient closure of rectal stump. A recurrent case 3 months after surgery was pathologically mucinous adenocarcinoma and Grade 1a effect with chemotherapy and 45 Gy radiotherapy. Another case with prolonged anastomotic leakage recurred 6 months after surgery. TaTME after CRT may make it difficult to develop the operative field when a tumor is in the posterior wall, then an abdominal guide should be used. Closure of rectal stump should be performed especially in ISR, when it is not completely done, prompt re-closure and lavage is needed. To prevent anastomotic leakage, secure suturing and evaluation of blood flow with ICG should be performed. Careful consideration should be given to cases with poor effect of CRT.
Conclusions: TaTME should be performed for locally advanced lower rectal cancer after chemotherapy and SCRT in consideration of various weak points.

427—COLORECTAL—Malignant

EVALUATION OF INTESTINAL BLOOD FLOW USING THE INDOCYANINE GREEN FLUORESCENCE METHOD DURING LAPAROSCOPIC SURGERY FOR COLORECTAL CANCER

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Background and Purpose: Anastomotic leakage is a severe complication following colorectal surgery and one of the most important factors for it may be the blood perfusion around the anastomotic site. The aim of this study was to evaluate the blood flow around the rectosigmoid region by indocyanine green fluorescence (ICG) method during laparoscopic colorectal surgery.

Methods: We enrolled consecutive patients with a preoperative diagnosis of left-sided colon and rectal cancer. During the surgeries, ICG was injected intravenously just before resecting the colorectum, and the blood flow was observed by a near-infrared camera system. If the blood perfusion was poor at the resecting site, the surgeon decided to change the transecting line or the surgical procedure. We compared these cases with earlier cases that underwent the surgery without ICG methods to evaluate the rate of anastomotic leakage and other surgical factors.

Results: From January 2018 to the present, 34 cases were enrolled. Eleven cases (32%) required additional colon resection because of poor blood perfusion and one case had to be eliminated from the study because a wide range of blood supply could not be observed. Anastomotic leakage occurred in 1 case in this series of patients and no statistical difference was found in the percentage of anastomotic leakage when compared with the earlier cases without using the ICG fluorescence method ($p = 0.5$).

Conclusion: ICG fluorescence method may be able to reveal precise blood perfusion of the colorectum during surgery. It may be helpful in preventing severe complications, such as wide-range colorectum necrosis after the surgery.

437—COLORECTAL—Malignant

WHICH IS WORSE? AN ILEOCOLIC ARTERY CROSSING ANTERIOR VS POSTERIOR TO THE SUPERIOR MESENTERIC VEIN DURING CURATIVE RESECTION FOR RIGHT-SIDED COLON

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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 ($p = 0.013$). We then performed univariate and multivariate analyses to determine the associations between DFS and ICA location and tumor-node-metastasis (UICC) stage. ICA location and UICC stage had a poor association with DFS on univariate analysis: ICA hazard ratio (HR): 2.52, CI 1.19–5.78, $p = 0.014$ vs HR: 3.18, CI 1.08–9.46, $p = 0.03$, and on multivariate analysis: HR: 2.48, CI 1.17–5.69, $p = 0.016$ vs HR: 3.86, CI 1.90–7.96, $p = 0.0002$.

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.

439—COLORECTAL—Malignant

TRANSANAL TOTAL MESORECTAL EXCISION AS AN ADJUNCT TO A LAPAROSCOPIC CONVERTED TO "OPEN" LOW ANTERIOR RESECTION

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Aims: The video depicts a case of transanal total mesorectal excision (ta-TME) preceded by a laparoscopic converted to "open" low anterior resection.

Methods: A 55-year old female with a near-obstructing, colonoscopically appreciated, annular, pseudopolypoid, histologically indeterminate for malignancy (three negative biopsies) but PET-scan highly suspicious for cancer, lower rectal mass was scheduled for a laparoscopic/ta-TME low anterior resection. Despite the mechanical bowel preparation, the fecally loaded rectosigmoid led to conversion of the laparoscopic to an "open" approach. Following the "open" left colon and splenic flexure mobilization, the ta-TME was performed. After positioning the Lone star retractor, the Gelpoint path Transanal Access Platform (Applied Medical Inc) was introduced and stabilized transanally. A purse-string suture was placed through the rectal mucosa to tightly occlude it distally to the lesion. A rectotomy was performed through all layers of the rectum using hook electrocautery and the perimesorectal space was entered at the level of the levator. CO2 was insufflated to a pressure of 12 mmHg and a peri-mesorectal dissection was performed posteriorly, laterally and anteriorly. Assistant's finger in the vagina aided in guiding dissection at the recto-vaginal septum plane. The specimen was extracted transabdominally. The colon was divided and a purse-string suture was placed. The anvil of the HEM3348 (Covidien EEA Hemorrhoid and Prolapse Stapler 33 mm-4.8 mm) circular stapler was inserted. The distal purse-string was placed at the anal muscosa and was stabilized by passing the needle through one of the openings of the anvil's long shaft. The colo-anal anastomosis was performed with the circular stapler HEM3348.

Results: A T2 mainly submucosally developed rectal cancer was histologically confirmed. The patient recovered satisfactorily at short- and long-term.

Conclusions: A conversion of laparoscopic to an "open" low anterior resection does not preclude the completeness of surgery by ta-TME. The addition of this transanal approach aids in the maintance of the potential technical and oncologic advantages of ta-TME.

562—COLORECTAL—Malignant

EXTRAMURAL VENOUS INVASION AS A PROGNOSTIC FACTOR IN RECTAL CANCER SURGERY

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Aims: Nearly one-third of patients with rectal cancer present with extramural venous invasion (EMVI) on preoperative magnetic resonance imaging (MRI). Robust evidence on long-term outcomes and causal treatment effects of MRI-EMVI is lacking. This single-center study aimed to assess whether MRI-EMVI worsens the prognosis by increasing the risk of developing metachronous distant metastases.

Methods: From 2011 to 2019, all consecutive patients with rectal cancer who underwent curative surgery were selected from a prospectively registered standardized database. Baseline and postoperative data were extracted for patients who developed a recurrence. Patients with disease-free survival had a minimum of 3 years follow-up. Univariate and multivariate logistic regression were performed, and the estimation of the effect of MRI-EMVI was assessed using Cox hazard models.

Results: Of the 208 included patients, 126 (60.6%) were male, and the mean (SD) age was 66.8 (12.2) years. The median (IQR) follow-up was 49.9 (38.5–62.8) months. Fifty-one (26.6%) patients were MRI-EMVI positive, and 59 (28.4%) developed distant metastases. On univariate analysis, distant recurrence was correlated with positive regional lymph nodes ($p = 0.030$) and threatened circumferential resection margin ($p = 0.005$) at baseline MRI, MRI-EMVI ($p = 0.004$), abdominoperineal resection (APR) ($p = 0.030$), pT4 ($p = 0.005$), pN + ($p < 0.001$), perineural invasion ($p = 0.001$), and lymphovascular invasion ($p = 0.007$). On multivariate analysis, distant recurrence was independently associated with APR (OR 4.25; 95%CI 1.190–15.208; $p = 0.026$) and MRI-EMVI (OR 3.687; 95%CI 1.686–8.064; $p = 0.001$). The Cox hazard model showed that MRI-EMVI increased the overall mortality (HR 2.766; 95%CI 1.119–6.835; $p = 0.028$).

Conclusions: These findings suggest that MRI-EMVI may be associated with an increased risk of distant recurrence and shorter overall survival among patients with rectal cancer.

576—COLORECTAL—Malignant

LAPAROSCOPIC TREATEMENT OF A T4 ADENOCARCINOMA OF SIGMOID RECTAL JUNCTION WITH INVOLVEMENT OF RIGHT SPERMATIC VESSELS AND RIGHT SPERMATIC DUCT

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This video shows the case of a T4 adenocarcinoma of sigmoid-rectal junction with involvement of the peritoneum, right spermatic vessels and right spermatic duct.

The patient was a 74th years old man referred to our unit with anemia (hb7,4 g/dL). A colonscopy demostreted a sub-stenotic, ulcerated lesion of the sigmod-rectal junction. Biopsies: adenocarcinoma.

At the CT scan the lesion was described as a T3 without infiltration of the peritoneum and the patient was scheduled for a laparoscopic left hemicolectomy.

After the pneumoperitoneum an involvement of the right pelvic peritoneum, right spermatic vessels and right spermatic duct was revealed.

In order to obltain a complete resection of the neoplastic lesion a left colectomy with right pelvic peritonectomy and resection of the right spermatic duct was necessary. An intraoperatory frozen section histopathological analysis documented margins free from neoplastic infiltration.

The patient was discharged in 5th postoperative day. The pathology report was adenocarcinoma T4a,N0 (0/27) G2.

588—COLORECTAL—Malignant

NEEDLESCOPIC NO SCAR INTERSPHINCTERIC RESECTION USING TURNBULL-CUTAIT PULL-THROUGH METHOD TO VERY LOW RECTAL CANCER

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Background and Aim: During these two decades of development of laparoscopic colorectal surgery, we have tried the needlescopic surgery especially for very low rectal cancer keeping oncological safety. Turnbull-Cutait pull-though operation is used to be performed over 40 years ago to avoid anastomotic leakage in the rectal cancer surgery. On these basis, no scar operation even without temporary stoma to an intersphincteric resection (ISR) case may have additional benefits for patients from a point of minimally invasive aspect. We introduced this new concept needlescopic and no scar (NNS) surgery to the very low rectal cancer patients in 2017 in our hospital, so now we investigate the short-term outcomes of this operation. Patients: Fourteen rectal cancer patients underwent ISR with NSS operation between 2017 and 2019 in our institute. Technique of operation: A 5 mm trocar on the umbilicus for 5 mm scope, other 3 3 mm trocars on the both flanks and the left lower quadrant, and another 5 mm trocar for energy devices and clips on the right lower quadrant were placed. The dissection of the rectum is performed as same as conventional laparoscopic procedure into the anal canal. The trans-anal procedure is simultaneously performed by using laparoscopic devices with GelpointR in TA-TME technique or followed, and the specimen is retrieved via anus. The second stage Turnbull-Cutait pull-through method is used to avoid anastomotic leakage.
Results: The mean operation time and estimated blood loss of the first and the second stage operation were 270, 71 min. and 46.1, 16.3 g, respectively. The mean interval to the second stage reconstruction was 6 days. There was a case of re-laparoscopy and creation of the temporary ileostomy in the second stage reconstruction operation because of difficulty of colo-anal anastomosis due to shortage of the proximal colon. There was a case of re-pullout the colon from the anus in the 1st postoperative day after the first stage operation because of diminishing of the pull-though colon. However, no anastomotic leakage was happened in this series. The mean postoperative hospital stay was 17.9 days.
Conclusion: The NS no scar ISR to the very low rectal cancer is another option to avoid temporary stoma with better cosmetic merit despite of rather longer hospital stay.

594—COLORECTAL—Malignant

INVESTIGATION OF POSTOPERATIVE ANASTOMOTIC HEMORRHAGIC COMPLICATIONS IN LAPAROSCOPIC COLON RESECTION

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Introduction: Along with the aging society, many patients taking antiplatelet agents for the purpose of treatment/prevention of cardiovascular disease and cerebrovascular disorder, and colorectal cancer surgery for patients with coexisting diseases also tends to increase.
We report on an anastomotic hemorrhagic complication after laparoscopic colon resection.
Methods: 578 patients underwent laparoscopy assisted colon resection with a standby operation under diagnosis of colorectal cancer from 2005 to 2015.
Results: Postoperative anastomotic hemorrhagic complications were 7/578 cases (1.2%). As a bleeding site, there were 5 in 199 cases (2.5%) after anterior resection using Circular stapler, and 2 in 354 cases (0.56%) of functional end-to-end anastomosis after colon resection using Linear stapler. The bleeding time was 5 cases on the day immediately or within a day after surgery, 1 bleeding case on the third postoperative day (POD) and 1 bleeding case on the 7th POD. Two patients were relieved with follow-up observation and one patient was immediately after super-low anterior resection surgery, and therefore, sutured hemostasis was performed transanally. In the other 4 cases, clipping and thrombin spraying were performed under CS. Patient with 7th POD bleeding was the case who received two antiplatelet agents from the third POD. All patients had a good postoperative course and no extension of the hospitalization period due to hemorrhagic complications was observed. The hemorrhagic complication rate of patients taking oral administration of antiplatelet agents was 2/168 (1.19%), and the hemorrhagic complication rate of patients who did not take antiplatelet agents was 5/410 (1.21%). After multivariate analysis of factors affecting the onset of postoperative anastomotic hemorrhagic complications, it was not independent risk factors for rectal resection and antiplatelet agents.
Discussion: Anastomotic area hemorrhagic complication after colorectal cancer operation is one of the complications rarely encountered. Since hemorrhagic complications tended to be more frequent in the anastomotic area using the circular stapler after rectal resection, it seems necessary to positively and promptly conduct CS examination when bleeding is suspected. At the time of functional end - to - end anastomosis, the anastomotic part could be observed under direct viewing, and suture hemostasis should be aggressively performed if hemorrhage was a concern.
Conclusion: Postoperative anastomotic hemorrhagic complications in laparoscopic colon resection were examined and reported.

609—COLORECTAL—Malignant

HOW TO AVOID ROUTINE ILEOSTOMY IN BORDER LINE RISK PATIENTS AFTER LAPAROSCOPIC RESECTION FOR RECTAL CANCER: PRELIMINARY RESULTS

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Aims: Protective ileostomy (PI) during anterior resection (AR) for rectal cancer decreases the incidence of anastomotic leakage (AL) and its subsequent complications, but it may itself be the cause of morbidity and readmission. Moreover, not negligible permanent ileostomy and morbidity rates after its closure are reported. The aim is to report our protocol in the management of selected patients with border line risk to develop AL after laparoscopic AR and ghost ileostomy (GI) creation.
Methods: From June 2017 and December 2018, patients who underwent laparoscopic AR in our center were stratified based on the risk to develop AL, according to the Colon Leakage Score (CLS) proposed by Dekker in 2011. According to our protocol, in patients with low risk (CLS 0–7) to develop postoperative AL, PI is not performed, while in patients with high risk (CLS $\geq$ 14) routine PI is performed. In selected patients with CLS ranging from 8 to 13 (border line patients) GI is performed and are included in the present study. Steps to avoid PI were: splenic flexure mobilization, reduced pelvic bleeding, use of proper stapler cartridge if neoadjuvant chemo-radiotherapy (n-CRT), straight section of the rectum, evaluation of vascular supply of the colon before the anastomosis by fluorescence angiography with indocyanine green, side-to-end anastomosis, intraoperative methylene blue test, pelvic, transanal tube placement and the GI creation. After surgery, inflammatory blood markers were monitored to detect potential leakages.
Results: Twelve patients were included in the border line group. In one case, the specimen section was changed after performing the fluorescence angiography. There were no conversions in this group of patients. One postoperative AL occurred, treated with radiological drainage placement, not been necessary to convert the GI. PI was avoided in 100% of cases.
Conclusions: AL is a multifactorial complication that occur after AR. Patients' characteristics cannot be changed, but several steps were used to avoid routinely PI creation. The present protocol could be a valuable option to avoid PI in selected patients. Further studies with a wider sample size, and defined criteria to stratify the patients based on the risk to develop AL, are required.

615—COLORECTAL—Malignant

IMPACT OF ADVANCED AGE ON OUTCOMES AFTER TRANSANAL TOTAL MESORECTAL EXCISION

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Aims: Transanal total mesorectal excision (TaTME) has emerged as a valid alternative to conventional rectal cancer surgery. Since the initial description, its safety and oncological effectiveness have been validated. However, the majority of studies and registries describe mean ages of the included patients between 60 and 65 years old, while the relative incidence of rectal cancer reaches its maximum at 80 years. This under-represented elderly population is more vulnerable to complications and 90-day mortality, so investigation for different treatment strategies is justified in these patients. This study aimed to evaluate the impact of advanced age in patients with rectal cancer treated with TaTME.
Methods: This is a retrospective cohort-study from a prospectively maintained database of patients undergoing TaTME for rectal cancer. We compared the outcomes of the elderly group ($\geq$ 75 years) and the young group ($<$ 75 years).
Results: A total of 356 patients were included in the analysis, 32.0% (n = 114) in the elderly group and 68.0% (n = 242) in the young group. The median follow-up was 29.0 months (IQR 14.2–47.1), with no difference between groups. Patients were predominantly male (64.9% vs. 57.0%, p = 0.157) and ASA II/III (97.4% vs. 94.1%, p = 0.183). Both groups did not differ in mean BMI (25.6 vs. 25.2 kg/m2) clinical TNM stage, neoadjuvant therapy (49.6% vs. 55.6%) and pathological TNM stage. Complete or near-complete mesorectal excision was obtained in 97.3% (n = 110) vs. 97.9% (n = 230), (p = 0.759), while circumferential resection margin involvement was reported in 13.2% (n = 15) vs. 7.7% (n = 18), (p = 0.102). Short-term postoperative complications rates were 46.5% (n = 53) vs. 35.7% (n = 85), (p = 0.053). The elderly group received more perioperative blood transfusion (11.4% vs. 3.8%, p = 0.006), while the need for emergency reoperation was 14.0% (n = 16) vs. 9.2% (n = 22), (p = 0.175). The 30-day readmission rates were 17.7% (n = 20) vs. 12.7% (n = 30), (p = 0.208). The 90-day mortality rates were 2.7% (n = 3) vs. 1.3% (n = 3), (p = 0.349). Emergency reoperation was found as an independent predictor of 90-day mortality, while being older than 75 years was not (OR 1.1; 95% CI, 0.167–7.707; p = 0.896).
Conclusion: In patients older than 75 years, TaTME is safe and provides similar 90-day mortality rates to those obtained in younger patients.

626—COLORECTAL—Malignant

ONCOLOGICAL SAFETY OF TRASANAL TOTAL MESORECTAL EXCISION (TaTME) FOR RECTAL CANCER: MID-TERM RESULTS OF A PROSPECTIVE MULTICENTER STUDY

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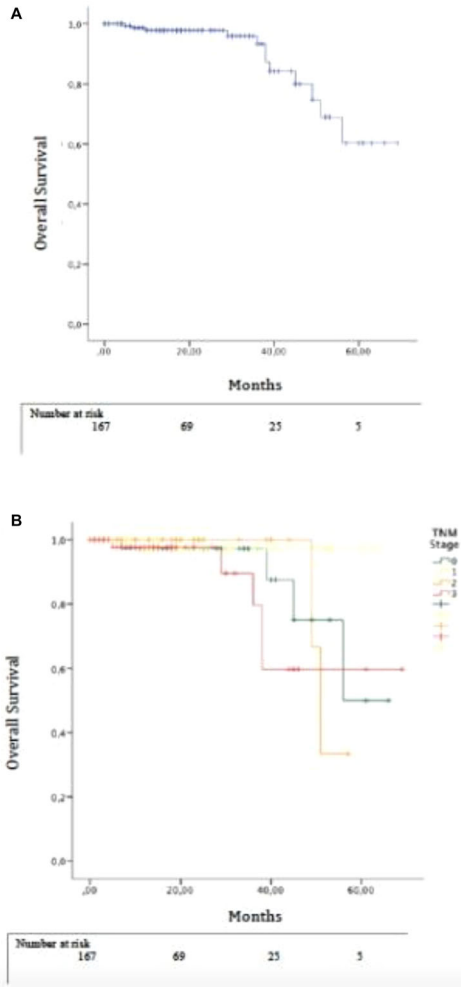
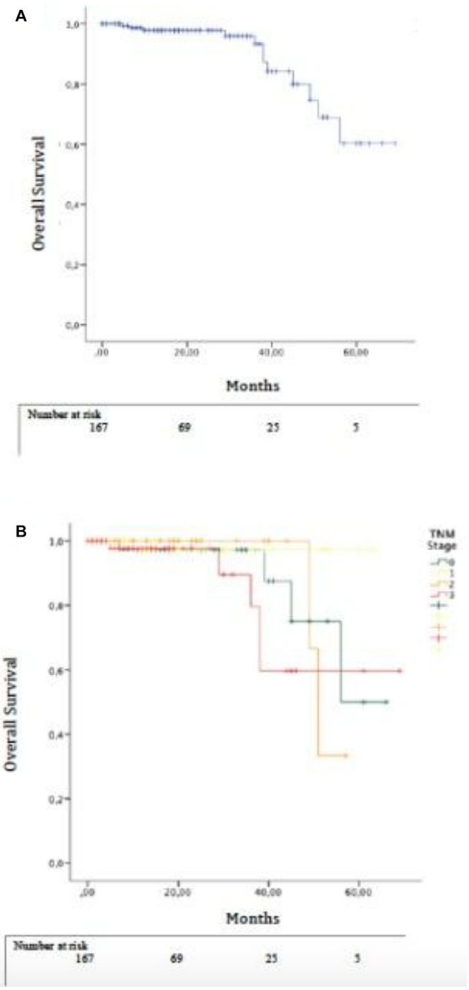
Aims: There is no consensus regarding the gold standard technique for rectal cancer as Total Mesorectal Excision (TME) may be safely performed either by open or minimally invasive surgery. The laparoscopic approach, however, may carry technical difficulties. For this reason, a novel technique has emerged in the last decade combining a dual laparoscopic dissection (abdominal and transanal) to perform the TME technique (TaTME). When focusing on oncological outcomes, there is a lack of literature about mid-long term results.

The aim of this study is to evaluate the mid-term oncological impact of TaTME for rectal cancer.

Methods: A prospective multicenter study was performed in four tertiary centers including consecutive patients who underwent TaTME for mid-low rectal cancer by the same group of experienced surgeons. The analyzed data included pathological results on the quality of TME and mid-term oncological outcomes.





Results: In total, 203 patients were included throughout a study period of 6 years. Our series included 70% males and 70% of patients with neoadjuvant treatments. The median follow-up was 24 [14–43] months. Regarding pathological results, a complete TME was achieved in 79%, while circumferential and distal margins were affected in 2.2 and 1.1%, respectively. Six patients developed local recurrences (3%) and 12% presented distant disease during the follow-up. The 2-year disease free survival and the overall survival rates were 87.5% and 95%, respectively (Figs. 1 and 2).

Conclusions: There is current lack of evidence in the literature regarding TaTME and oncological outcomes with absent data from randomized clinical trials. In the meantime, the reported results from different multicenter series are controversial. This study showed positive mid-term outcomes at 2-years of follow-up and supported good oncological outcomes with TaTME. However, it must be emphasized that previous experience in minimally invasive and transanal surgeries is essential for surgeons before intending to perform TaTME.

650—COLORECTAL—Malignant

SHOULD BE A LOCALLY ADVANCED COLON CANCER STILL CONSIDERED A CONTRAINDICATION TO LAPAROSCOPIC RESECTION?

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Aims: The role of elective laparoscopic resection (LR) for the treatment of locally advanced colon cancer is unclear. Most studies have retrospectively investigated the outcomes of LR for pT4 cancers, while clinical T4 (cT4) cancers are excluded in the large randomized controlled trials comparing LR and open resection (OR). The aim of this study was to investigate the outcomes in patients undergoing elective LR for locally advanced colon cancer.

Methods: A prospective single-institution database including consecutive patients undergoing elective LR for clinical locally advanced colon cancer (T3 N1-2 or T4 N0-2) between March 1996 and March 2017 was retrospectively reviewed. A multivariate analysis was performed to identify predictors of conversion to OR.

Results: A total of 300 patients undergoing LR for locally advanced colon cancer were included. There were 175 (58.3%) males; mean age and mean BMI were 68.5 $\pm$ 11.1 years and 25.3 $\pm$ 4.6 kg/m2. The tumor was in the right-sided colon in 135 (45%) cases, in the left-sided colon in 154 (51.3%) cases and in the transverse colon in 11 (3.7%) cases. A multi-visceral resection was needed in 13 (4.3%) patients. A total of 63 (21%) LRs were converted to OR, mainly due to the large tumor diameter (81%) or obesity (9.5%). Overall postoperative Clavien-Dindo type 3–4 complication rate was 4.7%, with no significant differences between completed LR and converted LR. Final pathology showed 18 (6%) pT2, 215 (71.7%) pT3, 54 (18%) pT4a, and 13 (4.3%) pT4b cancers. A R0 resection was achieved in 98.3% of patients. On multivariate analysis, tumor size $\geq$ 6 cm ($p < 0.05$) was the only independent risk factor for conversion to OR.

Conclusions: Clinical locally advanced colon cancer should not be considered a contraindication to LR per se. Bulky tumors $\geq$ 6 cm are at higher risk of conversion; however, there is no increased postoperative morbidity.

686—COLORECTAL—Malignant

APPROACHES TO ACUTE OBSTRUCTION CAUSED BY LEFT-SIDED COLON CANCER: ENDOPROSTHESIS VS EMERGENCY SURGERY

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Aims: The aim of this study is to compare the use of endoprosthesis and emergency surgery in acute obstruction of the left colon due to cancer, in terms of morbimortality, need for ostomy and long-term oncological results.

Methods: A retrospective, controlled and comparative analysis was performed of patients who were treated for acute obstruction due to colorectal cancer at the University Hospital Marqués de Valdecilla. Patient data was collected between 2007 and 2018.

Inclusion criteria for the study were:

(1) Presence of signs and symptoms of acute intestinal obstruction.
(2) Obstruction caused by cancer in the left colon, rectosigmoid junction or upper rectum.
(3) Confirmation of the obstruction by abdominopelvic computed tomography (CT) scan.
(4) Adenocarcinoma of the colon confirmed histologically as the cause of the obstruction.
(5) Treatment with curative intent.

Results: 129 patients met the inclusion criteria. 49 (38%) received an endoprosthesis as a bridge to surgery (BTS) and another 80 (62%) received emergency surgery (ES). In the BTS group endoprostheses were implanted in 95.9% of cases (47 out of 49 cases), with a rate of perforation of 4.1%. Endoprostheses successfully allowed surgery to be deferred a minimum of seven days in 79.5% of cases (39 out of 49).

Statistically significant differences between the BTS and ES groups were found for surgical approach, type of surgery performed, the need for ostomy and the appearance of complications. The BTS group was associated with a higher frequency of laparoscopic techniques and primary anastomoses, less frequent need for ostomy and fewer postoperative complications.

There were no significant differences found for the variables age, gender, American Society of Anesthesiologists classification (ASA), tumor stage, R 0–1, tumor localization or oncological prognosis.

Conclusions: In our experience the use of endoprostheses is safe and effective, allowing better patient preparation and posterior surgery in optimum conditions. Endoprostheses reduce the rate of postoperative complications and the need for ostomies. Long-term oncological results were similar between both groups.

767—COLORECTAL—Malignant

TRANSANAL APPROACH FOR INTERSPHINCTERIC RESECTION IN RECTAL CANCER: A PROOF OF CONCEPT STUDY

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Aims: Transanal total mesorectal excision (TaTME) has risen as a growing approach for rectal cancer, mainly for mid and low tumors. One of the crucial steps of the procedure is the placement of a purse-string to occlude the rectal lumen, before performing the transection of the rectal wall. However, in cases of ultra-low rectal tumors, an intersphincteric resection usually precedes the purse-string placement. This study aimed to analyze the outcomes of patients undergoing TaTME with an undescribed method of transanal minimally invasive surgery (TAMIS) intersphincteric resection.

Methods: Between November 2011 and September 2018, all patients with rectal cancer undergoing TaTME with curative intent in a tertiary referral center were prospectively included in a standardized database. Patients with ultra-low rectal tumors and clinical stage II or III were identified. The transanal intersphincteric dissection was performed with laparoscopic instruments after placing a transanal platform, which was holt outwards on the anal canal or customized. The primary endpoints of the study were survival and recurrence outcomes.

Results: A total of 16 patients were treated with the TaTME and TAMIS intersphincteric resection technique, and all the procedures were successfully completed. The mean age was 65 (SD 15.2) years, 43.8% patients were male, and the mean body mass index was 23.6 (SD 3.2) Kg/m2. Neoadjuvant therapy was administered in 87.5%. The median distance from anorectal junction was 1 (IQR 0.5–1.5) cm. Coloanal anastomoses were hand-sewn in 93.8%. Mean operative time was 157.8 (SD 40.7) minutes. The 30-day complication rate was 31.3%. Both the circumferential and distal resection margins were positive in 12.5%, but the mesorectal specimen quality was complete in all the specimens. An average of 14.3 (SD 7.7) lymph nodes were found per specimen. With a median follow-up of 20.6 (IQR 13.3–32.9) months, the locoregional and systemic recurrence rates were 0% and 13.3%, respectively. The overall survival and disease-free survival rates were 100% and 86.7%.

Conclusions: In specialized hands, TaTME with TAMIS intersphincteric resection is feasible and oncologically safe for the treatment of locally advanced rectal cancer. Longer-term evaluation is needed before this technique can be considered for routine clinical use.

795—COLORECTAL—Malignant

INTERVAL BETWEEN NEOADJUVANT THERAPY AND SURGERY IN THE TREATMENT OF LOCALLY ADVANCED RECTAL CANCER: IMPACT ON SHORT AND LONG-TERM OUTCOMES

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Aims: Neoadjuvant therapy (NAT) followed by total mesorectal excision (TME) could improve oncological outcomes in patients with locally advanced rectal cancer. The optimal interval between the end of NAT and surgery is still matter of controversy. Long intervals might increase the complete pathological response (cPR) rate, allowing to select patients who might benefit from active surveillance programs, avoiding comorbidities related to surgery. However, waiting more than 12 weeks could lead to technical difficulties, more intra and postoperative complications and a worse quality of the resected specimens. This study aims to analyze the impact of the interval between NAT and surgery in short and long-term outcomes.
Methods: This is a retrospective cohort study developed from a prospectively maintained database of patients with rectal cancer who underwent transanal total mesorectal excision (TaTME) in our center. We compared two groups according to the interval between NAT and surgery: short-interval group (< 12 weeks) and long-interval group (> 12 weeks). Radiological response to NAT assessed by magnetic resonance was classified according to tumor regression grade (TRG) in "good response" (TRG 1 and 2) and "bad response" (TRG 3, 4 and 5).
Results: 374 patients were included. 199 received NAT: 76.7% (n = 135) in the short-interval group and 23.3% (n = 41) in the long-interval group. Both groups did not differ in patient and tumor's characteristics. Radiological "good response" rate was 21.3% (n = 23) vs. 23.7% (n = 9) respectively, p = 0.821. The short-interval group had fewer diverting ileostomies (70.7% vs. 87.3%, p = 0.017). Intraoperative complications rate was 7.6% vs. 17.5% (p = 0.077). No differences were seen regarding operative time and conversion rate. The cPR rate was 14.9% (n = 20) versus 14.6% (n = 6), p = 0.653. After excluding pT4 tumors, complete or near complete mesorectal excision was obtained in 99.2% (n = 128) vs. 97.4% (n = 37), p = 0.404, while positive circumferential resection margin rate was 5.4% (n = 7) vs. 13.2% (n = 5), p = 0.147. 30-day postoperative complications rate was 37.3% (n = 50) vs. 36.6% (n = 15), (p = 1.00). No differences were found in locoregional and systemic recurrence, overall and disease-free survival.
Conclusion: Longer intervals were associated with cPR, quality of resection, morbidity, survival and recurrence rates, similar to short intervals.

816—COLORECTAL—Malignant

INADVERTENT BLEEDING DURING LAPAROSCOPIC SURGERIES AND ITS MANAGEMENT

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This video presents a compilation of 3 surgical videos which shows the possible causes of intraoperative bleeding while performing laparoscopic surgeries and its management.

833—COLORECTAL—Malignant

TRIAL OF STANDARDIZATION OF TATME AND DEVELOPMENT TO HIGH DIFFICULTY SURGERY IN OUR HOSPITAL

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Background and Purpose: There is a report that the non-inferiority of laparoscopic surgery to open surgery has not been proven in the radical rectal cancer surgery. TaTME is expected to solve these problems in the future. We have introduced robotic surgery for rectal cancer since October 2015, and TaTME since March 2016. We will introduce about the attempt and standardization of TaTME in rectal cancer in our hospital.
Subjects: The subjects were 173 rectal cancer patients who underwent radical surgery from April 2015 to June 2019. We performed 64 robotic surgery, 95 abdominal surgery, and 14 TaTME.
Laparoscope/Robot: In cases where there is a huge tumor in the rectum or cases of advanced lymph node metastasis, it is often experienced that the forceps operation and camera operation are restricted due to the limited space by the tumor, making it difficult to see the anal side of the tumor.
TaTME:Confirmation of Endpelvic fascia on the tumor anal side and selection of the peel layer of below the fascia can be expected to ensure CRM. In addition, it is relatively easy to confirm the rectal urethral muscle in the front, and the separation line can be determined to secure CRM.
Conclusion: In difficult cases such as narrow pelvis, giant tumor, advanced lymph node metastasis etc., transperitoneal operation limits the operation of forceps on the anal side of the tumor and is often difficult to observe, and it is difficult to secure CRM. It was suggested that TaTME could improve them.

937—COLORECTAL—Malignant

LAPAROSCOPIC SURGERY FOR SYNCHRONOUS COLORECTAL CANCER: RIGHT HEMICOLECTOMY WITH INTRACORPORAL ANASTOMOSIS AND HIGH ANTERIOR RESECTION

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Aims: Synchronous colorectal neoplasia presents an incidence range from 2 to 12%. In certain occasions the realization of two segmental resections with two anastomoses can be an optimal treatment. Total excision of the mesorectum is the gold standard in the surgical treatment of the rectal cancer, with an improvement of survival and local recurrence. In the same way, performing a complete mesocolon excision could also lead to an improvement in the survival of patients with colon cancer. We present a case of laparoscopic double colorectal resection with complete excision of de mesocolon and the mesorectum in a patient with synchronous neoplasia.
Methods and Results: A 79 year old male with history of penicillin allergy, smoker, diabetes, hypertension, obliterative arteriopathy, bilateral carotid stenosis, surgical history of appendectomy and right inguinal hernioplasty.
In October 2017, after a positive fecal occult blood test, a colonoscopy was performed with diagnosis of rectal cancer at 11 cm of the anal margin and non-resectable right colon polyps. Magnetic Resonance (MR) was performed diagnosing T3N2 rectal cancer. The patient received neoadjuvant treatment with chemotherapy and radiotherapy.
After the neoadjuvant treatment, a new MR was performed with good response to the treatment appreciating dense fibrosis, minimal residual tumor and disappearance of the nodes. In the view of the good response to treatment, we proposed him for surgical intervention: Laparoscopic double resection.
In March 2018, we performed High anterior resection with partial excision of the mesorectum and protective ileostomy; and right hemicolectomy with complete mesocolon excision and intracorporeal anatomosis. We extracted the surgical specimen through Pfannenstiel incision.
The patient had no surgical complications and was discharged after 8 days of hospitalization.
Final results of Pathology were: at the level of the right colon we found several adenomas with 13 negative nodes; at the level of rectum we found a pT3N0 adenocarcinoma with 17 negative nodes without.
Conclusion: Laparoscopic double colorectal resection with two anastomoses is feasible and save for the treatment of synchronous colorectal cancer.

844—COLORECTAL—Malignant

DIFFERENCES BETWEEN PATIENTS YOUNGER AND OLDER THAN 75 YEARS OLD DURING THE IMPLEMENTATION PHASE OF THE ERAS PROTOCOL

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Aims: This study aims to verify if there are significant differences in the application of the colorectal-ERAS protocol on patients under and over 75 years old, in order to redirect the application of the protocol to one of the populations or to the group of patients.
Methods: Data have been retrospectively analysed for all patients included in the colorectal-ERAS protocol during the first year of implantation. The 130 patients included in the study were separated into two differentiated groups. Group "Y" includes 88 patients younger than 75 and group "E" includes 42 patients older than 75. Previous comorbidities, adherence to the protocol, surgical characteristics, complications and hospital stay have been studied.
Results: There are statistically significant differences in comorbidities between both groups. Group E shows a greater prevalence anemia (40.4% E, 25% Y), risk of malnutrition (19% E, 4.5% Y), hypertension (69% E, 28.4% Y), renal insufficiency (19% E, 2.3% Y), ASA III-IV (54.8% E, 18.2% Y).
No differences have been observed in the previous preparation of the patients. Intestinal preparation has been used in more than 75% in both groups, antibiotic prophylaxis in 100% and antithrombotic prophylaxis in more than 95%.
There are no significant differences in the surgical approach (laparoscopic in 67% Y, 57.1% E), although the conversion rate was higher in the elder group, no statistical significance was reached (4.5% Y, 11.9% E). There were no statistical differences in surgical time (average of 173 min in both groups), stoma (21.6% Y, 26.2% E), drainage placement (86.4% Y, 81% E).
Elderly patients show a greater prevalence in ileus, but this does not determine differences in the times of reintroduction of oral diet or early mobilization. Higher postoperative pain rate has been seen in young patients.
Elderly patients double the rate of complications (59.5% E, 29.5% Y), analyzing them according to the Clavien-Dindo classification, more than 70% are type I-II in both groups. There are no differences in reintervention rate (6.8% Y, 11.9% E) or re-entry rate (8% Y, 4.8% E). Elder group have an unpurified hospital stay of 2.6 days longer than young patients.
Conclusions: Taking into account these results it seems safe to apply the protocol in elderly patients, without forgetting to continue working to reduce the rate of complications and hospital stay.

854—COLORECTAL—Malignant

MASSIVE SUBCUTANEOUS EMPHYSEMA DUE TO DEHISCENCE OF COLORECTAL ANASTOMOSIS

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Aims: The incidence of dehiscence of a colorectal anastomosis is between 2 and 7% in some series. It increases the morbidity and mortality of the patient. Clinical signs that indicate an anastomotic leak are well known. We report a case of anastomotic dehiscence that debuts as the only clinical sign massive subcutaneous emphysema.
Methods and Results: A 76-year-old woman with a history of hypertension and dyslipidemia is diagnosed of obstructive sigma neoplasm by abdominal CT in the emergency department due to intestinal obstruction. Urgent surgery is carried out by performing laparotomic anterior resection with mesenteric lymphadenectomy and lateral-terminal colorectal anastomosis.
On the second post-surgical day, there is an increase in soft tissue volume with crepitus that affects face, neck, chest, abdomen and thigh compatible with subcutaneous emphysema. The patient is thermodynamically stable, has no abdominal pain or dyspnea, drainage with serohematic debit, analytical without relevant alterations. Abdominal CT was performed, reporting as "extensive subcutaneous emphysema that extends from the left malar region to the ipsilateral inguinal region, dissecting the muscular planes of the anterior and posterior thoracic wall, abdominal and left lateral pelvic. Pneumomediastinum, pneumoperitoneum and retroneumoperitoneum. Few air bubbles perianastomotic due to recent surgical history. Without other findings."
The patient is evaluated by the Thoracic Surgery Service, who perform fibrobronchoscopy discarding tracheal lesions. Surgical review is decided, showing a moderate amount of cloudy free fluid, a colorectal anastomosis has a minimal leak at the colonic terminal edge. Leakage reinforcement is performed and negative pressure therapy system is left. Subsequently, the cavity is checked on the 2nd and 4th day, in the last review, anastomosis leak is seen again, deciding to perform Hartmann's intervention.
Conclusions: The incidence of dehiscence of anastomosis in colon and rectal surgery is 2–7%, associated with increased morbidity and mortality, increased hospital stay and risk of recurrence of neoplastic disease as well as delay in adjuvant treatments.
The majority dehiscences of anastomosis occur between the 5th and 7th day after surgery. Clinically, patients have pain, bloating and fever; drains with cloudy or intestinal debit, increasing in acute phase reactants will be observed. Risk factors include: advanced age, male gender, obesity, ASA III-IV, emergency surgery, anastomosis ischemia, tense anastomosis, prolonged operative time, etc. The management depends on the clinical state of the patient, the leak position and its size. Most require urgent surgical review.
Few cases are reported in bibliography about debut of an anastomotic dehiscence as subcutaneous emphysema.

858—COLORECTAL—Malignant

LAPAROSCOPIC LOW ANTERIOR RESECTION WITH EXTENDED TOTAL MESOECTAL EXCISION FOR LOCALLY ADVANCED RECTAL CANCER–A VIDEO ILLUSTRATION

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Introduction: Achieving negative surgical margins is the most important factor in determining the incidence of local recurrence. In this video we demonstrate the feasibility of laparoscopic surgery for patients with locally advanced rectal cancer planned for low anterior resection requiring with imaging suggestive of doubtful planes with adjacent structures.
Objectives: To demonstrate systematic approach for performing laparoscopic low anterior resection with prehypogastric fascia excision for locally advanced rectal cancer.
Methods: A 58 year old female with no major comorbidities presented with altered bowel habits for 2 months. Per rectal examination reveled stricturous growth at 8 cms from anal verge. Flexible sigmoidoscopy revealed a ulceroproliferatve growth starting at 7 cms from anal verge with significant luminal narrowing. Biopsy showed moderately differentiated adenocarcinoma. MRI pelvis showed a upper and mid rectal lesion with contiguous mesorectal deposit. The mesorectal deposit appeared to infiltrate the mesorectal fascia. Patient received neoadjuvant chemoradiation (NACTRT). Post NACTRT magnetic resonance imaging (MRI) revealed partial response of primary with CRM positive posteriorly presacral facia involved in first and second scaral vertebral region. Patient received four more cycles of chemotherapy with post chemo MRI showing persistent mesorectal fescial involvement .
Results: Patient underwent laparoscopic Anterior resection with prehypogastric fascia excision. operative time 280 min and blood loss of 150 ml. Postoperative period uneventful. Patient discharged on day 5. histopathology showed residual viable moderately differentiated adenocarcinoma of the rectum. TRG of 3/5. Tumour involved the subserosa with 0/13 nodes (ypT3N0).
Conclusions: Laparoscopic low anterior resections can be safely and effectively performed for locally advanced rectal cancers and can be beneficial in doing surgeries involving extended total mesorectal excision.

859—COLORECTAL—Malignant

ROBOTIC ASSISTED SUPRALEVATOR POSTERIOR EXENTERATION: A VIDEO ILLUSTRATION

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Introduction: Achieving negative surgical margins is the most important factor in determining the incidence of local recurrence. In this video we demonstrate the feasibility of laparoscopic surgery for patients with locally advanced rectal cancer planned for low anterior resection requiring with imaging suggestive of doubtful planes with adjacent structures.

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Conclusions: Laparoscopic low anterior resections can be safely and effectively performed for locally advanced rectal cancers and can be beneficial in doing surgeries involving extended total mesorectal excision.

893—COLORECTAL—Malignant

EARLY COMPLICATION FOLLOWING ROBOTIC RIGHT HEMICOLECTOMY

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This video presents the case of 73 years old female patient undergoing robotic right colectomy due to malignant lesion located in the caecum. The patients had a history of the previous appendectomy. After routine preoperative workup, the patient underwent a standard robotic right colectomy with intracorporeal anastomosis. The small incisional hernia at the site of an appendectomy was noticed during the procedure. The postoperative course was uneventful and the patient was discharged home on the third postoperative day. On a postoperative day five, the patient was readmitted to the surgical department with a complaint of abdominal pain and vomiting. Due to asymptomatic abdominal examination and low inflammatory markers an attempt for conservative treatment was made. On postoperative day six, however the patient presented again an episode of vomiting. The plain abdominal X-ray revealed small bowel obstruction. The patient was scheduled for diagnostic laparoscopy. The intraoperative examination revealed distended small bowel and Richter's hernia of small bowel antimesenteric wall at the site of the previous appendectomy. The ileo-colo anastomosis was intact. The hernia was reduced laparoscopically and the protruding wall of the small intestine was found viable. The hernia opening was subsequently closed with Z stitch. The patient's recovery was then uneventful and the patient was discharged home three days after the second intervention.

899—COLORECTAL—Malignant

VALUE OF INDOCYANINE GREEN (ICG) TO IDENTIFY PERITONEAL CARCINOMATOSIS OF COLORECTAL CANCER

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Aims: In patients with peritoneal carcinomatosis of colorectal cancer, staging and the integrity of cytoreductive surgery are important prognostic factors. Fluorescence-guided imaging may be a useful tool to facilitate intraoperative evaluation of the extension affected by tumoral disease beyond current methods of palpation and visual inspection.

Methods: Intravenous infusion of ICG was performed before performing anastomosis. Peritoneal implants can be easily and accurately identified with this technique, avoiding them from being unnoticed.

Results: This video shows the case of a 39-year-old male patient that was admitted for elective laparoscopic right hemicolectomy. In the CT-scan a tumor is observed in the mesenteric edge of the caecum with extramural extension. The colonoscopy showed a 3 cm nodular lesion that deformed the ileum-cecal valve and impeded the passing to the ileum. Possible peritoneal implants are observed in the pelvis, without seeing other significant findings. We perform duodenal identification and retroperitoneal dissection until the hepatic angle of the colon is dissected medially, dissecting the ileococolic vessels. Before performing the intestinal section, the ICG fluorescence angiography is done in order to check blood supply. There was not a change of transection line.

We waited 5 min to assess the fluorescence in these pelvic implants which showed it properly. Intracorporeal anastomosis is done on a regular basis. Subsequently, a biopsy of two of these implants is performed, revealing peritoneal carcinomatosis of neuroendocrine colon cancer. The patient is discharged four days after the surgery, referring to oncology to assess a possible subsequent HIPEC for peritoneal carcinomatosis.

Conclusion: The present video shows a case of how ICG imaging is an effective tool to help identify tumor nodules in the peritoneum both macroscopically and microscopically. Therefore, the use of the ICG could have a promising future with an important role in this type of interventions.

971—COLORECTAL—Malignant

INVESTIGATION OF THE TIME TO PERFUSION MEASURED IN ICG ANGIOGRAPHY IN COLORECTAL SURGERY

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Aims: ICG angiography (ICG-A) is considered to be a promising tool to visualize the blood supply, and is expected to reduce the incidence of anastomotic leakage (AL). In ICG-A, the time to perfusion from ICG injection (perfusion time; PFT) is one of the indicators that assess blood flow. However, optimal PFT has not been fully evaluated. The aim of this study was to clarify the clinical features of PFT measured in ICG-A in colorectal surgery.
Methods: Between Sep. 2017 and Nov. 2019, 97 patients who underwent colorectal surgery with ICG-A were retrospectively analyzed. ICG-A were performed in accordance with our predetermined protocol. PFT was defined as the time to arterial perfusion at the planned transection line of intestine from ICG injection. If the blood flow at observation point was supplied via marginal artery without regional major arterial flow, such situations were defined as "transsectional blood flow (TSBF)" in this study. The patients were divided into TSBF and non-TSBF groups, and PFT in each group was compared. All data was obtained from the oral transection line.
Results: There were 58 men and 39 women with a mean age of 70 (40–91) years. Operative procedures included 61 colonic resections, 33 rectal resections, 1 abdominoperineal resection, 1 proctocolectomy, and 1 pelvic exenteration. The surgical approaches were open for 17 cases, and laparoscopy for 80 cases. 58 patients were divided into TSBF group. In TSBF group PFT were 24 (IQR: 20–30) seconds which was significantly slower than that in Non-TSBF group (17 (IQR: 15–20.5) seconds; $p < 0.01$). The AL occurred in 6 of 94 cases with anastomosis (6.4%). When cases whose PFT was slower than 75th percentiles in each group were defined as delay group, it tended to be a risk factor for AL ($p = 0.082$, odds ratio 4.769).
Conclusions: PFT in colorectal surgery differs depending on TSBF. PFT which was slower than 75th percentiles in each groups might be a risk factor of AL.

1009—COLORECTAL—Malignant

PRONE VERSUS SUPINE POSITION IN APR: OUTCOMES IN THE LAPAROSCOPIC ERA

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Background: Abdominoperineal resection (APR) is still required for selected cases of low rectal cancer. Prone and supine position are the two options needed for the perineal time.
Aim: To compare immediate, pathological outcomes, long-term morbidity and oncological results between supine versus prone for patients undergoing laparoscopic APR for low rectal cancer.
Methods: We conducted a retrospective study from our prospective database including patients with rectal cancer who underwent curative laparoscopic APR from 2005 to 2018. We compared perioperative data, postoperative outcomes, oncological outcomes and survival.
Results: We recluted 123 patients (65 prone and 58 supine), with a median age of 72 (41–93) years. The media of follow up, expressed on months, was $47{,}76 \pm 30{,}9$ (13–158) for prone group and $67.35 \pm 45{,}7$ (28–169) for supine group.
The media of duration of surgery was statistically longer in PJ group (supine $210 \pm 56{,}64$ versus prone $237 \pm 52{,}25$, $p = 0{,}007$). Incidence of tumor perforation during surgery was 9% in supine group versus 3% in prone group ($p = 0{,}208$). Incidence of perineal wound infection was not significant different between the two groups (supine 22,4% versus prone 20%, $p = 0{,}930$). Mesorectum quality and CRM positivity was respectevely in supine group 25% and 21% and in 14% and 14% supine group (mesorectum $p = 0{,}175$; CRM $p = 0{,}374$).
Surgeons were more satisfied operating patients in prone for improved visualization of perineal planes and a more comfortable position.
Perineal hernia was reported in only four patients (2 in prone group and 2 in supine group).
Incidence of local (LR) and distant recurrence (DR) in patients with adenocarcinoma was higher in the supine position group (prone LR 4%DR 17%, supine: LR 10% DR 31% $p = 0{,}177$).
OS was longer in prone group ($p = 0{,}034$).
Conclusions: Position of patient in the perineal time of APR don't significantly influence post-operatory complication rates and incidence of perineal hernia. Mortality incidence for disease progression is reduced in prone group, however, in our series there is not a significant difference between two groups for oncological outcome.
In a spite of a long operative time surgeons were more satisfied with prone approach with similar morbidity and better long-term outcomes. According to results prone approach is our preferred position for APR with laparoscopic approach.

1025—COLORECTAL—Malignant

SHORT-TERM OUTCOME OF LAPAROSCOPIC SURGERY FOR CT4B COLON CANCER

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Aim: Laparoscopic surgery has not been established as a standard procedure for locally advanced colon cancer. However, there have been some reports related to laparoscopic surgery for colon cancer with adjacent organ invasion (T4b). Hence, we evaluated the short-term outcomes of the laparoscopic approach for cT4b colon cancer.
Methods: This was a retrospective study using a single-institutional database. Thirteen patients who underwent laparoscopic surgery in 20 cases of cT4b primary colon cancer between 2012 and 2019 were included in this study.
Results: The laparoscopic approach was performed in 3 (37.5%) of 8 cases in the early period (from 2012 to 2015) and in 10 (83.3%) of 12 cases in the latter period (from 2016 to 2019). The primary tumour locations were on the right and left sides in 4 and 9 patients, respectively. The invaded organs were the abdominal wall, small intestine, bladder, and uterus in 4, 3, 3, and 3 patients, respectively. Surgical resection was performed via right hemicolectomy, sigmoid colectomy, anterior resection, and Hartmann's operation in 4, 2, 5, and 2 patients, respectively. Four patients received preoperative chemotherapy. Conversion was required in 3 cases (23.1%) because of large tumours and difficulty in exposure of the surgical field. The median operative time was 246 (range, 133–350) minutes, blood loss volume was 80 (range, 0–150) mL, and postoperative hospitalization duration was 14 (range, 9–24) days. Two patients developed ileus and surgical site infections postoperatively. There were two cases of microscopic resection margin positivity in the early period; however, no such cases were noted in the latter period.
Conclusion: The laparoscopic approach for cT4b colon cancer is safe and feasible.

1097—COLORECTAL—Malignant

LAPAROSCOPIC RIGHT COLECTOMY: STEP-BY-STEP APPROACH BASED ON NATIONAL SURVEY

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Background: Since the description of the concept of complete mesocolon excision (CME) by Hohenberger in 2009, radical right colon surgery has undergone a conceptual change in the same way as complete mesorectal excision. The essential components of CME are anatomical plane dissections, central vascular ligations and adequate colic extension. When properly performed, CME may decrease locoregional disease recurrence (at least in stages II and III) and is not accompanied by increased surgical morbidity and mortality.
Methods: A simple and anonymous 5-question survey was conducted on 12 major hospitals in the country (Portugal) to understand the frequency of the technique (CME) and its variability. After assessment of responses a didatic video of minimally invasive CME for right colectomy was built using several surgical videos and shared among the participating hospitals at a National meeting in order to decrease variability of the performed technique. Here we present the video of the proposal of standardization of CME for right colectomy.
Results: In two thirds of cases the right colectomy is performed laparoscopically and in 8 (89%) of the hospitals that responded to the survey, it is a technique that is part of the resident's surgical curriculum. The variability of technique, positioning and anastomosis is at the mercy of the surgeon who performs the intervention in most cases, and therefore, the variability is high in practice. In order to standardize the technique a 10-step approach is proposed: (i) positioning; (ii) inspection; (iii) retro cavity of the greater omentum; (iv) midline marking; (v) mesocolon dissection; (vi) proximal ligation; (vii) head of the pancreas; (viii) resection; (ix) anastomosis; (x) removal of the specimen;
Conclusion: ECM increases the technical demand for radical right colectomy. The authors believe that the standardization of the procedure has pedagogical and comparison benefits and may bring better oncological results.

1137—COLORECTAL—Malignant

LAPAROSCOPIC TOTAL PELVIC EXENTERATION FOR LOCALLY ADVANCED COLORECTAL CANCER

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Background: Complete radical resection of locally advanced colorectal cancer is the most important factor for achieving cure. Total pelvic exenteration (TPE) is often employed to secure negative resection margins. Although minimally invasive approaches have become more common in the field of pelvic malignancies, the safety and efficacy of laparoscopic TPE (Lap-TPE) have not been well elucidated. The aim of this study was to evaluate the feasibility of Lap-TPE for colorectal cancer. After 2016, we have modified surgical procedure to reduce the intraoperative blood loss. Recent modified surgical procedure of Lap-TPE is also presented here.

Methods: From 2001 to 2017, totally 111 patients underwent TPE for locally advanced or recurrent colorectal cancer. To assess the feasibility and safety of Lap surgery, the records of 57 patients (37, open surgery; 20, laparoscopic surgery) with primary colorectal cancer were reviewed (recurrent cases were excluded).

Results: The mean intraoperative blood loss volume was significantly less in the Lap group than in the Open group (735 vs. 4447 ml, respectively, $p < 0.01$).

Especially, after 2016, mean intraoperative blood loss volume in the Lap group was 131 ml (n = 7) because we have modified the surgical procedure to reduce the blood loss volume.

The mean operative time was not significantly different between the Lap group and the Open group (738 vs 679 min, respectively, $p = 0.276$). The incidence of severe postoperative complication (grade 3 or higher in the Clavien-Dindo classification) was lower in the Lap group (4/17 (24%) vs 16/35 (46%), respectively). The mean postoperative hospital stay was significantly shorter in the Lap group than that in the Open group ($p = 0.022$).

Conclusions: Lap-TPE can be a safe and feasible procedure.

1147—COLORECTAL—Malignant

SHORT-TERM SURGICAL OUTCOMES OF RECTAL CANCER IN JAPAN: ANALYSIS USING THE BIG DATA

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Background: Several studies conducted by selected institutions demonstrated the efficacy and safety outcomes of laparoscopic surgery for rectal cancer. However, there are no report using all Japan practical record, so called 'real world' data. The Diagnosis Procedure Combination/Per-Diem Payment System (DPC/PDPS) is a payment system based on diagnostic group classification for acute medical care. It has 1730 Hospitals/490,000 beds. We analyzedthe short-term outcomes of laparoscopic vs open surgery for rectal cancer on national scale using this big data.

Methods: From about 130,000 hospitalizations for colorectal cancer, 32,349 cases (1065 medical institutions) of rectal cancer were analyzed, using 'Multi Level Analysis (MLA)' which can analyze data after correcting differences between facilities. In this analysis, confounding factors, such as gender, age, BMI, UICC Stage, smoking, coexisting disease, ADL and hospital volume were adjusted.

Results: 10899 laparotomy and 21450 laparoscopic surgery were done, for rectal cancer. Averaged medical expenseswere 2416404 yen for the laparotomy and 2248384 yen for the laparoscopic surgery. Morbidity(54.5% in laparotomy, 38.9% in laparoscopic surgery, OR 0.55), operative death (0.14%, 0.06%, OR 0.70), hospital death (0.39%, 0.12%, OR 0.49) were lower in the laparoscopic surgery group. As for hospital volume, mortality, morbidity, and reoperation rates tended to be lower at institutions with more annual cases.

Conclusion: Short-term efficacy and safetyof laparoscopic rectal resection were demonstrated using big data (DPC/PDPS) as a 'real world' in Japan.

1183—COLORECTAL—Malignant

LAPAROSCOPIC SUPRALEVATOR POSTERIOR EXENTERATION: A VIDEO VIGNETTE

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Objective: To present a systematic approach to Laparoscopic Supralevator posterior exenteration.

Method: We present a case of a 51 years old lady, diagnosed as a case of locally advanced carcinoma rectum(cT4N1M0). She received neoadjuvant chemoradiation following which a reassessment MRI scan was done,suggestive of loss of fat planes with uterus. She underwent Laparoscopic supralevator posterior exenteration with 5 ports.

Results: The procedure was performed in 500 min with a blood loss of 200 ml and had no intraoperative or postoperative complications.

Conclusions: Laparoscopic suparlevator posterior exenterations can be safely performed in selected patients at high volume centres.

1215—COLORECTAL—Malignant

ENDOSCOPIC VACCUM THERAPY FOR COLONIC ANASTOMOTIC LEAKAGE

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Aims: The colonic anastomotic leakage still remains a serious complication in colorectal surgery. The aim of this study was evaluation of efficiency and safety of transrectal endoscopic drainage by vaccum-assisted therapy in the patients with colonic anastomotic leakage after the surgical treatment of tumors in the middle and distal part of rectum.

Methods: Prospective treatment's results analysis of patients with colonic anastomotic leakage treated with transrectal endoscopic drainage by vaccum-assisted therapy in years 2016–2019 in the Department of General, Gastroenterological and Oncological Surgery, Collegium Medicum, Nicolaus Copernicus University in Toruń.

Results: 79 patients with tumor in the middle and distal part of rectum had laparoscopic resection performed. 16/79 (20.25%) patients [16 males, mean age 62.17 (43–86) years] were diagnosed colonic anastomotic leakage in post-surgery period. 8/16 (50%) patients had protecting ileostomy performed at the primary operation. All 16 patients were treated with transrectal endoscopic drainage by vaccum-assisted therapy. The mean time from the surgery to the beginning of endotherapy was 16 (3–728) days. The mean amount endoscopic procedures per one patient was 6 (1–11). The mean time of endoscopic treatment was 22 (4–43) days. five patients required secondary ileostomy during the endotherapy. Success of endoscopic treatment of colonic anastomotic leakage was achieved in 15/16 (93.75%) patients. The mean time of follow-up was 253 (78–510) days. Recurrence of pelvic abscess was diagnosed in two patients. Long-term success of endotherapy was stated in 13/16 (81.25%) patients.

Conclusion: Transrectal endoscopic drainage by vaccum-assisted therapy in the patients with colonic anastomotic leakage after the surgical treatment of tumors in the middle and distal part of rectum is a safe and efficient minimally invasive method of treatment.

1276—COLORECTAL—Malignant

TRANSANAL SUTURE OF A CHRONIC ANASTOMOTIC SINUS AFTER A LOW ANTERIOR RESECTION BY TAMIS APPORACH

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Chronic sinuses are a frequent complication after colorectal anastomosis.

Many different approaches have been described depending on the size and type of the sinus. In small sinus, fibrin glue, clips and direct suturing have been used.

For larger defects, marsupialization, suturing and reanastomosis are possible options.

We present the case of a chronic sinus after a low colorectal anastomosis with diverting ileostomy.

The patient was asymptomatic, and the sinus was a finding when completing the study for ileostomy reversal.

First option was watch and wait for healing, but after 10 months, the sinus was stable and no healing was observed.

We decided to perform a TAMIS approach and first a Friedrich of the sinus was done. After this, transanal suturing of the sinus was performed with interrupted sutures of absorbable material.

The patient recovery was uneventful, and no sinus was visible in later rectoscopies, so the patient is now waiting for stoma reversal.

TAMIS approach and suturing of an anastomotic chronic sinus is a safe and feasible tecnnique, and may be a good alternative in selected patients.

1283—COLORECTAL—Malignant

ICG FLUORESCENCE IMAGING IN LAPAROSCOPIC COLON SURGERY

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Introduction: In recent years, it has been increasingly talked about the possibility of directly peroperatively objectifying blood supply to the anastomosis. The possibility of verifying the perfusion of anastomosis peroperatively due to fluorescence angiography after application of ICG (indocyanin green) seams to be the most useful.
Methods: Most studies report a reduction in the incidence of anastomotic leakage, when using ICG fluorescence angiography.
However, we did not find any stronger data evaluating the possibility of using ICG angiography to evaluate anastomotic perfusion on a colon surgery. Therefore, we decided to evaluate this possibility in our own prospective study in 2018. A total of 57 patients indicated for elective colonic resection were enrolled within 12 months. Patients with rectosigmoideum or rectal resection were not included.
Results: There were 31 men and 24 women in our group. Average BMI 28.92, with a maximum of 56 and a minimum of 18. Average age of 62.7, with a maximum of 82 and a minimum of 24 years. Laparoscopically completed 54 operations (94.7%). Conversion was necessary in two patients (3.5%) and primarily one patient was operated on as open surgery. Right hemicolectomy was performed in 30 patients (52.6%), ileocecal resection 3x (5.3%), left hemicolectomy 8x (14.0%), sigmoid resection 16x (28.1%). Complete intracorporeal anastomosis was constructed in 52 cases (91.2%). Stapler anastomosis was also reported in 52 cases (91.2%). ICG was given to the peripheral venous entry at a dose of 12.5 mg. The mean time to evaluate fluorescence since intravenous ICG administration was 23.0 s, with a maximum of 45 s and a minimum of 10 s. In either case, we did not have to move the prepared oral resection line. In all cases, the surgeon correctly assessed adequate blood supply to the bowel. We did not have to remodel anastomosis already due to poor perfusion. In all cases, the anastomosis perfusion was assessed to be adequate by ICG fluorescence angiography. In this group we reported an anastomosis leak in two patients, i.e. 3.5%. In one case it was a laparoscopic sigmoid resection and once it was a sigmoid resection where conversion to open surgery was necessary.
Conclusion: Since we did not change the resection plan in our group due to ICG angiography, the routine use of ICG fluorescent angiography in elective colonic resections is questionable. The use of ICG fluorescent angiography in colonic resections will be indicated in selected cases.

1292—COLORECTAL—Malignant

NEW TAKE ON N1C: THE USE OF 3D MODELLING TO DEPICT EXTRANODAL TUMOUR DEPOSITS IN RECTAL CANCER

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Aims: Extranodal tumour deposits (ENTDs) still remain a controversial and not fully appreciated concept, despite the growing evidence of their prognostic significance and negative impact on the overall and disease-free survival in patients with colorectal cancer (CRC). They are defined as discrete tumour foci within the mesocolon or mesorectum, without a clear relation to lymph nodes or vessels. The novel 3D modelling technology has gained popularity as a tool allowing for a comprehensible depiction of complex anatomical and surgical entities. Our aim was to apply 3D modelling to raise the awareness of ENTDs and to facilitate their recognition in clinical practice, contributing to better patient outcomes.
Methods: Patients with rectal cancer, any T grade associated with N1c status, equivalent to the presence of ENTDs according to the current TNM8 staging system, were selected from the prospective multi-centre COMET trial. 3D models of rectal cancer associated with presence of ENTDs were constructed from the routinely-used rectal staging MRI scans, T2 sequence, analysed by two expert Colorectal Radiologists. The manual segmentation was performed in ITK-Snap, a free, open source programme. Further smoothing was applied in MeshLab.
Results: We have created 10 three-dimensional models of rectal cancer associated with N1c status. Examples of different T status have been included, from T1 to T4. Models depict the rectum with the tumour and the mesorectum, where the ENTDs are located. They can be rotated and inspected from different angles, while the transparency of layers can be manipulated which allows to bring the attention to different parts of the model.
Conclusions: This new exciting way of the illustration of the N1c status in rectal cancer addresses a challenging concept which significantly affects patients' prognosis and treatment planning. It can be used as an educational tool to facilitate the recognition of ENTDs. Simultaneously, it can become a crucial component of bespoke patient-tailored care to depict the individual anatomy, allowing for a swift multidisciplinary discussion between the Radiologist, Surgeon and Oncologist and a more satisfactory patient consultation. This technology can be applied to other parts of the colon and will assist in further research in this area.

1301—COLORECTAL—Malignant

USEFULNESS OF THE LOW ANTERIOR RESECTION SYNDROME SCORE IN THE EVALUATION AND MANAGEMENT OF LOW ANTERIOR RESECTION SYNDROME: PRELIMINARY RESULTS

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Aims: Low anterior resection (LAR) for rectal cancer often results in severe bowel dysfunction also known as low anterior resection syndrome (LARS), characterized by incontinence, urgency, and frequent bowel movements. The LARS score is a simple self-administered questionnaire measuring bowel dysfunction after rectal cancer surgery. The aim of this study was to compare the LARS score in three different periods before and after surgery to evaluate any variation of the scores in terms of worsening or improvement of symptoms. The results can help to predict and address in advance the patients in major need of intervention to relieve LARS symptoms after rectal cancer surgery.
Methods: Patients who underwent surgery for rectal cancer situated within 8 cm from the anal verge received the LARS score questionnaire, at the baseline, 6 months and 1 year after LAR or closure of ileostomy. The range of points (0–42) was divided into 0 to 20 (no LARS), 21–29 (minor LARS), and 30–42 (major LARS). Logistic regression analysis was performed to estimate the effect of patients' and tumor characteristics associated to worsening after surgical intervention. Radiotherapy status, gender, age (dichotomized at 65 years), distance from anal verge (dichotomized at 5 cm), and type of surgery were considered as independent factors.
Results: A total of 100 patients were included in the analysis, between 2017 and 2019. Four patients (4%) patients referred symptoms similar to major LARS at the baseline before surgery, none of these experienced a variation in the score. The percentage of major LARS was 44.4% and 28.9% at 6 months and 1 year after surgery respectively. All the patients with major LARS referred an improvement of symptoms from 6 to 12 months after surgery, with a median positive absolute variation in the LARS score of 11 points (95% CI 3.5–29; $p < 0.001$). Three patients (3%) without/with mild symptoms after 6 month referred major LARS at 1 year. Minor LARS rate was 18% at 6 months and 8.9% at 1 year. Eight (44.4%) patients referred an improvement of symptoms in 6 months with a median positive absolute variation of 9 points (95% CI 1–23; $p < 0.026$), 2 (11.1%) referred unchanged symptoms, 10 (55.5%) got worse. Worsened patients experienced a median absolute variation in LARS score of 10.5 points (95%CI 4.5–27.5; $p < 0.001$). The LARS score was able to discriminate between groups of patients differing with regard to radiotherapy ($p = 0.003$), surgery ($p = 0.05$), distance from the anal verge ($p = 0.003$) and age ($p = 0.04$).
Conclusions: In our experience an initial worsening of symptoms was followed by a plateau highlighted by a stabilization of the LARS score. The worsening of LARS score was related to specific factors. The use of this score could help to predict the need to direct selected patients to specific treatment after surgery.

1334—COLORECTAL—Malignant

THE IMPACT OF PERIOPERATIVE FLUID THERAPY ON SHORT-TERM OUTCOMES AFTER LAPAROSCOPIC COLORECTAL CANCER SURGERY COMBINED WITH ERAS PROTOCOL

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Introduction: The Enhanced Recovery After Surgery (ERAS) protocol was designed to accelerate convalescence, reduce morbidity and shorten the length of hospital stay (LOS). One of its major interventions is balanced perioperative fluid therapy. The impact of this single intervention on short-term outcomes is widely discuss.
Aim: The aim of this study was to assess the impact of perioperative fluid therapy on short-term outcomes.
Materials and Methods: The analysis included consecutive prospectively registered patients operated laparoscopically for colorectal cancer between January 2013 and January 2019. Patients were divided into two groups: restricted ($\leq$ 2500 ml) or excessive ($>$ 2500 ml) perioperative fluid therapy. All patients were treated according to ERAS protocol. Study outcomes were: recovery parameters, morbidity rate, LOS, 30-day readmission rate.
Results: Group 1 consisted of 361 and Group 2 of 80 patients. There were no statistically significant differences between the groups in terms of demographic and operative parameters. Morbidity was lower in Group 1 (27.4% vs 38.8%, $p = 0.044$). Patients in Group 1 were discharged home earlier than in Group 2 (4 vs 5 days, $p < 0.001$). Moreover, we observed differences in recovery parameters between the groups: tolerance of an oral diet on the 1st postoperative day (76% vs. 59%, $p = 0.002$) and patient mobilization on the day of surgery (90% vs. 78%, $p = 0.005$). 30-day readmission rate was lower in group 1 (7.8% vs. 15%, $p = 0.041$).
Conclusion: A balanced perioperative fluid therapy on the day of surgery may be associated with faster convalescence, lower morbidity rate, shorter LOS and lower 30-day readmission rate.

1359—COLORECTAL—Malignant

BENEFITS OF ROBOTIC SURGERY IN RECTAL CANCER: PATHOLOGICAL RESULTS IN A CENTER FOR MINIMALLY INVASIVE SURGERY

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Aim: Our study's main aim is to analyze the oncological adequacy this approach on a number of 74 cases, by assessing its oncological reliability in rectal malignancy over a period of four years. World-wide incidence of colorectal cancer (CRC) is significant, anticipated to have a crescent trend in the following years with more than 50%. Due to its increased risk of metastasis to other anatomical sites and risk of local recurrence, choosing the robotic approach for this malignancy is an ongoing debate. Therefore assessing the histological pattern of the resected specimens and following the response to oncological treatment are important.
Methods: The studied group was stratified according to the type of surgery performed: Anterior rectal resection (60 cases), and abdominoperineal resection (14 cases). We analyzed the resected specimens pathological results focusing on: the histological grading, postoperative TNM staging, molecular mutations, resection margins: linear and circumferential, lymphovascular and perineural invasion, number of regional lymph nodes identified; We analyzed the response to the oncological treatment, the metastatic evolution and recurrences.
Results: Our results show that numbers of 18 isolated lymph nodes affected by metastases were associated in the majority of cases with stage IIIB and stage IIIC (83.3% and 100%), the median number of lymph nodes obtained was 22. Robotic surgery proved to be efficient in terms of reaching oncological resection limits. Residual tumor (R1) was encountered in 5% of the cases Total mesorectal excision was obtained in 95% of the cases; the recurrence rate was 4.05%. G2 and G3 adenocarcinomas were linked with perineural and lymphovascular invasion. Our results indicate a direct relation between the molecular mutations patterns the response to the postoperative oncological treatment, metastatic evolution and recurrence risk.
Conclusion: Our experience indicates that robotic surgery is a promising approach in the treatment of rectal cancer.

1364—COLORECTAL—Malignant

LAPAROSCOPIC SIGMOIDECTOMY: FINDING DIFFICULTIES DURINGTHE ANASTOMOSIS: TIPS AND TRICKS

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Colorectal cancer is the third most commonly diagnosed cancer. Nowadays, surgical resection is the only curative treatment modality for localized colon cancer. Due to its high incidence, laparoscopic sigmoidectomy is performed daily. The aim of this video is to review some tricks that can be performed during this procedure.
We present the case of a 74-year-old woman with a past medical history of diabetes, who presents to the hospital due to the screening of colorectal cancer. After colonoscopy, numerous polyps were analyze, one of them results with a Haggit IV adenocarcinoma up to 20 cm from de anal margin. After the pathological results, surgical treatment by laparoscopic sigmoidectomy was decided.
During the surgery, we performed the sigmoidectomy following the standard technique and we proceed to the anastomosis by CEEA-stapled.
When introducing CEEA into the rectum we found certain difficulties for its advance until the end of the rectal stump. First, we performed the mobilization of the uterus and traction of the rectal stump to generate a less tortuous channel for the CEEA. Without success, it is decided to release the peritoneal junction of the rectal stump to give it greater mobility, and also release of the Pouch of Douglas. Next, the mesorectum is released in order to make the rectal wall more visible, however, the CEEA-stapled is not able to advance, so, finally, it is decided to section a small part of the rectum with EndoGIA to generate a shorter path achievable with the CEEA-stapled. With the completion of this last maneuver, the anastomosis is achieved. Due to the technical difficulty involved in performing the anastomosis, it was decided to reinforce it with interrupted stitches using absorbable suture.
The patient evolved satisfactorily, being discharged on her 5th post-operative day without complications.
Although laparoscopic sigmoidectomy is a technique usually performed in general surgery, we can find ourselves faced with obstacles during the procedure. We need to be up to solve these difficulties with small movements. The release of the peritoneal junction is an easy and save maneuver that can be carry out in order to give de rectum a greater mobility.

1384—COLORECTAL—Malignant

COMPARISON OF THE OUTCOMES IN RECTAL RESECTION OF FOUR DIFFERENT TECHNIQUES: TRANSANAL, LAPAROSCOPIC, ROBOTIC AND OPEN TOTAL MESORECTAL EXCISION

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Aims: Total mesorectal excision (TME) is the standard of care for rectal cancer. The narrow pelvic space and difficulties in obtaining adequate exposure may contribute to make this kind of surgery technically challenging. Nowadays, four techniques are available to perform rectal surgery: open laparotomy, laparoscopy (LAR), robot-assisted surgery, and transanal surgery (TaTME). The aim of this study was to offer comparative data of the technique with the ideal purpose to construct guidelines to address patients to one or another type of approach.
Methods: This is a retrospective study evaluating patients undergone a sphincter saving rectal resection between 2004 and 2018 using open, laparoscopy, robotic or transanal surgery. The primary endpoint was to evaluate the quality of surgery in terms of CRM $\geq$ 1 mm, TME grade III and minimal postoperative morbidity. Secondary endpoints were oncological results, length of hospital stay, operative time, and rate of unplanned conversions. Exclusion criteria were: T4b tumours, need of abdominal perineal resection, synchronous pelvic malignant tumours, ASA 4, emergency procedures, concomitant major procedures and follow-up $<$ 2 years.
Comparisons were performed using Fisher exact test and Wilcoxon rank sum test. Survival analysis was performed to estimate the overall (OS) and disease free survival (DFS) probability according to type of intervention by Kaplan–Meier curves.
Results: The study enrolled 453 patients (367 LAR, 40 open, 20 robotic and 26 TaTME). Patients did not differ for demographic characteristics as ASA score, BMI, age or gender. The distance of the tumour from the anal verge was statistically lower in the TaTME group (p = 0.001). Median operative time was 155 min and it was statistically longer in TaTME patients ($p < 0.001$) and shorter in the open group (p = 0.043). Intraoperative complications rate was 4.2%, without any statistical difference among the procedures. The conversion rate was 12.2%, no difference was noted. The post-operative complications rate was 12.4% and was statistically higher in the open group. The length of hospital stay was 6 days and was statistically longer in the open and TaTME group ($p < 0.001$). The type of surgery relates signignificantly with post-operative complications in both univariate and multivariate analysis (p = 0.009 e p = 0.054 respectively), as male sex (p = 0.039). The type of surgery did not influence the CRM (p = 0.786), the quality of mesorectum excision (p = 0.126) or the distal margin (p = 0.532). Only radiotherapy status related to recurrence (p = 0.007). The overall recurrence rate was 10.1% (p = 0.087), the 5 years overall survival was 82% (p = 0.253) and the 5 years disease free survival was 76% (p = 0.0982).
Conclusions: None of the technique showed striking differences in the evaluated parameters. The assessment of the ideal surgical treatment for rectal cancer patients need an accurate selection to obtain the best outcomes.

1422—COLORECTAL—Malignant

THE MODERN MANAGEMENT OF EARLY RECTAL CANCER: NEOADJUVANT RADIOTHERAPY AND LOCAL EXCISION LEADS TO BETTER OUTCOMES THAN EXCISION ALONE

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Background: Treatment is evolving from standard major resectional surgery to favour rectal preservation in selected patients with early rectal cancer with the use of transanal endoscopic microsurgery. However, international consensus regarding multi-modality treatment in combination with local excision remains in debate. The use of neoadjuvant radiotherapy has the potential to offer comparable oncological outcomes. We present a comparative study looking at the use of neoadjuvant radiotherapy with local excision at a regional specialist centre over a 12 year period.
Methods: Prospective data was collected on all patients undergoing local excision for early rectal cancer at our centre over a 12 year period between 2006 and 2018. We compared two groups—in 2006–2010 patients proceeded directly to local excision but from 2010 onwards, they received neoadjuvant radiotherapy prior to excision. Primary outcome measures were local recurrence rates, disease free survival and rescue surgery rate. Secondary outcomes examined clinical outcomes, histopathology and use of adjuvant contact brachytherapy. Statistical analysis was performed with Chi square and Mann–Whitney U tests for data.
Results: 30 patients underwent local excision in 2006–2010 and 52 patients were treated with neoadjuvant radiotherapy from 2010 to 2018. There were no significant differences in age, gender, ASA and length of stay between groups. There was a significantly higher rate of a complete clinical response, and a lower rate of lymphovascular invasion, in those treated with neoadjuvant radiotherapy compared to those with local excision alone (44.2% vs. 16.7% and 23.3% vs. 9.6% respectively). The rate of recurrence rate did not reach significance but there were no distant recurrences in the radiotherapy group compared to the other group (6.7%). Disease-specific mortality was significantly lower in the radiotherapy group (0% vs 13%) (p = 0.02) .
Conclusions: The modern treatment of early rectal cancer with neoadjuvant radiotherapy and local excision with/without adjuvant contact brachytherapy leads to better oncological outcomes, distant recurrence rates and long term survival of patients. This approach adopted in a specialist centre can avoid major resectional surgery and its complications in patients with early rectal cancer and so this data supports the STAR TREC model of treatment rather than other regimens relying on adjuvant therapy.

1479—COLORECTAL—Malignant

THE SAFETY OF LAPAROSCOPIC COLECTOMY FOR LEFT COLORECTAL CANCER WITH 8 K/2D SYSYTEM COMPARED TO HD (1 K)/3D SYSTEM

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Introduction: Laparoscopic surgery with 8 K/2D system is expected to improve surgical safety and educational effects due to its high resolution, but the impact is still unclear. In particular, there is no comparative study on the safety of surgery compared to HD (1 K)/3D system.
Aims: The aim of this study was to evaluate the safety of laparoscopic colectomy with 8 K/2D monitor.
Methods: From November 2018 to November 2019, we performed the laparoscopic surgery to 119 cases for the colorectal cancer in the left side (from sigmoid colon to rectal). We excluded laparotomy, robotic surgery, ta/tp-TME and cases that were unknown which monitor was used. 62 cases were selected. The median age was 71 years (42–92 years), and the sex is that male were 35 and female were 27 cases. Operative procedures were as follows, sigmoid colectomy: 23 cases, high anterior resection: 24 cases, low anterior resection: 7 cases, Hartmann's operation: 7 cases, total pelvic excision: 1 case. There were 52 cases for HD (1 K)/3D and 10 cases for 8 K/2D. We investigated the surgical time, the amount of bleeding, the complication rate, and the length of hospital stay after surgery. We used EZR as statistical software. The statistics test was performed using Fisher's test and Mann–Whitney U test.
Results: The median operating time were as follows, 8 K/2D: 243 (155–278) minutes and HD (1 K)/3D: 228 (119–567) minutes ($p = 0.95$). The median blood loss is as follows, 8 K/2D: 11 (5–657) ml and HD (1 K)/3D: 15.5 (0–824) ml ($p = 0.61$). The complication rate (Clavian-Dindo Grade II or higher) were as follows, 8 K/2D: 5/52 cases (9.6%), HD (1 K)/3D: 2/10 cases (20%, $p = 0.31$). The median length of hospital stay after surgery were as follows, 9 days: 8 K/2D and HD (1 K)/3D: 9.5 (7–33) days ($p = 0.72$). There were no complications due to the 8 K/2D monitor.
Conclusion: Laparoscopic colectomy for left-sided colon cancer using an 8 K/2D sysytem was similar in the operation time, the bleeding loss, the length of stay, and the complication rate compared to HD (1 K)/3D system. Laparoscopic colectomy for left-sided colorectal cancer with 8 K/2D system can be safely performed.

144—COLORECTAL—Stoma

PARASTOMAL HERNIA REPAIR WITH 3D FUNNEL MESH : A PILOT STUDY TO ASSESS QUALITY OF LIFE AND SUCCESS RATE

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Introduction: Parastomal hernia (PSH) is a common but morbid condition. Several trials are currently underway to assess if prophylactic mesh placement for end stoma formation is safe and feasible. At our institution, we have introduced a laparoscopic PSH repair with 3D funnel mesh. The aim of this study was to evaluate short-term clinical outcomes and quality of life (QoL) in patients undergoing PSH repair with funnel mesh.
Methods: A retrospective review of prospectively collected data identified all patients that underwent PSH repair with funnel mesh over a 30 months period. The data was collected using the hospital online database and patients' notes.
All patients were subject to 6 monthly clinical follow up. Further assessment with CT scan was performed if patients presented with signs of chronic pain, infection and recurrence or as part of cancer follow up.
Patient QoL was assessed using the validated Carolina Comfort Scale (CCS). This is divided into 8 sections of activities of daily living and allows global scoring for "general activity", "sensation of mesh", "pain", "movement limitation" and a "total score" (scale 0–5 where, 0 = no symptoms and 5 = severe symptoms).
Results: Ten patients (80% M) were included with a mean follow up of 14 months (range 30 months-3 months). Mean age was 70 years (range 84 years-50 years). All patients had a permanent stoma created (70% colostomy, 30% ileostomy). All patients replied to the all questionnaire.
No infections at the intraperitoneal mesh plane was reported, however 10% of patients was admitted with subcutaneous infection that was treated through simple percutaneous drainage and didn't warrant removal of the mesh. There were no reports of hernia recurrence, stenosis, retraction, prolapse or leakage at follow up. Median QoL of life scores were, 0.118 for "general activity", 0.22 for "sensation of mesh", 0.085 for "pain", 0.06 for "movement limitation", 0.173 for "total score".
Conclusion: Laparoscopic funnel mesh repair is a safe and feasible approach to PSH repair. Initial results are encouraging in regards to short term clinical outcomes and QoL. Future use of this technique may be directed towards prophylactic intervention.

857—COLORECTAL—Stoma

SAFETY AND EFFECTIVENESS OF LOOP ILEOSTOMY AS A DIVERTING STOMA FOR RESECTABLE LOWER RECTAL CANCER SURGERY:A SINGLE CENTRE, SINGLE OPERATOR EXPERIENCE

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Background: The purpose of a diverting stoma is most commonly to prevent fecal material from reaching a distal portion of the bowel, either because of fear of anastomotic leak or to treat a leak. Diverting stomas do not decrease the incidence of anastomotic leak, per se, but instead decrease the related morbidity. When treating pelvic infection from a colonic source or when planning diversion of a low pelvic anastomosis, the two options are transverse loop colostomy and loop ileostomy. Although not routinely to be used, in some locally condition of the intestine, stoma creation still could be performed. The aim of this study was to evaluated the safety and effectiveness of loop ileostomy as diverting stoma for resectable lower rectal cancer patients.

Methods: This was a prospective study which would evaluated the effectiveness of stoma creation during resection of lower rectal cancer patients. All resectable rectal cancer patients were included on this study, the patients with already known comorbidoty bedore operation would be excluded. The short term outcome would be evaluated such as infection, stoma retraction and skin iritation. The readmission related to the stoma creation would be reported.

Results: 15 patients were reported on this study during 1 year period. During evaluation, two patients had skin iritation after 30 days follow up and could be managed conservatively using stomahesive powder (stoma care) for another 7 days. There were no infection case and stoma retraction following this procedures. No readmission related to loop ileostomy has been reported.

Conclusion: Loop ileostomy as a diverting stoma creation for lower rectal cancer was safe, effective and not associated with post operative morbidity.

Keywords: loop ileostomy, diverting stoma, lower retal cancer, safety.

737—HEPATO-BILIARY & PANCREAS—Gallbladder

LAPAROSCOPIC APPROACH FOR EARLY GALLBLADDER CANCER WITH SUSPECTED GB-BED INVASION

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Purpose: Open extended cholecystectomy is a choice of gallbladder treatment options. To clarify the feasibility and safety of the laparoscopic extended cholecystectomy for the treatment of gallbladder cancer with suspected GB-bed invasion, we evaluated our surgical outcomes of this techniques.

Patients and Methods: Patients with gallbladder cancer suspected GB-bed invasion were evaluated by preoperative clinical images (CT and US). Laparoscopic extended cholecystectomy with reginal lymph-node dissection was performed in total 7 patients between Jun in 2014 and December in 2017, at a Japanese regional territory hospital. Five cases were performed by lap-extended cholecystectomy with reginal lymph node dissection and 2 cases were additionally treated with extrahepatic bile duct resection.

Results: Seven patients were treated successfully by these laparoscopic procedures. Post-operative course was uneventful and all patients remained well. One case with minor bile leakage was observed, but conservatively treated. The median operative time were 182 (115–219) min. Median blood loss was 46 (little-115) ml, median hospital stay was 7 (5–12) days, and median follow-up time was 32 months.

Conclusion: Laparoscopic extended cholecystectomy with or without bile-duct resection was feasible and safe in selected patients as well as open procedure. Although this series was relatively small, further accumulated study including randomized series were needed to evaluate the accurate result.

974—HEPATO-BILIARY & PANCREAS—Gallbladder

AN INTERESTING CASE OF LAPAROSCOPIC PRIMARY REPAIR OF BILE LEAKAGE FROM DUCT OF LUSCHKA DURING EMERGENCY LAPAROSCOPIC CHOLECYSTECTOMY

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Tan Tock Seng Hospital is Singapore's second largest acute care general hospital with over 1500 beds. It is affiliated to two medical schools in Singapore and it is a training hospital for both undergraduates and postgraduates. 59 years old lady was admitted to our hospital for right hypochondriac pain with fever for 3 days. Computed tomography showed acute cholecystitis with 2 cm stone obstructing at the gall bladder neck. Patient underwent emergency laparoscopic cholecystectomy after informed consent was given by the patient. Intraoperatively, patient was noted to have distended gall bladder secondary to empyema of the gall bladder. With difficult dissection, laparoscopic cholecystectomy was successfully performed. We noted the bile leakage from gall bladder bed after completion of cholecystectomy and we suspected that leakage might be from the Duct of Luschka. The primary repair of the duct of luschka with PDS 3/0 suture. We performed the intraoperative cholangiogram to confirm that there was no ductal injuries and found to be none. There was no more leakage both clinically and radiologically. Patient discharged well on day 3 after surgery. This is the video presentation of the primary laparoscopic repair of bile leakage from Duct of Luschka.

1470—HEPATO-BILIARY & PANCREAS—Gallbladder

DIFFICULT LAPAROSCOPIC CHOLECYSTECTOMY WITH CBD EXPLORATION FOR IMPACTED CBD CALCULI

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Introduction: Hereby discussing a case of impacted CBD calculi without cholangitis managed laparoscopically. An old aged female presented with pain in abdomen and on examination Tenderness present in right hypochondrium and Icterus present. MRCP suggestive of impacted CBD calculi with contracted Gall Bladder with proximal dilated CBD. Patient taken for Laparoscopic CBD Exploration. Post-operative period was uneventful. Orally started on POD-2. Abdominal drain removed on POD-3. T-tube cholangiogram was done on POD-5 and distal patency confirmed with no residual stones. T-tube removed on POD-6. Patient discharged on day 8.
Materials and Methods: Patient operated in Department of Surgery, GMCH, Nagpur, Maharashtra(India).
Discussion: Laparoscopic CBD exploration is the preferred option for impacted CBD calculi (3). If calculi size is less (< 2 cm) they should be managed by ERCP with lithotripsy (4,5), but here multiple stones are present & they are impacted(> 2 cm).
References
1. CostiR,MazzeoA,TartamellaF,ManceauC,VacherB,valverdeA. Cholecystocholedocholithiasis; a case–control study comparing the short and long term outcomes for a "laparoscopic-first: attitude with the outcome for sequential treatment (systemic endoscopic sphincteroromy followed by laparoscopic cholecystectomy) Surg Endosc.2010;24:51–62. https://doi.org/10.1007/s00464-009-0511-6.%5bpubmed].
2. MartinDJ,VernonDR,TooulIJ. Surgical versus endoscopic treatment of bile duct stones, Cochrane database syst rev.2006;2:CD003327.[PUBMED].
3. RhodesM,NathansonL,O'RourkeN,FieldingG. Laparoscopic exploration of the common bile duct: Lessons learned from 129 consecutive cases. BrJSurg.1995;82:666-668.https://doi.org/10.1002/bjs.1800820533.%5bpubmed].
4. RhodesM,SussamanL,CohenL,LewisMP. Randomised trial of laparoscopic exploration of common bile duct versus postoperative endoscopic retrograde cholangiography for common bile duct stones. Lancet. 1998;351:159–161.https://doi.org/10.1016/s0140-6736(97)09175-7.%5bpubmed].
5. OngTZ,KhorJL,SelamatDS,YeohKG,HoKY. Complications of endoscopic retrograde cholangiography in the post-MRCP era: a tertiary center experience. World J Gatroenterol. 2005;11:5209-5212.[PUBMED].

1443—HEPATO-BILIARY & PANCREAS—Gallbladder

INCIDENTAL GALLBLADDER CANCER. LAPAROSCOPIC TREATMENT?

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Background: Gallbladder cancer is an aggressive disease often diagnosed on advanced stages. When incidentally found after laparoscopic cholecystectomy a re-operation is often required to allow for complete nodal sampling and liver bed resection of residual disease. Due to its relative rarity and complex surgical procedure, there are not well sampled studies regarding the safety and effectiveness of laparoscopic surgery.
Clinical Case: We present the case of a 77 years-old man with prior history of type 2 diabetes, high blood pressure and stroke 10 years before. He had a gastric surgery 40 years ago due to perforated peptic ulcer with peritonitis. Three months before referral to our centre he underwent a sub-costal cholecystectomy whose pathological exam revealed an incidental gallbladder cancer (pT2a) of the free border of the gallbladder. The surgical margins were free from disease. The staging CT scan revealed multiple simple cysts of the liver but no residual or recurrent disease.
The patient was discussed on multidisciplinary tumour board and proposed for portal lymphadenectomy.
We performed a laparoscopic portal lymphadenectomy after adhesiolysis and fenestration of a segment IV/V biliary cyst. The vascular, venous and biliary channels of the porta hepatis were identified and dissected of the connective tissue. The post-operative period was complicated with a sub-hepatic infected hematoma, requiring percutaneous drainage and IV antibiotics and was discharged on the 15th post-operative day. The histological report revealed no residual disease in the 12 lymph nodes sampled.
Conclusion: Portal lymphadenectomy is a complex surgery, especially after previous surgeries with adhesions and anatomical distortions. A complete identification of the extra-hepatic vascular and biliary structures is mandatory to avoid iatrogenic injury.

43—HEPATO-BILIARY & PANCREAS—Gallbladder

INCIDENTAL CARCINOMA GALL BLADDER: INCIDENCE, RISK FACTORS AND FACTOR AFFECTING SURVIVAL -A TERTIARY CARE INSTITUTE EXPERIENCE

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Introduction: Carcinoma gall bladder is a very lethal disease. It can get detected incidentally after laparoscopic cholecystectomy. The overall outcome of incidentally detected carcinoma gall bladder is a matter of debate in literature.

Aim: To estimate the overall incidence of the incidental gall bladder carcinoma, the various risk factors associated with it and factors affecting overall survival in patients who underwent laparoscopic cholecystectomy with eventual histology turning out to be carcinoma gall bladder.

Methods: Data of all the patients undergoing laparoscopic cholecystectomies in the Department of Surgery at All India Institute of medical sciences, New Delhi, India between January 2014 and December 2018 was retrospectively collected and analyzed. All patients with incidental carcinoma gall bladder were followed up and completion radical cholecystectomy was performed. The demographic profile, preoperative imaging, intra operative finding, histopathology of primary surgery and median interval between two surgeries were analysed to look for various risk factors associated with incidental carcinoma gall bladder and factors affecting overall survival.

Results: Incidence of the incidental carcinoma gall bladder was 0.51% with a female: male preponderance of 4:1 and mean age of years. Preoperative imaging of most of them were suggestive of chronic cholecystitis, however one patient had polyps. Six patients had uneventful laparoscopic cholecystectomy, while four had bile spillages intraoperatively. Adenocarcinoma was the most common histopathology. Pathological staging of 4 patients was pT1b, 6 patients had pT2 tumor. The median interval between simple cholecystectomy and completion radical cholecystectomy in this series was 8 weeks. At the end of 19 months median follow up overall survival was 55.5%.

Conclusion: Incidence of incidental carcinoma gall bladder is 0.51%. Most commonly affecting middle-aged females. Risk factors associated with incidental carcinoma gall bladder were found to be chronic cholecystitis, multiple gall bladder calculi, single large stone and gall bladder polyps. Surgery for incidental carcinoma gall bladder may be difficult to perform intraoperatively. Survival is better in males, young patients with uneventful primary surgery and better-differentiated pathology.

223—HEPATO-BILIARY & PANCREAS—Gallbladder

ENDO-LAPAROSCOPIC ORGAN-SAVING OPERATIONS FOR THE GALLBLADDER PATHOLOGY

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Aim: To improve the results of treatment of cholecystolithiasis by using endo- laparoscopic organ-saving operations on the gallbladder (GB).

Materials and Methods: The analysis of the results of surgical treatment of 105 patients with GB pathology, including, cholecystolithiasis in 96 cases and the combination of cholecystolithiasis and GB pseudopolyps in 9 cases. Males were 18 (17.1%), females—87 (82.9%), aged 21–76 (36.2 ± 6.4) years. The selection criterion included patients with uncomplicated symptomatic and asymptomatic cholecystolithiasis. The main selection criterion was sonography, with the definition of structure, size and mobility of concrements, signs of active inflammation and motility function of GB. The attention was to establish causes and outcomes in cholecystolithiasis development.

At the same time the bile was taken and the lavage of the GB cavity was performed. For the revision of GB cavity, a flexible endoscope with diameter of 5 mm was used. Lithextraction was performed using the Dormia basket, clip of Babcock. For polypectomy there were used snare, hot biopsy forceps. The integrity of GB wall was restored by a continuous suture of absorbable material. Post-operatively, the rehabilitation program was used to prevent recurrence of cholecystolithiasis.

Results: For all patients there were performed organ-saving operations on the GB - laparoscopic endoscopically assisted cholecystolithotomy and cholecystopolypectomy. The number of removed gallstone ranged from 1 to 65. Their size ranged from 6 to 33 (18.7 ± 3.5) mm in diameter. In 18 cases, after lithextraction, at the endoscopic examination of the GB cavity, there were diagnosed small gallstones and mucus in the folds of the mucosa, which were removed by additional rinsing. In 9 cases, except of the lithextraction, GB cholesterol pseudopolyps have been removed, in the size of 2–6 mm. The surgical intervention lasted 55–150 (88.48 ± 23.14) min. The recurrence of cholecystolithiasis since 9 months to 7.5 years was diagnosed in 5 (6.1%) from 82 examined patients.

Conclusions: Endo-Laparoscopic organ-saving surgery is the optimal way for treating of uncomplicated cholecystolithiasis. This approach allows conducting not only endoscopic examination of cholecystolithotomy, but also performing removal of small-sized concrements, not diagnosed according to the sonography of GB and cholesterol pseudopolyps, fixed in the mucous membrane.

231—HEPATO-BILIARY & PANCREAS—Gallbladder

HYBRID TECHNIQUES IN THE TREATMENT OF PATIENTS WITH ACUTE CHOLECYSTITIS ASSOCIATED WITH CHOLECYSTOCHOLEDOCHOLITHIASIS

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Introduction: Cholelithiasis incidence among the adult population in Russia ranges from 10 to 20% and increases with age reaching 40% after 60.
Research Objective: To study the results of surgical treatment of patients with acute cholecystitis associated with cholecystocholedocholithiasis. Determine the surgical approach and the method of surgical treatment.
Materials and Methods: In the surgical departments of the Regional Clinical Hospital of Emergency Medical Care, Barnaul, from 2017 to 2019, 1677 patients with acute cholecystitis associated with cholelithiasis were operated by means of laparoscopic access. Of these, 173 (10.3%) patients had acute cholecystitis concomitant with choledocholithiasis.
Patients were divided into 4 groups depending on the surgical approach and treatment methods.
Group I– 19 (11.0%) patients underwent laparoscopic cholecystectomy (LCE) with the common bile duct external drainage and one-time lithoextraction by endoscopic papillosphincterotomy (EPST) according to the rendezvous technique.
The group included patients with calculi up to 2 cm without signs of acute pancreatitis.
Group II—109 (63.0%) patients underwent LCE with the common bile duct external drainage and the further stage lithoextraction by EPST in the delayed period of 3–7 days.
The group included patients with acute pancreatitis, patients with the oncological process with compression of the common bile duct distal third impossible to exclude or acute patients with signs of multiple organ failure.
Group III—25 (14.5%) patients underwent LCE combined with choledochotomy and one-time lithoextraction under the control of a video choledochoscope.
The group included patients with calculi over 2 cm in the common bile duct.
Group IV—20 (11.6%) patients underwent lithoextraction by EPST and stage LCE with external drainage of the common bile duct in 2–3 days.
The group included patients with the clinical picture dominated by obstructive jaundice (bilirubinemia of 100 or more μmol/l) with resistant acute cholecystitis.
Results: The analysis of the duration of inpatient treatment in all groups (8.5 days) did not show any difference between the methods of surgical treatment of acute cholecystitis associated with cholecystocholedocholithiasis and the surgical approach choice. The number of postoperative complications in group I was 3 times less than in group II and 2 times less than in group IV and constituted 5.3%, 15.6% and 10.0%, respectively, which was conditioned by the development of acute pancreatitis. No lethal outcomes across all groups were registered.
Conclusion: The choice of the surgical treatment method and surgical approach depends on the presence of cholecystocholedocholithiasis complications and the patient's individual characteristics. The rendezvous technique allows to reduce the number of postoperative complications.

284—HEPATO-BILIARY & PANCREAS—Gallbladder

CLINICAL VALUE OF FLUORESCENT CHOLANGIOGRAPHY FOR THE PATIENTS WITH INFRAPOTAL TYPE OF THE RIGHT POSTERIOR BILE DUCT DURING SINGLE = INCISION LAPAROSCOP

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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 min. Detectability of infraportal type of the right posterior bile duct before dissection in Claot's triangle was 23.1% (n = 3) and that during dissection in Calot's triangle was 53.8% (n = 7). The infraportal type of the right posterior bile duct could be identified under fluorescent cholangiography only when it joined into the common hepatic duct.
Conclusions: Utilization of fluorescent cholangiography can lead SILC to safe even for the patients with the infraportal type of the right posterior bile duct. Its benefit is emphasized when the infraportal type of the right posterior bile duct joins into the common hepatic duct.

424—HEPATO-BILIARY & PANCREAS—Gallbladder

SPHINCTEROTOMY COMBINED WITH ENDOSCOPIC PAPILLARY BALLOON DILATATION VERSUS SPHINCTEROTOMY ALONE FOR REMOVAL OF COMMON BILE DUCT STONES

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Background: Endoscopic sphincterotomy (EST) is currently recognized as the primary endoscopic treatment for common bile duct stones. However, it is difficult to remove multiple ($\geq$ 3) or large ($\geq$ 10 mm) common bile duct stones with EST alone. EST plus endoscopic papillary large-balloon dilation (EPLBD) was reported to be an effective treatment for such bile duct stones.
Aim of the Work: to compare the therapeutic benefits and complications between Endoscopic sphincterotomy (EST) alone and (EBT) plus (EPBD).
Methods: Fourty patients with large (largest diameter, $\geq$ 10 mm) or $\geq$ 3 common bile duct stones underwent EST + EPLBD (n = 20) or EST alone (n = 20). We compared final successful stone removal rates in the first session, procedure times and complications between the EST + EPLBD and EST groups.
Results: The rates of final successful stone removal were similar between the two groups (EST + EPLBD: 95% vs. EST: 90%; p = 0.115). The procedure time was not significantly shorter (EST + EPLBD: 52 min vs. EST: 54 min; p = 0.545).Complications like pancreatitis occurred in one patient in the EST + EPLBD group and in two patients in the EST group, but the differences were not statistically significant (EST + EPLBD: 5% vs. EST: 10%; p = 1.000).
Conclusions: Our results suggest that EST + EPLBD is safe and an effective alternative therapy to EST alone for patients with multiple or large common bile duct stones, because it requires fewer sessions and shorter operative times than EST alone.

476—HEPATO-BILIARY & PANCREAS—Gallbladder

FEATURES OF SURGICAL TREATMENT OF ACUTE CHOLECYSTITIS IN PATIENTS WITH OBESITY

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Acute cholecystitis causes the most difficult situation in patients with gallstone disease, and the presence of obesity increases the risk of complications from surgery due to altered homeostasis of the body and reducing its reserve capacity.

The aim of the study is to improve the results of treatment of acute cholecystitis in patients with obesity by modifying the surgical intervention method.
Methods: A prospective analysis of 67 cases with acute cholecystitis was performed. The exclusion criteria included the following patients: with chronic or exacerbation of chronic cholecystitis, less than 18 years of age, those who lacked the full spectrum of studies, patients with mechanical jaundice, including oncological pathology, patients with normal and overweight. Inclusion criteria are patients with acute cholecystitis and obesity. Two groups were identified. The first numbered 32 patients and underwent traditional laparoscopic cholecystectomy (LCE). In the second group, 35 patients underwent modified laparoscopic cholecystectomy (LCE). The essence of the modified surgical intervention was staging an additional 5th trocar in the left hypochondrium, projecting the Mayo-Robson's point, performing a step-by-step "safe" cholecystectomy and reducing intra-abdominal pressure from 15 to 17 mmHg to 0 mm. Hg every 30 min with hyperventilation for 1 min.
Results: The duration of surgery with modified LCE was 75.16 $\pm$ 5.72 min, and in the comparison group, the duration of traditional LCE was 84.17 $\pm$ 5.31 min.
The incidence of postoperative complications (hematoma in the place of the gallbladder, biloma, seroma of postoperative wounds) in the modified group was three times lower than in the traditional group, and was 4.73% (p = 0.019; α = 0.05).

In the early postoperative period, moderate metabolic acidosis was reported in patients with traditional LCE: pH 7.30 $\pm$ 0.005, pCO2 = 6.03 $\pm$ 0.38 kPa, HCO3- = 20.17 $\pm$ 1.19 mmol/L. This promotes the development of hypercoagulation and increases the risk of thrombosis in the background of obesity. In the comparison group, these indicators were within normal range due to modification of surgery. The level of fibrinogen in patients with traditional surgery was 3.64 $\pm$ 0.72 g/l, whereas in the comparison group it was 3.16 $\pm$ 0.63 g/l (p = 0.004; α = 0.05).
Conclusions: Performing modified laparoscopic cholecystectomy reduced the duration of surgery by 9.01 $\pm$ 0.41 min (p = 0.001; α = 0.05), reduced complications threefold, and prevented the development of metabolic acidosis pH 7.39 $\pm$ 0.03 vs 7.30 $\pm$ 0.005 (p = 0.001; α = 0.05), pCO2 5.05 $\pm$ 0.36 vs 6.03 $\pm$ 0.38 (p = 0.02; α = 0.05), reducing the risk of hypercoagulation and thrombosis.

513—HEPATO-BILIARY & PANCREAS—Gallbladder

LIVER FUNCTION TEST IN THE MANAGEMENT OF SUSPECTED CHOLEDOCHOLITHIASIS

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Aims: Clinical suspicion, abdominal ultrasound and liver function tests (LFT) play the main role in stratifying the risk of common bile duct stones (CBD). However, none of them has an adequate sensitivity or specificity and the recent literature is still controversial. The aim of our study was to find a reliable tool based on the LFTs to predict the presence of CBD stones with a mathematical equation.

Methods: We retrospectively considered the patients with an intermediate or high risk of CBD stones who underwent a MRCP from January 2014 to June 2019. Demographic, clinical data and LFT were collected and analyzed.

Results: 191 patients were selected, 64 (33.5%) with positive and 127 (66.5%) with negative magnetic resonance cholangiopancreatography. The analysis showed that none of single LFTs had a sufficient diagnostic value. Instead, our LFT-based score showed 84.4%, 87.3%, 76.1% and 91.6% of sensibility, specificity, positive and negative predictive values respectively. It showed the highest diagnostic value with an accuracy of 95% in excluding CBD stones and no unexpected neoplastic lesions were incorrectly classified.

Conclusions: Uncertainty in classified patients with suspected CBD stones can lead to a delay of the surgical treatment, increasing length of hospital stay and costs. We constructed a weighted score that shows a very high diagnostic value, especially a 91.6% of negative predictive value and 95% accuracy in negative cases. It could help to select patients to be primary treated with surgery and those who benefit from preoperative investigations.

520—HEPATO-BILIARY & PANCREAS—Gallbladder

MINIMALLY INVASIVE COLECISTECTOMY WITH 3 MM ACCESSES. OUR EXPERIENCE

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Background: The gallbladder stones are the most frequent diseases in general surgery. Although videolaparoscopic cholecystectomy, which is fundamental in the training of the young surgeon, has been standardized for years, same modifications to the technique are still possible.

Serie Report: We present our experience for the cholecistecomies performed with trocar and optics of 3 mm. in the last 5 years, we performed 132 with 3 mm accesses among total number of cases of 527 laparoscopic cholecistctomies (25%). General anesthesia is performed with laryngeal mask. The placement provides access in left hypochondrium, umbilical, right side and overpubic with 5 mm trocars. We use a 3 mm optic. Overpubic access is required for the extraction of gallbladder by endobag. Skin synthesis is performed by the use of cyanocrylate. Average operating times (35 min vs 40 min), average hospital days (1.8 days vs 2.1), the highest complication rate (0.5 vs 0.7) are overlapping. The aesthetic result turns out to be more satisfying.

Conclusion: Videolaparoscopic cholecystectomy with 3 mm accesses and optics is safe, overlapping on other techniques, without increasing costs, average hospitalization days, and complication rates. It also allows a better aesthetic result with greater patient satisfaction.

571—HEPATO-BILIARY & PANCREAS—Gallbladder

BOUVERET SYNDROME: AN UNCOMMON COMPLICATION OF CHOLELITHIASIS

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Gallstone ileus is a rare cause of small bowel obstruction but in gastric outlet obstruction is an even rarer entity. Biliary-enteric fistulas are an uncommon complication of cholelithiasis. In 85% of cases with such kind fo fistulas, stones tend to pass spontaneously. The remaining 15% tend to develop a clinical picture of bowel obstruction and the stone can lodge in the terminal ileum (60%), proximal ileum (24%), distal jejunum (9%), and large bowel (2%—4%).1 In 1% to 3% of cases, the stone obstructs the pylorus and duodenum, causing gastric outlet obstruction, which is known as Bouveret's syndrome. through a cholecysto-duodenal fistula. Bouvert syndrome affects mostly the elderly population. We report the case of a 38 year old female patient with this condition.

641—HEPATO-BILIARY & PANCREAS—Gallbladder

OPERATIVE DIFFICULTY SCORES FOR LAPAROSCOPIC CHOLECYSTECTOMY AND THEIR VALUE IN PREDICTING OUTCOME : A SINGLE CENTER PROSPECTIVE STUDY

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Aim: Prospective study of all laparoscopic cholecystectomies that were conducted in our department in an 8 month period and correlation between intraoperative findings and postoperative complications.

Method: Data recorded and analysed included demographics, relevant history (previous admissions due to acute cholangitis, acute cholecystitis or pancreatitis) and time interval between symptoms and surgery. Intraoperative parameters such as duration of operation, intraoperative hemorrhage, bile leak or gallbladder perforation were also studied. The operative difficulty was determined using Nassar 's scale, Parkland 's scale and the G10 cholecystitis severity score. The correlation of all the above with the conversion rate, the median hospital stay and the 30 day morbidity was recorded.

Result: 149 patients underwent laparoscopic cholecystectomies, the majority of which due to symptomatic cholelithiasis. The intraoperative difficulty scores concerning cholecystectomy referred above, were estimated for each case.

Conclusion: The intraoperative difficulty scores should be taken into consideration in predicting the outcome of laparoscopic cholecystectomy. These scores also offer a very useful tool in the description and grading of intraoperative findings.

701—HEPATO-BILIARY & PANCREAS—Gallbladder

VALUE OF INDOCYANINE GREEN (ICG) TO IDENTIFY THE BILIARY TRACT DURING COMPLEX LAPAROSCOPIC CHOLECYSTECTOMY

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Aim: To assess the importance of identifying the bile duct using indocyanine green (ICG) in patients undergoing elective laparoscopic cholecystectomy in order to avoid biliary injuries.

Methods: Intravenous infusion of ICG was performed 20 min before surgery. Bile duct can be easily and accurately identified with this technique, avoiding possible injuries and complications.

Results: A 44-year-old male was admitted for elective laparoscopic cholecystectomy. 90 days before surgery, a episode of acute cholecystitis was reported, treated conservatively initially. The patient underwent a previous surgical procedure 10 years before this surgery. The patient was diagnosed at that time of a pyloric stenosis of unknown origin, probably secondary to a chronic ulcer. A pyloroplasty was performed, developing a focal pancreatitis showing the biopsy the presence of an ectopic pancreas. The patient developed a new stenosis being necessary to perform a gastroenteroanastomosis. In this context, we were expecting a complex cholecystectomy deciding to infuse ICG before surgery in order to identify the biliary tract. An important inflammatory process was found with difficulties to identify the anatomical landmarks. ICG allows to identify the main bile duct after blunt dissection and after dissecting the adhesions of the duodenum and the colon. Even so, the adequate assessment of the bile duct with this technique, facilitated anatomical orientation and made possible to safely complete the elective cholecystectomy.

Conclusion: The present case shows a case of how ICG imaging is an effective tool to avoid biliary duct injuries and safely perform an elective laparoscopic cholecystectomy in a difficult setting and when a high risk of complications is expected.

818—HEPATO-BILIARY & PANCREAS—Gallbladder

LEFT-SIDED GALLBLADDER: AN INSIDIOUS ENEMY IN EMERGENCY SETTING

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Introduction: Sinistroposition of the gallbladder, or true left-sided gallbladder (LSG) without situs viscerum inversus, is a rare congenital anatomical variant, with a reported prevalence of 0,6%, where the gallbladder is located to the left of round/falciform ligament. It can be associated with anomalies of the biliary tree, portal system and hepatic vascularization. The surgical management of a LSG could be challenging even for an experienced operator, being usually an incidental intraoperative finding.

Case Report: A 72 years old woman was admitted to our emergency department because of acute cholecystitis. There were no pre-operative indications of sinistroposition of the gallbladder and its aberrant position was discovered during the explorative laparoscopy; because of the unusual anatomy and chronic flogosis, the laparoscopic approach was converted to open surgery. The patient underwent a successful intervention and was discharged after 4 days without complications. Her family history revealed a daughter with biliary atresia.

Discussion: LSG could remain undetected preoperatively, but today, with advances in diagnostic imaging, the report of this condition has increased. Although a laparoscopic approach is feasible with LSG, there shouldn't be any hesitations to convert to an open procedure whenever the anatomic situation is unclear. In this case, the laparotomic approach allowed to better understand the anatomy and to safely perform the dissection of the Calot's triangle. Several hypothesis suggest the presence of an underlying embriologic mechanism for LSG and its associated anomalies, but its aetiology is still unknown. The association with the daughter's biliary atresia makes reasonable a possible genetic correlation with this condition.

Conclusions: LSG is commonly an incidental intraoperative finding. Its presence should be suspected in case of unclear visualization of the fourth hepatic segment during preoperative diagnostic imaging.
Every surgeon should be aware of this condition to avoid bile duct injury or vessel damages. Althought laparoscopic cholecystectomy is feasible and safe, especially when performed by an experienced surgeon, laparotomic convertion and/or intraoperative cholangiography should be considered whenever the anatomy can not be promptly recognized, mostly in the presence of severe inflammation.

823—HEPATO-BILIARY & PANCREAS—Gallbladder

SAFE CHOLECYSTECTOMY: DYNAMIC EVALUATION OF THE BILIARY DRAINAGE WITH ICG CHOLANGIOGRAPHY AND INTRAOPERATIVE ULTRASOUND

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Aims: Diagnosis and treatment of biliary lithiasis has dramatically changed in the last 35 years. Intraoperative cholangiography (IOC) remains the gold standard technique for intraoperative imaging of the biliary tree. It allows to rule out the presence of choledocholithiasis or biliary strictures and also provide dynamic information regarding biliary drainage towards the duodenum. However, laparoscopic ultrasound (LUS) has gained importance as it has been demonstrated similar accuracy as IOC for the diagnosis of common bile duct (CBD) stones, but when performed alone dynamic information is lacking. Recently, fluorescent cholangiography with indocyanine green (ICG) has emerged as a valuable tool to assess the biliary drainage and if combined with LUS has potential advantages over conventional IOC. This video aims to demonstrate the usefulness of ICG duodenal fluorescence as an indirect parameter to assure correct biliary drainage.
Methods: a 73-year-old male presented in the Emergency Department with a seven-day history of pain in the right upper quadrant and fever. Abdominal ultrasound showed signs of acute cholecystitis. In addition, blood test results allowed to classify the patient as at high risk of choledocholithiasis. We performed a laparoscopic cholecystectomy and exploration of CBD with a 3 mm choledochoscope, after which transcystic ICG cholangiography was made, visualizing a correct duodenal fluorescence and confirming an adequate biliary drainage.
Results: The patient had a grade II cholecystitis according to the Tokyo Classification. It was possible to remove the biliary sludge completely. The patient started oral intake on the first postoperative day. Control blood analysis reported decreasing inflammatory parameters with no increase in bilirubin or pancreatic enzymes levels. No postoperative complications were seen. The patient was discharged on the 2nd postoperative day.
Conclusion: Adequate duodenal fluorescence after transcystic administration of ICG, offers indirect information regarding transpapillar biliary drainage. Fluorescent cholangiography could complement the dynamic information that is lacking when performing LUS.

839—HEPATO-BILIARY & PANCREAS—Gallbladder

ABERRANT RIGHT HEPATIC SECTORAL DUCTS INJURIES AFTER CHOLECYSTECTOMY. CLINICAL OUTCOMES AND MANAGEMENT

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Aims: Anatomical variations of the biliary tree are one of the causes of iatrogenic bile duct injuries (IBDI) during cholecystectomies. One of the most dangerous variants is the anomalous implantation of the aberrant right sectoral duct in the extrahepatic biliary tree and is one of the main risk factors for its injury during surgery. The aim of our review is to report these rarely published injuries, diagnosis and management options.
Methods: We reviewed the clinical files of all the patients who suffered a biliary complication after an open and laparoscopic cholecystectomy in our centre between the years 2000–2019.
Results: Four consecutive patients were diagnosed with IBDI caused by an aberrant duct and were identified for inclusion.Three of our patients had a right posterolateral sectorial and one had a right anteromedial sectorial bile duct injury. Based on the Strasberg classification three of our patients were classified as are type C (section) and one type B (occlusion). None of these cases were diagnosed during surgery. Two of our patients presented with a persistent biliary fistula, one presented with a bilioma and another with recurrent cholangitis. The time between the primary intervention and the surgical repair of the injury ranged between 2 weeks to 8 years. All of these cases underwent surgery and a bilio-enteric anastomosis was performed. All our patients have shown an asymptomatic postoperative follow up with no signs of cholestasis.
Conclusions: The accidental transection or ligation of an aberrant hepatic duct ranges from 5.6% to 17%. The absence of communication between the aberrant duct and the rest of the intrahepatic biliary tree delays the diagnosis despite repeated imaging. A ducto-jejunostomy with a Roux-en-Y reconstruction is considered a relevant treatment.The knowledge of these congenital anatomical variations of the biliary tree is essential for its appropriate and prompt management.

915—HEPATO-BILIARY & PANCREAS—Gallbladder

MINI-LAPAROSCOPY WITH ERAS FOR IMPROVAL OF COSMETIC RESULTS AND ELIMINATION OF POSTOPERATIVE PAIN FOR CHOLECYSTECTOMY AND NISSEN FUNDOPLICATION

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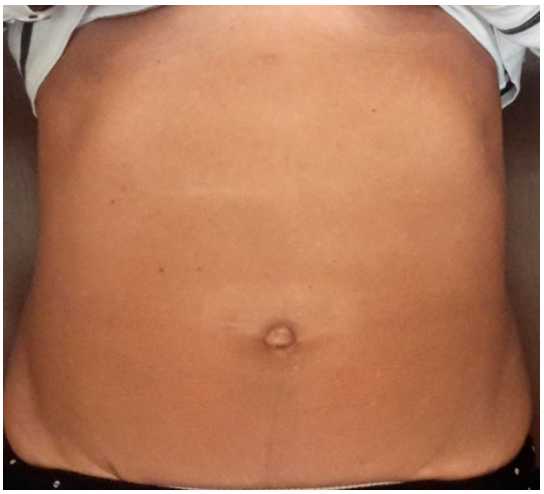
Aims: The need for fast recovery and excellent cosmetic results of laparoscopic procedures is current trend of minimally invasive surgery. The aim of study was to assess the results of mini-laparoscopic cholecystectomy and Nissen fundoplication combined with day surgery ERAS protocol compared to traditional procedures.

Methods: Mini-laparoscopic cholecystectomy (MLC) was performed using 4 trocars: 10-mm umbilical, 5-mm subxiphoidal and two 3-mm for mini-graspers in right subcostal region. Group 1A had 16 women with MLC, group 1B had eight women with standard laparoscopy cholecystectomy (SLC). Inclusion criteria were: age under 50, BMI under 35 kg/m^2, chronic cholecystitis and not severe acute cholecystitis. Groups were comparable.

Mini-laparoscopic Nissen fundoplication (MNF) was performed using 5 trocars: three 5-mm trocars and two 3-mm trocars. All the trocars were inserved in left upper quadrant. Group 2A included 8 patients with MNF. Group 2B included 17 patients with standard Nissen fundoplication (SNF). Inclusion criteria were: age under 40, BMI under 30, small type 1 hiatal hernia (symptomatic, severe GERD). Groups were comparable.

Results: There were no conversions to standard procedures in both groups, no intra- and postoperative complications in all patients. Postoperative stay was 1 day after MLC and 2 days after SLC, 2 days after MNF and 3 days after SNF. Mean duration of surgery was not much longer in mini-laparoscopic procedures compared to standard ones. Mean VAS score for intensity for pain on postop day 1 was 1.3 (range, 0–3) in group 1A and 4.5 (range, 3–7) in group 1B ($p < 0.05$); 2.2 (range, 0–3) in group 2A and 5.8 (range, 3–7) in group 2B ($p < 0.05$). Ten patients from 16 after MLC, and 4 patients from 8 after LNF had complete absence of pain on postop day 1. Cosmetic results 2 weeks and 1 month after surgery were better after MLC compared to SLC (Fig. 1), and after MNF compared to SNF (Fig. 2).



Conclusions: 1. Mini-laparoscopic cholecystectomy and Nissen fundoplication are good options for selected patients. 2. Mini-laparoscopic cholecystectomy and Nissen fundoplication produce less pain (almost absent), shorter postoperative stay and better cosmetic result compared to standard procedures. 3. More patient collection is needed to determine distinct indications for mini-laparoscopic procedures.

930—HEPATO-BILIARY & PANCREAS—Gallbladder

CHOLECYSTECTOMY IN PATIENTS AFTER ERCP: IS THERE A DIFFERENCE BETWEEN PATIENTS WITH PANCREATITIS AND CHOLEDOCHOLITHIASIS?

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Aims: The aim of this study was to compare the cases with laparoscopic cholecystectomy (LC) performed after endoscopic retrograde cholangiopancreatography (ERCP) with papillotomy with particular emphasis on the initial diagnosis prior to ERCP—biliary acute pancreatitis or cholelithiasis.

Methods: The study encompassed 96 patients who underwent LC secondary to ERCP between 2013 and 2018 in General Surgery And Polytraumatic Injury Department of University Hospital in Kraków, Poland. The cases were subsequently divided into two subgroups in terms of the initial diagnosis—40 cases of biliary acute pancreatitis and 56 cases of cholelithiasis alone. This was a prospective study. Data processing was based on Microsoft Excel. The statistics were performed using Student's T test, Chi squared test.

Results: There was statistically significant difference between both subgroups related to age, numeric rating scale of pain during admission, period of time from the start of pain to admission, mean corpuscular volume (MCV) of red blood cells, results in Acute Physiology And Chronic Health Evaluation II (APACHE II) severity–of-disease classification system, length of hospital stay, severity of destruction of gallbladder in histopathological results and the length of dissected gallbladder. There was no any statistically significant difference between both subgroups related to gender, type of admission (emergency/scheduled), body mass index (BMI), results in American Society of Anesthesiologists (ASA) physical status classification system, basic biochemical inflammatory parameters (leukocytosis, C-reactive protein), time between admission and the procedure, duration of surgical procedure, percentage of conversions from LC to open surgery, amount of complications. There was neither single death nor admission to intensive care unit after surgery in both subgroups respectively.

Conclusions: There is a difference in the severity of the inflammatory process between both subgroups. In cases secondary to biliary acute pancreatitis length of stay is extended and histopathological results are more severe. Perhaps the severity of the inflammatory response in the gallbladder may be one of the triggers of acute pancreatitis.

934—HEPATO-BILIARY & PANCREAS—Gallbladder

IS THE MALE GENDER FACTUALLY AN INDEPENDENT RISK FACTOR FOR COMPLICATIONS OF PATIENTS UNDERGOING LAPAROSCOPIC CHOLECYSTECTOMY?

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Aims: It is common to point out that male gender is one of strong risk factors for complications during laparoscopic cholecystectomy (LC), however the debate about that seems to be still open. Surprisingly, there are a few publications suggesting that female gender may be one of such risk factors. The aim of this study was to evaluate is male gender really the risk factor for complications of patients undergoing LC.

Methods: The study encompassed 455 patients who underwent LC between 2013 and 2018 in General Surgery And Polytraumatic Injury Department of University Hospital in Kraków, Poland, both emergency and scheduled procedures, due to acute cholecystitis and cholecystolithiasis respectively. In this group there was 289 (63%) female and 166 (37%) male patients. Subsequent inclusion criteria were scheduled admission with postoperative histopatological diagnosis of mild destruction of gallbladder and emergency admission with postoperative histopatological diagnosis of severe destruction of gallbladder, both genders respectively. This was a prospective study. Data processing was based on Microsoft Excel. The statistics were performed using Student's T test of difference between means in terms of different variances, Chi squared test and Chi squared test with Yates's correction for continuity if any value was between 5 and 10.

Results: There was statistically significant difference between male and female gender in general related to duration of surgical procedure, percentage of conversions from LC to open surgery, necessity of admission to intensive care unit after surgery. Nevertheless after incorporation of previously assumpted inclusion criteria in males and females respectively there was not any statistically significant difference with issues mentioned above.

Conclusions: After equalization of both gender subgroups in terms of type of admission and histopatological diagnosis there was no statistically significant differences. In our study group male gender is not an independent risk factor for complications during LC.

936—HEPATO-BILIARY & PANCREAS—Gallbladder

IS IT BETTER TO PERFORM ELECTIVE OR EMERGENCY CHOLECYSTECTOMY?

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Aims: The debate about the time when to perform laparoscopic cholecystectomy (LC) in cholecystolithiasis is still open. The majority of the latest outcomes tell about disadvantages due to overtreatment of performing urgent cholecystectomy. The aim of this study was the evaluation and the comparison of treatment outcomes in patients who underwent emergency and scheduled laparoscopic cholecystectomy.

Methods: The study encompassed 502 patients who underwent LC between 2013 and 2019 in General Surgery And Polytraumatic Injury Department of University Hospital in Kraków, Poland. Data processing was based on Microsoft Excel. The statistics were performed using Student's T test, Student's T test with range analysis, Chi squared test.

Results: The results were divided between emergency (233 patients consecutively) and scheduled procedures (269 patients consecutively). Both groups were matched in terms of age, sex, demographics, results in American Society of Anesthesiologists (ASA) physical status classification system, results in Acute Physiology And Chronic Health Evaluation II (APACHE II) severity-of-disease classification system, length of hospital stay, duration of surgical procedure, amount of defined complications, necessity of admission to intensive care unit after surgery, mortality rate and histopathological results. There was statistically significant difference between duration of LC, length of stay, the amount of complications and mortality.

Conclusions: Scheduled, delayed in time LC are much more safer for patients with cholecystolithiasis. However, its limitations increase the probability of necessity to perform urgent, emergency LC.

938—HEPATO-BILIARY & PANCREAS—Gallbladder

RISK FACTORS OF CONVERSION FROM LAPAROSCOPIC TO OPEN CHOLECYSTECTOMY

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Aims: The aim of this study was the prospective evaluation of patients who underwent conversion from laparoscopic to open cholecystectomy with focusing on risk factors leading to conversion.
Methods: The study encompassed 437 patients who were admitted to General Surgery And Polytraumatic Injury Department of University Hospital in Kraków, Poland between 2013 and 2018 with initial intention to perform laparoscopic cholecystectomy (LC) on them. They were divided into two subgroups, which the first consisted of 405 patients who underwent LC and the latter included 32 (7.3%) cases where the initial procedure was converted to open surgery. This was prospective study. Data processing was based on Microsoft Excel. The statistics were performed using Student's T test of difference between means in terms of different variances, Chi squared test and Chi squared test with Yates's correction for continuity if any value was between 5 and 10.
Results: There was statistically significant difference between both subgroups in terms of age, gender, type of admission (emergency or scheduled), numeric rating scale of pain during admission, biochemical test results related to inflammatory parameters, results in American Society of Anesthesiologists (ASA) physical status classification system, results in Acute Physiology And Chronic Health Evaluation II (APACHE II) severity-of-disease classification system. Length of hospital stay, duration of surgical procedure, higher amount of complications and more serious and sophisticated histopatological results were also statistically significant.
Conclusions: In our study the main risk factor related to conversion from LC to open surgery was local inflammatory changes surrounding gallbladder. However, age, gender and type of admission are also significant in terms of conversion.

941—HEPATO-BILIARY & PANCREAS—Gallbladder

ASSESSMENT OF THE IMPACT OF ERCP ON THE COURSE OF SECONDARY LAPAROSCOPIC CHOLECYSTECTOMY

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Aims: The aim of this study was to assess if the endoscopic retrograde cholangiopancreatography (ERCP) prior to laparoscopic cholecystectomy (LC) has any influence or if any—how strong impact on the course of the latter.
Methods: The study encompassed 495 patients who underwent LC between 2013 and 2019 in General Surgery And Polytraumatic Injury Department of University Hospital in Kraków, Poland. The cases were subsequently divided into two subgroups—399 cases that underwent LC due to cholecystolithiasis and 96 cases after ERCP because of choledocholithiasis or biliary acute pancreatitis, and secondary LC done due to cholecystolithiasis. This was a prospective study. Data processing was based on Microsoft Excel. The statistics were performed using Student's T test and Chi squared test. The comparison included demographics, past medical history, initial physical examination, biochemical test results, the severity of the disease, length of hospital stay, period of time between ERCP and secondary LC, duration of both procedures, postoperative diagnosis, histopathological results, the amount of complications and mortality in both groups respectively.
Results: There was not any statistically significant difference between subgroups in terms of age, gender, period of time from the start of pain to admission, results in American Society of Anesthesiologists (ASA) physical status classification system, length of hospital stay, period of time from admission to LC, duration of LC, percentage of conversion and complications. There was statistically significant difference between type of admission (emergency/scheduled), numeric rating scale of pain during admission, basic biochemical inflammatory parameters (leukocytosis, C-reactive protein), results in Acute Physiology And Chronic Health Evaluation II (APACHE II) severity-of-disease classification system, severity of destruction of gallbladder in histopathological results and the length of dissected gallbladder. In cases after LC secondary to ERCP there was neither single death nor admission to intensive care unit after surgery.
Conclusions: ERCP prior to LC has no impact on the course of the latter procedure. Statistically relevant in this subgroup higher amount of the cases after scheduled admission confirmed by lower inflammatory tests results and APACHE II results determines lighter course of the treatment and milder histopathological results.

943—HEPATO-BILIARY & PANCREAS—Gallbladder

ACUTE CHOLECYSTECTOMIES: A TIME SENSITIVE MATTER

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Background: Early cholecystectomy, during the index admission, has been widely accepted as the treatment of choice for acute cholecystitis offering decreased length of stay and decreased risk of further episodes of acute cholecystitis/pancreatitis. However, a definition of "early" has not yet been established in the literature. Whilst the definition of early varies between 24 h and 10 days, three papers highlighted the first 48 h as the optimum time for intervention. Controversy remains around the risk of early cholecystectomy and risk of common bile duct (CBD) injury.
Aim: To review surgical experience with early cholecystectomies in a level three centre.
Methods: Retrospective review of charts to identify our study cohort of patients who underwent cholecystectomy during their index admission. Data extracted: gender, age range, grading (Tokyo Guidleines 2018), time to theatre (TTT), length of stay (LOS), prior admission, complications (CBD injury, conversion rate, subtotal cholecystectomies, drain insertion).
Results: Of 160 laparoscopic cholecystectomies between 01/2015 and 09/2019, 46 were identified as acute. 63.5% of the patients were female. Mean age was 50.9. The average severity grading was 1.3. Average time to theatre was 2.8d. The average LOS was 6.2 days. Out of the TTT groups 0–1 days had the shortest mean length of stay 2.1 days (2–5 days x(LOS) = 5.0; 6–10 days xLOS:12.8). There was no significant difference between the 0–1 days and 2–5 days TTT groups (p value > 0.05), however there was a significant difference between LOS of group 0–1 and 6-10 as well as 2–5 days to 6–10 days, respectively. Complication rates were 1.5% for CBD injury, 7.7% conversion rate, 6.5% rate of subtotal cholecystectomies and 52% had drains inserted during the time of surgery.
Conclusions: A reduced length of stay for acute cholecystectomies up to 5 days post admission suggests a cost–benefit for the HSE and higher patient satisfaction. Complications rates were not statistically significant between the groups.

941—HEPATO-BILIARY & PANCREAS—Gallbladder

ASSESSMENT OF THE IMPACT OF ERCP ON THE COURSE OF SECONDARY LAPAROSCOPIC CHOLECYSTECTOMY

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Aims: The aim of this study was to assess if the endoscopic retrograde cholangiopancreatography (ERCP) prior to laparoscopic cholecystectomy (LC) has any influence or if any—how strong impact on the course of the latter.
Methods: The study encompassed 495 patients who underwent LC between 2013 and 2019 in General Surgery And Polytraumatic Injury Department of University Hospital in Kraków, Poland. The cases were subsequently divided into two subgroups—399 cases that underwent LC due to cholecystolithiasis and 96 cases after ERCP because of choledocholithiasis or biliary acute pancreatitis, and secondary LC done due to cholecystolithiasis. This was a prospective study. Data processing was based on Microsoft Excel. The statistics were performed using Student's T test and Chi squared test. The comparison included demographics, past medical history, initial physical examination, biochemical test results, the severity of the disease, length of hospital stay, period of time between ERCP and secondary LC, duration of both procedures, postoperative diagnosis, histopathological results, the amount of complications and mortality in both groups respectively.
Results: There was not any statistically significant difference between subgroups in terms of age, gender, period of time from the start of pain to admission, results in American Society of Anesthesiologists (ASA) physical status classification system, length of hospital stay, period of time from admission to LC, duration of LC, percentage of conversion and complications. There was statistically significant difference between type of admission (emergency/scheduled), numeric rating scale of pain during admission, basic biochemical inflammatory parameters (leukocytosis, C-reactive protein), results in Acute Physiology And Chronic Health Evaluation II (APACHE II) severity-of-disease classification system, severity of destruction of gallbladder in histopathological results and the length of dissected gallbladder. In cases after LC secondary to ERCP there was neither single death nor admission to intensive care unit after surgery.
Conclusions: ERCP prior to LC has no impact on the course of the latter procedure. Statistically relevant in this subgroup higher amount of the cases after scheduled admission confirmed by lower inflammatory tests results and APACHE II results determines lighter course of the treatment and milder histopathological results.

938—HEPATO-BILIARY & PANCREAS—Gallbladder

RISK FACTORS OF CONVERSION FROM LAPAROSCOPIC TO OPEN CHOLECYSTECTOMY

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Aims: The aim of this study was the prospective evaluation of patients who underwent conversion from laparoscopic to open cholecystectomy with focusing on risk factors leading to conversion.
Methods: The study encompassed 437 patients who were admitted to General Surgery And Polytraumatic Injury Department of University Hospital in Kraków, Poland between 2013 and 2018 with initial intention to perform laparoscopic cholecystectomy (LC) on them. They were divided into two subgroups, which the first consisted of 405 patients who underwent LC and the latter included 32 (7.3%) cases where the initial procedure was converted to open surgery. This was prospective study. Data processing was based on Microsoft Excel. The statistics were performed using Student's T test of difference between means in terms of different variances, Chi squared test and Chi squared test with Yates's correction for continuity if any value was between 5 and 10.
Results: There was statistically significant difference between both subgroups in terms of age, gender, type of admission (emergency or scheduled), numeric rating scale of pain during admission, biochemical test results related to inflammatory parameters, results in American Society of Anesthesiologists (ASA) physical status classification system, results in Acute Physiology And Chronic Health Evaluation II (APACHE II) severity-of-disease classification system. Length of hospital stay, duration of surgical procedure, higher amount of complications and more serious and sophisticated histopatological results were also statistically significant.
Conclusions: In our study the main risk factor related to conversion from LC to open surgery was local inflammatory changes surrounding gallbladder. However, age, gender and type of admission are also significant in terms of conversion.

936—HEPATO-BILIARY & PANCREAS—Gallbladder

IS IT BETTER TO PERFORM ELECTIVE OR EMERGENCY CHOLECYSTECTOMY?

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Aims: The debate about the time when to perform laparoscopic cholecystectomy (LC) in cholecystolithiasis is still open. The majority of the latest outcomes tell about disadvantages due to overtreatment of performing urgent cholecystectomy. The aim of this study was the evaluation and the comparison of treatment outcomes in patients who underwent emergency and scheduled laparoscopic cholecystectomy.
Methods: The study encompassed 502 patients who underwent LC between 2013 and 2019 in General Surgery And Polytraumatic Injury Department of University Hospital in Kraków, Poland. Data processing was based on Microsoft Excel. The statistics were performed using Student's T test, Student's T test with range analysis, Chi squared test.
Results: The results were divided between emergency (233 patients consecutively) and scheduled procedures (269 patients consecutively). Both groups were matched in terms of age, sex, demographics, results in American Society of Anesthesiologists (ASA) physical status classification system, results in Acute Physiology And Chronic Health Evaluation II (APACHE II) severity-of-disease classification system, length of hospital stay, duration of surgical procedure, amount of defined complications, necessity of admission to intensive care unit after surgery, mortality rate and histopathological results. There was statistically significant difference between duration of LC, length of stay, the amount of complications and mortality.
Conclusions: Scheduled, delayed in time LC are much more safer for patients with cholecystolithiasis. However, its limitations increase the probability of necessity to perform urgent, emergency LC.

934—HEPATO-BILIARY & PANCREAS—Gallbladder

IS THE MALE GENDER FACTUALLY AN INDEPENDENT RISK FACTOR FOR COMPLICATIONS OF PATIENTS UNDERGOING LAPAROSCOPIC CHOLECYSTECTOMY?

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Aims: It is common to point out that male gender is one of strong risk factors for complications during laparoscopic cholecystectomy (LC), however the debate about that seems to be still open. Surprisingly, there are a few publications suggesting that female gender may be one of such risk factors. The aim of this study was to evaluate is male gender really the risk factor for complications of patients undergoing LC.
Methods: The study encompassed 455 patients who underwent LC between 2013 and 2018 in General Surgery And Polytraumatic Injury Department of University Hospital in Kraków, Poland, both emergency and scheduled procedures, due to acute cholecystitis and cholecystolithiasis respectively. In this group there was 289 (63%) female and 166 (37%) male patients. Subsequent inclusion criteria were scheduled admission with postoperative histopatological diagnosis of mild destruction of gallbladder and emergency admission with postoperative histopatological diagnosis of severe destruction of gallbladder, both genders respectively. This was a prospective study. Data processing was based on Microsoft Excel. The statistics were performed using Student's T test of difference between means in terms of different variances, Chi squared test and Chi squared test with Yates's correction for continuity if any value was between 5 and 10.
Results: There was statistically significant difference between male and female gender in general related to duration of surgical procedure, percentage of conversions from LC to open surgery, necessity of admission to intensive care unit after surgery. Nevertheless after incorporation of previously assumpted inclusion criteria in males and females respectively there was not any statistically significant difference with issues mentioned above.
Conclusions: After equalization of both gender subgroups in terms of type of admission and histopatological diagnosis there was no statistically significant differences. In our study group male gender is not an independent risk factor for complications during LC.

930—HEPATO-BILIARY & PANCREAS—Gallbladder

CHOLECYSTECTOMY IN PATIENTS AFTER ERCP: IS THERE A DIFFERENCE BETWEEN PATIENTS WITH PANCREATITIS AND CHOLEDOCHOLITHIASIS?

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Aims: The aim of this study was to compare the cases with laparoscopic cholecystectomy (LC) performed after endoscopic retrograde cholangiopancreatography (ERCP) with papillotomy with particular emphasis on the initial diagnosis prior to ERCP—biliary acute pancreatitis or cholelithiasis.
Methods: The study encompassed 96 patients who underwent LC secondary to ERCP between 2013 and 2018 in General Surgery And Polytraumatic Injury Department of University Hospital in Kraków, Poland. The cases were subsequently divided into two subgroups in terms of the initial diagnosis—40 cases of biliary acute pancreatitis and 56 cases of cholelithiasis alone. This was a prospective study. Data processing was based on Microsoft Excel. The statistics were performed using Student's T test, Chi squared test.
Results: There was statistically significant difference between both subgroups related to age, numeric rating scale of pain during admission, period of time from the start of pain to admission, mean corpuscular volume (MCV) of red blood cells, results in Acute Physiology And Chronic Health Evaluation II (APACHE II) severity-of-disease classification system, length of hospital stay, severity of destruction of gallbladder in histopathological results and the length of dissected gallbladder. There was no any statistically significant difference between both subgroups related to gender, type of admission (emergency/scheduled), body mass index (BMI), results in American Society of Anesthesiologists (ASA) physical status classification system, basic biochemical inflammatory parameters (leukocytosis, C-reactive protein), time between admission and the procedure, duration of surgical procedure, percentage of conversions from LC to open surgery, amount of complications. There was neither single death nor admission to intensive care unit after surgery in both subgroups respectively.
Conclusions: There is a difference in the severity of the inflammatory process between both subgroups. In cases secondary to biliary acute pancreatitis length of stay is extended and histopathological results are more severe. Perhaps the severity of the inflammatory response in the gallbladder may be one of the triggers of acute pancreatitis.

915—HEPATO-BILIARY & PANCREAS—Gallbladder

MINI-LAPAROSCOPY WITH ERAS FOR IMPROVAL OF COSMETIC RESULTS AND ELIMINATION OF POSTOPERATIVE PAIN FOR CHOLECYSTECTOMY AND NISSEN FUNDOPLICATION

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Aims: The need for fast recovery and excellent cosmetic results of laparoscopic procedures is current trend of minimally invasive surgery. The aim of study was to assess the results of mini-laparoscopic cholecystectomy and Nissen fundoplication combined with day surgery ERAS protocol compared to traditional procedures.
Methods: Mini-laparoscopic cholecystectomy (MLC) was performed using 4 trocars: 10-mm umbilical, 5-mm subxiphoidal and two 3-mm for mini-graspers in right subcostal region. Group 1A had 16 women with MLC, group 1B had eight women with standard laparoscopy cholecystectomy (SLC). Inclusion criteria were: age under 50, BMI under 35 kg/m^2, chronic cholecystitis and not severe acute cholecystitis. Groups were comparable.
Mini-laparoscopic Nissen fundoplication (MNF) was performed using 5 trocars: three 5-mm trocars and two 3-mm trocars. All the trocars were inserved in left upper quadrant. Group 2A included 8 patients with MNF. Group 2B included 17 patients with standard Nissen fundoplication (SNF). Inclusion criteria were: age under 40, BMI under 30, small type 1 hiatal hernia (symptomatic, severe GERD). Groups were comparable.
Results: There were no conversions to standard procedures in both groups, no intra- and postoperative complications in all patients. Postoperative stay was 1 day after MLC and 2 days after SLC, 2 days after MNF and 3 days after SNF. Mean duration of surgery was not much longer in mini-laparoscopic procedures compared to standard ones. Mean VAS score for intensity for pain on postop day 1 was 1.3 (range, 0–3) in group 1A and 4.5 (range, 3–7) in group 1B ($p < 0.05$); 2.2 (range, 0–3) in group 2A and 5.8 (range, 3–7) in group 2B ($p < 0.05$). Ten patients from 16 after MLC, and 4 patients from 8 after LNF had complete absence of pain on postop day 1. Cosmetic results 2 weeks and 1 month after surgery were better after MLC compared to SLC (Fig. 1), and after MNF compared to SNF (Fig. 2).
Conclusions: 1. Mini-laparoscopic cholecystectomy and Nissen fundoplication are good options for selected patients. 2. Mini-laparoscopic cholecystectomy and Nissen fundoplication produce less pain (almost absent), shorter postoperative stay and better cosmetic result compared to standard procedures. 3. More patient collection is needed to determine distinct indications for mini-laparoscopic procedures.

839—HEPATO-BILIARY & PANCREAS—Gallbladder

ABERRANT RIGHT HEPATIC SECTORAL DUCTS INJURIES AFTER CHOLECYSTECTOMY. CLINICAL OUTCOMES AND MANAGEMENT

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Aims: Anatomical variations of the biliary tree are one of the causes of iatrogenic bile duct injuries (IBDI) during cholecystectomies. One of the most dangerous variants is the anomalous implantation of the aberrant right sectoral duct in the extrahepatic biliary tree and is one of the main risk factors for its injury during surgery. The aim of our review is to report these rarely published injuries, diagnosis and management options.
Methods: We reviewed the clinical files of all the patients who suffered a biliary complication after an open and laparoscopic cholecystectomy in our centre between the years 2000–2019.
Results: Four consecutive patients were diagnosed with IBDI caused by an aberrant duct and were identified for inclusion. Three of our patients had a right posterolateral sectorial and one had a right anteromedial sectorial bile duct injury. Based on the Strasberg classification three of our patients were classified as are type C (section) and one type B (occlusion). None of these cases were diagnosed during surgery. Two of our patients presented with a persistent biliary fistula, one presented with a bilioma and another with recurrent cholangitis. The time between the primary intervention and the surgical repair of the injury ranged between 2 weeks to 8 years. All of these cases underwent surgery and a bilio-enteric anastomosis was performed. All our patients have shown an asymptomatic postoperative follow up with no signs of cholestasis.
Conclusions: The accidental transection or ligation of an aberrant hepatic duct ranges from 5.6 to 17%. The absence of communication between the aberrant duct and the rest of the intrahepatic biliary tree delays the diagnosis despite repeated imaging. A ducto-jejunostomy with a Roux-en-Y reconstruction is considered a relevant treatment. The knowledge of these congenital anatomical variations of the biliary tree is essential for its appropriate and prompt management.

823—HEPATO-BILIARY & PANCREAS—Gallbladder

SAFE CHOLECYSTECTOMY: DYNAMIC EVALUATION OF THE BILIARY DRAINAGE WITH ICG CHOLANGIOGRAPHY AND INTRAOPERATIVE ULTRASOUND

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Aims: Diagnosis and treatment of biliary lithiasis has dramatically changed in the last 35 years. Intraoperative cholangiography (IOC) remains the gold standard technique for intraoperative imaging of the biliary tree. It allows to rule out the presence of choledocholithiasis or biliary strictures and also provide dynamic information regarding biliary drainage towards the duodenum. However, laparoscopic ultrasound (LUS) has gained importance as it has been demonstrated similar accuracy as IOC for the diagnosis of common bile duct (CBD) stones, but when performed alone dynamic information is lacking. Recently, fluorescent cholangiography with indocyanine green (ICG) has emerged as a valuable tool to assess the biliary drainage and if combined with LUS has potential advantages over conventional IOC. This video aims to demonstrate the usefulness of ICG duodenal fluorescence as an indirect parameter to assure correct biliary drainage.
Methods: a 73-year-old male presented in the Emergency Department with a seven-day history of pain in the right upper quadrant and fever. Abdominal ultrasound showed signs of acute cholecystitis. In addition, blood test results allowed to classify the patient as at high risk of choledocholithiasis. We performed a laparoscopic cholecystectomy and exploration of CBD with a 3 mm choledochoscope, after which transcystic ICG cholangiography was made, visualizing a correct duodenal fluorescence and confirming an adequate biliary drainage.
Results: the patient had a grade II cholecystitis according to the Tokyo Classification. It was possible to remove the biliary sludge completely. The patient started oral intake on the first postoperative day. Control blood analysis reported decreasing inflammatory parameters with no increase in bilirubin or pancreatic enzymes levels. No postoperative complications were seen. The patient was discharged on the 2nd postoperative day.
Conclusion: adequate duodenal fluorescence after transcystic administration of ICG, offers indirect information regarding transpapillar biliary drainage. Fluorescent cholangiography could complement the dynamic information that is lacking when performing LUS.

818—HEPATO-BILIARY & PANCREAS—Gallbladder

LEFT-SIDED GALLBLADDER: AN INSIDIOUS ENEMY IN EMERGENCY SETTING

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Introduction: Sinistroposition of the gallbladder, or true left-sided gallbladder (LSG) without situs viscerum inversus, is a rare congenital anatomical variant, with a reported prevalence of 0,6%, where the gallbladder is located to the left of round/falciform ligament. It can be associated with anomalies of the biliary tree, portal system and hepatic vascularization. The surgical management of a LSG could be challenging even for an experienced operator, being usually an incidental intraoperative finding.
Case Report: A 72 years old woman was admitted to our emergency department because of acute cholecystitis. There were no pre-operative indications of sinistroposition of the gallbladder and its aberrant position was discovered during the explorative laparoscopy; because of the unusual anatomy and chronic flogosis, the laparoscopic approach was converted to open surgery. The patient underwent a successful intervention and was discharged after 4 days without complications. Her family history revealed a daughter with biliary atresia.
Discussion: LSG could remain undetected preoperatively, but today, with advances in diagnostic imaging, the report of this condition has increased. Althought a laparoscopic approach is feasible with LSG, there shouldn't be any hesitations to convert to an open procedure whenever the anatomic situation is unclear. In this case, the laparotomic approach allowed to better understand the anatomy and to safely perform the dissection of the Calot's triangle. Several hypothesis suggest the presence of an underlying embriologic mechanism for LSG and its associated anomalies, but its aetiology is still unknown. The association with the daughter's biliary atresia makes reasonable a possible genetic correlation with this condition.
Conclusions: LSG is commonly an incidental intraoperative finding. Its presence should be suspected in case of unclear visualization of the fourth hepatic segment during preoperative diagnostic imaging.
Every surgeon should be aware of this condition to avoid bile duct injury or vessel damages. Althought laparoscopic cholecystectomy is feasible and safe, especially when performed by an experienced surgeon, laparotomic convertion and/or intraoperative cholangiography should be considered whenever the anatomy can not be promptly recognized, mostly in the presence of severe inflammation.

701—HEPATO-BILIARY & PANCREAS—Gallbladder

VALUE OF INDOCYANINE GREEN (ICG) TO IDENTIFY THE BILIARY TRACT DURING COMPLEX LAPAROSCOPIC CHOLECYSTECTOMY

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Aim: To assess the importance of identifying the bile duct using indocyanine green (ICG) in patients undergoing elective laparoscopic cholecystectomy in order to avoid biliary injuries.

Methods: Intravenous infusion of ICG was performed 20 min before surgery. Bile duct can be easily and accurately identified with this technique, avoiding possible injuries and complications.

Results: A 44-year-old male was admitted for elective laparoscopic cholecystectomy. 90 days before surgery, a episode of acute cholecystitis was reported, treated conservatively initially. The patient underwent a previous surgical procedure 10 years before this surgery. The patient was diagnosed at that time of a pyloric stenosis of unknown origin, probably secondary to a chronic ulcer. A pyloroplasty was performed, developing a focal pancreatitis showing the biopsy the presence of an ectopic pancreas. The patient developed a new stenosis being necessary to perform a gastroenteroanastomosis. In this context, we were expecting a complex cholecystectomy deciding to infuse ICG before surgery in order to identify the biliary tract. An important inflammatory process was found with difficulties to identify the anatomical landmarks. ICG allows to identify the main bile duct after blunt dissection and after dissecting the adhesions of the duodenum and the colon. Even so, the adequate assessment of the bile duct with this technique, facilitated anatomical orientation and made possible to safely complete the elective cholecystectomy.

Conclusion: The present case shows a case of how ICG imaging is an effective tool to avoid biliary duct injuries and safely perform an elective laparoscopic cholecystectomy in a difficult setting and when a high risk of complications is expected.

641—HEPATO-BILIARY & PANCREAS—Gallbladder

OPERATIVE DIFFICULTY SCORES FOR LAPAROSCOPIC CHOLECYSTECTOMY AND THEIR VALUE IN PREDICTING OUTCOME : A SINGLE CENTER PROSPECTIVE STUDY

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AIM: Prospective study of all laparoscopic cholecystectomies that were conducted in our department in an 8 month period and correlation between intraoperative findings and postoperative complications.

Method: Data recorded and analysed included demographics, relevant history (previous admissions due to acute cholangitis, acute cholecystitis or pancreatitis) and time interval between symptoms and surgery. Intraoperative parameters such as duration of operation, intraoperative hemorrhage, bile leak or gallbladder perforation were also studied. The operative difficulty was determined using Nassar 's scale, Parkland 's scale and the G10 cholecystitis severity score. The correlation of all the above with the conversion rate, the median hospital stay and the 30 day morbidity was recorded.

Result: 149 patients underwent laparoscopic cholecystectomies, the majority of which due to symptomatic cholelithiasis. The intraoperative difficulty scores concerning cholecystectomy referred above, were estimated for each case.

Conclusion: The intraoperative difficulty scores should be taken into consideration in predicting the outcome of laparoscopic cholecystectomy. These scores also offer a very useful tool in the description and grading of intraoperative findings.

571—HEPATO-BILIARY & PANCREAS—Gallbladder

BOUVERET SYNDROME: AN UNCOMMON COMPLICATION OF CHOLELITHIASIS

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Gallstone ileus is a rare cause of small bowel obstruction but in gastric outlet obstruction is an even rarer entity. Biliary-enteric fistulas are an uncommon complication of cholelithiasis. In 85% of cases with such kind fo fistulas, stones tend to pass spontaneously. The remaining 15% tend to develop a clinical picture of bowel obstruction and the stone can lodge in the terminal ileum (60%), proximal ileum (24%), distal jejunum (9%), and large bowel (2–4%).1 In 1% to 3% of cases, the stone obstructs the pylorus and duodenum, causing gastric outlet obstruction, which is known as Bouveret's syndrome. through a cholecysto-duodenal fistula. Bouvert syndrome affects mostly the elderly population. We report the case of a 38 year old female patient with this condition.

520—HEPATO-BILIARY & PANCREAS—Gallbladder

MINIMALLY INVASIVE COLECISTECTOMY WITH 3 MM ACCESSES. OUR EXPERIENCE

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Background: The gallbladder stones are the most frequent diseases in general surgery. Although videolaparoscopic cholecystectomy, which is fundamental in the training of the young surgeon, has been standardized for years, same modifications to the technique are still possible.

Serie Report: We present our experience for the cholecistecomies performed with trocar and optics of 3 mm. in the last 5 years, we performed 132 with 3 mm accesses among total number of cases of 527 laparoscopic cholecistctomies (25%). General anesthesia is performed with laryngeal mask. The placement provides access in left hypochondrium, umbilical, right side and overpubic with 5 mm trocars. We use a 3 mm optic. Overpubic access is required for the extraction of gallbladder by endobag. Skin synthesis is performed by the use of cyanocrylate. Average operating times (35 min vs 40 min), average hospital days (1.8 days vs 2.1), the highest complication rate (0.5 vs 0.7) are overlapping. The aesthetic result turns out to be more satisfying.

Conclusion: Videolaparoscopic cholecystectomy with 3 mm accesses and optics is safe, overlapping on other techniques, without increasing costs, average hospitalization days, and complication rates. It also allows a better aesthetic result with greater patient satisfaction.

513—HEPATO-BILIARY & PANCREAS—Gallbladder

LIVER FUNCTION TEST IN THE MANAGEMENT OF SUSPECTED CHOLEDOCHOLITHIASIS

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Aims: Clinical suspicion, abdominal ultrasound and liver function tests (LFT) play the main role in stratifying the risk of common bile duct stones (CBD). However, none of them has an adequate sensitivity or specificity and the recent literature is still controversial. The aim of our study was to find a reliable tool based on the LFTs to predict the presence of CBD stones with a mathematical equation.
Methods: We retrospectively considered the patients with an intermediate or high risk of CBD stones who underwent a MRCP from January 2014 to June 2019. Demographic, clinical data and LFT were collected and analyzed.
Results: 191 patients were selected, 64 (33.5%) with positive and 127 (66.5%) with negative magnetic resonance cholangiopancreatography. The analysis showed that none of single LFTs had a sufficient diagnostic value. Instead, our LFT-based score showed 84.4%, 87.3%, 76.1% and 91.6% of sensibility, specificity, positive and negative predictive values respectively. It showed the highest diagnostic value with an accuracy of 95% in excluding CBD stones and no unexpected neoplastic lesions were incorrectly classified.
Conclusions: Uncertainty in classified patients with suspected CBD stones can lead to a delay of the surgical treatment, increasing length of hospital stay and costs. We constructed a weighted score that shows a very high diagnostic value, especially a 91.6% of negative predictive value and 95% accuracy in negative cases. It could help to select patients to be primary treated with surgery and those who benefit from preoperative investigations.

476—HEPATO-BILIARY & PANCREAS—Gallbladder

FEATURES OF SURGICAL TREATMENT OF ACUTE CHOLECYSTITIS IN PATIENTS WITH OBESITY

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Acute cholecystitis causes the most difficult situation in patients with gallstone disease, and the presence of obesity increases the risk of complications from surgery due to altered homeostasis of the body and reducing its reserve capacity.
The aim of the study is to improve the results of treatment of acute cholecystitis in patients with obesity by modifying the surgical intervention method.
Methods: A prospective analysis of 67 cases with acute cholecystitis was performed. The exclusion criteria included the following patients: with chronic or exacerbation of chronic cholecystitis, less than 18 years of age, those who lacked the full spectrum of studies, patients with mechanical jaundice, including oncological pathology, patients with normal and overweight. Inclusion criteria are patients with acute cholecystitis and obesity. Two groups were identified. The first numbered 32 patients and underwent traditional laparoscopic cholecystectomy (LCE). In the second group, 35 patients underwent modified laparoscopic cholecystectomy (LCE). The essence of the modified surgical intervention was staging an additional 5th trocar in the left hypochondrium, projecting the Mayo-Robson's point, performing a step-by-step "safe" cholecystectomy and reducing intra-abdominal pressure from 15 to 17 mmHg to 0 mm. Hg every 30 min with hyperventilation for 1 min.
Results: The duration of surgery with modified LCE was 75.16 ± 5.72 min, and in the comparison group, the duration of traditional LCE was 84.17 ± 5.31 min.
The incidence of postoperative complications (hematoma in the place of the gallbladder, biloma, seroma of postoperative wounds) in the modified group was three times lower than in the traditional group, and was 4.73% ($p = 0.019$; $\alpha = 0.05$).
In the early postoperative period, moderate metabolic acidosis was reported in patients with traditional LCE: pH 7.30 ± 0.005, $pCO2 = 6.03 \pm 0.38$ kPa, $HCO3- = 20.17 \pm 1.19$ mmol/L. This promotes the development of hypercoagulation and increases the risk of thrombosis in the background of obesity. In the comparison group, these indicators were within normal range due to modification of surgery. The level of fibrinogen in patients with traditional surgery was 3.64 ± 0.72 g/l, whereas in the comparison group it was 3.16 ± 0.63 g/l ($p = 0.004$; $\alpha = 0.05$).
Conclusions: Performing modified laparoscopic cholecystectomy reduced the duration of surgery by 9.01 ± 0.41 min ($p = 0.001$; $\alpha = 0.05$), reduced complications threefold, and prevented the development of metabolic acidosis pH 7.39 ± 0.03 vs 7.30 ± 0.005 ($p = 0.001$; $\alpha = 0.05$), pCO2 5.05 ± 0.36 vs 6.03 ± 0.38 ($p = 0.02$; $\alpha = 0.05$), reducing the risk of hypercoagulation and thrombosis.

424—HEPATO-BILIARY & PANCREAS—Gallbladder

SPHINCTEROTOMY COMBINED WITH ENDOSCOPIC PAPILLARY BALLOON DILATATION VERSUS SPHINCTEROTOMY ALONE FOR REMOVAL OF COMMON BILE DUCT STONES

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Background: Endoscopic sphincterotomy (EST) is currently recognized as the primary endoscopic treatment for common bile duct stones. However, it is difficult to remove multiple ($\geq$ 3) or large ($\geq$ 10 mm) common bile duct stones with EST alone. EST plus endoscopic papillary large-balloon dilation (EPLBD) was reported to be an effective treatment for such bile duct stones.

Aim of the work: to compare the therapeutic benefits and complications between Endoscopic sphincterotomy (EST) alone and (EBT) plus (EPBD).

Methods: Fourty patients with large (largest diameter, $\geq$ 10 mm) or $\geq$ 3 common bile duct stones underwent EST + EPLBD (n = 20) or EST alone (n = 20). We compared final successful stone removal rates in the first session, procedure times and complications between the EST + EPLBD and EST groups.

Results: The rates of final successful stone removal were similar between the two groups (EST + EPLBD: 95% vs. EST: 90%; p = 0.115). The procedure time was not significantly shorter (EST + EPLBD: 52 min vs. EST: 54 min; p = 0.545).Complications like pancreatitis occurred in one patient in the EST + EPLBD group and in two patients in the EST group, but the differences were not statistically significant (EST + EPLBD: 5% vs. EST: 10%; p = 1.000).

Conclusions: Our results suggest that EST + EPLBD is safe and an effective alternative therapy to EST alone for patients with multiple or large common bile duct stones, because it requires fewer sessions and shorter operative times than EST alone.

284—HEPATO-BILIARY & PANCREAS—Gallbladder

CLINICAL VALUE OF FLUORESCENT CHOLANGIOGRAPHY FOR THE PATIENTS WITH INFRAPOTAL TYPE OF THE RIGHT POSTERIOR BILE DUCT DURING SINGLE = INCISION LAPAROSCOP

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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 min. Detectability of infraportal type of the right posterior bile duct before dissection in Claot's triangle was 23.1% (n = 3) and that during dissection in Calot's triangle was 53.8% (n = 7). The infraportal type of the right posterior bile duct could be identified under fluorescent cholangiography only when it joined into the common hepatic duct.

Conclusions: Utilization of fluorescent cholangiography can lead SILC to safe even for the patients with the infraportal type of the right posterior bile duct. Its benefit is emphasized when the infraportal type of the right posterior bile duct joins into the common hepatic duct.

231—HEPATO-BILIARY & PANCREAS—Gallbladder

HYBRID TECHNIQUES IN THE TREATMENT OF PATIENTS WITH ACUTE CHOLECYSTITIS ASSOCIATED WITH CHOLECYSTOCHOLEDOCHOLITHIASIS

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Introduction: Cholelithiasis incidence among the adult population in Russia ranges from 10 to 20% and increases with age reaching 40% after 60.

Research objective: To study the results of surgical treatment of patients with acute cholecystitis associated with cholecystocholedocholithiasis. Determine the surgical approach and the method of surgical treatment.

Materials and Methods: In the surgical departments of the Regional Clinical Hospital of Emergency Medical Care, Barnaul, from 2017 to 2019, 1677 patients with acute cholecystitis associated with cholelithiasis were operated by means of laparoscopic access. Of these, 173 (10.3%) patients had acute cholecystitis concomitant with choledocholithiasis.

Patients were divided into four groups depending on the surgical approach and treatment methods.

Group I–19 (11.0%) patients underwent laparoscopic cholecystectomy (LCE) with the common bile duct external drainage and one-time lithoextraction by endoscopic papillosphincterotomy (EPST) according to the rendezvous technique.

The group included patients with calculi up to 2 cm without signs of acute pancreatitis.

Group II—109 (63.0%) patients underwent LCE with the common bile duct external drainage and the further stage lithoextraction by EPST in the delayed period of 3–7 days.

The group included patients with acute pancreatitis, patients with the oncological process with compression of the common bile duct distal third impossible to exclude or acute patients with signs of multiple organ failure.

Group III—25 (14.5%) patients underwent LCE combined with choledochotomy and one-time lithoextraction under the control of a video choledochoscope.

The group included patients with calculi over 2 cm in the common bile duct.

Group IV—20 (11.6%) patients underwent lithoextraction by EPST and stage LCE with external drainage of the common bile duct in 2–3 days.

The group included patients with the clinical picture dominated by obstructive jaundice (bilirubinemia of 100 or more μmol/l) with resistant acute cholecystitis.

Results: The analysis of the duration of inpatient treatment in all groups (8.5 days) did not show any difference between the methods of surgical treatment of acute cholecystitis associated with cholecystocholedocholithiasis and the surgical approach choice. The number of postoperative complications in group I was 3 times less than in group II and 2 times less than in group IV and constituted 5.3%, 15.6% and 10.0%, respectively, which was conditioned by the development of acute pancreatitis. No lethal outcomes across all groups were registered.

Conclusion: The choice of the surgical treatment method and surgical approach depends on the presence of cholecystocholedocholithiasis complications and the patient's individual characteristics. The rendezvous technique allows to reduce the number of postoperative complications.

223—HEPATO-BILIARY & PANCREAS—Gallbladder

ENDO-LAPAROSCOPIC ORGAN-SAVING OPERATIONS FOR THE GALLBLADDER PATHOLOGY

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Aim: To improve the results of treatment of cholecystolithiasis by using endo- laparoscopic organ-saving operations on the gallbladder (GB).

Materials and Methods: The analysis of the results of surgical treatment of 105 patients with GB pathology, including, cholecystolithiasis in 96 cases and the combination of cholecystolithiasis and GB pseudopolyps in nine cases. Males were 18 (17.1%), females—87 (82.9%), aged 21–76 (36.2 ± 6.4) years. The selection criterion included patients with uncomplicated symptomatic and asymptomatic cholecystolithiasis. The main selection criterion was sonography, with the definition of structure, size and mobility of concrements, signs of active inflammation and motility function of GB. The attention was to establish causes and outcomes in cholecystolithiasis development.

At the same time the bile was taken and the lavage of the GB cavity was performed. For the revision of GB cavity, a flexible endoscope with diameter of 5 mm was used. Lithextraction was performed using the Dormia basket, clip of Babcock. For polypectomy there were used snare, hot biopsy forceps. The integrity of GB wall was restored by a continuous suture of absorbable material. Post-operatively, the rehabilitation program was used to prevent recurrence of cholecystolithiasis.

Results: For all patients there were performed organ-saving operations on the GB - laparoscopic endoscopically assisted cholecystolithotomy and cholecystopolypectomy. The number of removed gallstone ranged from 1 to 65. Their size ranged from 6 to 33 (18.7 ± 3.5) mm in diameter. In 18 cases, after lithextraction, at the endoscopic examination of the GB cavity, there were diagnosed small gallstones and mucus in the folds of the mucosa, which were removed by additional rinsing. In 9 cases, except of the lithextraction, GB cholesterol pseudopolyps have been removed, in the size of 2–6 mm. The surgical intervention lasted 55–150 (88.48 ± 23.14) min. The recurrence of cholecystolithiasis since 9 months to 7.5 years was diagnosed in 5 (6.1%) from 82 examined patients.

Conclusions: Endo-Laparoscopic organ-saving surgery is the optimal way for treating of uncomplicated cholecystolithiasis. This approach allows conducting not only endoscopic examination of cholecystolithotomy, but also performing removal of small-sized concrements, not diagnosed according to the sonography of GB and cholesterol pseudopolyps, fixed in the mucous membrane.

43—HEPATO-BILIARY & PANCREAS—Gallbladder

INCIDENTAL CARCINOMA GALL BLADDER: INCIDENCE, RISK FACTORS AND FACTOR AFFECTING SURVIVAL -A TERTIARY CARE INSTITUTE EXPERIENCE

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Introduction: Carcinoma gall bladder is a very lethal disease. It can get detected incidentally after laparoscopic cholecystectomy. The overall outcome of incidentally detected carcinoma gall bladder is a matter of debate in literature.

Aim: To estimate the overall incidence of the incidental gall bladder carcinoma, the various risk factors associated with it and factors affecting overall survival in patients who underwent laparoscopic cholecystectomy with eventual histology turning out to be carcinoma gall bladder.

Methods: Data of all the patients undergoing laparoscopic cholecystectomies in the Department of Surgery at All India Institute of medical sciences, New Delhi, India between January 2014 and December 2018 was retrospectively collected and analyzed. All patients with incidental carcinoma gall bladder were followed up and completion radical cholecystectomy was performed. The demographic profile, preoperative imaging, intra operative finding, histopathology of primary surgery and median interval between two surgeries were analysed to look for various risk factors associated with incidental carcinoma gall bladder and factors affecting overall survival.

Results: Incidence of the incidental carcinoma gall bladder was 0.51% with a female: male preponderance of 4:1 and mean age of years. Preoperative imaging of most of them were suggestive of chronic cholecystitis, however one patient had polyps. Six patients had uneventful laparoscopic cholecystectomy, while four had bile spillages intraoperatively. Adenocarcinoma was the most common histopathology. Pathological staging of 4 patients was pT1b, 6 patients had pT2 tumor. The median interval between simple cholecystectomy and completion radical cholecystectomy in this series was 8 weeks. At the end of 19 months median follow up overall survival was 55.5%.

Conclusion: Incidence of incidental carcinoma gall bladder is 0.51%. Most commonly affecting middle-aged females. Risk factors associated with incidental carcinoma gall bladder were found to be chronic cholecystitis, multiple gall bladder calculi, single large stone and gall bladder polyps. Surgery for incidental carcinoma gall bladder may be difficult to perform intraoperatively. Survival is better in males, young patients with uneventful primary surgery and better-differentiated pathology.

1012—HEPATO-BILIARY & PANCREAS—Liver

LAPAROSCOPIC THERMOABLATION: A SAFE AND EFFECTIVE SOLUTION FOR TRICKY HEPATOCELLULAR CARCINOMA

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Aims: In some cases, percutaneous thermo-ablation (TA) may be unfeasible by the tumor location: laparoscopic ablation therapies (LATs) are an alternative option. Objective of the study is to assess if LATs are safe and efficacy in the treatment of HCC not eligible for percutaneous TA or surgical resection.
Methods: the video shows the results obtained in 503 patients who underwent LATs. LAT was offered to patients with a single nodule or up to three nodules smaller than 3 cm not suitable for surgery and with lesion(s) not suitable for percutaneous TA because of inconvenient tumour location. The video shows tips and tricks to obtain the best results in terms of complete necrosis, local recurrences and complications.
Results: Complete necrosis was achieved in one session in 467 patients (93%). One-month mortality and severe morbidity rates were 0.4% (2 patients: 1 liver failure; 1 cardiac failure) and 1.8% (9 patients: 5 trocar access hematomas, 1 biliary fistula, 2 thoracic complications, 1 duodenal perforation), respectively. In the remaining 501 patients, 361 (67%) developed intrahepatic recurrences: it appeared as a local recurrence (LR) in 74 cases (15%). Subcapsular location showed the best results in terms of LR ($p = 0.008$), as well as HCC nodules contiguous to viscera ($p = 0.012$) in comparison with other sites (see table). Unfortunately, LATs did not improve the results for HCC adjacent to major vessels or with microinvasive patterns. The video shows how, in these cases, microwave ablation or intrahepatic vascular occlusion could obtain better results in terms of total necrosis or LR.
Conclusions: In the treatment of HCC, LATs proved to be a safe and effective technique, as they permit to successfully treat HCC nodules in difficult locations (not manageable by percutaneous approach) with a low morbidity rate.

1153—HEPATO-BILIARY & PANCREAS—Liver

HEMOSTASIS DURING LAPAROSCOPIC LIVER RESECTION: DEALING WITH VASCULAR INJURY

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Aims: To present the surgical technique of supplying vascular injury during laparoscopic liver resection.
Methods: Video material of laparoscopic liver resections performed in the Department of General, Transplant and Liver Surgery of Medical University of Warsaw and in the Department of Digestive, Oncological and Metabolic Surgery of Institute Mutualiste Montsouris in Paris were used to present the surgical technique. Video presentation contains four different cases of supplying the injuries of intrahepatic vein, left hepatic artery, right hepatic vein and inferior vena cava.
Results: Video presents three crucial steps required for supplying vascular injury during laparoscopic liver resection: clamping, exposure and injury supply. This technique provides sufficient hemostasis with decreasing the risk of injury extension.
Conclusions: Laparoscopic liver resection may relate to vascular injury. Proper surgical technique may help to avoid severe blood loss and a necessity of conversion to laparotomy.

1571—HEPATO-BILIARY & PANCREAS—Liver

PNEUMOBILIA AFTER BLUNT TRAUMA OF ABDOMINAL WALL CAUSED BY CAR CRASH WITH HEPATIC RUPTURE

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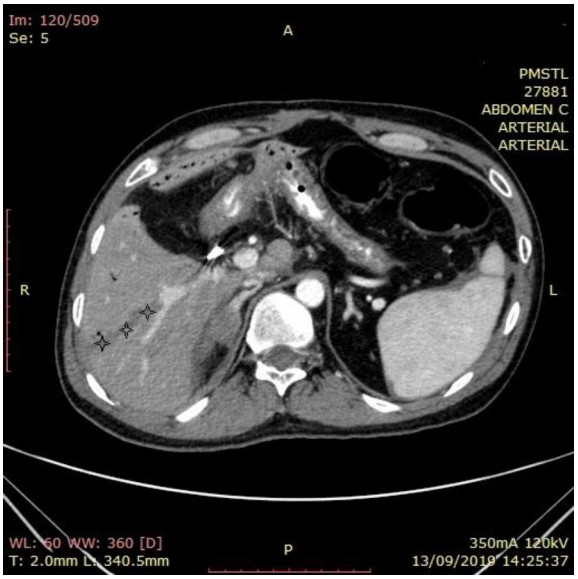
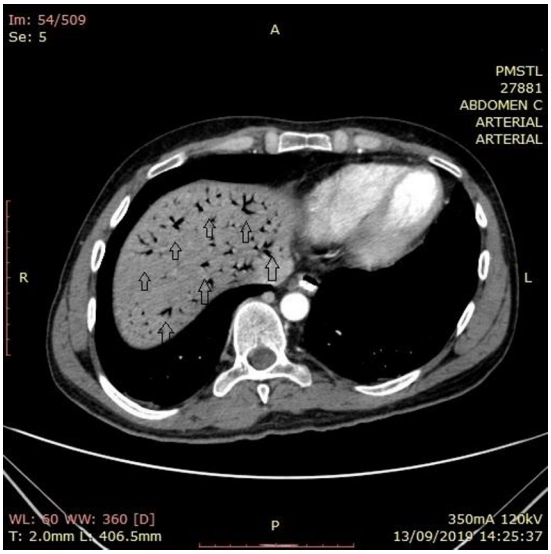
Pneumobilia is the presence of air in the biliary system. Most of all it indicates a possible connection between the biliary system and the gastrointestinal tract, although it also can appear after trauma. The best way of pneumobilia diagnosting is computer tomography (CT).A 32-years-old man was admitted to the emergency department after a car accident. He was driving at 60 km per hour and was not wearing a seatbelt. While inspecting his body there were some bruises on the extremities and epigastric area. The abdomen was diffuse tenderness. Laboratory signs were WBC—8.84 x 103, HGB—7.8 g/dL, elevated liver function tests (aspartate transaminase 943 iU/L, alanine transaminase 897 IU/L). Perfoming an abdominal X-ray showed fluid in the abdomen.

Initially performed computer tomography CT did not show any cerebral lesions and, the clinical condition was marked by hypotension and confusion. Later an abdominal CT showed liver laceration that involved hepatic rupture (crosses) (Fig. 1), haemaperitoneum and pneumobilia (arrows) (Fig. 2). An exploratory laparotomy was performed. It was found that there is about 1.5 L of blood in the right and left lateral channels and a rupture between 5th and 6th segments of the liver. All the gut and viscera were found normal. The rupture of liver was coagulated, a hemostatic sponge was placed and the rupture was sutured with 3–0 vicryl. The peritoneal cavity was irrigated with physiologic solution and toilet was performed. The abdomen was closed in layers after achieving hemostasis. Postoperative period remained uneventful.





Conclusion: After investigating the literature and most of all cases of pneumobilia we found out that blunt abdominal trauma is a rare cause of pneumobilia. In comparison to portal venous gas, pneumobilia obtained after blunt trauma has lower mortality risk which makes it possible to be surgically treated.

1497—HEPATO-BILIARY & PANCREAS—Liver

PURE LAPAROSCOPIC LIVER RESECTION OF THE SEGMENTS S6 AND S7 WITH PARTIAL RESECTION OF SEGMENT S8 FOR COLORECTAL CANCER METASTASES

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Aims: The objective of this video is to standardize the laparoscopic approach for liver resection of posterior segments (S6 and S7) and anterosuperior segment (S8).
Methods: A 42-year-old man was diagnosed with colorectal cancer and synchronous liver metastases (CRCLM). The primary colorectal cancer was intervened[J1],and a sigmoidectomy was performed due to bowel obstruction in March 2019. The patient received preoperative chemotherapy with FOLFOX. CRCLM downsizing was confirmed by computed tomography, which detected a 17 mm lesion in segment S6, 17 mm and 14 mm lesions in segment S7, and a 35 mm lesion in segment S8. Resection of the segments S6 and S7 with partial resection of segment S8 was indicated.
Result: The patient was placed in the 30-degree left lateral decubitus position with flexion of the operating table. An intraoperative ultrasound was performed in order to identify the liver lesions. Inflow vascular control via laparoscopic Pringle's maneuver was performed by encircling the hepatoduodenal ligament. Liver parenchymal transection was done by using the SonaStar ultrasonic surgical aspiration system. The hepatic parenchyma was transected from the surface of the liver to the right lateral-posterior portal pedicle of S6 and S7, and then it was selectively dissected and stapled. Transection continued with S8 subsegmentectomy to proximal third of the right suprahepatic vein, which was stapled after dissection. Right suprahepatic's tributary vascular brunch from S8's lesion was identified and stapled, and a subsequent hepatic parenchyma transection completed. Surgical[J2] piece was extracted by Pfannenstiel incision. Five 15-minute Pringle's maneuvers were done during the procedure, while there was no blood transfusion. The postoperative period was uneventful, and the patient was discharged on the 6th day postoperatively.
Conclusion: Liver resection of the segments S6 and S7 with subsegmentectomy of segment S8 for colorectal cancer metastases is safe and feasible via laparoscopic approach.

1371—HEPATO-BILIARY & PANCREAS—Liver

COMBINED MINI-INVASIVE SURGICAL CORRECTION OF REFRACTORY ASCITES IN PATIENTS WITH DECOMPENSATED LIVER CIRRHOSIS

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Introduction: Evolution of cirrhotic ascites is closely interrelated with violations of transperitoneal fluid absorption and blockage of central lymph circulation. Occurrence of refractory ascites in liver cirrhosis presents considerable difficulties for treatment.
Aim: To determine possibilities of surgical correction of refractory ascites in patients with decompensate liver cirrhosis by decompression of thoracic lymphatic duct with simultaneous laparoscopic sanitation followed by post-surgery fractional rinsing of abdominal cavity.
Methods: From 2014 to 2019, 109 patients (62 men (56.9%) and 47 women (43.1%),) aged 30 to 72 underwent surgery for cirrhosis with massive refractory ascites Child C (9–10), without obvious signs of hepatic encephalopathy. Major etiological factors were: viral hepatitis C (48 patients − 44.0%), B (33 pts–30.3%), B + D (21 pts–19.3%), toxicity (7 patients (6,4%)). To prevent possible bleeding at the first stage, endoscopic filling of esophageal varices with fibrin glue was performed in 92 patients (84.4%). After testing the effectiveness of varices filling, in the following 7–9 days decompression surgery of thoracic lymphatic duct was performed under local anesthesia to improve lymphatic drainage from liver and abdominal organs. Simultaneously, laparoscopic sanitation of abdominal cavity was performed, with complete evacuation of ascites fluid, rinsing and drainage. Fractional post-surgery rinsing was repeated daily for 3–5 days towards removing peritoneum edema and improving its absorptive properties. Evaluation of results was performed 6 and 12 months after surgery, based on criteria of liver reserves and ascites volume.
Results: Post-surgery mortality from liver failure was 4.6% (5 patients). Other 6 patients (5,5%) died of the same cause in the following 6 months. Annual survival rate was 88.1% (96 pts.). Complete ascites regression over 6–12 months after surgery was noted in 62 patients (56.9%), significant regression and stabilization in 27 (24.8%), moderate regression with need for periodic decompressive laparocentesis in 7 cases. In all patients, functional liver reserves and life quality significantly improved.
Conclusions: The above-described technique of refractory ascites correction in patients with liver cirrhosis by decompression of thoracic lymphatic duct, with simultaneous laparoscopic sanitation and post-surgery fractional rinsing of abdominal cavity showed very high efficiency and deserves establishment as a clinical practice.

1300—HEPATO-BILIARY & PANCREAS—Liver

MICROINVASIVE HEPATOCELLULAR CARCINOMA: WHICH TREATMENT?

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Aims: Small hepatocellular carcinomas (HCC) are approachable with surgery or ablation. Microinvasion (MI), infiltration of portal or hepatic vein or bile duct and intrahepatic metastasis are the more accurate indicators of a poor prognosis (1). Previous study showed that intraoperative ultrasound (IOUS) definition of MI-HCC had a high concordance with histological findings (2). We compared OS and recurrence patterns of patients with MI-HCC treated with liver resection (LR) or laparoscopic thermoablation (LAT).

Methods: A total of 156 consecutive patients with single, small HCC (< 3 cm) with a MI pattern at IOUS examination were evaluated. Outcomes of the LR group (n = 73), and the LAT group (n = 83) were compared analyzing overall survival and recurrence patterns during a median follow-up of 43.7 months (interquartile range: 17–56).

Results: HCC recurrence occurred in 49 patients (68%) of the LR group and 61 patients (73%) of the LAT group (p = 0.457). The type of recurrences (solitary/multiple) were similar between the two groups. In addition, the rate of local recurrences in the LR group was very low (3 pts; 4%) in comparison to LAT group (18 pts; 22%; p = 0.001). The disease-free survival and overall survival curves of LR are significantly better than that of the LAT group (p = 0.005 and p = 0.016, respectively).

Conclusions: Hepatic resection with a wide tumor margin should be preferred to LAT in patients with MI-HCC at IOUS evaluation, if technically feasible and in patients fit for surgery, in order to eradicate MI near the main nodule, even in HCC < 3 cm.

1290—HEPATO-BILIARY & PANCREAS—Liver

LAPAROSCOPIC THERMOABLATION versus HEPATIC RESECTION FOR SINGLE SMALL (< 3 CM) HCC LOCATED IN THE POSTEROSUPERIOR SEGMENT: A COMPARISON STUDY

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Background: Patients with hepatocellular carcinoma (HCC) in the posterosuperior(PS) segments (1, 4A, 7 and 8) of the liver have been considered poor candidates for percutaneous ultrasound-guided thermoablation: laparoscopic thermoablation (LTA) might overcome these ifficulties and influence the short- and long-term clinical results.

Aim: Aim of this study is to evaluate the clinical outcomes after LTA and after hepatic resection (HR) in patients with HCC located in PS segments.

Methods: A total of 222 Child–Pugh class A patients who underwent HR (n = 71) or LTA (n = 151) for a single HCC nodule (≤ 3 cm) located in the posterosuperior segments were included. Postoperative complications were evaluated. Cumulative local tumor progression (LTP), cumulative intrahepatic recurrence (IHR), disease-free survival (DFS), and overall survival (OS) rates were estimated. Data were retrieved from a prospectively maintained electronic database.

Results: The rates of major complication (Dindo-Clavien > 2) were significantly higher in the HR group (31% vs 5%; p = 0.0001), which also includes a postoperative death for intestinal perforation and septic shock. The LTP rate was significantly higher for the LTA group (15% vs 1,5%; p = 0.003), while the cumulative IHR rate was not significantly different between the groups (p = 0.495). The cumulative DFS rate and OS rate for the HR group and LTA group at 5 years were 35% vs 21% (p = 0.009) and 62% vs 40% (p = 0.114), respectively.

Conclusion: Single small HCC located in PS segments should be considered for HR as primary treatment if patient's liver function and general conditions are fitted enough to undergo surgery. LTA can be an alternative therapy for patients who are not eligible for surgical resection since has been shown similar overall survival compared to HT.

1263—HEPATO-BILIARY & PANCREAS—Liver

ROLE OF INDOCYANINE GREEN FLUORESCENCE IN LAPAROSCOPIC CHOLECYSTECTOMY

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Laparoscopic cholecystectomy has replaced the open technique sharply showing its advantages in terms of hospital stay, postoperative pain and surgical site infection incidence.

On the other hand, especially at the beginning, the laparoscopic approach produced a number of biliary tract iatrogenic lesions (0.3–0.5% vs 0.1%). Only the improved surgeons' laparoscopic skills, the standardization of the procedure and the introduction of the SAGES' Critical View of Safety reduced the incidence of biliary tract lesions.

Indocyanine Green Fluorescence (ICG) has been used for a better intraoperative identification of the biliary tract and showed similar results compared to the classic intraoperative cholangiography in reducing biliary tract lesions, with the advantage of a shorter time of operation.

This retrospective study investigate the possible advantages of the ICG method in relation to post-operative complications, time of operation and conversion to open surgery rate in both the elective and urgent cholecystectomy procedures.

Methods: A series of 126 laparoscopic cholecystectomies from a single surgical center was retrospectively analyzed in order to define whether a better identification of the biliary tree by ICG may have reduced the incidence of iatrogenic biliary lesions, the conversion to open surgery rate, the time of operation, and the hospital stay.

The factors affecting the qualitative and quantitative visualization of the fluorescence such as obesity, inflammation, timing of administration of the vital dye were also analyzed.

From January to December 2019, 109 elective laparoscopic cholecystectomies and 17 urgent laparoscopic cholecystectomies were performed by different operators. Seven of these patients had an associated surgical disease (incisional hernia, umbilical hernia, ovarian cyst, uterine fibroid).

71 patients (56.3%) were female and 55 were male (44%); 21 of them (16.7%) had associated cardiovascular, pulmonary and metabolic comorbidities, in 9 patients (7.1%) a BMI greater than 30 was observed.

One-hundred-eight patients were administered with intravenous green indocyanine at least 2 h before surgery. Intracholecystic administration of green indocyanine was used in one patient.

Results: Operation time ranged between 35 and 150 min (average 92.5), considering all the 126 patients. Examining only the patients operated with ICG technique and without associated pathologies (101 patients), the operation time falls in a range between 35 and 130 min (average 82.5).

The conversion to open surgery rate on 126 cases was 2.4% (3 patients), which drops to 1.1% (1 patient) if we consider ICG operated patients only.

The complications rate resulted 6.3% on 126 patients: 2 (1.8%) presented minor lesions of the biliary tract (type A according to the Strasberg classification), four patients (3%) had other complications including 1 postoperative fever, 4 postoperative bleedings conservatively treated, 1 reoperation for small bowel perforation; no major lesions of the biliary tract were observed.

The two cases of lesions of the biliary tract consisted of bile leakage from cystic duct and were treated successfully by ERCP and of bile stent. Considering only ICG cholecystectomies, only 1 lesion of the biliary tree was detected with an incidence of 0.9%.

The postoperative hospital stay was calculated excluding the 7 patients who had associated surgery: considering 116 patients, the postoperative hospital stay was 1.9 days, while in the ICG group (108) the postoperative hospital stay resulted 1.86 days.

Conclusions: The use of ICG during laparoscopic cholecystectomy allows a better intraoperative visualization of the anatomy of the biliary tree and seems to reduce the incidence of iatrogenic lesions of the biliary tract or at least reduces their severity. Moreover we observed a decreased conversion rate, while the hospital stay seemed not to be affected by the use of ICG.

We propose that the constant use of ICG can lead to a safer procedure, especially when technical conditions are unfavorable or when the surgeon is less experienced.

955—HEPATO-BILIARY & PANCREAS—Liver

SIMULTANEOUS MINIMALLY INVASIVE SURGERY OF SYNCHRONOUS COLORECTAL CANCER WITH LIVER METASTASES

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Aims: To evaluate the peri-operative and oncological outcomes of simultaneous minimally invasive surgery of synchronous colorectal cancer with liver metastases.
Methods: 453 operated patients with synchronous liver metastases were enrolled from September 2005 to June 2018. Among them, 21 patients with simultaneous laparoscopic and robotic-assisted (MIS) surgery and 16 patients with staged MIS surgery. Operative and peri-operative data were retrospectively evaluated.
Results: The median operation time was 410 min, with the median blood loss 150 ml. The hospital stay was 7 days. There was no surgical mortality and the morbidity rate was 4.8%. The 5-year disease free survival rate was 17.3% and 5-year overall survival rate was 68.8%. Compare with the 53 simultaneous and 54 staged surgery patients and also compare with 21 simultaneous MIS and 16 staged MIS surgery patients, both showed no specific morbidity different and with less surgical time, blood loss and hospital stay. The short term disease free survival rate and overall survival rate were no different.
Conclusions: Simultaneous minimally invasive surgery can be safely performed for synchronous colorectal cancer with liver metastases with acceptable morbidity and short-term oncological outcome.

325—HEPATO-BILIARY & PANCREAS—Liver

ENDOSCOPIC MANAGEMENT OF RETROPERITONEAL HYDATID

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Retroperitoneal isolated psoas and Iliacus hydatid cyst are rare entities accounts for 1–3% of the total hydatid cases.

CT scan remains the investigation of choice and surgery is the standard management.

We have presented two cases of Retroperitoneal hydatid cyst who presented with abdominal pain, they were managed preoperatively with Albendazole chemotherapy and then were treated by Laparoscopic excision of the cyst followed by 6 wks of Post op Albendazole chemotherapy .

Till date, around 21 cases have been reported.

Laparoscopic complete cyst excision of psoas/iliacus hydatid is not yet described and documented in the World literature.We present the technique of complete excision of retroperitoneal psoas/iliacus hydatid cyst.We recommend Laparoscopic total excision of cyst as ideal treatment.

470—HEPATO-BILIARY & PANCREAS—Liver

LAPAROSCOPIC LEFT LATERAL HEPATECTOMY FOR LIVER METASTASIS

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Introduction: Laparoscopic surgery is gaining acceptance in the treatment of liver metastasis. Laparoscopic treatment of liver metastasis often presents technical difficulties and requires an extensive learning curve.
Material-Method: We present the case of a 62 year old woman presented with a liver metastasis in section 3 of the liver. The patient had been submitted to a laparoscopic low posterior resection in February 2018. Patient underwent laparoscopic left lateral hepatectomy, with the use of three trocars (umbilical 10 mm, and two in the midclavicular line bilaterally.) Left lateral hepatectomy was conducted with the use of a linear stapler. The postoperative period was uncomplicated and the patient remains in good condition three months after surgery.
Conclusion: Laparoscopic approach seems to be safe for treatment of liver metastasis, offering better surgical field view and less postoperative complications. 5 year survival rate after laparoscopic hepatectomy is compared to the open approach.

314—HEPATO-BILIARY & PANCREAS—Liver

THE PROBLEMATIC PARASITE: LAPAROSCOPIC MANAGEMENT FOR THORACIC EXTENSION OF AN EXTENSIVE LIVER HYDATID CYST

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Being a common parasitic disease afflicting the liver, patients remain asymptomatic for long periods of time. Symptoms are produced very commonly due to complications, most common being infection and rupture. Laparoscopic management of hepatic hydatids are well known and documented. Only 0.6% incidence of a trans-diaphragmatic extension of hepatic hydatid has been recorded. We present two cases of a 14 year old male (Gomez I) and a 55 year old female(-Gomez III/IV) who were diagnosed and investigated as such. The emphasis lies on a laparoscopic technique for managing such an extended hepatic hydatid cyst into the thorax. Right lobe of liver was replaced by the hydatid cyst. Intraoperative Indocyanine green dye and fluoroscopic imaging helped to delineate the gall bladder from the hydatid cyst. Post-operatively patient was managed well and discharged on day 8. Literature search did not reveal similar case with intrathoracic extension of hydatid cyst across diaphragm managed by laparoscopic approach. To our knowledge this is the first ver case managed laparoscopically avoiding the need for thoracotomy.

127—HEPATO-BILIARY & PANCREAS—Liver

"MANAGEMENT AND FEASIBILITY OF HCC LOCATED IN THE POSTERO-SUPERIOR SEGMENTS" LAPAROSCOPIC PARENCHYMA-SPARING RESECTION OF SEGMENT VIII

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Introduction: Laparoscopic liver resection for hepatocellular carcinomas located in the postero-superior segments (VII, VIII, Iva) can be challenging due to the difficult access, reduced view and the increased risk of bleeding. However special tips and tricks described in our "Diamond Technique" article, have allowed to overcome difficulties ensuring safety, and oncological efficiency even in the treatment of HCC when more than 1 cm of clear margin is believed to be essential.

The aim of this video is to present the technical aspects and the feasibility of the laparoscopic parenchyma sparing liver resection, using the "Diamond Technique", for the treatment of hepatocellular carcinoma.

Video: The patient was a male of 72 years old man with a US and CT scan finding of a lesion of the segment 8. The past medical history was characterized by a previous proctocolectomy with ileostomy 40 years ago, diabetes type 2 and NASH. The patient was enrolled for ORANGE Trial (laparoscopic arm). We performed a segment 8 resection following the rules of the "Diamond Technique". The lesion was a 35x31x30 mm HCC with a resection margin > 10 mm (R0), no vascular invasion or satellitosis and the liver parenchyma showed a type 3 fibrosis (Ishak Score). The hospital stay was 4 days with no complications.

112—HEPATO-BILIARY & PANCREAS—Liver

ROBOT-ASSISTED LIVER RESECTIONS. LESSONS LEARNED FROM 127 PROCEDURES: OUTCOMES AND LITERATURE REVIEW

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Background: Minimally invasive liver surgery demonstrated to be safe and feasible for selected patients with equivalent oncologic outcomes compared to open surgery. Recently, the robotic technology was applied in liver surgery. The present paper is a retrospective analysis of a seven years of personal experience in robotic liver surgery.

Materials and Methods: During the last 7 yeras from September 2012 to September 2019 we treated 127 patients affected by both benign and malignant liver diseases using robotic-assisted surgery. Patients' data and operative parameters were collected in a dedicated database.

Results: Mean age was 66.3 years (range 21–89); 59% were males. The malignacies 97 (76%): 67 liver metastases, 22 hepatocellular carcinomas, 5 cholangiocarcinomas, 3 gallbladder cancers. The benign diseases were 30 cases (24%). The overall liver lesions removed by robotic approach were 198, 63% of the patients had more than one lesion. The median tumor size was 24,8 mm (range 4–92). The major resections were 20 cases (15,7%). Lesions involving posterior or paracaval segments (segments: 7,8,4a and 1) were 66 over 198 (33%). Twentyseven patients (21%) had a previous open abdominal surgery. Associated abdominal or thoracic diseases, treated during liver resections were 71: 25 colo-rectal resections, 22 cholecistectomy, 7 lymphadenectomy, 6 gastric resections, 2 lung resections, etc. The conversion rate was of 11 cases (8,6%). The Clavien 3–4 were 8,6%. One biliary leakage was observed (0,7%).

Conclusions: The robotic surgery is a safe and feasible procedure, it may increase the possibility of minimally invasive liver resection especially in challenging cases for conventional laparoscopy, in particular lesions located in right postero-lateral and para-caval segments and major liver resections. The robotic assistance is useful especially for vascular control, during tissue dissection and micro-suturing when it request. The current lack of dedicated robotic instruments in particular for parenchyma dissection, remains one of the most important deficiency; as well as the high costs.

111—HEPATO-BILIARY & PANCREAS—Liver

ROBOT-ASSISTED LEFT HEPATECTOMY WITH SEGMENT ONE FOR GIANT SYMPTOMATIC LIVER HEMAGIOMA

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Background: Liver hemangiomas are benign lesions that require surgical excision when symptomatic. Liver resection or parenchymal sparing technique of enucleation along the plane between the pseudo-capsule of the tumor and liver parenchyma, are possible in a minimally invasive approach too. Robotic-assisted technique is more recently used to overcome laparosocpic limits of challenging minimally invasive liver resections.

Presentation of the Case: A 48 years old female with symptomatic hemangioma of left liver lobe was treated in our center after preoperative planning with CT scan. A Robotic-assisted left hepatectomy more segment 1 resection was planned. The procedure was performed using da Vinci Xi 4 arms, the operation time was of 210 min, blood loss estimated 50 ml. The post-operative course uneventful, Hospital stay 5 days.

Conclusions: The robotic platform provides a powerful tool for challenging liver resections. The enhanced vision and the superior suturing ability allow more safely control during liver resection. Precision of the hilar dissection allows selective lobar or sectorial arterial control which helps minimize intraoperative bleeding. In our experience, robot-assisted resection of liver resection offers low morbidity, fast recovery, low conversion rate if compared to conventional laparosocpy.

886—HEPATO-BILIARY & PANCREAS—Pancreas

TOTAL LAPAROSCOPIC PANCREATODUODENECTOMY - HOW TO IDENTIFY IMPORTANT ANATOMICAL LANDMARKS AND IMPROVE ERGONOMICS IN PERFORMING ANASTOMOSES

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Total laparoscopic pancreatoduodenectomy (TLPD) is considered one of the most demanding abdominal procedures. It involves extensive dissection and difficult anastomoses. Therefore, TLPD is usually time consuming and may be associated with a relatively high risk of conversion due to difficulties in proper identification or injury of important anatomical structures. Moreover, there are many techniques of TLPD that differ in the order of the stages of surgery as well as the approach to creation of anastomoses.

This is a high quality instructional video based on a case of 65-year-old female patient with ampullary cancer. We present our approach to Whipple TLPD. The video is accompanied by graphic presentation and animations to show and help to understand the most important anatomical landmarks during the resection phase. We explain how to identify major arterial and venous vessels and how to approach so called artery first TLPD. Additionally, we show our way of duct to mucosa pancreatojejunostomy and hepaticojejunostomy using barbed sutures.

1039—HEPATO-BILIARY & PANCREAS—Pancreas

LAPAROSCOPIC SPLENIC VEIN INJURY REPAIR DURING SPLEEN PRESERVING DISTAL PANCREATECTOMY (LSPDP) FOR SOLID PSEUDOPAPILLARY TUMOR

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Preservation of spleen in distal pancreatectomy due to benign pancreatic tumors is beneficial for the prevention of overwhelming post splenectomy infection. However, the procedure is considered demanding and requires more technical skills than regular pancreatosplenectomy. The aim of this video was to show the key steps in the management of incidental splenic vein injury during spleen preserving distal pancreatectomy. We present a case of a 35 year old female with 30 mm solid pseudopapillary tumor (SPT) of the pancreatic body. Due to benign character of the lesion we have decided to perform LSPDP. During the procedure the main trunk of splenic vein was prone to injury. The difficulty resulted from the fragility of venous wall. The dissection started from the pancreatic neck towards the pancreatic tail. Thanks to this we were able to dissect main trunk of splenic vein from its origin. Nevertheless, during careful manipulation, the splenic vein was injured several times. With different methods e.g. suturing, clipping, electrocoagulation- we have managed to preserve splenic vein continuity and good blood outflow confirmed with intraoperative ultrasound. Postoperative course was not complicated. In conclusion, LSPDP procedure for benign tumors of pancreatic body and tail is safe but challenging. Expertise in laparoscopic hemostasis can decrease the risk of unintentional splenectomy.

1071—HEPATO-BILIARY & PANCREAS—Pancreas

KIMURA LAPAROSCOPIC APPROACH OF A SOLID-PSEUDOPAPILLARY TUMOR OF THE PANCREAS

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Solid pseudopapillary tumors (SPT) are unusual pancreatic neoplasms, accounting for 4% of all cystic pancreatic lesions. Frequently asymptomatic and found in young women, they have and excellent prognosis, although 10–15% of the patients show metastasis at the time of surgery.

We present a video of a laparoscopic distal pancreatectomy with preservation of the spleen and its blood supply (Kimura procedure).

Case of a 61-year-old female patient, referred to general surgery consultation due to a pancreatic incidentaloma detected on abdominal ultrasound. CT and MRI showed a nodular cystic lesion on the anterior surface of the pancreatic body with 18 mm. PET DOTA NOC was normal. Endoscopic ultrasound with biopsy was consistent with a SPT. Serologic tumor markers were normal.

The patient underwent laparoscopic distal pancreatectomy with preservation of the spleen and its blood vessels (Kimura procedure). Postoperative was uneventful with discharge on the 6th day. Histopathologic analysis confirmed a solid-pseudopapillary pancreatic neoplasia (pTMN: pT1c Nx ILV0 IPN0 R0). The patient was proposed for surveillance.

The SPT has an indolent behavior and a surgical reaction is considered curative in most patients, with overall 5-year survival as high as 97%. Pancreatic parenchyma preserving resections seems to the associated with higher risk of recurrence. Life-long follow up should be performed as recurrence may occur late.

1071—HEPATO-BILIARY & PANCREAS—Pancreas

KIMURA LAPAROSCOPIC APPROACH OF A SOLID-PSEUDOPAPILLARY TUMOR OF THE PANCREAS

Lúcia Carvalho, C. Osório, V. Oliveira, T. Ferreira, G. Gonçalves, M. Nora CHEDV, General Surgery, Portugal

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1418—HEPATO-BILIARY & PANCREAS—Pancreas

SPLEEN PRESERVING LAPAROSCOPIC DISTAL PANCREATECTOMY FOR INSULINOMA

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Insulinoma is the most frequent producing pancreatic neuro-endocrine tumour. Its presence is clinically suspected by the Whipple triad (symptoms on fasting or exertion, low glycemia and symptom reversal with glycaemic correction). Hypoglycaemic symptoms are non-specific and might range from irritability to convulsions and coma.

Insulinomas are usually small tumours (1–1.5 cm) that appear in the 5th decade of life. They might appear throughout the pancreatic gland and are usually benign and solitary. The clinical suspicion should be validated by measuring insulin and its precursors in prolonged fasting. Most lesions are identified on CT or MRI and their treatment is surgical resection.

We present the case of a 35 years-old man with several episodes of hypoglycaemia that lead to hospital admission. The symptoms were reversed with glucose control. Lab values for insulin, pro-insulin and C-peptide were increased after prolonged fasting and the MRI revealed a solid, 24 mm lesion in the pancreatic body. The patient was proposed for laparoscopic distal pancreatectomy with spleen preservation.

The surgery and post-operative were uneventful, and the patient was discharged on the 5th post-operative day. The histological report revealed a pancreatic neuro-endocrine tumour with staining for insulin and the patient has been euglycemic ever since.

Surgical resection is the cornerstone of treatment for pancreatic NETs and the minimally invasive approach allows for a faster recovery with increased patient satisfaction.

1428—HEPATO-BILIARY & PANCREAS—Pancreas

INCIDENTAL EOSINOPHILIC PANCREATITIS AFTER MINIMALLY INVASIVE RADICAL PANCREATICODUODENECTOMY FOR SUSPECTED BILE DUCT CANCER

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Background: Eosinophilic pancreatitis is a very rare form of chronic pancreatitis, with less than 100 cases described worldwide. It usually presents with obstructive jaundice and a mass simulating pancreatic or bile duct cancer. Patients might present peripheral eosinophilia and most reported cases are in young adults or children, thus increasing the suspicion of non-malignant disease. However, due to the difficult diagnosis and the risk of malignancy most patients end-up having surgery and the diagnosis is made on histological analysis.
Clinical Case: We present the case of a 77 years-old female patient with prior history of multinodular goitre, high blood pressure and COPD. She presented in the ER, complaining of jaundice with 1-week evolution, preceded by a 2-months history of abdominal pain, fullness, vomiting and weight-loss. On admission she had obstructive jaundice with signs of infection (elevated CRP with high WBC count). The CT scan revealed a Curvoisier gallbladder, massive dilatation of the CBD and an intraluminal nodule of the terminal bile duct. Serum CA 19.9 was elevated, and CEA was normal. The patient was treated with IV antibiotics and proposed for laparoscopic pancreatoduodenectomy 2 weeks later.
During surgery, we noticed several enlarged lymph nodes and completed a radical peri-pancreatic lymphadenectomy. The post-operative period was uneventful.

The histological examination revealed a chronic pancreatitis with extensive eosinophilic infiltration of the pancreas and bile-duct. The 46 lymph nodes were reactive to inflammation and on retrospective analysis the patient had prior blood samples with eosinophilia (not present in the acute phase).
Conclusion: This is an extremely rare diagnosis, especially with advancing age but in order to avoid potentially unnecessary surgeries, we must increase our level of suspicion of these forms of pancreatitis.

1494—HEPATO-BILIARY & PANCREAS—Pancreas

1494—PRESERVATION OF AN INTRA-PANCREATIC HEPATIC ARTERY DURING A DUODENOPANCREATECTOMY

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Aims: Detailed knowledge of the anatomic variations of the hepatic artery is essential when operating on pancreatic tumours.
Methods: We present a case report and possible consequences of one of the anatomical variations where the right hepatic artery arises from the superior mesenteric artery (SMA) and travels not behind, but through the head of the pancreas. This is a rarely observed abnormality and there is lack of published literature.
Results: A 62 y-o gentleman presented to our emergency department with jaundice, no abdominal pain. A USS and MRI scan was performed and they showed marked dilatation of the main pancreatic duct and the intra and extra hepatic biliary duct by ampuloma. A left suprarenal mass of 45 x 42 mm was also identified. A Cephalic duodenopancreatectomy and left adrenalectomy was performed. During the procedure a left hepatic artery branch of the left gastric artery was found and an aberrant right hepatic artery was identified, it was originated in the SMA and then showed a trajectory through the pancreatic parenchyma. This aberrant artery was easily dissected along its intra-pancreatic path and was successfully preserved. The patient showed an uneventful recovery.
Conclusion: Only a few cases of an intra-pancreatic hepatic artery with origin in the SMA have been reported. In almost all cases, the aberrant artery was preserved because its intra-pancreatic dissection was found to be favourable. There was an avascular dissection plane surrounding the artery as it traversed the pancreas. Preserving the artery is the preferred option, whereas if injured, the reconstruction is believed to be safe, in this case a simple revascularisation is impossible due to the absence of a gastro-duodenal artery therefore, the recommended published options are: splenic artery transposition and a spleno-hepatic arterial anastomosis or a graft or prosthetic material interposition.

HEPATO-BILIARY & PANCREAS—Pancreas

1281: ROBOTIC "DEEP" PANCREATIC ENUCLEATIONS AFTER ENDOSCOPIC STENTING OF THE MAIN PANCREATIC DUCT

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Aims: Pancreatic enucleation is a viable option for the removal of non- malignant pancreatic masses leading to complete preservation of organ function. This video describes a novel technique of robotic "deep" pancreatic enucleation preceded by endoscopic stenting of the main pancreatic duct.

Methods: A fifty-year-old man presenting hypoglycemic crisis was diagnosed with a small functioning neuroendocrine tumor of the head of the pancreas. Given the deep location of the tumor, a 7 Fr pancreatic stent was placed endoscopically 26 days before scheduled surgery.

Results: The endoscopic procedure was complicated by a transitory mild pancreatitis that was treated conservatively with success. Robotic, ultrasound guided enucleation was performed from the posterior aspect to the pancreatic head. The patient developed a grade B pancreatic fistula and was discharge on day 27. The pancreatic stent was removed on day 40 by endoscopy. Pathology confirms the diagnosis of low grade insulinoma.

Conclusions: In the setting of a high-volume center, this procedure is safe and it is associated with acceptable short-term surgical morbidity. The preoperative stenting of the main pancreatic duct might extend the surgical indications for PE.

1240—HEPATO-BILIARY & PANCREAS—Pancreas

ENDOSCOPIC TREATMENT OF PANCREATIC DUCT DISRUPTION IN THE PATIENTS WITH WALLED-OFF PANCREATIC NECROSIS

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Aims: The place of endoscopic techniques in the treatment of main pancreatic duct (MPD) disruption arising in the course of acute necrotizing pancreatitis (ANP) remains unclear. The aim of this study was to evaluate the role of endotherapy pancreatic duct disruption in patients with walled-off pancreatic necrosis (WOPN).

Methods: Prospective treatment's results analysis of 49 patients, which underwent endoscopic treatment of symptomatic WOPN between years 2018 and 2019 in the Department of General, Gastroenterological and Oncological Surgery, Collegium Medicum, Nicolaus Copernicus University in Toruń.

Results: Endoscopic retrograde pancreatography (ERP) was performed in 47/49 (95.92%) patients. Partial and complete disruption of the MPD were identified in 31 (65.96%) and 12 (25.53%) out of 47 patients. Endoscopic treatment (transpapillary drainage) was used in all 43 patients with MPD disruption. The success of endoscopic treatment of MPD disruption was achieved in 40/43 (93.02%) patients with WOPN. The therapeutic success of WOPN endotherapy was stated in 47/49 (95.62%) patients. The mean follow up duration was 212 (33–396) days. Long term success of treatment of WOPN was achieved in 44/49 (89.79%) patients with symptomatic WOPN.

Conclusions: This study conducted on a large group of patients demonstrated that passive transpapillary drainage is an effective method of treating MPD disruptions in the course of ANP, which improves long-term outcomes of endoscopic treatment in patients with WOPN, reducing the number of recurrent pancreatic fluid collections.

1245—HEPATO-BILIARY & PANCREAS—Pancreas

THE ROLE OF MINIMALLY INVASIVE PANCREATIC SURGERY IN THE TREATMENT OF MENI PATIENTS PRESENTING WITH PNETS

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The role of minimally invasive pancreatic surgery in the treatment of MENI patients presenting with pNETs.

Pancreatic neuroendocrine tumors (pNETs). are rare with an incidence of one per 100,000 population, accounting for 1–4% of all pancreatic tumors. Minimally invasive surgery has an established role in the treatment of patients with pNETs. PNETs are the second most common manifestation in patients with MENI. The most common type of pNETs in MEN I is a non-functional tumour. This systematic review aimed to investigate the role of minimally invasive surgery in the treatment of MENI patients with pNETs.

Methods: Electronic databases were searched with the appropriate search terms up to December 2019. Full publications providing evidence on the effectiveness and safety of minimally invasive pancreatic surgery in MENI patients met inclusion criteria.

Results: Thirty one studies met inclusion criteria. There are a few studies focusing solely on MENI patients. There is disagreement on the cut off criterion of tumor size varying between 1 and 3 cm for offering surgery for patients with non functional pNETs. Most studies recommend the size cutoff to be 2 cm. There are series of MENI patients treated with robotic assisted surgery or conventional laparoscopy for pNETs. The outcomes and complications were similar to those with traditional open surgery but with less operating time and less blood loss. Pancreatic enucleation, a really parenchyma preserving operation is an ideal option for MENI patients with insulinoma. The most common operation is a distal pancreatectomy with enucleation of any tumours in the pancreas.

Conclusion: Large randomized studies or even large series are lacking for patients with MENI and pNETS. The overall strategy of surgical treatment in these patients differs from that of sporadic tumors. There are questions on surgical indications. Minimally invasive surgery seems to be the ideal approach for these patients that are often submitted to multiple operations. A registry of MENI patients with pNETs treated with minimally invasive surgery could provide useful information. EAES could successfully host this registry.

1233—HEPATO-BILIARY & PANCREAS—Pancreas

ENDOSCOPIC NECROSECTOMY DURING TRANSMURAL DRAINAGE OF WALLED-OFF PANCREATIC NECROSIS

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Aims: Endotherapy is a recognized minimally invasive method of treatment of walled-off pancreatic necrosis (WOPN). It was aimed to evaluate the efficiency and safety of direct endoscopic necrosectomy during the transmural drainage in patients with symptomatic WOPN.

Methods: Prospective analysis of treatment's results of patients with symptomatic WOPN treated endoscopically in years 2018–2019 in the Department of General, Gastroenterological and Oncological Surgery, Collegium Medicum, Nicolaus Copernicus University in Toruń.

Results: The transmural endoscopic drainage was performed in 49 patients with symptomatic WOPN. 31/49 (63.27%) patients (nine females, 22 males, mean age 44.23 [29–73] years) were qualified to direct endoscopic necrosectomy. The averaged size of WOPN collection was 23.28 cm (12.6–34.0 cm). Transgastric access was performed in 28 (90.32%) patients, transduodenal access was performed in 3 (9.68%) patients. Active endoscopic drainage was continued averagely for 15.5 (9–38) days. The average number of endoscopic procedures during continued drainage was 5.46 (2–10) per patients. The complications of endotherapy were present in 5/31 (16.13%) patients. Success of endoscopic treatment was achieved in 30/31 (96.77%) patients. Long-term success of endotherapy was stated in 27/31 (87.1%) patients.

Conclusion: Direct endoscopic necrosectomy during transmural drainage is an effective minimally invasive method of treatment of patients with symptomatic WOPN with acceptable number of complications.

1194—HEPATO-BILIARY & PANCREAS—Pancreas

PROGNOSTIC VALUE OF TP53, CDKN2A/P16 AND SMAD4/DPC4 IN LOCALLY ADVANCED, BUT RESECTED, PANCREATIC CANCER

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Aims: The most frequently mutated genes in pancreatic ductal adenocarcinoma (PDAC) are KRAS, TP53, CDKN2A/p16, and SMAD4/DPC4. These gene mutations affect disease specific survival (DSS) and progression free survival (PFS). Our aim is to evaluate the impact of SMAD4/DPC4, CDKN2A/p16 and TP53 expression on survival of patients who received a pancreatectomy with arterial resection (P-Ar) because of a locally advanced PDAC (LA-PDAC).

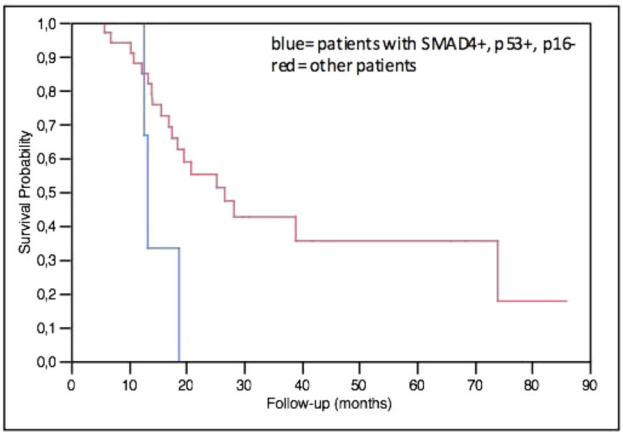
Methods: A retrospective study on P-Ar performed for LA-PDAC between 2000 and 2017 was conducted. Post-operative deaths were excluded. The genes status was immunohistochemically assessed and the differences in term of DSS and PFS between patients with positive and negative status were calculated by using Kaplan–Meier curves and Log-rank test. The relationship between preoperative features and genes expression was evaluated by using logistic regression.

Results: A total of 38 patients were eligible for this study. The superior mesenteric artery was resected in 16 (42.1%) patients and the celiac axis/hepatic artery in 26 (68.4%) patients. Median DSS and PFS were of 25.3 (14.2–74) months and 12.8 (10.3–22) months, respectively. Abnormal immunolabeling of TP53 was present in 21 (55.2%) PDACs. Loss of p16 and SMAD4 was identified in 23 (60.5%) and 22 (57.9%) PDACs, respectively. DSS and PFS were higher in patients with positive SMAD4, positive P53 and loss of p16 (Table 1). When the loss of SMAD4 was associated with an abnormal labelling of p53 and the expression of p16 concurrently, both DSS (13.3 vs. 26.7 months, p = 0.03*) (Fig. 1) and PFS (10.3 vs 15 months, p = 0.01*) were statistical significantly worse. Preoperative level of Ca 15.3 was correlated with the expression of SMAD4/DPC4 (p = 0.01*).

Table 1 – Median disease specific survival and progression free survival in patients with LA- PDAC based on SMAD4/DPC4, CDKN2A/p16, and TP53 status

	SMAD 4/DPC4			CDKN2A/P16			TP53		
	Intact	Loss	p	Positive	Negative	p	Normal	Abnormal	p
DSS	26.7 (20.9-39)	18.6 (13.3-74)	0.43	18.8 (13.3-NA)	25.3 (15.7-74)	0.88	39 (15.7-NA)	18.8 (14-74)	0.37
PFS	16 (10.8-21)	12.7 (8.1-59.6)	0.83	12 (9.9-18.7)	15 (12-22)	0.77	16 (10.8-21.9)	12.7 (10.3-22)	0.58

Figure 1 – Kaplan-Meier for Disease specific survival



Conclusions: Positive SMAD4 and P53 and negative p16 discriminated survival in a cohort of 38 patients with LA-PDAC following P-Ar. A larger number of patients are required to validate our results

882—HEPATO-BILIARY & PANCREAS—Pancreas

LAPAROSCOPIC PANCREATICOJEJUNOSTOMY USING BARBED ABSORBABLE SUTURES: SIMPLE, SAFE AND EFFECTIVE: A CONSECUTIVE SERIES OF 34 PATIENTS

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Aims: The paper aims at presenting our experience with laparoscopic pancreaticojejunal anastomoses fashioned using a resorbable 3/0 barbed suture.

Methods: For the purpose of the study we analysed a non-randomised prospectively selected series of 34 consecutive cases of laparoscopic duodenopancreatectomies operated in the General and Minimally Invasive Surgery department of the Centre Hospitalier de Luxembourg between January 2016 and April 2019. In our unit, the standard of care for patients requiring a duodenopancreatectomy is a Child reconstruction in which the pancreaticojejunostomy is an end-to-side anastomosis with a stent in the Wirsung duct. The anastomosis is performed using an anterior and a posterior running suture using a 3/0 resorbable V-Loc making sure that one passage of each running suture is through the Wirsung duct. The primary endpoint of our study was to assess the number of anastomotic leaks. Secondary endpoints were time to perform the anastomoses and the need for conversion to another type of anastomosis.

Results: We recorded a 26,47% (9/34) leak rate with 17.64% (6/34) type A fistulas and 8,82% (3/34) type B fistulas. There were 73,52% (25/34) soft pancreases and 26,47% (9/34) firm pancreases. The size of the Wirsung duct was 1 mm in 11,76% (4/34) of the patients, 2 mm in 17,64% (6/34) of the patients, 3–4 mm in 55,88% (19/34) of the patients and above 4 mm in 14,70% (5/34) of the cases. There were no conversions to other types of anastomoses, no biliary fistulas or stenoses, no haemorrhagic complications and only one conversion to laparotomy. The time required to perform the anastomosis was 17,3 ± 6,7 min (range: 10.6–24 min).

Conclusion: This is an easy to perform, safe and effective anastomosis in terms of time in the hands of hepato-bilio-pancreatic surgeons with experience in laparoscopy.

874—HEPATO-BILIARY & PANCREAS—Pancreas

FULL LAPAROSCOPIC DUODENOPANCREATECTOMY FOR CANCER: CASE REPORT AND DESCRIPTION OF THE TECHNIQUE

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Aims: The aim of this paper is to present our technique of full laparoscopic duodenopancreatectomy. A recent pan-european survey shows that only 4,4% of surgeons perform the pancreaticoduodenectomy laparoscopically which is why we think every report on the subject may contain valuable information.
Methods: We present the case of a 35-year-old woman with a BMI of 38,5 kg/m2 and a history of Lynch syndrome admitted to our unit after having been diagnosed with an ulcerated circumferential obstructing tumor of the second portion of the duodenum. The biopsy taken from the lesion revealed an adenocarcinoma with a mucinous component. The whole-body CT-scan showed an obstructive lesion, a bulky mass with infiltration of the periduodenal fat but no metastasis. A right hepatic artery originating from the superior mesenteric artery was identified. Further workup including a PET-scan showed no metastatic disease and the decision of the multidisciplinary board was that the patient should undergo a Whipple's procedure. The standard of care in our unit for such cases is a laparoscopic duodenopancreatectomy followed by a full laparoscopic Child reconstruction. A 0° scope was used throughout the procedure. Reconstruction consisted of a termino-lateral pancreatico-jejunal anastomosis using two running 3–0 resorbable barbed sutures, posteriorly and anteriorly. The Wirsung duct was tutorised. A termino-lateral hepatico-jejunal anastomosis was performed using 2 continuous PDS 5–0 sutures and the gastro-jejunal anastomosis was performed using a stapler and closing the enterotomy by a running 3–0 resorbable barbed suture.
Results: The operating time was 320 min with a blood-loss of approximately 100 ml and a postoperative fast-track protocol was followed. We measured the level of amylase in the liquid of the drain on the third postoperative day, after enteral nutrition was started. No bile or pancreatic leaks were noted. The patient was discharged on the 7th postoperative day. The pathology showed an R0 resection of a pT3 N2 (4/24) mucinous adenocarcinoma.
Conclusion: Laparoscopic pancreaticoduodenectomy is a difficult procedure but can be standardised to a degree that makes it is feasible and safe in the hands of hepato-bilio-pancreatic surgeons with extensive experience in laparoscopy.

865—HEPATO-BILIARY & PANCREAS—Pancreas

A RETROSPECTIVE STUDY: TREATMENT OF INFLAMMATORY PANCREATIC FLUID COLLECTIONS AND WALLED-OFF PANCREATIC NECROSIS

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Background: Acute pancreatitis (AP) is an inflammatory process of the pancreas, with variable involvement of peri-pancreatic tissues and remote organ systems. In this study we discuss surgical and conservative management of acute pancreatitis and its local complication.
Methods: This retrospective study was carried out on patients, were admitted to Gastrointestinal surgery unit, Main Alexandria University Hospital, Faculty of medicine. who were complaining of acute pancreatitis with fluid collections and sequels pseudocyst (PP), acute necrotic collection (ANC) and well-off pancreatic necrosis (WOPN) between October 2013 and October 2018.
Results: This retrospective study included 128 patients complaining of acute pancreatitis with fluid collections and sequels that needed intervention (45 patients with free collection, 32 patients with PP, 23 patients with WON, and 28 patients with NP). 45 patients with acute edematous pancreatitis with free collection were managed conservatively successfully. 32 patients with PP underwent drainage, endoscopic (n = 17), or open (n = 15) approach, 23 patients with WON underwent drainage and debridement whether by open (n = 11), endoscopic (n = 9), or percutenous drainage PCD (n = 3) approaches,28 patients with necrotizing pancreatitis, 16 patients were managed conservatively, 12 patients needed intervention either, PCD (n = 9) or open surgical necresectomy (n = 3).
Conclusions: The operative management of acute pancreatitis is focused on managing the acute complications, the long-term sequels, or the prevention of recurrent pancreatitis. Patience, vigilance, expertise, and judgment, and an ability to be humbled are necessary for the successful practitioner who manages patients with severe pancreatitis.

477—HEPATO-BILIARY & PANCREAS—Pancreas

LAPAROSCOPIC SURGERY FOR ACUTE NECROTIZING PANCREATITIS

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Introduction: Laparoscopic operations in pancreatic surgery have already become routine, even for pancreatoduodenectomy for pancreatic cancer. However, laparotomy interventions are still used to treat necrotizing pancreatitis. Among minimally invasive interventions in the surgery of necrotizing pancreatitis and its complications, endoscopic intraluminal surgery and interventional sonography are used more often.
Materials and Methods: The experience of treatment of 133 patients with necrotizing pancreatitis is presented, 163 operations were performed, of which 66 (49.6%) patients were operated exclusively with laparotomy access, with the use of minimally invasive methods 67 (50.4%) The indications for surgery in all patients were 1) peritonitis; 2) formation of a local site of destruction in the abdominal cavity or in the retroperitoneal space; 3) progression of intoxication syndrome. Laparoscopic drainage of the abdominal cavity for pancreatogenic peritonitis was performed for 30 (44.7%) patients, supplemented by drainage of the omental bag, retroperitoneal space – 4 (5.9%). Laparoscopic pancreatic necrosectomy for purulent-necrotic complications were performed by 18 (26.8%) patients underwent, drainage of pancreatic abscesses was performed in 15 (22.3%) patients using interventional sonography.
Results: Against the background of intensive care, only laparoscopic drainage of the abdominal cavity resulted in recovery of 13 (19.4%) patients. 7 (10.4%) pancreatic abscesses were formed at different times, which were effectively drained under ultrasound control. The remaining 10 (33.3%) patients, due to disease progression (pancreatic necrosis, development of phlegmon, peritonitis), performed laparotomy with distal pancreatic resection.
In 18 (26.8%) patients with NP, a laparoscopic necrosectomy was performed with drainage of the retroperitoneal space and abdominal cavity. From this group in 16 (88.8%) patients the operation was effective, two more patients (11.1%) underwent repeated (planned) laparoscopic necrosectomies before complete recovery. In two patients (11.1%), due to the progression of the necrotic process in both the pancreas and the retroperitoneal space, laparotomies with pancreatic necrosectomies were performed. In 7 (38.8%) patients, pancreatic abscesses were eliminated by interventional sonography.
Conclusions: One of the promising directions in the problem of necrotizing pancreatitis may be the further development of an algorithm for the use of laparotomy and laparoscopic operations, both in independent and combined variants, with clear indications to each of them, and the main criterion for assessment is a decrease in the mortality rate.

322—HEPATO-BILIARY & PANCREAS—Pancreas

LAPAROSCOPIC MODIFIED PUESTOW'S - A TRIAL OF SUTURE VS STAPLER TECHNIQUE

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Chronic Pancreatitis has a fair incidence in South-east Asian countries. However, there are considerable differences in morphology of South-East Asian patients' when compared to the west. Pancreatic duct have more calculi with dilated duct and lesser stricture. Modified Puestow's (Partington and Rochelle modification) Procedure is the gold standard drainage procedure for chronic pancreatitis. Laparoscopically, the pancreatico-jejunal anastomosis is usually performed in sutured manner. Endostapler ® anastomosis has been described at its earliest in 2000 by Glaser et al. However, Guidelines for its use are yet to be formulated. We describe our experience of 10 years, 33 cases of chronic pancreatitis who were enrolled for laparoscopic pancreatico-jejunostomy. Pre-operative radiological evaluation of main pancreatic ducts was performed & those with ducts larger than 10 mm diameter(i.e. large enough to permit insertion of endostapler anvil) were divided into two groups and randomized, one group underwent endostapler anastomosis, while the other were completed with purely sutured technique.The procedure was unchallenging, and reduced operating time in the selected cases. They suffered from no significant complications & had an uneventful post-operative recovery. Only a single case with duct larger than 12 mm was converted to an open procedure due to finding of an abnormally supple pancreas which hindered duct localization in absence of laparoscopic ultrasound. Patients were followed up for a 6 months post-operatively & were found to have reduced to no pain in most of them with improvement in digestive function evidenced by gain in their weight. We opine that endostapler pancreatico-jejunostomy is a viable alternative in grossly dilated ducts with diameter of more than 12 mm in head and body. It serves to reduce operative time and is technically less challenging. In our study, we did not observe any detrimental effects however further evaluation of the procedure has potential to reveal a diminished complication rate.

254—HEPATO-BILIARY & PANCREAS—Pancreas

TOTAL LAPAROSCOPIC PANCREATECTOMY IN A PATIENT WITH SYNCHRONOUS SOLID PSEUDOPAPILLARY NEOPLASM AND INTRADUCTAL PAPILLARY MUCINOUS NEOPLASM OF PANCREAS

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Aim: To report and discuss the first case in the literature of a 39-year-old pregnant woman suffering synchronous solid pseudopapillary neoplasm (SPN) and intraductal papillar mucinous neoplasm (IPMN) of pancreas treated successfully with total laparoscopic pancreatectomy postpartum.

Method: A 39-year-old woman was admitted to our hospital due to abdominal pain. The CT-scan demonstrated a mixed type lesion (solid-cystic) in the body to tail of pancreas. The EUS-FNA was not diagnostic. One month later the PET-scan confirmed the CT-scan finding and the presence of a fetus. At this time the patient refused any surgical intervention. After her childbirth the new investigation (CT-scan, PET-scan, EUS-FNA) revealed the presence of synchronous SPN and IPMN of pancreas. She underwent total laparoscopic pancreatectomy using 6 trocars (one 10 mm in umbilicus as it is introduced in single incision laparoscopic surgery, one hypoxiphoid 12 mm, 2 suprapubic 5 mm, 2 in the middle clavicle line 5–12 mm proximally to the suprapubics ones.

Results: The microscopic examination confirmed the synchronous presence of two distinct primary neoplasms of the pancreas. A branch-duct type papillary mucinous neoplasm of the head of the pancreas of gastric type and a solid pseudopapillary neoplasm in the body to the tail of the pancreas. The postoperative period was uncomplicated. Nine months after the operation the patient is in good health and according to MRI investigation disease free.

Conclusion: The synchronous presence of SPN and IPMN has reported only in two cases, both in men, until now. The existence of SPN in pregnancy has been discussed in the view of potential rapid growth and spontaneous rupture of the lesion. No IPMN lesion has been reported in pregnancy. Laparoscopic total pancreatectomy constitutes an effective and safe minimally invasive surgical procedure. Many studies have shown its advantages compared to open surgery regarding blood loss and hospital stay.

156—HEPATO-BILIARY & PANCREAS—Pancreas

PURE LAPAROSCOPIC UNCINATECTOMY WITH INFRA-AMPULLARY DUODENECTOMY FOR PANCREATIC NEURO-ENDOCRINE TUMOR (NET)

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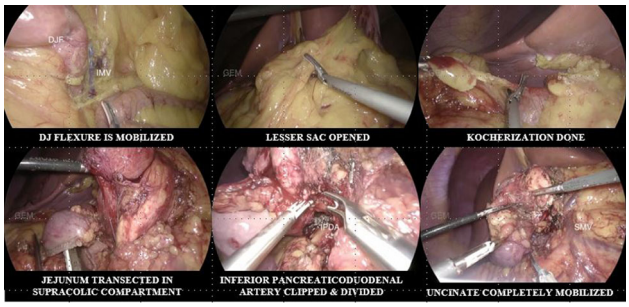
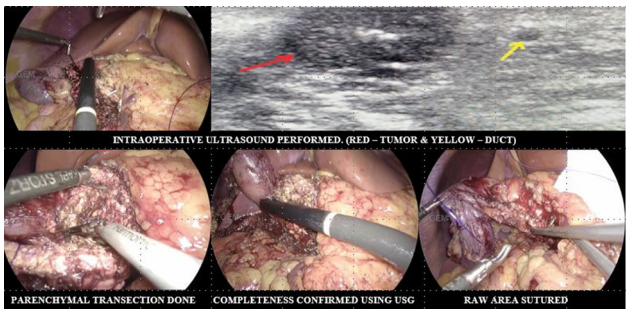
Background: Tumors of the head and uncinate process of the pancreas are usually resected via Whipple's procedure. Isolated uncinate process excision is a rarely described procedure which is an adequate surgery for benign/low-grade malignancies of uncinate process. The main advantages of this procedure are: preservation of normal pancreatic parenchyma, maintenance of physiological pancreatic juice and bile flow into the duodenum and lesser post-operative morbidity.

Objective: We present a rare case of a 40-year-old male with localized neuroendocrine tumor (NET) of uncinate process of pancreas who underwent total laparoscopic uncinate process excision with infra-ampullary duodenectomy and duodenojejunostomy.

Patient and Methods: 40-year-old-male was evaluated for upper abdominal pain of 2 months duration and found to have a localized NET in uncinate process of pancreas on thorough evaluation. Herein, we demonstrate a video of this procedure.

Key Steps (Figs. 1 and 2): Diagnostic laparoscopy, Cattle-Brasch manoeuvre, duodenal kocherisation, ligament of Trietz incision, proximal jejunal division, uncinate process mobilization, laparoscopic intra-operative ultrasound (IOUS), parenchymal transection and pancreatic reinforcement, D2 division, end to side duodeno-jejunostomy.





Results: Total operative time was 185 min and blood loss was 80 ml. Patient had post-operative ICU stay for 2 days and was discharged on post-operative day.

Conclusion: Laparoscopic uncinatectomy is safe, feasible and less invasive alternative for low grade uncinate process NETs. Intra-operative ultrasonography plays a pivotal role in this parenchymal-sparing surgery. Therefore, it should be considered in order to avoid exocrine and endocrine pancreatic insufficiency and morbidity.

130—HEPATO-BILIARY & PANCREAS—Pancreas

LAPAROSCOPIC PANCREATICODUODENECTOMY WITH TOTALLY INTRACORPOREAL HAND-SEWN ANASTOMOSES: FEASIBILITY AND EFFECTIVENESS

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Background: Whipple procedure has been described since 1935, using classic open surgery. Pancreaticoduodenectomy (PD) is a complex procedure, associated with a definite risk of mortality and 30–50% risk of complications. With the rising of minimally invasive surgery (MIS), it has been described to be feasible using the latest technology. In contrast to laparoscopic distal pancreatectomy, laparoscopic pancreatoduodenectomy (LPD) has not been widely accepted, probably because technically demanding especially during the pancreatic anastomosis.

Methods: In this video the authors report a full LPD procedure, performing the three anastomoses by a totally intracorporeal method the modified Blumgart pancreaticojejunostomy. Indications for LPD are all pancreatic and ampullary tumors without vascular involvement. Relative contra-indications are chronic pancreatitis, midcholangiocarcinomas and large duodenal infiltrating tumours.

Results: A 65-year-old woman who presented an ampullary carcinoma infiltrating the pancreatic parenchyma underwent to a LPD. Preoperative staging showed a tT3N1M0 tumour. The postoperative course was uncomplicated with a regular hospital stay. The histologic findings showed an ampullary cancer with free resection margin (R0, pT3N2M0).

Conclusion: In our experience, LPD appears to be feasible, safe, and effective. Despite being few data in literature regarding LPD, it holds promise for providing advantages seen with minimally invasive approaches in other procedures. However, large cohort studies and controlled trials are needed.

98—HEPATO-BILIARY & PANCREAS—Pancreas

THE INTRODUCTION OF NEW DRUGS AND TECHNOLOGIES TO IMPROVE THE TREATMENT OF PATIENTS WITH ACUTE BILIARY PANCREATITIS

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Key words: Acute pancreatitis, endo-video surgical methods of treatment, ulinastatin.

Relevance: The incidence of acute pancreatitis both abroad and in Kazakhstan has a tendency to increase. Today this is a rather serious problem and requires considerable attention.

The Goals: To improve the treatment outcomes of patients with acute pancreatitis by using endovide surgical methods of treatment and the inclusion of the protease inhibitor Ulinastatin (U-Tryp) in the complex treatment: to improve the results of treatment of patients with acute pancreatitis by using the infusion solution "Ulinastatin"; to develop an algorithm of treatment for the use of the drug Ulinastatin in the treatment of acute biliary pancreatitis.

Materials Research Methods: The study was carried out on the bases of the emergency room at the City Hospital No 1 "and the emergency room at the City Hospital No 2" in the city of Nur-Sultan.

CT, MRI, installation of "ZORING", endoscopic stand "Karl Stors", argon-plasma coagulator company "Karl Stors". Laparoscopic setup with manual assistance: GelPort (Applied Medical). radiography of the abdominal organs, ultrasound of the abdominal organs. Morphological, microbiological research methods, clinical and laboratory studies.

Results: At this stage treated 35 patients with acute biliary pancreatitis were treated. Of these, 19 were women and 16 were men. The average age of the patients was 44 ± 3 years. All patients received therapy according to the approved clinical protocol "Acute pancreatitis" (dated November 30, 2015, Protocol No. 18, MH RK). 9 - treated without surgery. 26 - endovideo surgical treatment was combined with the appointment of ulinostatin according to the developed scheme. In 34 cases, recovery; 1 patient died - was admitted with severe pathology of cardiovascular pathology complicating the course of acute destructive pancreatitis.

Conclusion: The results of our studies showed the high efficiency of the developed algorithm treatment for acute pancreatitis.

1291—HERNIA-ADHESIONS—Abdominal wall hernia

ENHANCED-VIEW TOTALLY EXTRAPERITONEAL (ETEP) APPROACH FOR III TYPE PARASTOMAL HERNIA

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Parastomal hernia repair is still challenging for majority of surgeons. There is no proper "gold standard" procedure which would provide low recurrence and complacations rate. New mini-invasive approach was applied by Belyansky in 2015 which names enhanced-view totally extraperitoneal (eTEP) repair, it also may be suitable for parastomal hernias.

Seventy years old female undergo 3 years before laparoscopic abdominoperineal excision of the rectum and colostomy on account of rectal cancer. Afterwards III type parastomal hernia was appeared. There was performed Pauli-like operation by eTEP approach with left-side unilateral posterior component separation. 18x15cm mesh was set up. Duration of operation was 255 min. Postoperative period was without complications. Patient was discharged on 5th day after surgery. Special features of procedure is demonstrated on video. In conclusion, eTEP is a feasible approach for parastomal hernia repair.

1231—HERNIA-ADHESIONS—Abdominal wall hernia

PARTICULAR CASE OF A GIANT BOCHDALEK HERNIA IN ADULT - MINIMALLY INVASIVE TREATMENT

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Introduction: Bochdalek hernia is the most common congenital diaphragmatic defect, in the majority of cases left side being affected. But few patients are diagnosed late in adulthood.

Method: We present the case of a 33 years old female patient who was admitted in our clinic with the diagnosis of posterior diaphragmatic hernia, with intrathoracic migration of the left kidney, ascending and transverse colon and greater omentum. We've decided a laparoscopic approach, with 5 trocars, and we've performed the reduction of the abdominal organs, we have found an inflamed appendix, we've closed the diaphragmatic defect with a running suture, put a biological mesh over the suture, fixed with tackers and we removed the appendix. The postoperative course was uneventful, with discharge in the fourth day.

Conclusion: We consider that the laparoscopic treatment of diaphragmatic hernias is feasible and safe and the use of a mesh that is compatible with intraperitoneal content can help to reduce the risk of recurrence.

1005—HERNIA-ADHESIONS—Abdominal wall hernia

MINIMALLY INVASIVE REPAIR OF SUPRAPUBIC INCISIONAL HERNIA: CASE SERIES REPORT

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Aims: Suprapubic hernias (less than 5 cm above the pubic arch in the midline) require important anatomical knowledge because of complexity of their repair and low incidence. The problem to repair this type of hernias is that inferior margin of the defect is very close to pubic symphysis, consequently, mesh overlap is often inadequate. Treatment of suprapubic hernias is controversial because of limited evidence in the literature. We present our laparoscopic experience with this uncommon type of incisional hernia.
Methods: We retrospectively studied 19 patients with suprapubic incisional hernias which were operated between May 2008 and October 2018. All the surgeries were performed by the same surgeon. We performed a laparoscopic repair with a bilateral peritoneal flap of the groin region. Over the years we have slightly changed the technique in terms of defect closure and type of mesh, respecting the principles of peritoneal flap and mesh fixation.
Results: There were a total of 19 patients (16 females and 3 males), with a mean age of 56.3 years (range 37–75) and a mean BMI of 29,2 kg/m2 (range 22,9–36,2). All cases were incisional hernias. The mean hernia size was 82,5 cm2 (range, 15–320), with an average mesh size of 330 cm2 (range, 135–884). Mean operating time was 56 min (range, 30–105), with no significant blood loss. Hospital stay averaged 2,3 days (range, 1–11). Most cases were hospitalized 2 days, the first patient of the series was 11 days due to a hematoma and paralytic ileus that was managed conservatively. Pfannenstiel incisions seem to have a higher incidence of hernias than the lower midline laparotomies (17 vs. 2). Complications were seen in 1 patient who had the ileus; also 4 patients with asymptomatic seromas that spontaneously resolved. All the meshes were placed intraperitoneally. We have found no recurrence or chronic pain at this time in any patient with a minimum follow-up of one year.
Conclusions: Due to the complexity of the dissection and the proximity of these hernias to the bone, vascular and nervous structures, the repair of suprapubic hernias is a difficult operation being a challenge for the surgeon. Even if it's technically demanding, the laparoscopic repair of suprapubic hernias can be considered as the first option in treatment. The main advantages are that allows a proper visualization the anatomy and a proper fixation of the mesh and is safe and technically feasible even in large and recurrent hernias, with a satisfying result in medium-term follow-up.

926—HERNIA-ADHESIONS—Abdominal wall hernia

OUR PRIMARY EXPERIENCE OF ENHANCED-VIEW TOTALLY EXTRAPERITONEAL (eTEP) VENTRAL HERNIA REPAIR

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When Igor Belyanski in 2015 reported first about enhanced-view totally extraperitoneal (eTEP) approach, he wrote that eTEP approach can be made through upper or lower crossover techkique. Transversus abdominis release is also allowed in this approach, which can be bilateral and unilateral (in particular for flank hernias). From December 2018 we operated more than 60 patients in our clinic. In 65% of patients was performed retromuscular alloplasty (Rives-Stoppa) by eTEP approach, and in 35% was performed eTAR, 14% of all operated hernias was flank. The aim of this report is to describe our preliminary experience and to show different types of eTEP which was performed by our surgeons.

902—HERNIA-ADHESIONS—Abdominal wall hernia

SUTURING THE HERNIA DEFECT WITH 3D-LAPAROSCOPY FOR PREVENTION OF UNDESIRED EFFECTS OF IPOM PROCEDURES

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Aims: IPOM is still the most popular technique for umbilical and incisional hernia repair. Suturing of hernia defect and sac can decrease the rate of seromas and pseudo-recurrences and improve cosmetic results. The need for suturing is still debateful. The aim was to compare the immediate results of suturing and non-suturing in IPOM procedures.
Methods: From 2017 till 2019, 22 patients underwent IPOM. Group A had 14 patients with suturing of the hernia defect and sac (IPOM +) (W1—7 patients, W2—7 patients). Group B had 10 patients without suturing (5 patients - umbilical hernias, 5 patients with incisional hernias, all W1). Mean age was 58 (range, 35–75). There were 16 women and 8 men. The groups were comparable by age, gender and sizes of hernias. Suturing was done by non-absorbable 2–0 V-loc suture (Covidien) facilitated by 3D-laparoscopy (Epic 3DHD system, Wolf).
Results: There were no conversions and complications in both groups. The mean duration of procedure was 95 min (range, 60–120) in group A, and 45 min (range, 30–60) in group B ($p < 0.05$). The intensity of postoperative pain on postop day 1 was slightly larger in IPOM + group. In W1 hernias, the mean volume of seroma on postop day 2 was 0.8 ml (range, 0–4) in group A and 1.7 ml (range, 1–5) in group B ($p > 0.05$). In W2 hernias, the mean volume of seroma was 3.2 ml (range, 1–8) in group A and 7.5 ml (range, 2–20) in group B ($p < 0.05$). The cosmetic result 2 weeks after surgery was better in IPOM + group, especially in W2 hernias.
Conclusions: 1. In W1 hernias, there is no difference in the rate and volume of seromas between two techniques. 2. In W2 hernias, IPOM + produces better cosmetic results and smaller rate and volume of postoperative seromas compared to standard IPOM. 3. 3D-laparoscopy improves performance of suturing the hernia defect and sac. 4. More cases collection and long-term follow-up is needed to prove that suturing the hernia defect and sac helps to avoid such undesired effects of IPOM as seroma and bulging, for distinct types and sizes of hernias.

894—HERNIA-ADHESIONS—Abdominal wall hernia

COMPARISON OF MONOfiLAMENT BARBED RUNNING SUTURE VERSUS BRAIDED INTERRUPTED SUTURE IN INCISIONAL HERNIA FOR LAPAROSCOPIC COLORECTAL SURGERY

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Background: Incisional hernias are a common postoperative complication with laparoscopic colorectal surgery. Conventionally, specimen extraction wound fascias had closed with braided interrupted suture (Polyglycolic acid, 0-OpepolixTM; Alfresa, Tokyo, Japan), however since the 2017 year, switched to monofilament barbed running suture (Polydioxanone, StratafixTM, Jonhson & Johnson, USA).
Objective: The primary aim of this study retrospectively compared braided interrupted suture with monofilament barbed running suture in the incidence of incisional hernia formation after laparoscopic colorectal surgery. The secondary considering from the study was to identify as risk factors for extraction site hernia.
Methods: Patients who underwent laparoscopic colorectal surgery at The Kansai Medical University Hospital between two periods were included. In Group A, 312 patients from January 2014 to December 2015 performed by braided interrupted sutures, and in Group B, 247 patients from April 2017 to August 2018 conducted by barbed running suture. The extraction site of all cases was paraumbilical midline incision. Patients had to satisfy the following inclusion criteria: have undergone a computed tomography (CT) scan at a minimum of 12 months after the surgery. Exclusion criteria were as follows: (1) Unfollowable patient. (2) Cases of conversion to laparotomy (3) Within one year after surgery, laparotomy was performed for other causes. A radiological incisional hernia (IH) defined as evidence that: (1) the transverse abdominal fascia was not in continuity; (2) fat, peritoneum or bowel was seen to breach a surgical incision site in the paraumbilical midline incision. The area of an ellipse calculated by the semimajor and semiminor axes of radiological hernia site. The incidence of IH and the area of ellipse shapes IH were compared in group A and group B. Uni-and multivariate analyses were performed for searching IH risk factor using the following variables: gender; comorbidities [diabetes and pulmonary disease]; previous surgery; surgical site infection (SSI); and body mass index (BMI); tumor size; the prognostic nutritional index (calculated as 10 × serum albumin (g/dl) + 0.005 × total lymphocyte count (/mm3).
Results: Results: 294 cases in group A and 176 cases in group B. The overall IH rate was 10% (A and B 11.9% vs 6.81%, p = .0681). The area of ellipse shapes IH (cm2) was Group A median 35.81(range, 5.09–222.27), Group B area median 26.07 (range, 6.13–135.09), and p = .427. There was no statistically significant difference between the two groups. Independent factors associated with IH were BMI [p = < .0001, OR: 1.12 (95%CI 1.11–1.32)], Gender of female [p = .0019, OR: 3.16 (95%CI 1.52–6.52)], SSI [p = .006, OR: 6.48 (95%CI 2.24–18.73)]. BMI, Gender, and SSI had a statistically significant relation with the incidence of IH in multivariate analysis (p = < .01).
Conclusions: The methods of fascial closure did not affect the incidence of IH. There are apparent risk factors for IH, and countermeasures for these cases need to be considered.

885—HERNIA-ADHESIONS—Abdominal wall hernia

MINIMALLY INVASIVE REPAIR OF CONCOMITANT VENTRAL AND SUPRAPUBIC HERNIA

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Aims: Ventral hernias continue to be a very common pathology. Suprapubic hernias (less than 5 cm above the pubic arch in the midline) require important anatomical knowledge because of complexity of their repair and low incidence, by approximately 2% of all hernias. The problem to repair this type of hernias is that inferior margin of the defect is very close to pubic symphysis, consequently, mesh overlap is often inadequate. A case may arise in which a herniary defect covering both anatomical areas may occur.
Methods: This video shows the case of a 67-year-old female previously operated from a Hartman procedure for perforated diverticulitis. Patient with concomitant suprapubic hernia and ventral hernia with a total defect of 9 x 18 cms.
Results: We performed a laparoscopic repair performing a LIRA procedure (Laparoscopic intracorporeal rectus aponeuroplasty) in order to make a proper reconstruction of the abdominal wall. The posterior rectus aponeurosis was opened lengthwise around the hernia defect using a laparoscopic approach to create two flaps, and then for the suprapubic area we made a bilateral peritoneal flap of the groin region (as it is perfromed during TAPP) for proper view of the pubic symphysis, Cooper's ligaments, epigastric and major vessels, nerves and meticulous dissection the space of Retzius. The defect was repaired by reconstructing the middle line with two running sutures. Subsequently, titanium helical tacks were used to fix the mesh to the pubis and Cooper and following the double-crown technique having special attention when fixing the mesh near to inguinal chanal, due to the possibility of causing chronic pain. The peritoneal flap was not fixed over the mesh, and then we seal the mesh with fibrin glue.
Conclusions: Laparoscopic repair of concomitant suprapubic and ventral hernias can be considered as the first option in treatment, because it endeavors to join the advantages of a minimally invasive approach and it is associated to low recurrence. The main advantages are that allows a proper visualization the anatomy and a proper fixation of the mesh with a better post-operative recover.

849—HERNIA-ADHESIONS—Abdominal wall hernia

LAPAROSCOPIC RECURRENT LUMBAR HERNIA REPAIR

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Aim: to describe the feasibility and steps of laparoscopic recurrent lumbar hernia repair.

Methods: 38 year male with lumbar hernia after renal surgery followed by an attempt at open repair, presented with recurrent bulge and pain over right lumbar region of 3 years duration. Laparoscopic repair was performed by placing the patient in left lateral position, followed by reduction of contents and transfacial closure of defect. 15 cm x 15 cms. Polyprolene mesh was placed behind the colon with fixetion to psoas muscle and anterior abdominal wall muscles.

Results: Quick recovery and discharge in 24 h. The follow-up on day 7 for suture removal and telephonic follow-up at 6 months were free of postoperative complications or recurrence.

Conclusions: Laparoscopic repair of recurrent lumbar hernia is feasible and has the advantage of quick recovery without any complications or recurrence.

717—HERNIA-ADHESIONS—Abdominal wall hernia

COMPONENT SEPARATION TECHNIQUE WITH SYNTHETIC MESH IN MANAGEMENT OF LARGE VENTRAL HERNIA

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Incisional ventral hernias are estimated to occur after 15% of all laparotomies. Most are non-complex and can be repaired with conventional techniques. Strong evidence shows that there are advantages in terms of lower morbidity and recurrence rates when defects are completely closed and reinforced with appropriate materials.the incorporation of autologous tissue using myofascial advancement flaps (component separation) has benefitted patient outcomes with a reduction in rate of failed repair. However, the use of component separation without mesh, the recurrence rate remains at least 20%.
The aim of this work is to evaluate component separation techniques (CST) accompanied with synthetic mesh in large ventral hernia repair regarding duration of operation, intraoperative and postoperative complications and recurrence rate.

Patients: the study carried on 20 patients with large ventral hernia, admitted to the GIT surgery unit, Main Alexandria University Hospital.

Methods: this prospective study carried on 20 patients. All patients were subjected to preoperative assessment with assessment of size of defect. After dissection of hernial sac, closure of hernial defect using CST followed by hernioplasty with recoding of operative and postoperative complication. follow up of all patients for 1 year.

Results: the results of this study were tabulated and analyzed by the appropriate statistical method.

Conclusion: CST is effective techniques for closer of defect of large ventral hernia with low rate of complications.

564—HERNIA-ADHESIONS—Abdominal wall hernia

STRANGE CASE OF ABDOMINAL BORDER HERNIAS (M5/L3): LAPAROSCOPIC TREATMENT

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Introduction: Laparosocopic approach represent a minimally invasive approach to the hernia, particularly in border area, hard to treat with classic open approach. The advantage of a better and complete view of abdominal wall make the surgeon able to plan a correct and "updated" repair.

Case: The patient, a 53 y old men, had a long surgical history:
1995: open right inguinal hernia with mesh.
2000: open right inguinal hernia repair for recurrence (plug repair).
2001: open left inguinal hernia repair.
2005: Sleeve Gastrectomy (BMI 45 kg/m2).
2007: Tummy tuck surgery.
2010: Tapp repair for recurrent left inguinal hernia.
2015: Conversion of Sleeve Gastrectomy to Gastric Bypass for GERD.
2018: Bulging in the lower abdominal quadrant: Diagnosis of abdominal border hernia (M5/L3). No inguinal recurrence.

Results: The chosen approach after laparoscopic exploration was a pre-peritoneal repair with a large polypropilene mesh covering all the defects. The operative time was 75 min and the patient was discharged after 24 h. At 14 months follow-up the clinical exploration didn't demonstrate recurrences.

Conclusion: Laparoscopic repair of abdominal wall border hernias is safe and feasible representing a very good option to have in a modern surgeon armamentarium.

354—HERNIA-ADHESIONS—Abdominal wall hernia

THE INCIDENCE OF COMPLICATIONS WITH USING VERESS NEEDLE IN PALMER'S POINT AND STRATEGIES TO AVOID COMPLICATIONS

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Introduction: As advances in laparoscopic skills and instrumentation evolve, increasingly complex procedures are being performed, yet most complications are associated with primary access. Gaining access into the abdomen has been the challenging issue in terms of complications. Risk increases in cases with previous surgery.
Post surgical adhesions occur in 70–95% of patients undergoing major GI surgery. The overall incidence of major injuries at the time of entry is 1.1/1000. Bowel injuries have occurred in 0.7/1000 laparoscopies and major vascular injuries in 0.4/1000 laparoscopies. Despite considerable advances in endoscopic techniques and instrumentation, inadvertent and potentially avoidable entry injuries continue to occur.
Objectives: Veress needle continues to be used in vast majority of smaller centres for creating pneumoperitoneum in ventral, umbilical hernia and in cases where there was a previous surgery and high chance of adhesions.
Retrospective data from case records and video reviews were used to critically analyse how the complications occurred and formulate guidelines to prevent them.
Materials and Methods: A total of 50 cases listed for diagnostic or operative laparotomy with a history of previous abdominal surgeries, where palmar point was used for veress needle insertion were studied. All cases were done between January 2017 to December 2018, the clinical data was filled in data sheets and results were analysed.
Exclusion criteria.

Splenomegaly.
Hepatomegaly.
Previous left upper quadrant surgery.

Results: 5 (10%) cases had complications requiring multiple attempts. In 3 (6%) cases the needle entered pericolic omentum, but there was no injury to the colon. In 1 (2%) case the needle caused extra-peritoneal pneumoperitoneum and in 1 (2%) case the veress needle grazed omentum near umbilicus and caused bleeding.
Conclusion: People with high BMI(> 28) has increased risk of organ injury with veress needle.
Large sagging abdomen changes landmarks.
In obese patients the point of initial entry was reassessed after surgery, the point was lateral to palmar point,So there was minimal space and more risk of injury.
Good relaxation is an absolute prerequisite.
We strongly advise marking all the landmarks before surgery.
All the tests like aspiration, drop suction and intra-peritoneal pressure readings should be done with each attempt.
When more than 2 attempts are taken, if uncertainty exists alternative approach to create pneumoperitoneum should be chosen for safety.

225—HERNIA-ADHESIONS—Abdominal wall hernia

EARLY AND DELAYED RECURRENCES AFTER LAPAROSCOPIC INTRA-PERITONEAL ON-LAY MESH REPAIR WITH A COMPOSITE IMPLANt. SERIES OF CLINICAL CASES

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Laparoscopic intra-peritoneal on-lay mesh repair (IPOM) has been widely disseminated as a method of umbilical and postoperative hernias treatment due to its technical simplicity, short mean operation time and good functional outcomes. Wide distribution of this surgical method and its application by surgeons without sufficient experience may potentially lead to various complications. Over the past 3 years, there were 11 cases of recurrence after IPOM performed for linea alba hernias (3), incisional hernias (6) and umbilical hernias (2) detected in Russian hospitals. The recurrence detection time varied from 1 month to 2 years. The pathogenesis and causes of recurrence were different. In one case, the hernia recurrence was accompanied by a small bowel strangulation which required urgent surgical procedure. In 4 reported cases there was no connective tissue between the parietal peritoneum and the implant accompanied by a omentum protrusion into thwe space above the implant detected. In 2 cases the mesh sizes did not correspond to the hernia defect width and there appeared recurrent hernias near the implants edge. In 3 cases mesh fixation with absorbable tacks lead to the mesh twisting. In 2 cases recurrence was caused by a mesh migration into incisional hernia sac. The recurrent hernias treatment in these clinical cases was different. In 5 cases extended totally extraperitoneal repair (eTEP) was performed, in 3 patients - open retromuscular sublay techuque, in the other three - laparoscopic intra-peritoneal on-lay mesh repair. There was no recurrence of hernias after surgery during the observation period. This series of clinical cases demonstrates the necessity of indications clarification for IPOM technique and its limitations.

206—HERNIA-ADHESIONS—Abdominal wall hernia

TOTALLY EXTRAPERITONEAL LAPAROSCOPIC SPIGELIAN HERNIA REPAIR

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Aims This video shows our technique to perform a totally extraperitoneal laparoscopic repair of a Spigelian hernia.

Methods: The patient is a 68-years-old man with several months' history of abdominal pain in the lower left quadrant associated with a non-reducible lump at the same level which increased in size with Valsalva maneuver. Abdominal CT scan showed the presence of a hernia sac protruding through a 2x3 cm fascial defect in keeping with Spigelian hernia. In addition, there was a femoral hernia on the same side.

The patient was scheduled for a totally extraperitoneal laparoscopic hernia repair. The patient was placed in supine position and three trocars were placed in the midline, in preperitoneal space. The dissection of the preperitoneal space was performed from medial to lateral using the scope and then laparoscopic instruments, identifying pubic bone and epigastric vessels. Laparoscopic exploration revealed the presence of a voluminous Spigelian hernia and a concomitant femoral hernia both on the left. The hernias were reduced showing two fascial defects. A 3D polypropylene mesh was placed to cover the defects. The mesh was fixed to pubic bone and anterior abdominal wall by tackers.

Results: The postoperative course was uneventful and the patient was discharged on the same day. On follow up visit there was good healing and no pain.

Emphasis Type="Bold">Conclusion: Totally extraperitoneal laparoscopic approach to Spigelian hernia is a safe and feasible procedure.

190—HERNIA-ADHESIONS—Abdominal wall hernia

"SLIM-MESH": 10-YEAR FOLLOW-UP STUDY ON INTRAOPERATIVE/SHORT/MID-TERM OUTCOMES IN 67 OVERWEIGHT/OBESE/SUPEROBESE PATIENTS

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Aims: We operated on a series of overweight/obese patients (Ov, BMI 25–29.9 kg/m^2/O, BMI 30–49.9) with ventral hernias (VH) using the sutureless "Slim-Mesh" technique (SM) in order to decrease operative time (OT) and intra (IO)/post-operative (PO) complications, as well as PO pain and recurrence (R).

Methods: Between September 2009 and November 2018, 67 consecutive Ov/O affected by VH were operated on at our center with SM. This was a prospective (65%)-retrospective study.

Results: Our study comprised 36 males and 31 females; mean age was 59 years old and mean BMI 31. There were 28 Ov, 28 Class I O (BMI 30.0–34.9), and 11 Class II O (BMI 35.0–39.9)-III O (BMI 40.0–49.9)-superobese (SO, BMI 50.0–59.9) patients. VH operative size (OS) was 3–10 cm (small/medium), 10–20 cm (giant) and $\geq$ 20 cm (massive) in 45, 17 and 5 cases respectively. Mean OT for Ov, Class I O, and Class II-III O-SO was 95, 103 and 103 min respectively. In 28% of cases, VH OS was larger than pre-OS, and in 16%, laparoscopy detected additional VH undetected by US and/or CT-scan.

A composite mesh and a non-composite mesh were used in 91% and 9% of cases respectively. Titan tacks and absorbable straps for mesh fixation were used in 15% and 85% of patients respectively. Mean hospital stay was 2.6 days. Mean follow-up time was 3.5 years (range, 1–10 years). There were 3 early (< 30 PO days) complications: 1 case of seroma, 1 case of transient abdominal pain, and 1 case of transient urinary retention. We found 5 late PO complications: 3 cases of VH R (4.4%), one of which underwent surgery, and 2 cases of trocar site hernia.

Conclusions: SM is compact, thus increasing intrabdominal visibility and operating space, which is raised to the abdominal wall front side, well-clear of the organs, reducing iatrogenic injuries when maneuvering and simplifying calculations of overlap size ($\geq$ 5 cm). This increased visibility also ensures optimal SM unrolling and tensioning. In our Ov/O patients, SM has reduced OT, recovery, IO/PO complications, and R rate. SM is safe, fast and easy-to-reproduce, even when treating Ov/O.

135—HERNIA-ADHESIONS—Abdominal wall hernia

LAPAROSCOPIC REPAIR OF RECURRENT LEFT-SIDED BOCHDALEK HERNIA COMPLICATED WITH ACUTE UPPER DIGESTIVE OBSTRUCTION

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Aims: Description of laparoscopic repair of a recurrent massive left-sided Bochdalek hernia in an adult patient who presented with an acute upper digestive obstruction due to gastric incarceration.

Methods: Single case review of an acute complication of a rare type of hernia in an adult patient. The clinical presentation is described along with chest X-ray and thoraco-abdominal CT scan images. Laparoscopic surgical repair is explained. A literature review of laparoscopic approach of Bochdalek hernias complicated with acute digestive obstruction is presented.

Results: After diagnosing the upper digestive obstruction with a CT scan, gastric decompression was achieved via endoscopy and placement of a nasogastric tube. Elective surgical repair was then performed via laparoscopy. Intraabdominal reduction of the herniated stomach, transverse colon and greater omentum was performed and the diaphragmatic defect was closed with a running 2–0 Prolene suture, reinforced with a non-absorbable DualMesh® attached to the diaphragm with 2–0 Prolene sutures and tacks. The patient had an uneventful postoperative recovery and clinical and radiologic controls were normal at 6 months.

The literature review showed that although most of the cases were approached by laparotomy and/or thoracotomy, the minimally invasive approach (laparoscopic and/or thoracoscopic) is feasible, with good results. The repair is usually performed with a non-absorbable suture reinforced with a non-absorbable mesh .

Conclusions: Acute presentation of a Bochdalek hernia in adults is a rare occurrence. In our case the patient presented with an acute upper digestive obstruction one year after the first laparoscopic hernia repair was performed. The recurrence was probably related with the type of repair at the index operation—defect closure with absorbable Maxon suture reinforced with a small TiO2 mesh (6x9 cm). The recurrent laparoscopic repair is possible although with significant additional difficulty due to the adhesions of the herniated viscera to the diaphragmatic defect. In conformity with the review literature, we consider that the use of non-absorbable suture and mesh reinforcement are mandatory. Although non-absorbable mesh was used in most cases, recently, biologic mesh reinforcement has been described, with good short-term outcomes.

853—HERNIA-ADHESIONS—Adhesions

ADHESIOLYSIS-RELATED DIFFICULTIES DURING RE-LAPAROSCOPY AFTER PRIOR VENTRAL HERNIA REPAIR WITH INTRAPERITONEAL ONLAY MESH

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Aim: The increasing number of patients with intraperitoneal mesh increases the chance for the surgeon to face with the need of re-laparoscopy for another pathology. The video recording that we are presenting highlights the issues encountered during access to the abdominal cavity and the overall difficulty we have encountered at re-laparoscopy while performing adhesiolysis to the intraperitoneal meshes.

Method: In our Center of Excellence for Abdominal Wall Surgery we have reviewed all documents and video recordings of the patients with laparoscopic re-exploration after prior ventral or incisional hernia repair. Main objectives were: the conversion rate, the surface of the mesh covered with adhesions, the adhesion's tenacity using the Jenkins's scale, operative incidents and perioperative complications.

Results: Indications for the 37 laparoscopic re-exploration were: recurrent or primary abdominal hernia repair (n = 13), mesh related sepsis (n = 6), occlusive syndrome (n = 8), bariatric surgery (n = 6) and other pathology (n = 4). Adhesions were found at the site of the intraperitoneal mesh in all cases but one. Intestinal adhesions were encountered in 15(40.5%) cases. The mean percentage of the area covered by the mesh was 70%. The mean of adhesions' tenacity was 3.0 ± 0.9, ranking from 0 to 4. Conversion to robotic surgery was needed in 2(5.4%) cases and to open surgery in 3(8.1%) due to difficult adhesiolysis. There were 6(16.2%) small bowel perforations. There were no major perioperative complications related to adhesiolysis.

Conclusions: The study demonstrates that the laparoscopic approach after previous IPOM is feasible but challenging. Adherences to the mesh are expected in the majority of the cases.

1365—HERNIA-ADHESIONS—Emergency surgery

MINIMALLY INVASIVE TREATMENT OF BOWEL OBSTRUCTION: STRATEGIC CONSIDERATIONS

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Aims: There are no clear recommendations for a minimally invasive or open treatment of acute bowel obstructions. We analysed all surgically treated cases of bowel obstruction within the past ten years to point out reasons for and results of minimally invasive and open surgery.

Methods: A total number of 106 patients was treated surgically for acute bowel obstruction (57 laparotomies, 21 multiport laparoscopies and 28 single port laparoscopies). All data was collected prospectively and analyzed retrospectively. This included patient´s demographic data, underlying disease, type of bowel obstruction, surgeons and assistants experience, time of surgery, conversion rates, complications, length of stay and restoration of bowel function.

Results: There is a correlation between surgeons personal experience, disease, BMI, time of surgery and patient´s medical history. Single adhesive bands are more often treated by minimally invasive surgery (28/53) and have a better outcome than complex adhesions. Besides sophisticated imaging, single port laparoscopy takes an important role in the evaluation of the pathology and can be a useful tool in experienced hands.

Conclusion: Bowel obstruction can be treated successfully by minimally invasive surgery with potentially favorable outcomes copmpared to open surgery. A history of previous abdominal surgery, BMI > 30 and time for surgery after 22 pm were reasons for primary laparotomy. These may be the facors to be tackled for an increase of minimally invasive procedures.

1335—HERNIA-ADHESIONS—Emergency surgery

PREDICTIVE ROLE OF SELECTIVE LABORATORY PARAMETERS FOR THE OCCURRENCE OF "UNWANTED EVENTS" IN THE PATIENT TREATED WITH LAPAROSCOPIC APPENDECTOMY

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The aim of our study is to measure the predictive role of certain laboratory parameters in recognizing the cases in which laparoscopic appendectomy (LA) would be associated with various kind of "unwanted events" such as: intraoperative difficulties, complications or conversion to open approach. We conducted a prospective, cohort, clinical study, between 2016 and 2018, in the Clinical hospital of Shtip and in the University clinic for digestive surgery, in Skopje. Exactly 75 adult patients with acute appendicitis (AA) and performed LA or conversion were included in the study. A total of 25 laboratory parameters were measured preoperatively in each patient. Intraoperatively for each patients the intraoperative difficulties were registered as well as any kind of intraoperative complication or the reason for conversion if present. Postoperatively each patient was followed on the 7-th and 30-th postoperative day for the presence of abdominal or extra abdominal complications. From the 75 (100%) participants in the study, 51(68%) were included in the group "without unwanted events" and 24 (32%) were included in the group "with unwanted events". The analysis indicated that there was no significant difference between the groups regarding the gender and the age of the patients. Regarding the 25 laboratory parameters the binary statistical analysis showed that there is significantly higher values of total bilirubin, sodium and C—reactive protein in the group "with unwanted events". Additionally, the multiple logistic regression analysis showed that the value of the total serum bilirubin is the only independent predictor for occurrence of "unwanted events" during LA. When deciding to utilize the laparoscopic approach in the treatment of AA, a close attention should be paid on the extremely high values of the CRP, high values of total serum bilirubin and high values of serum sodium. In such cases one should consider the possibility to use the open approach in the surgical treatment of AA or at least the laparoscopic exploration should be done in the presence of an experienced surgeon.

1191—HERNIA-ADHESIONS—Emergency surgery

SURGICAL AVAILABILITY OF LAPAROSCOPIC APPROACH IN STRANGULATED SMALL BOWEL OBSTRUCTION

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Aim: Strangulated small bowel obstruction (SBO) is the disease which surgeons need to undergo emergency surgery rapidly. Because, in this condition, the blood flow to the small bowel is interrupted and the bowel is exposed to high risks of necrosis. In this study, we examined the availability of laparoscopic surgery in strangulated SBO.

Method: We reviewed the medical records of 25 patients who underwent surgery for strangulated SBO between June 2017 and November 2019. We separated 25 cases to two groups, laparoscopic group (LG) and open surgery group (OG). The patients who underwent laparoscopic surgery and completed (7 cases) were included to laparoscopic group. The other patients who underwent laparoscopic surgery required conversion to open surgery (8 cases) and open surgery from the first (10 cases) were included to open surgery group. We made a comparison of operation time, perioperative blood loss, postoperative complications and length of hospital stay between the two groups.

Result: Patients backgrounds as age, sex, preoperative laboratory data (WBC, CRP, LDH), and the time from pathogenesis to operation ware not statistically different between two groups. In laparoscopic group, all patients were avoided from bowel resection. On the other hand, in open surgery group, 15 patients were undergone bowel resection. The medians of operation time were 57 min (LG) and 105 min (OG). Postoperative complications in LG and OG were 0 cases and 13cases. The details of complications were postoperative bowel obstruction (5 cases), surgical site infection (2 cases), dysfunction of kidneys (2 cases), cardiac failure (1 case), anemia (1 case), pneumonia (1 case), and bladder inflammation (1 case). The medians of length of stay were 11 days (LG) and 24 days (OG). And the medians of perioperative blood loss were 35 ml (LG) and 148 ml (OG). The three factors (operation time, postoperative complications, length of hospital stay) were shown the significance of difference ($p = 0.015$, 0.005, 0.001). However, perioperative blood loss was not shown the difference ($p = 0.084$).

Conclusion: The cases which we can select and complete laparoscopic surgery lead a good outcome in comparison with open surgery. Laparoscopic surgery was considered as a first choice in selected patients with strangulated small bowel obstruction. And early diagnosis is important to bring an opportunity starting surgery with laparoscopy.

1100—HERNIA-ADHESIONS—Emergency surgery

NEW RISK FACTORS FOR POST-OPERATIVE INTRA-ABDOMINAL ABSCESS AFTER LAPAROSCOPIC APPENDECTOMY FOR DIFFUSE APPENDICULAR PERITONITIS

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Background: The high risk of formation post-operative intra-abdominal abscesses (IAA) is one of the limiting factors for the use of laparoscopic surgery for diffuse appendicular peritonitis (DAP).

Aim: To evaluate risk factors of IAA in cases of DAP, that can be the basis for reducing this serious complication.

Methods: Risk factors for the development of 15 IAA were studied in 231 operated patients with DAP. Standardised operative technique was used for all patients with DAP. In addition to the 10-mm optical trocar, two trocars were used: 5 mm in the suprapubic position and 5 mm in the right mid-abdomen (SAGES 1) - 152 patients or LLQ (SAGES 4) - 79 patients according to the discretion of the operating surgeon. Demographics, clinical and intraoperative variables were analyzed. Independent risk factors for postoperative IAA were determined by logistic regression analysis.

Results: Mean age was 43.4 ± 18.4 years. 117 (50.6%) patients had perforated appendicitis. The mean operative time was $87 + 37$ min. There were no deaths. 15 patients (6.5%) experienced intra-abdominal abscess (IAA); 8 of those were treated conservatively. The mean length of hospital stay was 7.74 ± 3.8 days. Perforated appendicitis (OR 9, 95% CI 1.7–47.2, $p = 0.009$), SAGES 4 laparoscopic approach (OR 6.7, 95% CI 1.5–30.9, $p = 0.01$), and number of drains (< 2) (OR 10.3, 95% CI 1.2–91.5, $p = 0.04$), were found to be significant predictive factors for IAA in multivariate analyses.

Conclusion: For the first time one of the type of laparoscopic ergonomics (sectorisation) were determined as risk factor for the formation of IAA in DAP.

945—HERNIA-ADHESIONS—Emergency surgery

ASSESSMENT OF EFFICACY, EFFICIENCY AND SAFETY OF LAPAROSCOPIC PROCEDURES IN DIFFUSE PERITONITIS

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Aims: The aim of this study was to assess the usefulness, efficacy, efficiency and safety of laparoscopic procedures during treatment of severe, diffuse peritonitis.
Methods: The study encompassed 145 patients with mean age 67,2, age range 24–101 years old admitted with acute, diffuse peritonitis to General Surgery And Polytraumatic Injury Department of University Hospital in Kraków, Poland between 2013 and 2018. 99 (68,2%) cases underwent laparotomy, 21 (14,5%) patients were treated laparoscopically and in 25 (17,3%) of persons there was a necessity of conversion from laparoscopic to open surgery. Exclusion criteria consisted of acute appendicitis, acute cholecystitis and ruptured gastric or duodenal peptic ulcer that were primary qualified to respective laparoscopic procedures.
Results: In our study group cases underwent laparoscopic procedures due to peritonitis with unknown reason and perforated sigmoid colon. Conversion to open surgery was performed in case of perforation of any part of gastrointestinal tract or because of genitourinary infection. Mortality during laparoscopic procedures was 0%, in converted surgery 28% and in primary open procedures 46%.
Conclusions: Laparoscopic procedures in the course of diffuse peritonitis are safe and with very low mortality rate. However their usefulness in terms of contemporary medical technology and medical staff skills is limited.

487—HERNIA-ADHESIONS—Emergency surgery

EMERGENCY SURGERY IN THE ELDERLY: IS THE ATTITUDE CHANGES CAUSE LAPAROSCOPY?. A 2 YEARS PROSPECTIVE FOLLOW-UP IN 120 CONSECUTIVE PATIENTS

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Aims: World population is becoming rapidly ageing in Western Countries (1). At the same time these demographic modifications are changing the setting of emergency abdominal surgery in elderly. For this reason, the attention for treatments in the elderly urgent surgical patients is growing (2, 3). The typical diagnoses nowadays include acute incarcerated hernia, cholecystitis, bowel obstruction, colic obstruction and acute appendicitis (4). Despite it, still little is reported about remote follow-up. The aim of this study is a 2-year prospective follow-up evaluation of mortality in patients treated with urgent surgical intervention in our department.
Methods: This is a prospective observational single - centre study which included 120 patients over 65 years old, treated in our department between July 2016 and October 2017 (15 months) for surgical Abdominal emergencies. The date of last contact was the 31st October 2019. We followed patients during this time with remote callings every 6 month. We considered number of death at 2 years, their cause and relationship with admittance diagnosis, ASA Score and complications.
Results: In 120 consecutive patients, 70 (58.3%) were males and 50 (41.7%) were females. The most common diagnoses were: cholecystitis (n: 43, 35,8%), colic obstruction (n: 32, 26,7%), ileal obstruction (n: 19, 15,8%), inguinal hernia obstruction (n: 13, 10,8%), appendicitis (n: 10, 8,4%) and incarcerated abdominal wall hernia (n: 3, 2,5%). In 70 (58,4%) cases, patients were treated with laparoscopic approach, in 49 (40,8) cases with laparotomic approach, only in 1 (0,8%) case surgery was converted from laparoscopic to laparotomic. At 2 years follow-up 86 (71.6%) patients were alive and 34 (28,4%) were dead. We analyzed data with statistical Chi square considering $p < 0.05$ as significant. The univariate analysis showed that mortality at 2 years is correlated with type of illness with p 0,000045, type of surgery (laparoscopic VS laparotomic) with p 0,02, ASA Score with p 0.0005 and complications occurred after surgery with p 0.044.
Conclusions: Long-term follow-up can be a useful tool to identify a better surgical approach and to confirm the value of the laparoscopic one in the elderly.

References

1. Christensen K, Doblhammer G, Rau R, Vaupel JW (2009) Ageing populations: the challenges ahead. Lancet 374:1196–1208.
2. 4. Kettunen J, Paajanen H, Kostiainen S (1995) Emergency abdominal surgery in the elderly. Hepatogastroenterology 42: 106–108.
3. Emergency Abdominal Operations in the Elderly: A Multivariate Regression Analysis of 430 Consecutive Patients with Acute Abdomen. Ukkonen M, Kivivuori A, Rantanen T, Paajanen H. World J Surg https://doi.org/10.1007/s00268-015-3207-1.
4. Miettinen P, Pasanen P, Salonen A, Lahtinen J, Alhava E (1996) The outcome of elderly patients after operation for acute abdomen. Ann Chir Gynaecol 85:11–15.

392—HERNIA-ADHESIONS—Emergency surgery

MINIMALLY INVASIVE METHOD FOR THE DIAGNOSIS AND TREATMENT OF NON-COMMUNICATED POSTHAEMORRHAGIC HYDROCEPHALUS IN INFANTS

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Keywords: Ventriculoperitoneal shunting, ventriculosubgaleal drainage, posthaemorrhagic hydrocephalus, intraventricular haemorrhage.

Actuality: A major role in the development of hydrocephalus is played by intraventricular hemorrhage (IVH), their frequency currently ranges from 36 to 53%, reaching 70% among premature babies. The problem of treating hydrocephalus remains relevant at all stages of development of modern pediatric surgery. According to the literature, the frequency of occlusal posthaemorrhagic hydrocephalus (PHH) is: from 1 to 10 cases per 1000 newborns. Currently, the problem of IVH in newborns is acquiring special significance for the Republic of Kazakhstan in connection with the adoption of laws on the need for nursing infants with extremely low body weight (from 500 gr), in connection with the transition of Kazakhstan to international criteria for live birth and stillbirths.

Objective: To improve the results of treatment of children with occlusive hydrocephalus, which developed against the background of intraventricular bleeding.

Materials and Research Methods: Evans Index, CT, MRI, NSG, CSF, PCR, Apgar score, clinical and laboratory studies. The studies are based on an analysis of the results of treatment and examination of 92 patients with posthe,orrhsgic hydrocephalus. The examined patients were hospitalized urgently at the "City Children's Hospital No. 2" in Nur-Sultan in the Department of Neurosurgery for the period 2009–2019.

Results: The first group included 25 children with IVH grade 3–4, treated by external drainage and ventricular puncture + diuretics. Diuretics were used as symptomatic therapy, the basis of which was dehydration therapy - diacarb of 20–30 mg/kg in combination with potassium preparations (aspartame). Of the 25 children, 14 (56%) children survived (1A subgroup); 11 (44%) (1B subgroup) of them recorded a fatal outcome, which was caused by severe brain damage due to progressive hydrocephalus and concomitant multiple congenital malformations. The second group included 30 children, the treatment tactics of which consisted in the installation of ventriculosubgaleal drainage followed by ventriculoperitoneal shunting. Of the 30 children, 28 (93.3%) children (2A subgroup) survived, fatal outcome occurred in 2x (6.7%) children (2B subgroup). In 35 newborns with occlusion of the cerebrospinal fluid tract on the background of IVH grade 3–4. Ventriculosubgaleal drainage with intrathecal injection of thrombolytic agents into the subgaleal pocket was included in their treatment regimen. Of the 36 newborns, 35 (97.1%) children (3A subgroup) survived, fatal outcome was observed in 1 (2.9%) child (3B subgroup).

Conclusions: A combined technique has been developed for the treatment of posthemorrhagic hydrocephalus that developed against the background of intraventricular hemorrhage, based on the removal of excess cerebrospinal fluid by ventriculosubgaleal drainage and subsequent lysis of thrombotic masses.

319—HERNIA-ADHESIONS—Emergency surgery

OUR EXPERIENCE WITH DIAPHRAGMATIC HERNIAS

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Adult onset diaphragmatic hernias is rare. It was first described by Vincenz Alexander Bochdalek in 1848 and first repaired in 1901. Posterolateral Bochdalek diaphragmatic hernia is the most common congenital diaphragmatic hernia in literature. Right sided diaphragmatic hernia is even rarer with less than 20 cases reported till today. Traditionally, diaphragmatic hernia have been repaired by laparotomy or thoracotomy. Minimal access surgery using laparoscopy and thoracoscopy are newer modalities in the repair of diaphragmatic hernia providing comparable results with less recovery time and hospital stay. We present a retrospective case series of 5 years at Sir JJ Group of Hospitals, Mumbai on laparoscopic and thoracoscopic management of diaphragmatic hernia with the aim to establish that endoscopic repair of diaphragmatic hernia as a safe and effective modality of surgical treatment. 17 patients with CT proven diaphragmatic hernia were operated in the last 5 years. Laparoscopy and thoracoscopy were used in tandem in the surgeries. Outcome of surgery in terms of morbidity and mortality and post op complications were recorded. Of the 17 patients operated, 1 had right sided hernia. 2 patients presented in emergency with tension gastrothorax. Mini thoracotomy had to be performed for in patient for suturing the hernial defect. Composite mesh was placed for all patients with defect size greater than 4 cm.Screening for recurrence was done with chest radiographs and post op CT scan and no recurrence was noted in any patients at 6 months. Owing to risk of strangulation and intestinal obstruction, all cases of diaphragmatic hernia should be operated at the time of diagnosis. Use of composite mesh is a good option for repair of diaphragmatic hernia of size > 3 cm. Endoscopic repair is a safe and feasible option for management of diaphragmatic hernia. However, dearth of cases limits the learning curve.

299—HERNIA-ADHESIONS—Emergency surgery

DIAPHRAGMATIC EVENTRATION- A 6 YEAR EXPERIENCE IN THORACOSCOPIC REPAIR (GRANT MEDICAL COLLEGE & SIR JJ GROUP OF HOSPITALS, MUMBAI)

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Introduction: Eventration of diaphragm is an abnormal elevation of one of the segments presenting with distressing symptoms.

Aim: To assess the feasibility of various options pertaining to the repair by an entirely thoracoscopic approach.

Materials/Methods: Plication alone v/s endostpaler alone v/s combined endostpaler + plicaton were compared and followed up for any recurrence or complications.

Results: We found no recurrence in the 14 cases of the hybrid subset as compared to almost 50% recurrence rates in the stapler alone & plicaton alone group.

Conclusion: A hybrid technique of endostpaler resection of redundant diaphragm, over sewing of the stapled line followed by a graded plicaton should be employed to deal with the diaphragmatic eventration cases, yielding excellent results on a long term follow up.

211—HERNIA-ADHESIONS—Emergency surgery

LAPAROSCOPIC MANAGEMENT OF INTESTINAL OBSTRUCTION AFTER TOTALLY EXTRAPERITONEAL LAPAROSCOPIC INGUINAL HERNIA REPAIR

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Aims: Small bowel obstruction is a rare complication of totally extraperitoneal laparoscopic hernia repair (TEP) described in several case reports and case series. The suggested mechanism of intestinal obstruction is the combination of a peritoneal defect and the rapid evacuation of intra-abdominal pneumoperitoneum which causes bowel herniation. This video shows a case of this complication with laparoscopic management of intestinal obstruction after TEP.

Methods: The patient is a 52-years-old man, who underwent a bilateral TEP laparoscopic inguinal hernia repair, without intraoperative complications. The patient was discharged seven hours after surgery.

Thirty-six hours after discharge, the patient was re-admitted due to the onset of abdominal pain and distention associated with nausea and vomiting. Abdominal CT scan with contrast showed the presence of dilated small bowel loops with concentric wall thickening and non-dilated colon. Pelvic CT scan slices revealed a small bowel loop in the pre-peritoneal space, compressing the bladder.

The patient was scheduled for an urgent exploratory laparoscopy. He was placed in supine position and three 5 mm trocars were used.

The diagnostic laparoscopy confirmed the herniation of small bowel loops into the extraperitoneal space through a peritoneal defect which was not identified during the original surgery.

The small bowel loops were reduced into the abdominal cavity, showing the peritoneal tear. Two more smaller peritoneal lacerations were identified: one on the right side and another one on the left side. All the tears were repaired through a running suture with a barbed suture. The integrity and the vascular supply of the herniated bowel loops were verified before pneumoperitoneum evacuation.

Results: The postoperative course was uneventful and the patient was discharged on post-operative day two.

Conclusion: Laparoscopic management of intestinal obstruction after TEP laparoscopic hernia repair is a safe and feasible procedure, maintaining the benefits of minimally invasive approach. In case of peritoneal tear, techniques of prevention of intestinal obstruction are pneumoperitoneum evacuation through a Verres needle and the possibly repairing of peritoneal tear, even if some authors do not agree on the last technique. The diagnosis should be suspected in patients presenting with obstructive symptoms following TEP repair.

39—HERNIA-ADHESIONS—Emergency surgery

RIGHT INCARCERATED DIAPHRAGMATIC HERNIA WITH COLONIC PERFORATION IN A CIRRHOTIC PATIENT

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Aim: Traumatic diaphragm injuries are usually an early surgical indication to avoid early affectation of other vital organs. Sometimes the diagnosis can go unnoticed, especially if there is an unknown previous traumatic injury. This video presents the case of an incarcerated right diaphragmatic hernia in a patient with alcoholic cirrhosis, who had had a previous unknown diaphragmatic injury. Clinical manifestation and diagnostic tools are explained in detail, as well as the surgical technique in the laparoscopic approach.

Clinical Case: We present a 58-year-old female with medical history of alcoholic liver cirrhosis, with a daily consumption of 7 SDU. In 2014, she suffered an accidental fall on his own height with right rib trauma associated. She consulted the emergency department for chest pain, general discomfort and dyspnea. Traumatic pneumothorax was confirmed by urgent chest X-ray. After placement of pleural drainage, she presented clinical improvement with resolution of respiratory compromise. A CT scan was performed without reveling signs of active bleeding, but showing signs of chronic liver disease with ascites fluid, previously unknown.

Years later, the patient consulted the emergency department in 2019 for constipation, nausea, progressive dyspnea and fever. Laboratory test showed an elevation of acute phase reactants, without leukocytosis. Chest X-Ray revealed a right diaphragmatic hernia containing the colon and associated right pneumothorax. Based on the findings, an urgent thoracoabdominal CT was performed, reporting a large incarcerated right diaphragmatic hernia containing the hepatic flexure of the colon, with signs of parietal injury. Radiological findings suggested a perforation of the colon to the thoracic cavity. Given the findings, urgent surgical treatment was indicated.

Methods/Results: The patient is placed in 45° left lateral recumbent position. An exploratory laparoscopy is performed, identifying intraoperatively a right pleuritis and peritonitis with a huge right diaphragmatic hernia which contains hepatic flexure of the colon and the greater omentum. A laparoscopic reduction of the content is performed. The diaphragmatic defect measures 7 cm x 5 cm. Because of the morphology of the hole, an inverted T-shaped phrenorraphy is performed using a continuous monofilament polypropylene suture. After closure of the diaphragmatic hole, a partial resection of the hepatic flexure with right end-colostomy is performed. The patient stayed hemodynamically stable without vasoactive support and correct ventilation and oxygenation. She was moved to the surgical-ICU for postoperative evolution, because of the risk of cirrhotic decompensation.

During the postoperative period, the patient presented an ascitic decompensation that required a prolonged hospital admission. She remained afebrile, without infectious intra-abdominal complications and correct oral intake. Finally, she was discharged on the 21st postoperative day. CT-scan was performed at 7th month after surgery, showing a correct resolution of the diaphragmatic without signs of recurrence, and no intra-abdominal collections.

Conclusion: Laparoscopy is a safe approach in the urgent treatment of hernias, as it can facilitate access to narrow and difficult spaces, as well as reduces surgical aggression and morbidity.

References

1. Crandall M, Popowich D, Shapiro M, West M. Posttraumatic hernias: historical overview and review of the literature. Am Surg. 2007;73(9):845–850.
2. Macfarlane R, Pollard S. Traumatic rupture of the diaphragm. Br J Hosp Med. 1987;37(5):418–420.
3. Maekawa T, Yabuki K, Satou K, et al. A patient with a traumatic right diaphragmatic hernia occurring 4 years after sustaining injury–statistical observations of a delayed diaphragmatic hernia caused by uncomplicated injury in Japan. Nihon Geka Hokan. 1997;66(4):116–125.

1558—HERNIA-ADHESIONS—Inguinal hernia

THE NEW GOLD STANDARD IN HERNIA SURGERY? NEEDLESCOPIC MINI-SCAR-LESS (MSL) TOTALLY EXTRA PERITONEAL (TEP) INGUINAL HERNIA REPAIR

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Aim: Since the first TEP (Totally Extra Peritoneal) hernia repair was performed by Dulucq in 1988 there has been little improvement in the surgery. The cosmesis though excellent and pain scores in the lower third of the scale still needed improvement. We aim to demonstrate the TEP hernia repair can be improved to such an extent that total incision can be reduced to nearly 1 cm while maintaining the effectiveness of the original procedure. We aim to prove through meta-analysis that TEP repair should be the gold standard in bilateral inguinal hernia repairs and further demonstrate the benefit to the patient of Mini-Scar less (MSL) TEP repairs.

Method: Meta-analysis of data from 2004 to present to review the prevalence of groin hernia repairs both in the United Kingdom as well as globally. Additional research with regards to duration of hospital stay, intra-operative complication rates, post-operative pain and patient satisfaction to specifically compare surgical outcomes of open groin hernia repairs with TEP repairs. A subsequent prospective cohort study dealing with a central demographic aged 35–65 years is currently being conducted. Enrolment of participants from 3 tertiary level care centres within Dubai, United Arab Emirates is allowing us to compare patient outcome of our new surgical technique MSL TEP to the currently more popular open hernia repair.

Results/Conclusions: Groin hernia repairs account for over 20 million surgical procedures annually worldwide. Nearly 85,000 groin hernia surgeries are carried out annually in United Kingdom; less than 10% of these operations are carried out laparoscopically, the rest are done with open conventional technique. Laparoscopic surgery brought a major advancement in the field of surgery by reducing the trauma to the patient and improving the immediate, short, medium- and long-term outcomes of the patient and of course better cosmesis. Our prospective cohort study is demonstrating that to continue along this trend of improving upon laparoscopic surgery in the field of groin hernia repairs is benefitting our patients, not only in terms of cosmetic outcome but as well as clinical results.

1531—HERNIA-ADHESIONS—Inguinal hernia

TEP (LAPAROSCOPIC TOTALLY EXTRA-PERITONEAL HERNIA REPAIR) AS A SOLUTION FOR RECURRENT BILATERAL INGUINAL HERNIA

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Aim: to describe the feasibility and steps of totally extra-peritoneal hernia repair (TEP) for repairing recurrent bilateral inguinal hernia.

Methods: 32 year old male presented with bulge and mild pain over bilateral inguinal region of a year's duration, following bilateral inguinal hernia repair done in the past. After confirming diagnosis of bilateral recurrent inguinal hernia by imaging, he was taken up for surgery. TEP (Laparoscopic totally extra-peritoneal hernia repair) was performed in usual way. The adhesions were tackled by a combination of sharp and blunt dissection, with use of energy resources as required. Following identification of landmarks in preperitoneal space and confirmation of adequacy of dissection, bilateral placement of 15 cm x 15cms Polypropylene mesh, one on each side with overlapping in midline, was performed.

Results: Quick recovery with ambulation on the day of surgery and discharge next day. The follow-up on day 7 for suture removal and telephonic follow-up at 6 months were free of postoperative complications or recurrence.

Conclusions: TEP (Laparoscopic totally extra-peritoneal hernia repair) is feasible for recurrent bilateral inguinal hernia and has advantage of quick recovery without any complications or recurrence.

1462—HERNIA-ADHESIONS—Inguinal hernia

EXTRAPERITONEAL LAPAROSCOPIC APPROACH TO GIANT SCROTAL INGUINE BLADDER HERNIA

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Introduction: Inguinal hernia (IH) repair is the most frequently performed procedure in general surgery. The life risk of the occurrence of IH is estimated at 27% in men and 3% in women. The standard methods for IH repair had few changes over the years until the introduction of the LPS. TEP allows exploration, dissection and reduction of the hernia sac (HS) and its content and allows the placement of the mesh without entering the abdominal cavity.This minimal invasive intervention has been confirmed as an effective procedure in several studies but is considered technically demanding.The most important advantage is minimal invasive access without the need to open the peritoneum, with a lower risk of abdominal organs injury.This procedure facilitates shorter recovery time, less postoperative pain, earlier discharge form hospital and minimize the costs. Objectives:We were looking to improving the outcomes in patients with IH by application of advanced minimally invasive procedures.We want to present a case of giant IH with ureteral and bladder content without the presence of peritoneal sac, which in these cases facilitates surgical intervention by extra-peritoneal route regardless of size.

Materials and Methods: We present the case of a patient, a 66-year-old male, active smoker. BMI of 32.And a giant IH scrotal with long evolution.He comes to outpatient clinic complaining of difficulty urinating, sensation of incomplete emptying and urinary frequency.Complementary tests are initiated to complete diagnosis, where left ureter hydronephrosis is evidenced due to large left scrotal inguine bladder hernia.TAC shows:Large left scrotal inguine hernia with bladder and left ureteral meatus and condition severe ipsilateral hydronephrosis ureter by compression of the meatus at the level of the inguinal canal.Thickening of diffuse edematous appearance of herniated bladder wall.It was decided to perform a TEP.

Results: Performing a TEP by 3 of 12 mm trocars. It begins with a small incision about 2 cm below the umbilicus. Next step was retracting the rectus muscles and create a space between the peritoneum. This preperitoneal space is created with blunt dissection with the trocar and the expander balloon. Two additional ports in the midline between the umbilicus and pubis symphysis. Important steps is to identify the hypogastric vessels, pubic bone, spermatic cord to minimize the risk of hemorrhage, and iatrogenic lesions. Identify the HS, carefully dissected and retracted in one direction. Avoid the tearing of the HS, it may lead the abdominal cavity to fill with gas and produce significant reduction of the operating field or produce a lesion in the bowels.In this case, one of the greatest difficulties was the presence of a giant IH that included the presence of the urinary bladder.The IH was dissected with great difficulty, avoiding at all times not to injure the bladder.The identification of the HS and the spermatic cord was achieved thanks to a very careful dissection.Methylene blue was instilled into the urinary catheter to ensure that there was no perforation of the urinary bladder. And finally, an auto fixable mesh of Progrip of 10*15 cm was placed, depends of the size of the hernia, most of the time we didn't fixed the mesh with any suture to reduce the pain and perioperative complications. And then we facilitate the removal of gas from the preperitoneal space.Operating time of one hour and 30 min and low blood loss.The patient presented a correct post-operative evolution.With a 2 day hospital stay. No post-operative complications.

Conclusions: The LPS approach by totally extraperitoneal vision seems to be a safe and effective technique. An effective surgical technique should be characterized by a low complication rate, short learning curve, short recovery time, and cost effectiveness and in this cases TEP presents these characteristics. No method is suitable for all kinds of hernias. Technique needs to be standardized and centralized.

843—HERNIA-ADHESIONS—Inguinal hernia

TAPP VS TEP– STUDY REGARDING SURGEONS PREFERENCE

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Background: TAPP and TEP are trusted surgical techniques for minimally invasive treatment of inguinal hernia. TEP technique has the advantage of requiring shorter OR, but TAPP technique has a shorter learning curve. Both procedures have similar outcomes.
Aims: To evaluate surgeon's preference for either techniques, their experience and their opinion on the use of laparoscopic inguinal hernia repair.
Materials and Methods: We asked 20 surgeons form 4 hospitals to watch videos of 5 TEP and 5 TAPP videos performed by the same teams and to complete a survey. The survey included questions related to their previous surgical experience emphasizing laparoscopic experience, knowledge of literature, opinion on minimally invasive hernia repair and their opinion on the videos. We analysed their answers in order to identify correlations between their answers and the surgery they usually perform.
Results: Out of 20 surgeons only 15 were in favor of minimally invasive hernia repair. Of these 15 only 9 perform it on a regular basis, the other 6 perform it only in selected cases. The surgeons that preferred the minimally invasive surgery had the following characteristics: age < 50 years, surgeons with a higher percentage of laparoscopic procedures (any laparoscopic surgery) performed, had read more than 5 articles/studies on minimally invasive surgery in the last 2 years. The TAPP procedure was favored mainly because the TEP procedure seemed more difficult to perform.

822—HERNIA-ADHESIONS—Inguinal hernia

LAPAROSCOPIC TOTALLY EXTRA-PERITONEAL REPAIR (TEP) FOR A MULTI RECURRENT INGUINAL HERNIA PREVIOUSLY TREATED WITH ANTERIOR AND POSTERIOR APPROACHES

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Aims: Recurrent groin hernias remain a major health problem. Currently, recurrence rate is estimated to be as high as 15% and could vary considerably according to the length of follow-up and the setting in which surgery is performed (emergency or elective). Recurrent hernias differs markedly from a primary hernia in terms of prognosis and outcomes, mainly because tissues are scarred or destroyed. European and international guidelines recommend a posterior approach, either open or laparoscopic, if the primary hernia was treated with an anterior approach. The opposite is recommended if primary repair was posterior. When an anterior or posterior repair fails, a tailored management is urged, dependent upon the previous interventions and the significance of the recurrence. With this video, we aim to demonstrate the feasibility of a laparoscopic totally extra-peritoneal repair (TEP) for the treatment of serially recurrent inguinal hernia.
Methods: An 88-year-old man presented in the outpatient clinic with a symptomatic right inguinal hernia. The patient underwent three hernia repairs previously. The primary hernia was treated by a tension-free anterior approach. Afterwards, he presented a recurrence that was repaired with an open pre-peritoneal approach. Subsequently, an open anterior repair was performed for a second recurrence, after which a new early recurrence occurred. We performed a laparoscopic totally extra-peritoneal repair in an elective setting, evidencing multiple attachments to the previous preperitoneal mesh and a great femoral defect together with a small inguinal hernia. A self-fixating mesh was placed covering all the defects completely.
Results: total operative time was 105 min. The patient started oral intake within the first 24 h after surgery. Excellent postoperative pain control was observed. No complications were seen during admission. Patient was discharge on the 2nd postoperative day. No recurrences were evidenced during follow-up.
Conclusion: laparoscopic total extra-peritoneal approach allows to repair all the groin hernia defects and could be an appropriate option for cases where preperitoneal meshes were placed before.

808—HERNIA-ADHESIONS—Inguinal hernia

SUTURE AND FIXATION OF THE TRANSVERSALIS FASCIA DURING R-TAPP: CAN WE PREVENT SEROMA FORMATION AFTER DIRECT INGUINAL HERNIA REPAIR?

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Aim: The aim of this study was to investigate the incidence of postoperative seroma in direct hernia robot-assisted TAPP repair (R-TAPP), modified by suturing and fixating the trasversalis fascia to the Cooper ligament.

Methods: The study was approved by the local ethic committee (2019-01132 CE 3495). Patients undergoing R-TAPP for direct inguinal hernia from October 2017 to December 2019 were included. In all patients a barbed running suture of the transversalis fascia was performed to close the cavity resulting from the hernia reduction and to fix the it to the Cooper ligament. A light-weight mesh was used and kept in place with absorbable sutures. Patients were planned to stay overnight in hospital and after discharge were systematically followed-up over the time. Demographic and clinical data were retrospectively collected in a database and further analysed.

Results: Over the study period, 148 consecutive patients (191 R-TAPP) with inguinal hernias were operated on. Among those, 67 were direct or combined hernia. All patients were male, with a mean age of 63.1 ± 12.7 years. There was one case of conversion to open surgery because of adhesions of the caecum to the groin as result of neonatal perforated appendicitis. The mean length of hospital stay was 1.8 ± 0.6 days. After discharge, no cases of seroma or recurrence at 30 days, nor chronic pain at a mean follow-up of 10.3 ± 6.8 months were detected.

Conclusions: In the treatment of direct inguinal hernia with R-TAPP, suturing and anchoring the transversalis fascia to the Cooper ligament is safe, feasible and recommendable in order to prevent postoperative seromas.

676—HERNIA-ADHESIONS—Inguinal hernia

MANAGEMENT OF NON-REDUCIBLE PERITONEAL SAC OF A GIANT INGUINOESCROTAL HERNIA BY TEP APPROACH

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Aims: This video aims to demonstrate that giant inguinoescrotal hernias can be surgically repaired using laparoscopic totally extraperitoneal (TEP) approach.

Methods: A 42-year-old male with a clinical history of hypertension and a surgical history of an open appendectomy. He presented in the emergency department with a symptomatic right inguinoescrotal hernia, but not complicated. Afterwards patient was evaluated in the outpatient clinic and it was decided to perform an elective TEP repair.

Results: Through an infraumbilical incision a dissection balloon was placed to dissect the preperitoneal space after which an 11 mm optical trocar was placed. Two more trocars were positioned in midline (5 mm and 11 mm). Dissection of the preperitoneal space was completed and allow to visualize the myopectineal orifice (MPO). Additional hernias were assessed in its potential formation sites (direct, indirect, femoral and obturator spaces). In this case, we identified a lateral hernia (L2P). We performed blunt dissection in order to reduce the sac. As it was technically impossible to reduce it after several maneuvers, we decided to section it. Spermatic cord elements were individualized. Before sectioning the peritoneal sac, we ruled out the presence of any abdominal content. Afterwards, we grasped it with a clinch in which a pre-tied suture of Propylene was inserted, allowing for a complete closure of the sac avoiding the peritoneal cavity to be filled with pneumoperitoneum, which might cause technical difficulties. After section the sac, we reinforced the MPO using a polypropylene self-fixating mesh. Operative time was 25 min and the patient was discharged after three hours. No complications were seen during the surgery or postoperative follow-up.

Conclusion: Laparoscopic totally extraperitoneal (TEP) approach is a safe and feasible procedure to operate giant inguinoescrotal hernias. The implementation and results of this approach should be investigated in clinical series.

605—HERNIA-ADHESIONS—Inguinal hernia

POLYTETRAFLUOROETHYLENE VERSUS POLYPROPYLENE MESH DURING LAPAROSCOPIC TOTALLY EXTRAPERITONEAL REPAIR OF INGUINAL HERNIA. A RANDOMIZED CONTROLLED TRIAL

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Aims: Pain and discomfort after inguinal hernia repair could depend on mesh material used. Lighter material or different pore size could improve patients' recovery but increase recurrences. It is important to identify how materials could affect the postoperative results. The aim is to compare large pore polytetrafluoroethylene mesh (LP-PTFE) versus small pore polypropylene mesh (SP-PPL) in terms of postoperative acute and chronic discomfort and pain, difficulty in mesh handling during surgery, and long-term recurrence rate.

Methods: A prospective, double blind randomized controlled trial (ClinicalTrials.gov Identifier: NCT02023203) is performed enrolling 52 patients with bilateral hernias. Each hernia, in the same patient, was randomized to receive either LP-PTFE or SP-PPL mesh during totally extraperitoneal (TEP) laparoscopic hernia repair. Patients were followed with office visits at 7 days, 1, 3, 6, 12 and 60 months after surgery.

Results: For discomfort, median visual analogue scale (VAS) score in case of SP-PPL was significantly higher than LP-PTFE at 1 month ($p = 0.003$) and at 3 months after surgery ($p = 0.003$). Evaluating pain at movement, LP-PTFE showed significantly lower median score than SP-PPL at 7 days after surgery ($p = 0.025$). Testicular pain was lower in case of LP-PTFE than SP-PPL at 7 days ($p = 0.005$), 1 month ($p = 0.004$) and 3 months after surgery ($p = 0.004$). No other statistically significant differences were observed. Difficulty in mesh handling was significantly higher with LP-PTFE (mean 3.92 ± 1.82 versus 2.57 ± 1.1, $p = 0.001$). The mean time for mesh placement for LP-PTFE and SP-PPL was 3.21 ± 2.1 and 2.51 ± 1.45 min, respectively ($p = 0.64$). Sixty months after surgery, 1 recurrence was observed in the LP-PTFE group, none in SP-PPL group ($p = 1.0000$).

Conclusions: LP-PTFE has less postoperative discomfort and overall pain up to 3 months after surgery, showing no difference after that period of time, although this material shows more difficulty in intraoperative handling and increase risk for recurrence rate, not statistically significant.

575—HERNIA-ADHESIONS—Inguinal hernia

TRANS ABDOMINAL PROPERITONEAL PLASTY - TAPP. OUR EXPERIENCE

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Background: Repairing inguinal hernia is the second most frequent operation in Italian hospitals. The benefits of laparoscopic technique against traditional open surgery have been demonstrated, including: postoperative pain reduction, shorter stay, faster return to work. However, there is a longer operating time, higher costs and an overlapping or higher recurrence rate. In addition, laparoscopy is associated with some complications, rare, but very serious: major vascular damage, intestinal injury or occlusion, bladder lesions, nerve lesions.
Serie Report: We present our experience in the Trans Abdominal Properitoneal Plasty - TAPP for inguinal hernia, performed with 5 mm trocar and optics. In the last 5 years we have performed 782 inguinal hernia repairs, 369 (47.19%) were TAPP. General anesthesia was performed with laryngeal mask. The placement of the trocars includes access, umbilical, right side and left flank with 5 mm tracars. We use a 5 mm optic. The mash is placed tension-free without stitches or tacks. The peritoneal flap is synthesized with reabsorbed monofilament suture. Skin synthesis was performed by the use of cyanocrylate.
Conclusion: TAPP is feasible, safe and it reduces post-operative pain. It also allows a earlier return to the patient's usual activities.

563—HERNIA-ADHESIONS—Inguinal hernia

RE-TAPP FOR BILATERAL RECURRENT INGUINAL HERNIAS

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Introduction: Laparoscopic inguinal hernia repair represent a solid and valid option to treat this common pathology with excellent outcomes on post-operative pain and recovery. Particularly indicated in case of recurrences after open approach or in case of bilateral defects, still remain controversial it applicability in case of bilateral recurrence after the same approach.
Case: The patient, a 34 y old healthy normal weight men was submitted to:
2001: open left inguinal hernia repair with mesh.
2011: Laparoscopic TAPP for bilateral inguinal hernia (M2 left (recurrent); L2 right)- Mesh used: Ultrapro 6 x 8 cm.
2019: Re-TAPP for symptomatic bilateral recurrent hernia (L2 each side) with optilene mesh 10 x 15 cm.
Results: The operation was made with totally laparoscopic approach. Operative time 90 min, Blood loss unremarkable, discharge in day 1. No peri-post.operative complications were noted and, at 10 months follow-up, no recurrence were registered.

529—HERNIA-ADHESIONS—Inguinal hernia

A NOVEL TECHNIQUE USING MESH TO REPAIR A RECURRENT LARGE INDIRECT INGUINOSCROTAL HERNIA

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Aim: The positioning of a slit mesh around the cord structures during laparoscopic Transabdominal Pre-Peritoneal (TAPP) hernia repair rests the mesh better without kinks, thus minimising recurrences. However, studies also suggest that insufficient closure of the mesh slit may lead to recurrences. This report describes a novel technique using AbsorbaTacks (Covidien) to close the mesh slit and refashion an artificial deep ring to achieve a successful repair.
Methods: We report the case of an 82-year-old Caucasian male presenting with a recurrent large right indirect inguinoscrotal hernia (8 x 8 x 7 cm with 4 x 4 cm deep ring) who underwent a transabdominal preperitoneal (TAPP) repair, on a background of previous unsuccessful open repair performed by another surgeon. Following mesh deployment and positioning, a slit was made in the inferior medial aspect of the mesh to wrap it around the cord structures. The trouser flaps were then anchored in an overlapping manner by AbsorbaTacks to create a secure artificial deep ring. Edges of the mesh were also affixed by AbsorbaTacks to the Cooper's ligament and anterior abdominal wall to prevent 'windsock' effect and early recurrence. The peritoneal incision was closed after then.
Results: No complications were registered during the early postoperative period. The patient was discharged shortly on postoperative day 1 with simple as required analgesia, suggesting an excellent patient experience of the procedure. No reports of recurrence or pain following the repair were registered during the 6 months follow up period.
Conclusion(s): The creation of a new deep ring around the cord structures using a slit mesh and tacks is a novel and successful technique that could be used to repair large recurrent inguinal hernias laparoscopically to prevent further recurrences.

132—HERNIA-ADHESIONS—Inguinal hernia

SPINAL ANAESTHESIA VERSUS GENERAL ANAESTHESIA DURING LAPAROSCOPIC TOTAL EXTRAPERITONEAL REPAIR OF INGUINAL HERNIA: A SYSTEMATIC REVIEW

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Objectives: To evaluate comparative outcomes of spinal anaesthesia (SA) and general anaesthesia (GA) during laparoscopic total extraperitoneal (TEP) repair of inguinal hernia.

Methods: We systematically searched MEDLINE; EMBASE; CINAHL; CENTRAL; the World Health Organization International Clinical Trials Registry; ClinicalTrials.gov; ISRCTN Register, and bibliographic reference lists. We applied a combination of free text and controlled vocabulary search adapted to thesaurus headings, search operators and limits in each of the above databases. Post-operative pain assessed by visual analogue scale (VAS), individual and overall perioperative morbidity, procedure time and time taken to normal activities, were the outcome parameters. Combined overall effect sizes were calculated using fixed-effect or random-effects models.

Results: We identified 5 comparative studies reporting a total of 1,518 patients (2134 hernia) evaluating outcomes of laparoscopic TEP inguinal hernia repair under SA (n = 1277 patients, 1877 hernia) or GA (n = 241 patients, 257 hernia). SA was associated with significantly lower post-operative pain assessed by VAS at 12 h (MD: − 0.32; 95% CI − 0.45 to − 0.20, $p < 0.0001$) and shorter time to normal activities (MD: − 0.30; 95% CI − 0.48 to − 0.11, p = 0.002) compared to GA. However, it significantly increased risk of urinary retention (OR: 4.02; 95% CI, 1.32–12.24, p = 0.01), hypotension (OR: 3.97; 95% CI 1.57–10.39, p = 0.004), headache (OR: 7.65; 95% CI, 1.98–29.48, p = 0.003), and procedure time (MD: 3.82; 95% CI 1.22–6.42, p = 0.004) There was no significant difference in VAS at 24 h (MD: 0.06; 95% CI − 0.06, 0.17, p = 0.34), seroma (OR: 1.54; 95% CI 0.73- 3.26, p = 0.26), wound infection (OR: 1.03; 95% CI 0.45–2.37, p = 0.94), and vomiting (OR: 0.84; 95% CI 0.39–1.83, p = 0.66) between two groups. There was a non-significant decrease in overall morbidity in favour GA (OR: 1.84; 95% CI 0.77–4.40, p = 0.17) which became significant following sensitivity analysis (OR: 2.59; 95% CI 1.23–5.49, p = 0.01).

Conclusions: Although TEP inguinal hernia repair under SA may reduce pain in early postoperative period, it seems to be associated with increased postoperative morbidity and longer procedure time. It may be an appropriate anaesthetic modality in selected patients who are considered high risk for GA. Higher level of evidence is needed.

121—HERNIA-ADHESIONS—Inguinal hernia

TRANSABDOMINAL PRE-PERITONEAL (TAPP),TOTALLY EXTRAPERITONEAL (TEP) LAPAROSCOPIC TECHNIQUES VS OPEN APROUCH INGUINAL HERNIA REPAIR

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The choice of approach to the laparoscopic repair of inguinal hernia is controversial. The most commonly used laparoscopic techniques or inguinal hernia repair are transabdominal preperitoneal (TAPP) repair and totally extraperitoneal (TEP) repair. TAPP requires access to the peritoneal cavity with placement of a mesh through a peritoneal incision. This mesh is places in the preperitoneal space covering all potential hernias sites in the inguinal region. The peritoneum is then closed above the mesh leaving it between the prepertoneal tissues and the abdominal wall where it becomes incorporated by fibrous tissue. TEP repair was first reported in 1993(Ferzli 1993), TEP is different in that the peritoneal cavity is not entered and mesh is used to seal the hernia from outside the peritoneum. This approach is considered to be more difficult than TAPP but may lessen the risks of damage to the internal organs and of adhesion formation leading to intestinal obstruction, which has been linked to TAPP.

Indirect comparisons between TAPP and TEP have raised questions about whether the tow procedures do perform differently for some outcomes such as recurrence. Very large randomized controlled trails such as those conducted by the MRC Laparoscopic Groin Hernia Group and Neumayer and colleagues, both of which a compared a predominatly TEP arm with open repair, suggested that TEP has a higher risk of recurrence than open mesh repair. However, a systematic review comparing laparoscopic with open mesh repair found no evidence of a difference in recurrence rates between TAPP and open mesh repair (McCormack 2003; McCormack NICE 2004). While any conclusions drawn on such indirect comparisons should be treated with caution they do raise questions that can only be satisfactory addressed by well designed studies and systematic reviews of such studies that directly compare TAPP with TEP. There is a scarcity of data directly comparing laparoscopic TAPP and laparoscopic TEP and question remain about their relative merits and risks. IN light of this, the review aims to compare TAPP and TEP directly in order to determine which method is associated with better outcomes, in particular, serious adverse events and subsequent potential consequences such as persisting pain.

Objectives. The purpose of this review was to compare the clinical effectiveness and relative efficiency of laparoscopic TAPP and laparoscopic TEP for inguinal hernia repair.

Criteria for considering studies for this review.

Type of studies. All published and unpublished randomized controlled trails and quasi-randomized controlled trails comparing laparoscopic TAPP with laparoscopic TEP were eligible for inclusion.

Type of Participants. Relevant participants are adult patients requiring surgery for repair of inguinal hernia (direct and indirect), children (particularly under the age of 12) were no included.

Keywords: TAPP,TEP,INGUINAL HAERNIA, OPEN SURGERY.

1177—ROBOTICS & NEW TECHNIQUES—Basic and technical research

NEEDLESCOPIC VERSUS CONVENTIONAL LAPAROSCOPIC CHOLECYSTECTOMY IN ADULTS: A PROSPECTIVE RANDOMIZED CLINICAL TRIAL

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Background: Laparoscopic cholecystectomy in adults is the gold standard of treating non-complicating gall bladder pathology. Unlike conventional laparoscopy, Laparoscopic surgery using needles further improves surgical outcomes as regard of, Post-operative pain, hospital stay and cosmetic appearance.

Aim: to compare the clinical outcomes of Conventional Laparoscopic Cholecystectomy (CLC) with Needlescopic Cholecystectomy (NC) using a 14 gauge needles in adults. Materials and methods. From 2016 to 2018, one hundred patients with non-complicating gall bladder pathology were randomly assigned to CLC and NC, 50 patients in each group. The primary outcome were, post-operative pain score (at 6 h and 7th day). The secondary outcomes were, Operative time, conversion rate, intra-operative complications, post-operative analgesic requirements, hospital stay, and cosmetic.

Results: There were no conversion or intra-operative complications in either groups. The two groups were comparable as regard of operative time (mean ± SD, 39.6 ± 18 min vs. 42.5 ± 21 min), hospital stay (mean ± SD, 1.0 ± .3 day vs. 1.0 ± .6 day), respectively. NC showed significant better Visual analogue pain score at 6 h after surgery (mean ± SD, 1.9 ± 1.3 vs. 3.4 ± 1.5), however, the two groups were comparable at 7th day (mean ± SD, 2.1 ± 1.2 vs. 2.6 ± 1.3). Cosmetic satisfaction, estimated 2 months after the surgery using a survey, showed superiority of NC to CLC (mean ± SD, 7 ± .5 vs. 5 ± .3).

Conclusion: NC is a safe, feasible, and alternative approach for treating symptomatic benign gall bladder pathology. Its main advantages are the better cosmetic appearance and less post-operative pain.

1120—ROBOTICS & NEW TECHNIQUES—Basic and technical research

LAPAROSCOPIC ASSISTED CYTOREDUCTIVE SURGERY IN RECURRENT PSEUDOMYXOMA PERITONEI - A CASE REPORT

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Introduction: Pseudomyxoma peritonei (PMP) is a feared complication of appendicular mucocele perforation. Traditionally, exploratory laparotomy cytoreductive surgery (CRS) is a commonly used for peritoneal surface malignancies modality. However, laparoscopic approach may also provide a convincing surgical result with other benefits, such as smaller wound, better recovery and shorter hospital stay.

Case Presentation: We report a case of minimal invasive approach in a 79-year-old male, with recurrent pseudomyxoma peritonei. The patient presented with appendiceal cystic lesion and magnetic resonance imaging (MRI) revealed mucinous tumor with ascites and diffuse peritoneal thickening. The patient underwent laparoscopic appendectomy, cytoreductive surgery and partial peritonectomy in April, 2015. Results of (CT) revealed tumor recurrence and progression in the following 3 years and the patient underwent laparoscopic assisted secondary cytoreductive surgery, including peritonectomy in March, 2019. The latest result of CT scan in September, 2019 revealed only thin residual hypodense fluid collection along the surfaces of liver and spleen computed tomography scan.

Discussion: Recurrent pseudomyxoma peritonei is characterized by mucinous material on the peritoneal surfaces. Postoperative adhesions and space-occupying mucinous tumor are obstacles for laparoscopic approach for secondary cytoreductive surgery. Excision of the peritoneal surface malignancies via laparoscopic approach is also a preferred modality of treatment.

536—ROBOTICS & NEW TECHNIQUES—Basic and technical research

QUANTITATIVE SEROSAL AND MUCOSAL OPTICAL IMAGING PERFUSION ASSESSMENT IN GASTRIC CONDUITS FOR ESOPHAGEAL SURGERY: AN EXPERIMENTAL STUDY IN THE PIG

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Introduction/Objective: Gastric tubulization is a common reconstruction method after esophagectomy. The incidence of anastomotic leakage (AL) remains high (20 to 35%). The sudden and extensive disruption of circulation at the future anastomotic site (FAS) has been identified as one of the main risk factors. Currently, there is no reliable method to quantitatively measure the FAS blood flow intraoperatively. Hyperspectral imaging (HSI) has been identified as a feasible method to quantify StO2 during esophageal resection. However, it only measures serosal perfusion. Confocal laser endomicroscopy (CLE) can visualize mucosal microcirculation, additionally through a special software it is possible to quantify it as functional capillary density area (FCDA). The objective of this study was to quantitatively assess serosal and mucosal microperfusion at the FAS of gastric conduits using HSI and CLE respectively. Local capillary lactate (LCL) was sampled and used as an ischemia biomarker.

Methods: Open gastric tubulization was performed in 5 male pigs and serosal StO2% at the FAS was quantified using HSI. After an intravenous injection of sodium fluorescein (0.5 g), mucosal microperfusion was assessed using CLE, in the following regions of interest (ROIs): ROI-A (FAS), ROI-D (antrum), ROI-C (body). LCLs were quantified via a portable lactate analyzer at the ROIs. The FCDA was calculated using a segmentation software provided by the CLE manufacturer.

Results: After gastric tubulization, HSI-based StO2 at ROI-A (41 10.6%) was significantly lower than ROI-C and ROI-D (73 16% and 80 26% respectively; p value = 0.005). The FCDA at ROI-A (3.3–3.8%) was significantly lower than ROI-D (15.7 3.1; p value = 0.001) and ROI-C (18.4–7; p value = 0.01). Inversely, LCL were significantly higher at ROI-A (5 2.5 mmol/L) when compared to ROI-D (1.4–0.7 mmol/L; p value = 0.04) and to ROI-C (1.4 0.7 mmol/L; p value = 0.04). Additionally, serosal HSI-based StO2 correlated with the mucosal CLE-based FCDA (Pearson's r = 0.6710). The LCL had a negative correlation with both HSI-based StO2 (Pearson's r = − 0.5745) and the CLE-based FCDA (Pearson's r = -0.7822).

Conclusions: After gastric tubulization, a decrease in blood perfusion occurs at the FAS both at serosal and mucosal sides. HSI and CLE show a good correlation and might be valuable intraoperative tools to measure gastrointestinal tract perfusion intraoperatively.

207—ROBOTICS & NEW TECHNIQUES—Basic and technical research

INCIDENCE OF ADVERSE EVENTS AS A POTENTIAL RISK FOR INADVERTENT INJURY DURING LAPAROSCOPY

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Aims: Uncontrolled movements of the instruments in laparoscopic surgery can lead to inadvertent tissue damage. The risk is particularly high, when the dissecting or electrosurgical instrument is located outside the field of view of the laparoscopic camera. The incidence and relevance of such events are currently unknown. The present work aims to quantify potentially dangerous situations using the example of laparoscopic cholecystectomy (LC) in a standardized training environment.
Methods: Twenty-four medical students were prompted to perform four consecutive LCs following a standardized surgical protocol in a training environment on a well-established box trainer. The captured video material was evaluated by two independently working investigators. The following situation was defined as adverse event (AE): The dissecting instrument is inadvertently located outside the laparoscopic camera's field of view. Simultaneous activation of the electrosurgical unit was defined as a critical AE. Primary endpoint was the incidence of AEs.
Results: While performing 96 LC, 2895 AEs could be registered. Of these, 1059 were critical AEs. This corresponds to a ratio of 36.6%. The median number of AEs per LC was 20.5 (range = 1–125; IQR = 33) and the median number of critical AEs per LC was 8.0 (range = 0–54, IQR = 10). The mean total operation time was 34.7 min (range = 15.6–62.5 min, IQR = 14.3 min). Although the median number of AEs increased over the course of the test series, the results of attempt one and four showed no significant difference ($p = 0.099$).
Conclusion: Our study demonstrates the significance of AEs as a potential risk of collateral damage during LC in a standardized training environment. Further studies are needed to investigate the occurrence of AE in the setting of a real operating room not only for laparoscopic cholecystectomy but also for other procedures. In order to ensure patient safety and to avoid adverse events during surgery, thorough and systematic training of future surgeons is essential. Furthermore, technical solutions to overcome this safety issue are appreciated.

620—ROBOTICS & NEW TECHNIQUES—Colorectal

SINGLE PORT ROBOTIC SURGERY OF RIGHT HEMICOLECTOMY : NEW ROBOT SURGERY PLATFORM FOR COLON CANCER

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Introduction: Two new developments in recent colon cancer surgery have been integrated: robotic surgery techniques and Single port laparoscopic surgery(SPLS). Some surgeons have applied the advantages of robotic systems to overcome the limitations of SPLS in newly introduced technologies: Single Port Robotic Surgery(SPRS). And in 2018 Da Vinci SP was introduced as a new robot surgery platform. The aim of this study was to evaluate the feasibility, initial outcomes and feasibility of SP-robotic colon cancer surgery.
Patients and Method: The patient was a 76-year-old woman diagnosed with partial obstructive cecal cancer. Cell type was adenocarcinoma, moderated differentiation. The clinical stage of the patient identified through preoperative examination was cT3N1M0. And the patient had a history of appendectomy and was now being treated for diabetes.
Result: The patient underwent right hemicolectomy using a Da vin ci Single port robot platform. The total surgery time was 155 min and there were no special events during the surgery. On the first day after surgery, sips of water were performed and on the second day, a soft diet was performed. There was no specific morbidity in the surgical recovery process and no re- hospitalization for 60 days.
Conclusion: Da vin ci single port robot platform is a newly applied surgical method for colon cancer surgery. Long-term oncological findings require further study as more information is accumulated. However, in terms of short term outcome, Da vin ci SP robot is considered to be a safe surgical method for colorectal cancer patients. In addition, the cosmetic aspects of the patient and the process of recovery after surgery is considered to have advantages.

415—ROBOTICS & NEW TECHNIQUES—Colorectal

SURGICAL ANTERIOR PLANE FOR RECTAL SURGEONS - PRESERVING DENONVILLIERS'

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Aims: Denonvilliers' fascia (DVF) has been described as a 'fusion' of embryonic planes that form a 'multilayered' structure. We aim to describe the dissection between the two layers of DVF, and the benefits of robotic surgery for identifying this plane.

Methods: This video shows 4 cases of pelvic dissection in males, focusing on anatomy of DVF.

Dissection anterior to DVF can lead to increased risk of nerve damage and long-term urinary/sexual dysfunction due to injuries to the neurovascular bundles of Walsh. Dissection posterior to the DVF may result in mesorectal plane of dissection associated with a risk of positive margin, especially in anteriorly based tumours. Dissection between the two layers of DVF will minimize the risk of nerve injuries.

Results: Dissection starts 1 cm above peritoneal reflection. This plane leads to the dissection anterior to DVF. Dissection is carried out to the level of seminal vesicles, where attempt is made to enter between the two layers of DVF. The endowrist instruments allow the surgeon to continue in this plane, till a safe margin below the tumour is achieved. At this stage, DVF is completely divided and dissection is completed to the pelvic floor.

Conclusions: The identification of this fascia is a key component in rectal cancer surgery, which enables the surgeons to mobilize the rectum safely. The accuracy in robotic surgery makes it possible to identify and dissect in the correct plane. Rectal cancer surgeons should be familiar with this anatomy to reduce the risk of nerve injuries.

811—ROBOTICS & NEW TECHNIQUES—Colorectal

VIDEO PRESENTATION OF A DAVINCI ASSISTED CONSTRUCTION OF A NEO-VAGINA BY SIGMOIDOCOLPOPLASTY AS A SALVAGE-PROCEDURES IN A 27 YEAR OLD TRANSGENDER FEMA

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Background: The Construction of a neo vagina in transgender patients using a sigmoidocolpoplasty is a rare yet feasible method in male to female reassignment surgeries. In this presented case we have a 27 year old female patient after gender reassignment 2013 with a insufficient neovaginal length of 2,5–3 cm and recurring vaginal tearing during sexual intercourse.

Several Techniques have been described and are in common use including the application of non genital skin grafts; penile skin graft; penile scrotal skin flaps; non genital skin flap; pedicled intestinal transplants. All these cases have been evaluated according to patients satisfaction with depth, sensation and overall function.

In our presented case the femal patient was not satisfied with the reconstructed depth of 2,5- 3 cm. A introitus stenosis has been dilated prior to our surgery.

Methods: We report a case of robotic assisted (daVinci®Xi™ Surgical System) sigomoidocolpoplasty as a salvage procedure for a patient not satisfied with a neo-vaginal depth of 2.5–3 cm. Overall surgery time was 5 h 25 min. No intraoperative complications were reported.

Results: The Surgery could be performed without any major complications. A drainage was inserted as a safety measure but could be removed on the third post-operative day without any abnormalities. The female Patient was discharged on the 10thpostoperative Day. With an intact passage and without healed wounds and no signs of intrabdominal inflammation or pain. The postoperative satisfaction is yet to be evaluated in the follow-ups.

Conclusions: Using the daVinci®Xi™ Surgical System for a simoidocolpoplasty in a salvage operation after neovaginal construction seems to be a usable method in female transgender patient not satisfied with vaginal depth after gender reassignment surgery.

1006—ROBOTICS & NEW TECHNIQUES—Colorectal

FEASIBILITY OF ABDOMINOPERINEAL RESECTION WITH PROSTATECTOMY IN T4 RECTAL CANCER: 'BLADDER SPARING' ROBOTIC PELVIC EXENTERATION

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Introduction: The complications of creating a conduit or a neobladder as a urinary diversion in a patient undergoing total pelvic exenteration for locally advanced rectal cancer ranges from recurrent urinary infection and electrolyte imbalance to renal failure. These can be prevented by avoiding cystectomy altogether, if the organ is not involved.

Objectives: To demonstrate the short term feasibility of minimally invasive abdominoperineal resection with prostatectomy with respect to the complications and oncological outcomes in locally advanced rectal cancer.

Methods: A 34 year-old male with no comorbidities presented with altered bowel habits and bleeding per rectum for 4 months. Per rectal examination revealed a circumferential growth at 3 cms from anal verge. Flexible sigmoidoscopy revealed a growth starting at 3 cms from anal verge with significant luminal narrowing, with a biopsy suggesting moderately differentiated adenocarcinoma. Pre-neoadjuvant MRI pelvis showed a lower third rectal lesion with contiguous involvement of prostate. Patient received neoadjuvant chemoradiation (NACTRT). Post NACTRT MRI showed stable disease with lower rectal wall thickening with mesorectal fascia involvement and obliteration of fat plane with prostate (ycT4 ycN1).

Patient went into acute large bowel obstruction due to the tumour. A diversion sigmoid stoma was performed following which 4 cycles of neoadjuvant chemotherapy (CAPEOX) was given.

Post Chemo MRI showed partial response with persistent involvement of mesorectal fascia.

Results: Patient underwent robotic extralevator abdominoperineal resection with en bloc prostatectomy and fasciocutaneous V–Y advancement flap reconstruction of the perineum.

The operative time 540 min and blood loss of 750 ml. Postoperative period uneventful. His final histopathology report is awaited.

Conclusions: Bladder sparing minimally invasive pelvic exenteration is feasible in a T4 disease of rectal cancer involving prostate without jeopardising the oncological outcomes and providing better quality of life for the patient.

1058—ROBOTICS & NEW TECHNIQUES—Colorectal

INTRAOPERATIVE CHECK AND REPAIR OF COLORECTAL ANASTOMOSIS BY TAMIS APPROACH AFTER POSITIVE LEAK TEST

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Different techniques have been described after a positive leak test when performing a colorectal anastomosis: suturing of the leak, re-do anastomosis, or temporal or definitive stoma.

We present 4 different cases of anastomotic positive leak test that were solved by TAMIS approach.

When a positive test is present, our trend is to reconstruct the anastomosis, but sometimes this may not be easy to perform, specially in cases of low or ultra-low anastomosis. In this 4 cases the decided to use the TAMIS platform in order to check the anastomosis. In two cases, no anatomical defects were seen, so we decided to reinforce the anastomosis with single stitches. In other two cases a visible defect was seen, one probably due to a diverticulum located in the proximal colon, and in the other case, a small defect in the anastomosis was found. We decided to suture the defect in both cases, and a diverting stoma was also performed.

Postoperative course was uneventful in all cases, and both cases with the diverting stoma are awaiting ilestomoy closure after successful anastomosis review.

Intraoperative TAMIS check and repair of anastomosis after a positive leak test is a safe and feasible technique, and may be a preferred option in order to avoid further and more aggressive solutions.

1461—ROBOTICS & NEW TECHNIQUES—Colorectal

OPTIMAL DOSE OF PREOPERATIVE COLONOSCOPIC ICG TATTOOING FOR FLUORESCENCE GUIDED LAPAROSCOPIC COLORECTAL SURGERY

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Background: This prospective study aimed to establish the optimal dose of indocyanine green (ICG) for preoperative colonoscopic tattooing to obtain multifunctional applications of ICG fluorescence during laparoscopic colorectal surgery.

Methods: Colorectal cancer patients (n = 37) were enrolled for endoscopic submucosal injection of preoperative colonoscopic ICG tattooing from May 2017 to May 2018. ICG was performed by the 12 to 18 h before the surgery. The dilution concentrations of ICG were gradually decreased from standard dose (25 mg) to acceptable minimal dose. According to the ICG injection doses, patients were sequentially categorized to 5 groups (group 1; 12–25 mg, group 2; 2–4 mg, group 3; 1–2 mg, group 4; 0.5–1 mg, group 5; < 0.5 mg). The appropriateness score of ICG tattooing was assessed using visual score of localization (2 points), ICG lymph node mapping (1 points), and availability of ICG perfusion test (1 points). The near infrared system (IMAGE1 S^{TM}, Karl Storz, Germany and 1588 AIM camera system, ENV mode, Stryker, CA) were used for fluorescence imaging.

Results: The mean age of patients was 62.4 years, and the male to female ratio was 22:15. Visual localization was possible in group 1 under white light image mode. When using the fluorescence view, the visual localization were impossible in group 1 for diffuse ICG enhancing in abdominal cavity. Tumor localizations were easily possible all in group 2–4 and 85.7% in group 5. ICG Lymph node mapping was successful in more than 80% of group 3–4, but only 14.3% in group 5. Intraoperative ICG perfusion tests were all possible in group 2–5. The appropriateness score for ICG was 3.5–3.86 in group 2–4. However, the scores for group 1 and group 5 were significantly lower than for group 2–4 (0.17 and 2.14, respectively, $p < 0.001$).

Conclusions: The optimal dose of preoperative ICG tattooing could be appropriate at 0.5–2 mg that enables tumor localization, lymph node mapping and perfusion test.

1444—ROBOTICS & NEW TECHNIQUES—Colorectal

INNOVATIVE APPROACH TO RECTAL CANCER TREATMENT IN OUR HOSPITAL -INNOVATION OF FUSION SURGERY FROM ROBOTIC SURGERY TO TATME

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Background and Objectives: We have introduced robotic surgery for rectal cancer since October 2015, and TaTME since March 2016. This time, we ensured CRM for rectal cancer treatment in this hospital, robotic surgery for functional preservation, The video introduces the ingenuity of approach methods such as Robotic surgery and TaTME, and reports postoperative short-term results, sexual and urinary function evaluation by each approach method.

Subjects: The subjects were 199 patients with rectal cancer who underwent radical surgery from April 2015 to December 2019. In 88 cases of robotic surgery (RALS group), 105 cases of laparoscopic surgery (LS group), and 20 cases of TaTME. We conducted a short-term postoperative result with each approach, and examined sexual and urinary dysfunction in patients who had passed 1 year or more after the operation.

Results: In postoperative short-term results, there was no significant difference in the operation time, bleeding volume, RM positive rate, and complication rate. Urinary dysfunction(RALS group2.8%, LS group7.37% in the group, $p = 0.3424$), IPSS score (RALS group 5.25, LS group 8.81, $p = 0.049$). IIEF score in sexual function evaluation (RALS group 15.71, LS group 19.50, $p = 0.517$), 12 months after surgery later erection score (RALS group 6.94, LS group 5.37, $p = 0.039$), Wexner score in the evaluation of defecation function (RALS group 2.95, LS group 2.66, $p = 0.797$). Urination function, postoperative erection ability in RALS group The result was retained.

Discussion: RALS for rectal cancer has the potential to improve postoperative dysfunction compared to LS, and is considered to be a useful treatment with excellent operability and visibility in the deep pelvis. One of the options was to do easy parts with each approach without sticking to one modality.

Conclusion: For quality of rectal cancer treatment, high quality TME will be performed using the modalities in the facility. It was thought that it was important.

1330—ROBOTICS & NEW TECHNIQUES—Colorectal

DO WE NEED PROTECTIVE ILEOSTOMY IN ROBOTIC RECTAL RESECTION?

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Aims: The authors retrospectively evaluate data from their own set of robotic resections for rectal cancer in connection with performed diverting ileostomy in the period from 2009 to the end of 2018. It evaluates the indications for its implementation, surgical and metabolic postoperative complications, the number of embedded ileostomies and the solution of the leak in the ileostomy performed.
Method: The Center of robotic surgery KZ a.s 297 operations for rectal cancer were performed, anastomosis was established in 268 cases in the period from January 2009 to December 2018. Protective ileostomy was constructed in 143 cases, all after performing TEM for mid or lower rectal cancer.
Results: Concerning patients with constructed ileostomy, there were 91 men and 52 women. At the Age of 19 up to 47 years, there were 91 men and 52 women. In this group with protective ileostomy, the anastomotic leak was 18.9%. Complications of ileostomy occurred in 17.5% of patients and metabolic complications in 9.1%. Surgery was required by 7.69% of patients with ileostomy. Closing of ileostomy was performed in 87.4% of patients, ranging from 2 weeks from surgery to 27 months. Complications associated with closing of ileostomy occurred in 10.4%. There were ileus states and anastomosis dehiscence. The occurance of hernia in scar after ileostomy was 7.2% in this group.
Conclusions: These figures are appropriate dramatic, asking when using ileostomy and current leak that the patient can localize to small masters, without the need for diffuse peritonitis and the development of septic state. Therefore, we are not always leaking through the transanal approach using Endo Sponge. Until a clear prediction of anastomotic leakage, protective ileostomy will be an integral part of robotic rectal surgery. Although this is a question, it is necessary to closely monitor the postoperative attack by avoiding protective ileostomy and only addressing those operations with proven protective ileostomy at a second time and subsequent attempted VAC.

1274—ROBOTICS & NEW TECHNIQUES—Colorectal

ROBOTIC SIGMOIDECTOMY AS A FEASIBLE OPTION IN ADVANCED COLORECTAL TUMORS

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Background: Robotic platforms allows for a stereoscopic 3D view, a greater range of mobility, less tremor and better surgical precision. It also facilitates dissection maneuvers, helping to better dissect the rectum and to identify and preserve key structures, such as ureters, gonadal vessels and nerve plexuses. Given these advantages, surgeons should increase utilization of this technology, even in locally advanced tumors.
The following video shows a robotic sigmoidectomy on a patient with an advanced colorectal tumor.
Intervention: 81-year-old patient, with a history of labial neoplasm and childhood TB, who has a colon adenocarcinoma at 20 cm from the anal verge, extended to the mesosigma fistulizing and infiltrating a proximal sigma segment. Tumor mesosigma implants and inflammatory changes with two adjacent collections where found. No distant metastases. It was decided to perform a robotic approach.
The tumor was attached to the bladder. Given the significant fixation to the pelvis we decided to release part of the parietocolic and subsequently also access medially to gradually surround the large mass. We proceeded to transect the inferior mesenteric vessels by means of clips and Harmonic device.
Throughout the procedure, we changed the approach to surround the tumor. Edema and fibrosis make dissection difficult, so care must be taken to avoid lesions.
Once the bladder was separated we decided to change our strategy in order to release the most problematic area. We proceeded to section the proximal colon to retract it and have a better view of the area closely attached to the left parietocolic.
Gradually we accessed the pelvis. Once the tumor was passed, we proceeded to perform the circumference section of the rectum.
Indocyanine green was used to check correct vascularization. The specimen was extracted through a Pfannenstiel incision. Finally an end-to-end colorectal anastomosis was performed with laparoscopic instruments.
Outcomes: The surgery took 185 min. Patient started oral intake 4 h after surgery and was discharged on the 2nd postoperative day. Pathological examination revealed a colon adenocarcinoma pT4N0.
Conclusion: Robotic sigmoidectomy is safe and feasible as a procedure of choice in advanced colorectal tumors as a minimal invasive technique.

1261—ROBOTICS & NEW TECHNIQUES—Colorectal

THE USE OF INDOCYANINE GREEN FLUORESCENCE IN THE ASSESSMENT OF BOWEL PERFUSION IN EMERGENCY AND ELECTIVE COLORECTAL SURGERY

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Aims: The use of ICG fluorescence is now widespread in colorectal surgery for the evaluation of bowel stump perfusion, even if there is still no definitive validation with respect to only intraoperative macroscopic evidence regarding the incidence of anastomotic leakage.
The aim is to confirm the same efficacy and reliability not only in elective colorectal surgery, but also in the emergency one, certainly more exposed to peri and postoperative complications often related to inadequate vascularization, in order to reduce the incidence of intestinal derivations and at the same time trying to increase the number of primary anastomosis.
Methods: From January 2019 to December 2019 we used ICG fluorescence to evaluate the perfusion of colonic stumps before and after packaging the anastomosis in emergency and elective surgery of right, left hemicolectomy, rectal resection and Hartmann reversals.
Results: A total of 28 patients (11 males and 17 females) have been operated, 16 for benign pathology and 12 for tumors, 9 in emergency and 19 in election. We performed 4 right hemicolectomy, 11 left hemicolectomy, 2 transverse colon resections, 1 rectal resection, 3 TaTME with loop ileostomy, 5 Hartmann reversals, 1 resection and reanastomosis for stenosis and colocutaneous fistula after left hemicolectomy for stenosis, 1 resection and reanastomosis for stenosis after left hemicolectomy for diverticulitis with left ureteral reconstruction.
In all cases the postoperative course was regular, in only 1 case of TaTME there was a small anastomotic leakage (delimited according to the Schein classification), treated and resolved with surgical drainage, probably due however to a clear intraoperative malfunction of the circular stapler. Other complications (1 death due to cerebral stroke after 30 days with a complicated course of massive haemorrhage due to duodenal stress ulcer, 1 reoperation for hemoperitoneum in the 2nd po day, 1 enterocutaneous fistula due to radiological drainage for abscess spontaneously resolved, 1 wound infection SSI) were not related to the anastomosis, but some of them have validated the excellent perfusion despite episodes of prolonged acute ischemia due to postoperative hemorrhage.
Conclusions: From these data we confirm the validity of the use of ICG fluorescence as a method for intraoperative assessment of bowel perfusion even in emergency conditions and in acute postoperative hemorrhage, detecting only an incidence of 5% (1 case out of 20) of anastomotic leakage in a case, however, affected by intraoperative technical problems.
It is evident that to validate the method further randomized studies on larger data are needed, evaluating also qualitatively the fluorescence between the mucous and serous layer, but it confirms however, as already many studies and trials have done, the clear reduction of anastomotic leakage incidence, the evidence of a better perfusion of the bowel and, especially in emergency, the potential reduction of primary derivative operations together with safer reversal operations.

1092—ROBOTICS & NEW TECHNIQUES—Colorectal

ROBOTIC ABDOMINOPERINEAL RESECTION (RAPR) WITH PERINEAL INTRAOPERATIVE RADIOTHERAPY (IORT) FOR A LOCALLY ADVANCED LOWER RECTAL CANCER

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Introduction: Robotic surgery overcomes the limitations of laparoscopy, and reduces conversion rates with similar oncologic outcomes for rectal cancer. IORT improves local control in locally advanced rectal cancer and increases overall survival rate of locally recurrent rectal cancer.
Aim: To describe the surgical process of a rAPR with perineal IORT in a lower rectal cancer.
Methods: The case of a 57-year-old male, with lower rectal adenocarcinoma cT3N1 is presented. In the magnetic resonance imaging (MRI), an 8 cm concentric thickening was found from the pectinate line, affecting all rectal layers. In its posterior margin, it extended across the mesorectal fascia, lying towards the iliococcygeus muscle, compromising the circumferential resection margin. He was treated with preoperative chemotherapy and radiotherapy with partial radiologic response (yT3N1), and a rAPR with IORT was planned.
Results: The patient was placed in a modified lithotomy position. We found an ulcerative rectal tumor 0.5 cm from the pectinate line, fixating the posterior face of the rectum. A rAPR was performed with high ligation of the superior rectal artery and dissection to the levatori ani plane in the abdominal time, concluding the dissection and extraction of the surgical specimen in the perineal time. The patient was transferred then to the radiotherapy operating theatre and the IORT was performed in a forced Trendelemburg position. 15 Gy were dispensed in the tumor bedding through the perineal incision. The patient was discharged on the 8th postoperative day, and the pathology study showed a rectal adenocarcinoma (ypT3), with 29 lymph nodes (0/29) (ypN0) and negative surgical margins. No recurrence has been found 3 months from the surgery.
Conclusion: A complete minimally invasive surgery with perineal IORT is feasible for locally advanced lower rectal cancer in selected cases.

975—ROBOTICS & NEW TECHNIQUES—Colorectal

ROBOTIC ANTERIOR RESECTION FOR A SIGMOID POLYP WITH WIDE BASE HAVING FEATURES OF HIGH GRADE DYSPLASIA IN THE BACKGROUND OF VILLOUS ADENOMA

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This is a case of 42 year old obese female patient who was being worked up by bariatric surgeons for gastric bypass was eventually discovered to have wide base sigmoid polyp on colonoscopy, for which reason, she was referred to colorectal outpatient clinic. The patient herself had been having a few months history of on and off mild constipation associated with rectal bleeding. Other than that, she did not have any upper GI symptoms or weight loss.She has got no medical illness but has surgical history of 2 Ceserean sections and laparoscopic cholecystectomy that was done in 2010. She has got no family history of Colorectal cancer otherwise. On examination, this patient was found to be obese with a BMI of 54. Her abdomen was not distended but fatty with well healed c section and port site scars. Her labs prior to surgery showed Hb of 11.2,Albumin 35, Glucose 4.4, normal renal functions. Her tumor markers were found to be in normal range- CEA 1.3, CA 19–9 < 2. She underwent full colonoscopy that showed none obstructing ulcerated mass with wide base which was present 28 to 30 cm from anal verge.The rest of the colon was normal and the mass was biopsied. Biopsy result showed superficial fragments of tubular adenoma with some of which showing high grade dysplasia. Underlying sinister pathology couldn't not be excluded.

Her staging CT that included chest/abdomen and pelvis was negative for distant metastasis.

Her case was then discussed in GI MDT and a decision of re-biopsy was made. Her repeat biopsy that was done through sigmoidoscopy showed tubulovillous adenoma which was negative for dysplasia and malignancy. The case was then re discussed in GI MDT and a decision to proceed with oncological resection of the sigmoid colon was made as the lesion wasn't amenable for EMR or ESD. Following that, she was electively admitted for surgery and underwent an uneventful robotic anterior resection. During the surgery, no liver or peritoneal lesions were seen and the sigmoid tumor was felt to be mobile polyp with wide base. The patient had a smooth post operative course and was thus discharged on post operative day 8. Her final histopathology revealed Tubulovillous adenoma exhibiting focal high grade dysplasia, completely excised. No invasive carcinoma was seen and 14 benign lymph nodes were extracted from the specimen. Her case was taken back to GI MDT for discussion of her final pathology. It was decided to follow her up with colonoscopy after 1 year. She has already been seen a few times in the clinic post surgery. She is currently in good state and is being prepared to undergo bariatric surgery. Inspite of here high BMI robotic approach seemed a good option as a minimally invasive approach with good results

621—ROBOTICS & NEW TECHNIQUES—Colorectal

EXTENDED INDICATION OF ROBOTIC SURGERY FOR IATROGENIC PATHOLOGY

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Aims: This video is intended to show the versatility of robotic surgery technology usage to address complex cases in colorectal pathology. The current use of robotic surgery should be extended to different indications.

Materials and Methods: A 67-year-old woman with past medical history of vaginal prolapse and cystocele underwent a vaginal hysterectomy and anterior repair. Twelve days after surgery she presented to the emergency department complaining of vaginal faecaloid discharge. She did not report fever neither other symptoms. Computed tomography revealed a 7 mm rectovaginal fistula, together with a poorly defined soft tissue image of 60 mm associated with mild trabeculation of adjacent fat in Douglas space, compatible with an abscess. No free fluid or pneumoperitoneum were identified.

Results: On July 4, the patient underwent a robotic rectovaginal fistula repair. The pelvis was blocked, with significant inflammation including the fallopian tubes closely adhered to the sigma and the area of the rectovaginal fistula. A low anterior resection with side-to-end anastomosis and closure of the vaginal stump was performed. The anastomosis was totally performed intracorporeally, and the specimen was removed through the vagina for a totally robotic procedure with Natural Orifice Specimen Extraction (NOSE). The surgical time was 125 min, and there were no intraoperative adverse events. The patient started oral diet 6 h after surgery and was discharged after 4 days without any complication.

Conclusions: Robotic surgery is a good alternative for solving complex cases of colorectal surgery. The use of the robotic platform is safe and feasible to treat extended pelvic indications beyond rectal cancer, and allows more accurate dissections by minimally invasive approach.

589—ROBOTICS & NEW TECHNIQUES—Colorectal

LONG-TERM OUTCOMES OF LATERAL PELVIC LYMPH NODE DISSECTION FOR ADVANCED LOW RECTAL CANCER: A COMPARATIVE STUDY OF ROBOTIC VERSUS LAPAROSCOPIC APPROACH

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Aims: The long-term outcomes of minimally invasive lateral pelvic lymph node dissection (LPND) are not completely known. Thus, this study aimed to compare long-term outcomes between robotic and laparoscopic LPND in low rectal cancer patients with suspicious metastatic nodes in their pelvic side wall.
Methods: We retrospectively reviewed the records of all rectal cancer patients who underwent laparoscopic or robotic total mesorectal excision (TME) with LPND between March 2006 and June 2016. Stage IV patients were excluded. The outcomes were compared between patients who underwent laparoscopic and robotic LPND.
Results: In total, 29 and 70 patients underwent robotic and laparoscopic LPND, respectively. No significant differences were observed in patient characteristics between the two groups. Median duration of operation was 230.0 (interquartile range [IQR], 180.0–290.0) min in the laparoscopic group and 260.0 (IQR, 220.0–320.0) min in the robotic group ($p = 0.033$). The median interval from surgery to regular diet was 3 (IQR, 2–4) and 4 (range 3–4) days in the robotic and laparoscopic groups, respectively ($p = 0.012$). Regarding morbidities, the urinary retention rate was lower in the robotic group than in the laparoscopic group (7.1% vs. 24.1%; $p = 0.043$). During a median follow-up of 44.3 months, the overall recurrence rates were 48.3% and 31.4% in the laparoscopic and robotic groups, respectively ($p = 0.175$). The 5-year disease-free survival rates were 43.5% and 67.0% in the laparoscopic and robotic groups, respectively ($p = 0.145$). The 5-year overall survival rates were 65.0% and 92.2% in the laparoscopic and robotic groups, respectively ($p = 0.017$).
Conclusion: Robotic TME with LPND is safe and feasible and might yield favorable long-term oncologic outcomes.

345—ROBOTICS & NEW TECHNIQUES—Colorectal

A CASE OF GIANT RECTAL GASTROINTESTINAL STROMAL TUMOR RESECTED BY TATME

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An 83-year-old woman was admitted to the gynecological hospital because of persistent genital bleeding. Abdominal computed tomography showed a 14-mm large bloody pelvic tumor that was in contact with the posterior wall of the vagina and the right side of the rectum. Transvaginal needle biopsy The patient was diagnosed as a rectal gastrointestinal stromal tumor (GIST), and she was going to undergo surgery. Since the tumor invaded the posterior wall of the vagina, a total hysterectomy was performed in advance, and exfoliation was performed laterally from the bladder side cavity. In addition to the transanal microscopic approach, partial internal anal sphincter resection was performed to connect to the abdominal cavity that had been exfoliated. The posterior wall of the vagina was excised in combination, allowing complete resection without damage to the capsule. We could select the optimal release layer using the simultaneous transabdominal and transanal approach to the giant lower rectal lesion, which is continuous from the cranial and anal sides, and resection around the tumor without damaging the capsule Resection with secured resection stumps is possible.

From the above, this method is considered a useful surgical technique.

199—ROBOTICS & NEW TECHNIQUES—Colorectal

BEYOND MINIMAL INVASIVE SURGERY: SINGLE PORT ROBOT TRANSANAL TOTAL MESORECTAL EXCISION

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Introduction: Transanal total mesorectal excision (TaTME) is one of the newly introduced surgical methods in rectal cancer. Recently, single port robot(SPR) surgery has been newly released. We performed TaTME with a single port robotic platform. The aim of this study is to assess the initial feasibility of SPR TaTME surgery.
Patients and Method: The 77-year-old woman was diagnosed as mid rectal cancer with an ulcerofungating mass of 5 cm and 6 cm above anal verge. Patients' underlying diseases included hypertension, angina pectoris, and previous history of spinal surgery. The preoperative clinical stage of the patient was identified as T4aN1M0. Patients underwent neoadjuvant concurrent chemo-radiation therapy with capecitabine 1300 mg twice a day prior to surgery. Patients was treated for 6 weeks from April 22 to June 4, the clinical stage was identified as ycT3N1M0.
Result: The patient underwent TaTME and LAR using a single port robot platform. The total operation time was 211 min and the total surgeon console time was 94 min. TaTME time was performed for a total of 27 min. We first started with a transanal approach, through the sacral promontory for the posterior and douglas pouch anteriorly to the abdominal cavity. Additional entry was considered, but the fat of rectum was bulky and uterus limited the field of view. We again used a transabdominal approach through umbilicus to ligation IMA and IMV and to perform mobilization of Lt.colon. There was no special event during surgery. The patient began to sips of water three days after surgery and received a soft bland diet on day four. The patient's first bowel movement was confirmed on day 4. The patient was discharged 7 days after surgery. There was no specific morbidity in the surgical recovery process and no re- hospitalization for 120 days. Postoperative pathology revealed no residual tumors. There were 13 harvested LNs and no metastasis was identified in the LNs. The final pathology was confirmed as ypTx N0.
Conclusion: TaTME using a single port robot platform is a new surgical method for colorectal cancer surgery. No scar surgery is also possible through TaTME beyond minimal invasive surgery. It is considered a safe surgical method for patients with short term follow up after surgery. In addition, there was no clear difference in the patient's recovery after surgery. Further research is needed for long-term oncologic outcomes.

174—ROBOTICS & NEW TECHNIQUES—Colorectal

USEFULNESS OF ANASTOMOTIC PERFUSION CHECKING BY NEAR-INFRARED INDOCYANINE GREEN-ENHANCED FLUORESCENCE IN LAPAROSCOPIC COLORECTAL SURGERY

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Aims: To assess the role of near-infrared indocyanine green-enhanced fluorescence in the evaluation of anastomotic perfusion during laparoscopic colorectal surgery (LCS). Our hypothesis is that this technology improves the perfusion checking, helping to minimize the rate of anastomotic leakage.
Methods: We retrospectively considered a consecutive unselected series of 55 patients underwent LCS for both benign and malignant diseases. Of these, 12 (21.8%) were totally laparoscopic right colectomies, 35 (63.6%) laparoscopic left colectomies "high-tie", 8 (14.6%) anterior rectal resections without loop-ileostomy for cancer of the upper rectum. Surgical steps and post-operative management have been standardized. In all cases, indocyanine green (Verdye, Diagnostic Green GmbH, DE) at the dose of 0.2 mg/kg was intravenously administered before any visceral resection and checked by near-infrared fluorescence imaging system (Karl Storz SE & Co, Tuttlingen, DE).
Results: No conversions nor dye allergic reactions were registered. Both complications scored > 3 according to Clavien-Dindo system and mortality rates were 0%. In 3 cases we changed the section site due to because it was found to be ischemic at the perfusion assessment. We recorded one case (1.8%) of subclinical anastomotic leak after left colectomy, without any treatment required.
Conclusions: Indocyanine green-enhanced fluorescence technology technology was useful and effective for assessing the anastomotic perfusion in laparoscopic colorectal surgery.

77—ROBOTICS & NEW TECHNIQUES—Colorectal

THE THIRD ARM. SURGEON'S FRIEND IN THE MANAGEMENT OF INTRAOPERATIVE COMPLICATION

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Different studies have shown that robotic-assisted rectal surgery compared to laparoscopic traditional surgery is associated with less blood loss and a better preservation of the pelvic autonomic nerves that is a fundamental component in rectal surgery in order to avoid anterior resection syndrome.

Robotic technological advantages should facilitate rectal cancer resection and some authors demonstrated that robotic conversion rates to open surgery, especially in low anterior resection, are lower than laparoscopic surgery.

Therefore, robotic-assisted surgery is gaining popularity in the treatment of rectal cancer.

We present a case of rectal cancer treated by robotic approach, in which an acute bleeding from the IMA occurred.

With the help of the third robotic arm the bleeding was temporarily stopped, making possible the procedure to continue without any necessity of conversion. Moreover, the surgeon could go on with the other instruments without any discomfort.

After the dissection of the vascular plane along the Inferior Mesenteric Artery (IMA), and the correct linphadenectomy, the IMA could be clipped at its origin, stopping definitively the arterial bleeding.

The intervention was completed without conversion and the patient was discharged on the 4th postoperative day without any complication.

1480—ROBOTICS & NEW TECHNIQUES—Colorectal

INFERIOR MESENTERIC ARTERY PRESERVING ROBOTIC RECTAL RESECTION

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Laparoscopic surgery is considered the gold standard treatment for colorectal cancer. However, this technology is associated with some limitations, like 2-dimensional vision, uncomfortable ergonomic position for the surgeon, a decreased range of instrument movement and unavoidable physiological tremors.

Robotic-assisted surgery for colorectal cancer overcomes these technical difficulties: it provides a stable 3-dimensional magnification vision, superior dexterity, a better ergonomic comfort and it also reduces physiological tremors.

Many studies have shown that robotic rectal surgery compared to laparoscopic traditional surgery is associated with less intraoperative bleeding, rapid postoperative recovery and lower conversion rates to open surgery.

We present a case of an 80-year old woman (BMI = 24.8 kg/m2) affected by low rectal adenocarcinoma, without any other comorbidities.

The anterior low rectal resection with the preservation of the Inferior Mesenteric Artery (IMA) was performed using da Vinci Xi® robot (Intuitive Surgical, Sunnyvale, USA), according to a critical view of safety previously described in laparoscopy.

After the robotic docking, the surgical procedure began with the identification and ligation of the Inferior Mesenteric Vein (IMV) at its origin. The dissection began right next to the Treitz ligament where the identification is easier, and then the vein is totally isolated and divided.

The procedure continued with the detachment of the mesocolon from the pancreatic surface and the division of Toldt's fascia from Gerota's plane.

Then the retroperitoneal layer was opened towards the pelvis to identify the origin of IMA. After the IMA was isolated, the dissection proceeded on Sigmoid Artery, which was clipped at its origin, sparing the origin of IMA.

The parietal peritoneum was dissected alongside the lateral margin of the colon, beginning from the proximal sigma up to the splenic flexure.

The mesorectal dissection proceeded as same as descrbed by Heald [4], starting from posterior dissection of the mesorectum, moving down to the pelvis, and continuing laterally, until the rectal wings were separated. Anteriorly the peritoneum was incised at 1 cm from the Douglas reflection so that the Douglas pouch could be entirely removed, finishing in front of the Denonvillers' fascia.

Finally, the distal rectum was resected using a robotic stapler and a Knight-Griffen colorectal was performed.

Before and the anastomosis an Indiocianine Green Enhance Fluoroangiography was performed to assess the presence of a correct vascolarization of the rectal stump and the anastomosis, respectively.

Histopathologic results showed a pT3G1N0 tumour, with 31 harvested nodes (pathologic nodes: 0/31), and a complete Total Mesorectal Excision (TME), negative Distal Resection Margin (DRM) and Circumferential Resection Margin (CRM).

The postoperative period was uneventful, and the patient was discharged on the 4th postoperative day.

1480—ROBOTICS & NEW TECHNIQUES—Colorectal

DEVELOPMENT AND EVALUATION OF ROBOTIC TRAINING THE TRAINER CURRICULUM: A PILOT STUDY

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Aim: Robotic techniques are being increasingly used across all surgical specialities. There is, however, a lack of training opportunities and structured training programmes for training the trainer (TTT) in robotic surgery.
The aim of this study was to develop and evaluate a training curriculum for TTT in robotic surgery with enhance teaching skills and provide a training framework for robotic trainer.
Methods: A bespoke structured training curriculum for robotic TTT was developed by experts in robotic surgery and education and provided an overview on the different simulating training modules, technical and nontechnical skills. The framework of LAPCO TT was used and adapted to fit in with the robotic training requirements. Trainers with at least 1 year experience on robotic surgery from different specialities (performed an average 35 cases) were selected for this pilot course. A combination of assessment of impact on robotic skills as well as teaching skills using evaluation cSTTAR (Course - Structured Training Trainer Assessment Report) were used to assess the delegates before and after attending the workshop across three stage of teaching: set, dialogue and closure. Every step was scored from 1 (did not happen) to 4 (happened perfect amount).
Results: The curriculum was piloted by 12 candidates including three trainers. Delegates showed significant improvement in the preparation for teaching with improvement from a score of 2 in the pre-assessment to a score of 4. The training dialogue also improved as trainees did not consider necessary the dialogue at the pre-assessment evaluation (mean score 3); However, the mean score at the post-assessment time was 4, considered done at a perfect amount. After the teaching, the mean evaluation of the feedback obtained in every step was 4.
Conclusions: The robotic TTT curriculum was developed and initially piloted to demonstrate immediate improvement in teaching skills. Further research is needed to assess long term effectiveness of the TTT courses, and its clinical impact.

1420—ROBOTICS & NEW TECHNIQUES—Colorectal

HYBRID ENDOSCOPY SIMULATOR FOR ADVANCED INTERVENTIONAL PROCEDURES (HESIP)

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Aims: Flexible endoscopy has developed rapidly from a diagnostic instrument to a more complex interventional procedure, such as per-oral endoscopy myotomy (POEM), endoscopy mucosal resection (EMR), endoscopy mucosal dissection (ESD), bariatric endoscopy, and treatment of complications by echo endoscopy guide. We need new simulators for training in these new procedures.
We have developed a hybrid simulator with physical haptic of human stomach tissue and sono graphic properties for the training of advanced flexible endoscopy skills.
Methods: Task modules were assessed by a panel of 8 experts, which includes: tool flexible endoscopy manipulation, tool targeting (polypectomy and fistulae treatment), endoscopy resection, and endoscopy suturing and echo endoscopy drainage.
Prototype task modules were designed to mimic each skill. The prototype was constructed from a combination of thermoplastic polymer and biopolymers, which provides echogenicity and resistance to needle penetration like body tissues. 3D print technology was used to obtain stomach human anatomy. The prototype was put into the final training box.
Conclusions: The use of additional technology (3D printing) provides development of very realistic simulators for flexible endoscopy training. This hybrid simulator corresponds to the current quality standards, being less expensive than analogs cadavers or pig models, finally we believe the new prototype could be part of training programs in advanced flexible endoscopy procedures.

1374—ROBOTICS & NEW TECHNIQUES—Colorectal

LIVE SURGERY BROADCAST: SYSTEMATIC REVIEW ON THEIR IMPACT ON PATIENT SAFETY

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Aims: Live surgery broadcast (LSB) has gained popularity in conferences and meetings. This is due to rapid advancement in both transmission ease and technology to help broadcast the operation to a live audience, primarily for teaching and training. In 2014, an evidence synthesis was reported on the educational value of LSB. The aim of this study was to update the evidence with specific emphasis on patient safety issues related to LSB.
Methods: A systematic review of the literature was performed using Medline, Embase and Pubmed using defined search terms, in accordance with the PRISMA guidelines and independently by two authors. Inclusion criteria included reports on LSB in educational events across all surgical specialities. Studies reported on < 10 patients and reports on social media transmission were excluded. Outcomes included patient safety as measured by clinical outcomes, dedicated LSB consenting process, and overall stress level of the surgical team. Additionally, patient safety issues were also searched and summarised in the guidelines by the different surgical institutions.
Results: A total 1226 abstracts were identified and after application of inclusion criteria, 23 papers were identified (11 original articles and 12 position statements/guidelines). Clinical outcomes were not compromised in 8 studies but were inferior in the remaining three, including lower success rate of endoscopic surgery. Only two studies reported return to theatre but the overall reports on the follow up period were heterogeneous. All studies reported educational benefits for LSB but there was no clear objective measure. There was lack of clarity of the application of dedicated consent forms. Stress level of the surgical team was only reported in one study which demonstrated higher stress level with LSB. All 12 guidelines highlighted the educational value with an emphasis on patient safety. However there was no clear input from learners or patients/public involvement in the development of these guidelines to contextualise them in relation to learning and patient safety.
Conclusions: Evidence on patient safety of live surgery broadcast is limited. Further research is necessary to develop a quality assurance process for LSB in consultation with key stakeholders to maximise patient safety.

1126—ROBOTICS & NEW TECHNIQUES—Colorectal

A TRAINING COURSE OF LAPAROSCOPIC PRECISION CUTTING FOR MEDICAL STUDENTS: THE FEASIBILITY STUDY

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Aims: To set up a training course of laparoscopic precision cutting for medical student and evaluate its feasibility.
Methods: We provided an opportunity of practice laparoscopic precision cutting for the 5th medical students without formal teaching when they rotated to our division of general surgery. Thus, we developed a training course of this skill which combines 15 min online teaching with video demonstration and tips and tricks reminding. Them, an experienced laparoscopic surgeon as a preceptor demonstrates how to do laparoscopic precision cutting perfectly and observes the medical students' practices and give them feedback during this one-hour hands-on section. The 6th year medical students and PGY doctors who had previous self-practice experience of laparoscopic precision cutting were invited to participate this training course and give their feedback. The final products were assessed by a validated self-developed assessment tool as one of training outcome.
Results: Between Sep 2019 to Nov 2019, eighteen 6th year medical students and two PGY doctors participated this training course. All participants agreed that the quality and the duration of online teaching were good (3.65 ± 1.3; 4.11 ± 0.6). The quality and the duration of hands-on section were also good (3.95 ± 0.9; 4.04 ± 1.3). The mean score of each item in the assessment tools of laparoscopic precision cutting were as followed: completion 3.5 ± 0.9; degree of deformation 3.11 ± 1.2; degree of being pulled 3.1 ± 1.1; and overall appearance 3.6 ± 0.9. The immediate feedback from the preceptor benefited them most. More practice time were requested.
Conclusions: We successfully set up a training course of laparoscopic precision cutting for medical student and its feasibility has been evaluated. Organizing the training course in large scales will be conducted and its short terms training effect will be evaluated.

1061—ROBOTICS & NEW TECHNIQUES—Colorectal

THE USE OF 3D DIGITAL TECHNOLOGIES IN SURGICAL EDUCATION

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Aims: Surgical training has evolved enormously in the recent decades. The reduction in working hours and recognition of patient safety requirements, coupled with a tremendous development of digital technologies, have shifted a significant portion of training outside the operating theatre. 3D modelling, 3D printing, simulation and virtual reality (VR) play an increasingly important role in acquisition of various surgical skills.
Methods: Literature search has been performed via NICE Healthcare Database for Advanced Search, PubMed and EMBASE to identify the general areas and specific examples of application of the novel technologies, including 3D modelling, 3D simulation, VR and serious gaming in surgical training within the last 20 years.
Results: We have identified examples of the application of digital 3D technologies related to various surgical domains, from anatomy and clinical knowledge, through decision making, to operative skills. Various applications address different educational needs at different stages of surgical training or career progression. 3D virtual and printed models are used to study generic anatomy, as well as patient-specific anatomy to assist in recognition of pathology, surgical planning and decision making. High fidelity VR surgical simulators present multiple advantages over traditional teaching methods, including increased patient safety, delivery of immediate feedback and creation of a controllable and modifiable environment, where the trainee can practise at their pace, independently of the availability of suitable cases. VR stimulators have low maintenance cost and are reusable allowing for repeated training without generating extra cost. Hybrid simulation, which combines the advantages of a physical 3D printed model (haptic feedback, deformability) with advantages of a VR simulator (building complex interfaces and environments) is an especially exciting joint application of the two novel technologies. 3D model also allows for an objective assessment of the task completion as it can be easily inspected. There is evidence to confirm an improved patient safety when the skills have been gained through a VR simulator.
Conclusions: With the changing requirements of the surgical training, digital 3D technologies are presenting new opportunities of maximising training exposure. They improve the educational experience by providing a wide selection of training scenarios, allowing for a controlled clinical exposure.

907—ROBOTICS & NEW TECHNIQUES—Colorectal

THE RELATION BETWEEN SPEED OF EXECUTION OF LAPAROSCOPIC TASK PERFORMANCE AND SURGICAL ERRORS

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Background: The accuracy of any motor-skill-based performance is impaired with increasing speeds of task execution. Laparoscopic surgery does not escape this speed-accuracy trade-off, though little is known about its safe limits in surgery. The aim of this study was to quantify this speed accuracy trade-off by measuring errors committed by novices and non-novices performing simulated laparoscopic tasks at varying speeds of execution.
Methods: Thirty novices, with no previous surgical experience, each performed a standardized peg-transfer task, initially at their chosen natural speed of execution and then randomly at progressively faster or slower speeds of task execution as dictated by an auditory metronome signal. In a separate setup, 20 surgical residents as non-novices, were tasked to pierce standardized 1 mm laparoscopic targets with a needle at different speeds paced by a metronome. Performances were video-recorded and later analysed for error numbers and probability (errors/number of movements) using human reliability analysis. Non-parametric statistical analysis was used, with significance set at $p < 0.05$.
Results: A total of 13,078 movements were analysed and 3818 errors were detected. Novices took a median of 10 s (IQR 8.25–10) per peg transfer when performing at their chosen natural speed of task execution with a median error probability of 0.21 (IQR 0.16–0.27). Increasing speed to 8 s per transfer or faster significantly raised the error probability to 0.24 (IQR 0.18–0.31, $p < 0.05$). Speed needed to be slowed down to 14 s per transfer to show statistically significant reduction of error probability to 0.18 (IQR 0.10–0.23, $p < 0.05$). However, there was no additional benefit to slow down below this speed.
For non-novices each incrementally slower task execution resulted in a 15% (range 12–18%) average reduction of errors ($p < 0.01$).
Conclusion: This study confirms and quantifies the association between slower speeds of surgical task execution and reduction by the observed surgical errors committed in both novices and non-novice surgeons. Importantly both groups benefited by slowing down below their chosen natural speed of execution. These findings may have applications in error reduction mechanisms and in surgical training.

840—ROBOTICS & NEW TECHNIQUES—Colorectal

ASSESSING THE CONCURRENT VALIDITY OF THE EOSIM LAPAROSCOPIC SIMULATOR: CAN THIS AUGMENTED REALITY SIMULATOR REALLY ASSESS THE ACCURACY OF A KNOT?

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Aims: Laparoscopic suturing remains an essential skill to be mastered for surgeons in training. This is mostly done with validated laparoscopic box trainers or virtual reality simulators. These simulators mainly score on instrument movement parameters which are not direct outcomes on how well a suture is performed. Therefore, this study aims to assess the concurrent validity of the EoSim laparoscopic simulator.

Methods: The simulator parametric results from novice and laparoscopic experienced participants performing a laparoscopic suturing learning curve were gathered. Participants repeatedly performed an intracorporal suturing task on the EoSim augmented reality laparoscopic simulator. Parameters recorded by the simulator consisted of task time, instrument movements and composite score. Subsequently two blinded experienced surgeons independently scored the recorded video of the first and last knot of each participant using the CAT-LS form. Also, several objective measurements were gathered from the physical knots, including strength of the knot, adequate surgeons knot and distance of the sutures to the edge.

Results: A total of sixteen participants were included from which thirty-six suture task simulator outcome results and videos of the first and last knot were assessed with the CAT-LS form. As shown in Table 1 significant differences between the first and last knot were found for all the CAT-LS sections, the time, working space, distance, off-screen time and smoothness parameters from the simulator. The CAT-LS instrument score, tissue handling and total score outcomes were highest correlated to the time, working space, distance, off-screen time, smoothness and composite score parameters (Cronbach's alpha 0.795, 0.770 and 0.805) shown in Table 2. The simulator time distance and composite score parameters show good and significant correlation to the CAT-LS parameters outcomes. The objective measured parameters show moderate correlation to either the time, off-screen time or composite score parameters.

Table 1: Mean (SD) values at the start and end of the suturing learning curve

CAT parameters	Start LC (n=18)	End LC (n=18)	p-values
Instrument score	12.2 (2.1)	7.7 (1.3)	0.000
Tissue score	11.1 (1.4)	7.4 (1.3)	0.000
All errors score	3.4 (4.0)	0.6 (0.6)	0.007
Total assessment score	26.7 (6.0)	15.7 (2.6)	0.000
Objective parameters			
Knot Strength	0.9 (0.3)	1.0 (0.0)	0.163
Surgical knot	0.8 (0.4)	1.0 (0.0)	0.083
Adequate distance	0.8 (0.4)	0.9 (0.2)	0.187
EoSim parameters			
Time (s)	683 (432)	161 (45)	<0.001
Working space (cm)	6.4 (1.0)	5.2 (0.7)	0.002
Distance (m)	14.4 (10.6)	4.0 (1.5)	0.001
Off-screen time (s)	42.9 (42.9)	16.7 (12.6)	0.010
Handedness (%)	7.4 (5.4)	7.6 (6.5)	0.925
Speed (mm/s)	3.9 (2.9)	3.4 (1.9)	0.581
Acceleration (mm/s^2)	2.3 (1.8)	2.1 (1.0)	0.629
Smoothness (mm/s^3)	0.0 (0.0)	0.1 (0.1)	0.037

P-values were calculated using paired t-tests. A p-value of <0.05 was considered statistically significant.

Table 2: Correlation coefficients between CAT and EoSim parameters

	CAT score				Objective measurements		
EoSim parameters	Instrument	Tissue	All errors	Total	Knot strength	Surgical knot	Adequate distance
Time (s)	0.817**	0.647**	0.851**	0.903**	0.285	0.600**	0.163
Working space (cm)	0.404*	0.340*	0.374*	0.432**	0.064	0.232	0.293
Distance (m)	0.745**	0.597**	0.712**	0.797**	0.305	0.365*	0.070
Off-screen time (s)	0.531**	0.425**	0.497**	0.563**	0.475**	0.694**	0.234
Handedness (%)	-0.022	-0.065	0.135	0.031	0.190	0.196	-0.044
Speed (mm/s)	0.025	-0.055	0.216	0.088	-0.063	-0.105	-0.097
Acceleration (mm/s^2)	0.020	-0.068	0.224	0.085	0.293	0.336*	0.038
Smoothness (mm/s^3)	-0.485**	-0.536**	-0.214	-0.455**	-0.178	-0.028	0.091
Composite score	0.795**	0.633**	0.791**	0.863**	0.401*	0.668**	0.208
Internal Reliability†	0.795	0.770	0.898	0.805	0.645	0.886	-

Data in this table represents the Pearson correlation coefficient. * indicates a significant p-value of <0.05. ** indicates a significant p-value of <0.001. † Calculated from combining p<0.05 significant correlations using Cronbach's Alpha based on standardized items.

Conclusions: This study shows evidence for concurrent validity for five out of eight simulator parameters on the outcome of a CAT-LS assessment during laparoscopic suturing. The Handedness, speed, acceleration and smoothness parameters were unable to show concurrent validity with the relevant CAT-LS sections. These results indicate which relevant simulator parameters are to be used during laparoscopic skill assessment.

828—ROBOTICS & NEW TECHNIQUES—Colorectal

TRADITIONAL RIGID LAPAROSCOPIC NEEDLE HOLDERS COMPARED TO A FULLY MECHANICAL ARTICULATING NEEDLE HOLDER (FLEXDEX®) IN SURGICAL NOVICES

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Aims: The main aim of this project was the comparison of performance, using traditional and articulating laparoscopic needle holders, in surgical novices. The additional aim to this study was comparing the ergonomics and user satisfaction between the two types of needle holders.

Methods: The project was a prospective randomized cohort study. Participants (Medical students) (n = 40) without any previous laparoscopic surgical experience were randomized into either Group 1 (n = 20) who used the rigid needle holders or Group 2 (n = 20) who used the articulating FlexDex®. Individuals were then asked to perform 10 repetitions of validated assessment task. Time and error rate were calculated for all attempts.

Results: Group 1 achieved an average time of 217.9 s and an average error rate of 6.2 per attempt whereas Group 2 had an average time of 339.3 s and an average error rate of 9.3 per attempt. Comparison of the average times and error rates between the two groups achieved statistical significance with $p < 0.001$ and $p < 0.010$ respectively.

Conclusion: Medical students allocated to the FlexDex® group had poorer performance when compared to the students in the rigid needle holder group. Participants in both cohorts showed improvements in completion times and error rates throughout the 10 attempts hinting at a possible learning curve when using both instruments. Ultimately, results indicate a longer and harder learning curve associated with the FlexDex as compared to the rigid needle holder in novices.

Key Statement: Novices to laparoscopic surgery had inferior outcomes in terms of time and number of errors when using the FlexDex® than those who used traditional rigid needle holders.

798—ROBOTICS & NEW TECHNIQUES—Colorectal

TRAINING OF ROBOTIC VERSUS LAPAROSCOPIC CHOLECYSTECTOMY: A PROSPECTIVE RANDOMIZED CROSSOVER STUDY

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Aims: The objective of this study was to compare robotic surgery and conventional laparoscopy for the initial learning phase for minimally invasive cholecystectomy in novices.

Methods: In a prospective randomized cross-over study at Heidelberg University Hospital training center of minimally invasive surgery medical students in their clinical years (n = 40) were randomized in two groups. RAC1 group started with robotic assisted cholecystectomy (RAC) and afterwards performed laparoscopic cholecystectomy (LC). LC1 group started with LC and then performed RAC. Cholecystectomies were performed on porcine livers in the validated Pulsating Organ Perfusion trainer. Before cholecystectomies, all participants received standardized instructions and performed a standardized basic skill training for robotics laparoscopy. Primary endpoints were operating time and complications.

Results: RAC1 group injured the liver significantly less than LC1 group during the first cholecystectomy (RAC1 = 1.15 ± 0.59 vs LC1 = 1.60 ± 0.50; p = 0.035). After changing the modality, the RAC1 group damaged the liver significantly more than the LC1 group (RAC1 = 1.40 ± 0.60 vs LC1 = 0.89 ± 0.46; p = 0.019). Liver damage was not significantly different for each LC and RAC between groups. There was no significant difference in operating time between the groups for the first cholecystectomy (RAC1 = 78.40 ± 14.47 vs LC1 = 78.25 ± 12.53 min; p = 0.659) as for the robotic cholecystectomies (RAC: RAC1 = 78.40 ± 14.47 vs LC1 = 75.53 ± 16.41 min; p = 0.967) and the laparoscopic cholecystectomies (LC: RAC1 = 72.75 ± 17.51 vs LC1 = 78.25 ± 12.53 min; p = 0.478).

Conclusion: The results indicate that the robotic system can help novices learn cholecystectomy safer than conventional laparoscopy at the beginning of the learning curve, resulting in less liver damage. The experience from laparoscopic surgery seems to transfer skills when transitioning to the robotic system, while the robotic experience did not transfer to conventional laparoscopy. This should be considered when designing training curricula to prepare novices for safe performance of minimally invasive procedures.

378—ROBOTICS & NEW TECHNIQUES—Colorectal

SURGICAL TRAINING WITH 3D PHANTOM: A NEW MODEL FOR KIDNEY TRANSPLANTATION

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Three-dimensional (3D) printing technology has been recently introduced in surgery with multiple purposes like pre-operative planning, intra-operative navigation, patients counselling and simulation of surgical tasks by phantoms creation.

In the field of living donor kidney transplantation, latest radiological and engineering innovations allow to realize 3D phantoms replicating donor kidney and recipient pelvic anatomy with iliac vessels. These models would be useful for understanding the relationship among the anatomical structures and pre-operatively face some technical challenges in order to facilitate surgery and minimize intra-operative complications. Furthermore, 3D printed phantoms are training tools for young transplant surgeons who can familiarize with vascular and urinary anastomosis in safety.

We have recently set up a 3D printed phantom including donor specific kidney with related vessels, collecting system and recipient pelvic cavity with bladder and patient-specific iliac vascular structures made of soft and easily suturable material. It proved to be effective in mimicking a renal transplant, allowing to practice on vascular and urinary anastomosis and to preoperatively deal with the same technical and anatomical challenges that would be found in vivo.

We would like to present our experience with 3D printed phantoms in the field of kidney transplantation by demonstrating their effectiveness in training residents and young surgeons, analyzing the learning curve in terms of quality of the suture and time needed to perform the anastomosis.

330—ROBOTICS & NEW TECHNIQUES—Colorectal

SERIOUS GAMING AND VIRTUAL REALITY IN THE MULTIMODAL TRAINING OF LAPAROSCOPIC INGUINAL HERNIA REPAIR: A RANDOMIZED CROSSOVER ASSESSMENT AND VALIDATION

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Aims: The aim of this study was to assess the transferability of surgical skills between the laparoscopic hernia module on the serious game TouchSurgeryTM (TS) and on the virtual reality (VR) trainer LapMentorTM.

Methods: This prospective monocentric randomized cross-over study in the training center of minimally invasive surgery was conducted within a voluntary elective module for students in their 3rd to 6th year of medical school at Heidelberg University (n = 40). All participants were randomized in a 1:1 ratio to group 1 and 2. Group 1 started with the "Laparoscopic Inguinal Hernia Module" on TS (phase 1: patient preparation, phase 2: hernia repair) and performed the module first in training, then in test mode until proficiency goals were reached. Group 2 started with the "Inguinal Hernia Module" on a VR trainer (task 1: anatomical identification, task 2: incision and dissection) and also performed the module until proficiency goals were reached. Once the goals reached, the groups changed and performed the other training modality until the proficiency goals were reached. Primary endpoints were the number of attempts needed to achieve the goals for each group for each task/phase.

Results: Students who performed on TS first needed significantly less attempts to reach the predefined goal for task 1 on the VR trainer than students who directly started with the VR trainer (TS = 2.70 ± 0.57 vs VR = 3.15 ± 0.67; p = 0.028). No significant differences for task 2 were observed between the groups (TS = 2.25 ± 1.11 vs VR = 2.05 ± 0.83; p = 0.524).

For both phases on TS no significant skill transfer from the VR trainer to TS was observed (phase 1: TS = 1.95 ± 0.51 vs VR = 2.30 ± 0.66; p = 0.157).

Conclusion: The results show that surgical skills could be transferred from TS to the VR trainer for task 1 but not for task 2. Skill transfer from the VR trainer to TS as we expected could not be shown. VR and TS should thus be used in combination in multimodal training to ensure optimal training conditions.

214—ROBOTICS & NEW TECHNIQUES—Colorectal

VALIDITY OF A STEP-BY-STEP SURGICAL TRANING: AN ITALIAN SURGICAL SOCIETY EXPERIENCE

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In the last three years, in the framework of the activities of the Italian Society of Surgery School on: "Technological innovation: clinical aspects and research methodology", a structured surgical training was proposed.

Every year 15 post-graduate students and new surgical specialists underwent a full-intensive surgical training on minimally invasive techniques.

It was structured from single tasks to most complex procedures, with a clear procedural step-by-step protocol of increasing difficulties, starting from a dry laparoscopic simulator, then moving to the Wet Lab, and finally to the Animal Lab, where a complete procedure was performed in laparoscopy.

Learners were divided into two groups and tutored by menthors on every single task of the three day -full immersion- course.

A group of learners carried out advanced skills (suturing), subsequently performing basic skills. The OSATS system (Objective Structured Assessment of Technical Skill) was used to monitor them while performing the exercises. The results of the two groups were compared. The learners who carried out procedural step-by-step protocol of increasing difficulties, showed a better result in time and effectiveness of implementing advanced skills.The results were statistically evaluated by mean of time spending during the exercises eye -hand coordination and bimanual coordination, showing that the consequentiality of the exercises, performed with increasing difficulty, reduces the execution time and improves the performance of the surgeon.

79—ROBOTICS & NEW TECHNIQUES—Colorectal

TRANSFERABILITY OF THE ROBOT ASSISTED AND LAPAROSCOPIC SUTURING LEARNING CURVES IN A CROSSOVER STUDY

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Aim: With increasing use of robot assisted surgery, surgeons (in training) are challenged to learn robot assisted surgery (RAS) besides conventional minimally invasive surgery (cMIS). This leads to an increased array of skills that need to be mastered. Therefore, this study aimed to assess the learning curve of both surgical approaches and the influence on each other.

Method: A prospective randomized crossover study was performed as shown in Fig. 1. Medical students with basic surgical knowledge (group 1 and 2) and cMIS experienced, but RAS inexperienced, residents were recruited (Group 3). Three suturing tasks (intracorporal suturing, tilted plane needle transfer and anastomosis needle transfer) were repeatedly performed on the EoSim cMIS augmented reality simulator (Group 1) or the RobotiX RAS virtual reality simulator (Group 2) for a maximum of twenty repetitions. Subsequently, participants performed the learning curve on the other surgical modality. Simulator parameters (time, movements and safety), validated composite scores and cutoff values were used for the learning curve.

Results: Forty-three participants completed the learning curves, of which sixteen in Group 1 (cMIS first, then RAS), ten in Group 2 (RAS first, then cMIS) and seventeen in Group 3 (RAS only). Overall mean RAS suturing time and composite scores are presented in Fig. 1 and are significantly better in Group 1 and 3 versus Group 2 (time $p = 0.004$, $p = 0.001$ and composite scores $p = 0.008$, $p = 0.020$). Similar results were shown for the cMIS suturing time and composite scores being significantly better for Group 2 versus 1 (time $p = 0.005$, composite score $p = 0.002$). Significant difference from the cutoff score (Fig. 2) for RAS suturing was reached fastest by Group 3 (repetition six), followed by Group 1 and 2 (repetition nine and twelve). For the cMIS learning curve Group 2 showed the fastest difference from the cutoff score compared to Group 1 (repetition four and six).

Figure 1: study design flowchart and overall mean results

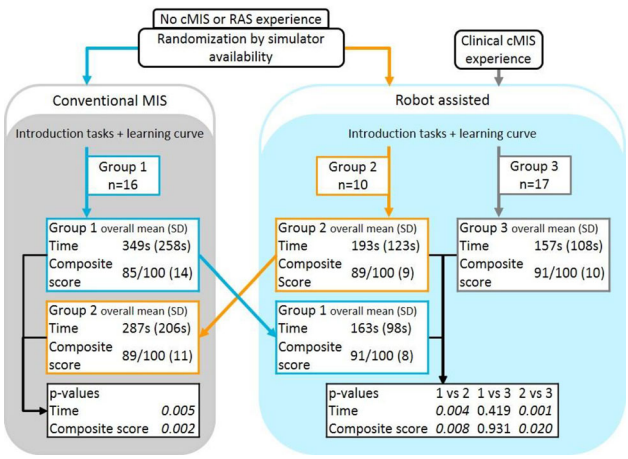
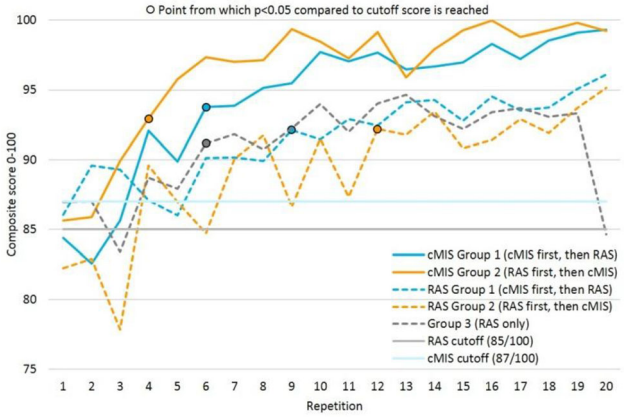


Figure 2: mean suturing composite scores



Conclusion: There was a transferability of skills in both groups, indicating that suturing experience on either conventional minimal invasive surgery (cMIS) or robot assisted surgery (RAS) is beneficial in learning the other approach. The most effective transferability was seen after learning the RAS approach before the cMIS approach.

644—ROBOTICS & NEW TECHNIQUES—Flexible surgery

THE IMPORTANT ROLE OF LAPAROSCOPY IN THE DIAGNOSIS OF LYMPH NODES SUSPECTED OF MALIGNANCY

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Aims: Due to imaging techniques, the number of patients with abdominal and retroperitoneal adenopathies has increased. It is often necessary to perform a directed biopsy.

Sometimes, image-guided needle biopsy yields inadequate tissue or tissue that has lost its architecture. Also, in patients suspected to have lymphoma image-guided needle biopsy fails to provide adequate tissue specimen to accurate study. This kind of biopsy may be hazardous in patients with nodes situated in close proximity to major blood vessels or important viscera.

Surgeons experienced in laparoscopic surgery are able to biopsy adenopathies intra-abdominal at almost all locations including those from areas that are considered difficult to access by image-guided needle biopsy.

Methods: The case of 20-year-old women is presented. She goes to the emergency room due to she has abdominal pain, hyporexia and fever. On examination, she has pain in right iliac fossa with localized peritoneal reaction. She has not adenopathies in the groin area, neck and supraclavicular fossa. In the abdominal CT, a hepatosplenomegaly and pathological mesenteric adenopathies are observed. However, there are not suspicious extra abdominal adenopathies. It is suspected that she has lymphoproliferative disease. Therefore, it is performed biopsy of adenopathy by laparoscopic approach.

Results: In surgery, an adenopathic conglomerate is observed in the ileocolic artery mesocolon. The conglomerate is biopsied and a part is sent to pathological anatomy, and another two part to haematology and microbiology. The patient is diagnosed with Kikuchi disease.
This disease is benign and self-limited. It preferably affects young women. The differential diagnosis should include lymphomas, bacterial lymphadenitis, toxoplasmosis, lupus erythematosus disseminated.

Conclusions: Laparoscopic biopsy is a minimally invasive method of obtaining tissue from abdominal nodes present in locations unsuitable o when tissue obtained by image-guided needle biopsy is inadequate. Laparoscopy allows to obtain adequate-sized biopsy specimen under visual control from lymph nodes in almost any intra-abdominal location, moreover, affords the surgeon an opportunity to examine the entire abdominal viscera.

1046—ROBOTICS & NEW TECHNIQUES—Liver

ROBOT-ASSISTED RESECTION OF A TYPE 1 CHOLEDOCHAL CYST WITH ROUX-EN-Y RECONSTRUCTION

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This video shows our technique for the surgical resection of a cyst of the common bile duct using a minimally-invasive, robot-assisted approach.

We present the case of a 47 year-old obese female patient, classified as ASA II, who underwent a cholecystectomy in 2012 and suffered since 2016 from a biliary colic-like pain attacks.

A Magnetic resonance cholangiopancreatography showed a Todani 1 cyst of the Common Bile Duct (CBD) with subsequent indication for a surgical resection.

The operation was performed using the robotic system Intuitive Surgical DaVinci Xi® with the patient in supine position with a 15° of anti-Trendelenburg angle.

The 8 mm camera trocar was inserted just below the umbilicus and 3 more 8 mm trocars were placed in the upper right quadrant and flank. An assisting 5 mm trocar was added in the epigastric region. The hepatic hilum was dissected to free the cyst from the surrounding structures.

The right and left hepatic arteries and the portal vein were seen and preserved.

The main bile duct was prepared from the confluence of the right and left bile ducts to the pre-pancreatic region. The CBD was resected and, using the robotic stapler for section and the robotic VesselSealer® for a proper mobilisation of the jejunum, a transmesocolic biliojejunal anastomosis was performed 60 cm distal to the Treitz ligament with a 4–0 V-lock and a double-layer reinforcement with 3–0 Vicryl.

The distal anastomoses were then performed with a mechanical Stapler 80 cm distally. Two Jackson-Pratt where placed near the biliary anastomosis.

Postoperatively we observed no complications with early mobilisation and realimentation, The drainages were removed on the 2nd and 4th postoperative day, so that the patient was discharged 6 days after the surgery.

The histological examination showed a well differentiated adenocarcinoma pT1 G1 R0 associated with intraepithelial biliary neoplasia (BiIIN-3).

In minimally-invasive surgery, based on our experience, the robotic approach with its excellent 3D-visualization, precision of movements and EndoWrist technology with fully wristed articulation represent a major advantage in this procedure, which would have been in this obese patient hardly practicable with the conventional laparoscopy.

1014—ROBOTICS & NEW TECHNIQUES—Liver

APPLICATION OF INDOCYANINE GREEN-FLUORESCENCE ADJUVANT TO LAPAROSCOPIC ULTRASOUND IN MINIMALLY INVASIVE LIVER RESECTION

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Aims: In the era of minimally invasive liver surgery, intraoperative laparoscopic ultrasound (LUS) has largely proved to be a necessary tool to support hepatobiliary surgeons. Moreover, recent research showed indocyanine green fluorescence (ICG) can also be a valid technique in this field, thus joining a better intraoperative staging and visualization of the tumors, and providing a real time guide during parenchymal resection.
Aim of this video is to report our experience in routinely application of ICG during laparoscopic liver resection (LLR), evaluating its easy reproducibility and effectiveness comparing to traditional LUS.
Methods: In this 4 K high resolution video, we analyzed 10 consecutive cases underwent LLR for malignant tumors, 6 hepatocellular carcinoma (HCC) and 4 colorectal liver metastases (CRLM), using ICG-fluorescence imaging at our HPB Surgical Unit. ICG was injected intravenously at a dose of 0.5 mg/kg body weight for a preoperative liver function test within 3 days before surgery for CRLM and 7 days before for HCC. Afterwards, the dye also served as the fluorescence source for the intraoperative identification of hepatic tumors. After liver mobilization, LUS firstly and ICG successively were routinely performed in order to evaluate number and localization of the lesions and finally to define sharp transection line.
Results: Correct tumor staining was reported in all patients. Fourteen tumors were correctly visualized with ICG-fluorescence, while only eleven with LUS (100% vs 71%). The Achille's heel of LUS was the identification of superficial lesions (< 5 mm in depth) in cirrhotic patients with irregular nodular surface. Moreover, by analyzing the role as a navigator, we found the use of ICG useful in providing a real-time marker of the tumor edge leading an adequate transection line while going deeper, thus helping to obtain tumor-free resection margins (100%).
Conclusions: ICG-fluorescence adjuvant to LUS, has proved to be an easy reproducible technique, thus helping hepatobiliary surgeons to gain a sharp intraoperative staging and perhaps a better detection of superficial tumors in cirrhotic patients comparing to LUS.

778—ROBOTICS & NEW TECHNIQUES—Liver

ROBOTIC SEGMENT III LIVER RESECTION IN CIRRHOTIC PATIENT: EXTRAGLISSONIAN AND ICG GUIIDED

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Aims: Robotic surgery allows to perform liver resections following the principles of anatomical resection through an extraglissonian approach and with indocyanine green.
Methods: We present the case of a 51-old patient with HBV cirrhosis and stage Child A with a hepatocellular carcinoma of 2.5 cms in segment III.
Results: 1. The patient is placed supine. 2. The camera is placed in an umbilical port, two trocars to the left of it and a trocar to the right. 3. The ligament is released between segments III and IVb to expose the round ligament throughout its length. 4. Prepare for a possible Pringle maneuver. 5. The extraglissonian virtual space between gate II and gate I (from Sugioka) is dissected, isolating the pedicle of segment III. 6. A Vascular clamp is placed in the segment III pedicle and indocyanine green (ICG) is injected intravenously. 7. The ischemia line is demarcated. 8. Partition of the parenchyma with robotic instrumentation is initiated, using kellyclasia technique and bipolar energy. 9. The segment III pedicle is sectioned between polymer clips (Grena clips). 10. The left hepatic vein is sectioned and stapled at its level.
Conclusions: The purely robotic approach allows for resections of anatomical hepatic segments following the same principles as in conventional laparoscopic surgery.

630—ROBOTICS & NEW TECHNIQUES—Liver

FULL ROBOTIC LEFT SECTIONECTOMY PARTIALLY EXTENDED TO THE FOURTH SEGMENT FOR LEFT BILE DUCT CHOLANGIOCARCINOMA

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Aims: The da Vinci robotic technology, particularly the Xi system, can improve and simplify challenging minimally invasive abdominal procedures such as major hepatectomies. Indeed, 3D magnified vision, Endowrist instruments and robotic staplers can be valuable tools to reduce blood loss and biliary leakage during the hepatic parenchyma dissection. We present a case of a full robotic left sectionectomy partially extended to the fourth segment, for left bile duct cholangiocarcinoma carried out with the da Vinci Xi system.
Methods: A 72-years old woman with a finding of alteration of cholestasis enzymes was referred to our center. A CT scan showed a 7x4 mm contrast enhancement in the left hepatic duct, with a consensual dilatation of left intrahepatic biliary ducts, referring to a left bile duct cholangiocarcinoma. Thus, she underwent a robotic left sectionectomy partially extended to the fourth segment, with the da Vinci Xi platform. The patient was placed in a supine position, with anti-Trendelemburg 15° inclination. The trocars were positioned according to the upper quadrants trocars' position suggested by Intuitive.
Results: The procedure was successfully completed in 255 min. The hepatic parenchyma transection was performed with bipolar grasps and the left hepatic vein was transected with a robotic vascular stapler. No intra-operative complications occurred. The post-operative course was uneventful and the patient was discharged 5 days after surgery.
Conclusion: The da Vinci Xi platform can improve the exposure and the dissection maneuvers during minimally invasive hepatic surgery. The dexterity of robotic manipulation can simplify the dissection of hepatic parenchyma and the 3D magnified vision may help to recognize the structures of hepatic parenchyma and of hepatic hilum.

1203—ROBOTICS & NEW TECHNIQUES—Pancreas

MINIMALLY-INVASIVE DISTAL PANCREATECTOMY: A COST-ANALYSIS COMPARISON BETWEEN ROBOTIC AND DIRECT MANUAL LAPAROSCOPIC APPROACH

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Aims: To date few studies have reported a structured cost analysis of robotic distal pancreatectomy, and none has compared the relative costs between the robotic-assisted surgery (RAS) and the direct manual laparoscopy (DML) in this setting. The aim of the present study is to address this issue by comparing surgical outcomes and costs of robotic distal pancreatectomy with the da Vinci Si and Xi, and with the DML.
Methods: Data related to 88 robotic distal pancreatectomies performed with either da Vinci Si (Si-Rob group) (47 cases) and da Vinci Xi (Xi-Rob group) (41 cases) and to 47 laparoscopic distal pancreatectomies (Trad-Lap group) performed between April 2010 and January 2020 were retrospectively analysed and compared. Si-Rob and Xi-Rob interventions were matched to laparoscopic distal pancreatectomies by case–control matching method using age, gender, BMI and ASA risk score as matching variables. Overall costs (including costs of personnel, hospital stay, consumables and fixed costs related to robot acquisition and maintenance) were compared between groups using generalized linear regression model adjusting for covariates.
Results: Thirty-five patients for each group were selected. No differences were found in overall mean operative time (OT) between Xi-Rob (226 min) and Si-Rob group (247 min) vs Trad-Lap group 262 min ($p = 0.164$). The conversion rate was significantly higher in the Trad-Lap group: 5/35 cases (14.3%) (2 cases to hand-assisted laparoscopic technique and 3 cases to traditional open technique) vs 1/35 case (2.9%) in the Si-Rob group and 0 case in the Xi-Rob group ($p = 0.045$). Overall costs associated with Trad-Lap procedures were significantly lower than with Xi-Rob and Si-Rob groups, also when adjusted for covariates ($p < 0.001$). However, excluding fixed costs, the difference between Trad-Lap and robotic groups resulted no longer statistically significant with the da Vinci Xi ($p = 0.105$ and $p = 0.049$ for Xi-Rob and Si-Rob respectively) at multivariate analysis.
Conclusions: RAS is more expensive than DML for distal pancreatectomy because of higher acquisition and maintenance costs. The flattening of these differences considering only the variable costs suggests a possible optimization of the cost-effectives of RAS in this setting.

633—ROBOTICS & NEW TECHNIQUES—Pancreas

ROBOTIC LEFT-SUBTOTAL SPLENOPANCREATECTOMY FOR A PANCREATIC NECK CARCINOMA

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Aims: The da Vinci Xi represents an evolution of the previous da Vinci Si and traditional laparoscopy, allowing an easier and faster surgery in challenging procedures, such as pancreatic resections. We are presenting a case of a left subtotal splenopancreatectomy for a solid lesion of the body of the pancreas, determining compression on the splenomesenteric confluence, performed by using the da Vinci Xi.

Methods: A 78-years old man with an incidental finding at US of a lesion of the neck of the pancreas located just above the spleno-mesenteric confluence, confirmed with a CT scan, was operated with the da Vinci Xi platform. For the procedure, we used the upper quadrants trocars disposition suggested by Intuitive.

Results: The operation was successfully completed in 350 min. The left subtotal splenopancreatectomy, with section of the pancreas at the gastroduodenal artery level, was performed totally robotic, despite the contact of the lesion with the spleno-portal-mesenteric confluence, determining compression, without signs of infiltration. No conversion or intra-operative complications were recorded. The postoperative course was uneventful and the patient was discharged on the 7th postoperative day.

Conclusions: The da Vinci Xi gives some advantages in pancreatic surgery allowing to perform challenging procedures, such as pancreatic resections for lesions close to the vessels, with a minimally invasive technique. These advantages could improve the widespread of minimally invasive surgery for the treatment of pancreatic disease.

619—ROBOTICS & NEW TECHNIQUES—Pancreas

THE USE OF BARBED SUTURE WITHOUT FASHIONING THE "CLASSIC" WIRSUNG-JEJUNOSTOMY IN A MODIFIED ROBOTIC END-TO-SIDE INVAGINATED PANCREATOJEJUNOSTOMY

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Aims: The treatment of the pancreatic stump is a critical step of pancreaticoduodenectomy (PD) because leaks from this anastomosis incur major morbidity and mortality. Robotic technologies can facilitate minimally invasive surgery in challenging abdominal procedures such as pancreato-jejuunostomy, increasing their widespread. However, one of the major limitations of this application could be the lack of a tactile feedback, that can lead to pancreatic parenchyma laceration during knots ligation, or during traction in the continuous suturing techniques. Moreover, a Wirsung-jejunostomy is not always easy to be fashioned, especially in case of very small diameter of the duct. We herein describe the technical details of a robotic modified end-to-side, invaginated robotic pancreatojejunostomy (RmPJ) with the use of barbed suture and without fashioning the "classic" Wirsung-jejunostomy.

Methods: The RmPJ technique consists of a particular double layer suture: the outer layer is a monofilament absorbable running barbed suture (using 3–0 V-Loc) to reach the invagination of the pancreatic stump; then a small enterotomy is made in the jejunum exactly opposite respect to the location of the pancreatic duct, and a stent (usually 5 Fr) is inserted inside the duct. The internal layer is another row of 3–0 V-Loc running suture, placed between the pancreatic capsule/parenchyma and the seromuscular layer of the jejunum.

Results: With this technique, we have experienced that the two layers of running barbed suture are at lower risk of parenchymal damage because they maintain the suture's tension at any passage, avoiding the need of tractions and of multiple knots tying. Furthermore, the absence of a "classic" Wirsung-jejunostomy, as the duct and the enterotomy are only faced and stented, allows to easily reproduce this technique in every kind of pancreas and in Wirsung ducts of every size. The post-operative course was uneventful and the patient was discharged on POD 7th, without developing any fistula.

Conclusions: In our experience the RmPJ technique resulted to be fast, safe and reproducible in any kind of pancreatic duct and parenchyma. Its application on a large number of patients is needed to draw conclusions

400—ROBOTICS & NEW TECHNIQUES—Pancreas

TIPS AND TRICKS TO SIMPLIFY A ROBOT ASSISTED PANCREATO-DUODENECTOMY

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Aims: Robotic technology can facilitate challenging minimally invasive abdominal surgeries such as pancreato-duodenectomy. We are presenting a case of an ampullary tumor treated with full robotic Traverso-Longmire (T-L) procedure, reporting some tips and tricks to simplify the entire intervention, making it easier and faster.

Methods: A 64-years old woman with a finding of an ampullary neoplasia, underwent a robot-assisted pancreato-duodenectomy with the use of the da Vinci Xi system. Patient was placed in lithotomic position and robotic trocars on the transverse umbilical line.

Results: The T-L procedure was successfully completed in 385 min. A clip was applied to close the main bile duct after its section, avoiding a bile leakage staining the operative field. The Treitz liberation was performed by the right side, continuing the Kocher maneuver, to minimize the risk of malrotation of the intestinal loop during its retromesenteric transposition for the reconstructive phase. The dissection of the pancreatic head from the portal vein and of the retroportal lamina were entirely performed using the EndoWrist Vessel Sealer device, avoiding any ligation or clips application. A personal modified end-to-side invaginated pancreatojejunostomy was carried out with 3/0 V-Loc double layer running suture. The duodeno-jejunostomy was also fashioned with a double layer of running barbed suture. No intra- or post-operative complications occurred and the patient was discharged on POD 7th.

Conclusions: The da Vinci Xi gives some advantages in pancreatic surgery allowing to perform challenging procedures, such as pancreato-duodenectomy, with a minimally invasive technique. The Treitz liberation by the right side to minimize the risk of malrotation of the anastomotic loop, the use of the fully wristed Vessel Sealer Extend, which allows a fast dissection and safe sealing of vessels, the use of a personal end-to-side invagination technique of pancreato-jeujeunostomy with a double layer of running barbed suture and the fashioning of the duodeno-jejunostomy with a double layer of running barbed suture, can definitely enhance the surgical workflow.

913—ROBOTICS & NEW TECHNIQUES—Solid organs

FIRST CASE OF COMPLETE FULL ROBOTIC SURGICAL RESECTION OF LEIOMYOSARCOMA OF THE RIGHT RENAL VEIN

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Background: Leiomyosarcomas present high post-operative morbidity and poor prognosis. In the literature, only few cases of localized small leiomyosarcoma have been described. These cases might benefit from a minimally invasive approach. Robotic surgery has been claimed to have several advantages over the laparoscopy such as enhance vision and instruments movements which might make more feasible the execution of this type of surgery where partial renal resection is required.
Methods: A 53-year old female with a medical history of myeloid leukemia and with chronic renal failure (creatinin: 2.6) was referred to our hospital for an incidental finding of right perirenal tumor of almost 3 cm compatible with leyomiosarcoma arising from right renal vein.
Results: The operation was performed using a Da Vinci Robotic Surgical System model Si (Intuitive Surgical, Sunnyvale, CA, USA). Robotic ports were placed in a standard configuration for minimally invasive right nephrectomy.

The dissection started with the partial mobilization of the right liver and Kocher maneuver. After the identification of the inferior vena cava the tumor is finally localized and dissected. Resection ended with a partial right vein resection and suture. Pathological final exam confirmed the diagnosis with margins free from tumor.
Conclusions: In selected cases, robotic resection of leiomyosarcoma might be a safe and feasible procedure in experienced hands.
Disclosure of interest: The authors declare that they have no competing interest.

1196—ROBOTICS & NEW TECHNIQUES—Solid organs

ROBOTIC MEDIAN ARCUATE LIGAMENT SYNDROME RELEASE

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This video presents the case of a 51-year-old female presenting non-specific chronic abdominal pain increasing steadily over the previous six months. Following a diagnostic work-up including CT angiography, the patient was diagnosed with Medical Arcuate Ligament Syndrom. The operation was performed with the da Vinci Si surgical robot.

The procedure started with the opening of the gastro-hepatic ligament. This was followed by the opening of the phrenoesophageal ligament. In the next step, the right and left crura of the diaphragm were identified. The crura were subsequently separated. This allowed for the exposure of the anterior aspect of the aorta. The meticulous dissection was then carried out caudally, in the preaortic plane until the origin of the celiac trunk was identified. The celiac trunk was gradually dissected with robotic monopolar hook cautery. The fibers of the median arcuate ligament were identified and divided. The left and right crura were then re-approximated with sutures. The patient noticed the relief of the symptoms already on the first postoperative day and was discharged home two days after the surgical procedure.

636—ROBOTICS & NEW TECHNIQUES—Solid organs

ROBOTIC PYELOLITHOTOMY AND PYELO-URETERAL PLASTY IN A PATIENT WITH PYELOURETERAL JUNCTION STENOSIS AND STAGHORN RENAL STONES

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Aims: The treatment of staghorn renal stones can be very challenging, especially in patients with pyeloureteral junction stenosis who also require a pyelo-ureteral plasty. The robotic technology can be very useful in this setting, allowing to perform such difficult procedures with a minimally invasive approach. We present here a case of a full robotic right pyelolithotomy for staghorn renal stones and a contestual pyelo-ureteral plasty for pyeloureteral junction stenosis causing recurrent pyelonephritis.
Methods: A 57-years old obese woman with a history of pyeloureteral junction stenosis from childhood and a finding of staghorn renal stones causing recurrent pyelonephritis was referred to our center. She underwent surgery with the use of the da Vinci Si surgical system. The patient was placed in a left sided position. The trocars were positioned according to the right-side trocars disposition suggested by Intuitive.
Results: The procedure was successfully completed in 210 min. The right ureter was isolated and an intra-operative ultrasound scan was carried out to confirm the precise location of the stones. The pyelolithotomy was easily performed after resection of the stenotic tract, at pyeloureteral junction with the extraction of the stones. Then, another ultrasound scan was used to confirm the absence of residual stones. The pyelo-ureteral plasty was carried out with a PDS 5/0 running suture, prior stent placement. No conversion or intra-operative complications were recorded. The postoperative course was uneventful and the patient was discharged on the 4th postoperative day.
Conclusions: The da Vinci Surgical System is a useful tool in the surgical treatment of staghorn renal stone disease and pyeloureteral junction stenosis. The enhanced surgical dexterity offered by robotic assistance allows to easily perform these challenging abdominal procedures with a minimally invasive approach, also in difficult cases such as obese patients or history of recurrent pyelonephritis.

634—ROBOTICS & NEW TECHNIQUES—Solid organs

ROBOTIC ASSISTED PARTIAL NEPHRECTOMY AND PLEDGETED RENORAPHY

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Aims: Partial nephrectomy represents the standard treatment for small renal masses. Currently, it is commonly performed using minimally invasive approaches, but one of the main concerns still remain the achievement of good hemostasis and the closing of parenchymal defect. Robotic assistance, thanks to the well-known versatility, allows to safely perform these procedures, also in difficult cases, that have so far been treated by an open approach. We are presenting a case of robotic assisted partial nephrectomy and pledgeted suture for the parenchymal defect performed with the use of da Vinci Xi.

Materials and Methods: A 48-year-old woman with an incidental US finding of a 50 mm partially exophytic tumor of the superior pole of the left kidney, confirmed with CT scan, was operated with the da Vinci Xi® platform. Patient was positioned in right lateral decubitus with the trocars' disposition for the "upper left quadrants" suggested by the Intuitive.

Results: The procedure was successfully completed in 185 min. The partial nephrectomy was performed following the isolation and clamping of an upper renal vein and artery for the superior pole of the kidney. For the improvement of hemostasis and the closure of parenchymal defect, we used five PTFE pledgets anchored with V-Loc sutures. There were no surgical complications or need for conversion to laparoscopy or laparotomy. The patient had an uneventful recovery and she was discharged on the 3rd postoperative day.

Conclusions: The use of robotic assistance, allows to perform complex partial nephrectomies with a total minimally invasive technique. Moreover, it has the advantage of transferring and easily apply to the minimally invasive surgery field the use of adjunctive techniques borrowed from open procedures for achieving hemostasis and closing parenchymal defects, such as the pledgeted renoraphy.

1517—ROBOTICS & NEW TECHNIQUES—Technology

ONCOLOGIC GASTRECTOMY PERFORMED WITH ROBOTIZED LAPAROSCOPIC INSTRUMENT (HANDX. HUMANXTENSIONS) FIRST WORLD'S EXPERIENCE

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Robotic surgery is emerging as an interesting alternative to laparoscopic surgery with conventional instruments.
There are more and more publications showing evidence of its advantages in different surgical procedures.
However, mainly due to economic reasons, the availability of surgical robot is limited in many countries and surgical centers.
For this reason, technological alternatives have arisen that provide the most outstanding advantages of the surgical robot in devices that can be used in the conventional laparoscopic approach.
One of these devices is HandX.
HandX™ is a single-use, handheld, powered laparoscopic device. HandX™offers the technical benefits of robotic surgery via a lightweight and cordless handheld modular platform. It is capable of passing through 5 mm trocars and offers ease of access in the surgical field. HandX™ is intended to assist in the laparoscopic manipulation of tissue, including grasping, approximation, ligation, and suturing.
HandX™ has similar indications for use as the predicate devices and the reference device: the daVinci robotic system. Human Xtensions received FDA approval for the HX device (HandX™) on Mar. 20, 2018.

We present the case of a 73-year-old male patient diagnosed with localized adenocarcinoma in the gastric body. The extension study was negative.

A laparoscopic subtotal gastrectomy with modified D2 lymphadenectomy was performed using the HandX device (HumanXtensions) on the grasper and needle holder. Roux-en-Y reconstruction was performed with gastrojejunal anastomosis in two planes and jejunejunal anastomosis in one plane both with barbed suture.

We present the surgical video of the case to illustrate the characteristics of the referred device and its applicability in oncological gastric surgery in which we consider the first case of gastrectomy described with this device.

1286—ROBOTICS & NEW TECHNIQUES—Technology

NEW ERA IN PATIENTS' CARE - THE USE OF NOVEL TECHNOLOGIES IN PATIENT ENGAGEMENT

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Aims: Patient's role has evolved enormously in the recent decades, with more attention being placed on patient safety, measurable outcomes and overall satisfaction. Simultaneously, patients have gained an important voice in shaping clinical research and healthcare systems. Novel 3D technologies have become an important modality assisting surgeons in various ways. They are being applied in surgical planning, navigation and in surgical education. Although they have not been utilised to the same degree to influence patients' experience, several exciting examples of their use in patient care have started to emerge.
Methods: Research literature has been explored via NICE Healthcare Database for Advanced Search, PubMed and EMBASE to identify the general areas and examples of application of the novel technologies, including 3D modelling, simulation, virtual reality and serious gaming in patient engagement within the last 10 years.
Results: Four different areas of the application of the 3D technologies have been identified. Firstly, they have been used to improve patient knowledge and healthcare literacy. Virtual and 3D-printed models, as well as virtual reality platforms, are used to present generic or patient's specific anatomy to increase patients' understanding of their condition, to explore the treatment options and to obtain a more meaningful consent, which results in reduction of anxiety and helps to manage patients expectations. The second largest area of the application focuses around pain management, both acute and chronic. Patients submerge in the virtual reality worlds, which provide distraction during the occurrence of an unpleasant stimulus, which is especially useful in children or burns patients. Thirdly, serious gaming has been applied to promote healthy lifestyles, including weight management. Lastly, by participating in focus group discussions in virtual worlds, patients, via their avatars, contribute to shaping healthcare systems by presenting their views and needs based on personal experience.
Conclusions: The novel 3D technologies are enhancing patient experience by providing new ways of fruitful communication through an interactive presentation of patient individual anatomy and pathology. They can be also successfully applied to alleviate pain and anxiety, and to promote healthy lifestyle, as well as shape the future of healthcare systems in general.

1273—ROBOTICS & NEW TECHNIQUES—Technology

MINIMALLY INVASIVE INGUINAL LYMPH NODE DISSECTION IN THE TREATMENT OF MELANOMA

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Introduction/Aims: Lymph node dissection for the regional treatment of inguinal metastasis of melanoma improves disease free survival but has been associated with significant morbidity. Complication rates can be up to 70%, namely surgical wound complications such as infection, dehiscence and seroma. Aiming to reduce these adverse events and improve quality of life, a minimally invasive approach has been developed.
Methods: We present a video demonstrating the technique of minimally invasive inguinal lymph node dissection (MILND) for the treatment of inguinal lymph node metastasis of melanoma in an 82-year-old male. The patient presented with a melanoma of the left foot with a positive sentinel lymph node in the left inguinal region and a MILND was proposed.
Results: A perioperative ultrasound was performed to clearly identify the anatomic boundaries of the femoral triangle; 3-trocars were placed at the inferior limit of this triangle with blunt dissection in the area between the trocars. After CO2 insufflation, superficial dissection was made, defining the limits of the femoral triangle; the sartorius and adductor longus muscles were identified and the great saphenous vein was ligated at the apex of the triangle. After clear identification of the femoral artery and vein, the great saphenous vein was safely ligated at the sapheno-femoral junction. The remaining tissue was dissected until the inguinal ligament superiorly and the specimen was extracted inside an endobag through one of the trocars' incisions and a drain was placed. The postoperative period was uneventful. One out of ten isolated lymph nodes was positive and the patient was proposed adjuvant radiotherapy.
Conclusion: The MILND appears to be feasible and safe in patients with inguinal lymph node metastasis of melanoma, emerging as an alternative to reduce surgical wound complications.

1057—ROBOTICS & NEW TECHNIQUES—Technology

FORCE-BASED ASSESSMENT OF TISSUE TRAUMA IN ROBOTIC VERSUS LAPAROSCOPIC SUTURING; A PROSPECTIVE RANDOMIZED CROSSOVER STUDY

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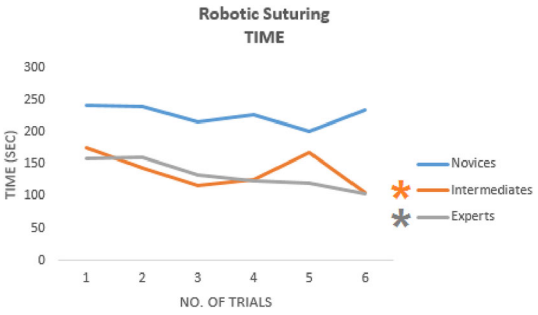
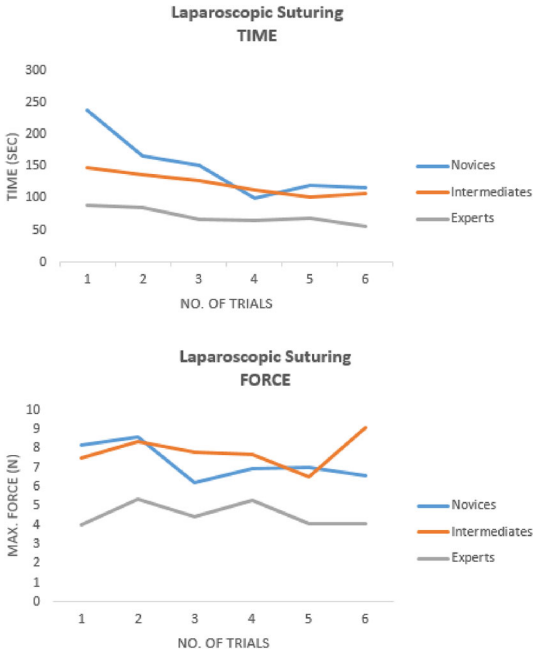
Aim: To provide validity evidence for objective force-based assessment of tissue handling skills in robotic surgery. Moreover, we aimed to provide a detailed comparison of learning curves for robotic and laparoscopic suturing.

Methods: Thirty trainees were included and classified as novices, intermediates, and experts based on prior laparoscopic experience. In a crossover study, each participant executed six trials of a suturing task on the DaVinci robotic simulator and six trials of the same task on a box trainer. Both simulators were equipped with the validated state-of-the-art Forcesense measurement system for objective force and motion-based assessment. At first, we assessed validity by comparing outcomes of forces applied to the tissue between novices and experts. Secondly, learning curve outcomes for both the robotic simulator (RS) and laparoscopic simulator (LS) were analysed and plotted (Fig. 1 and 2).





Results: Over three hundred trials were captured successfully and included for analysis. Validity for force-measurements was assessed by comparison of novices and experts for LS and RS (resp. (8.20 ± 2,57(N) vs. 3,79 ± 0,75(N); p = 0,005 for LS and (7,21 ± 3,07(N) vs. 5,07 ± 1,17(N); p = 0,099 for RS). For RS, intermediates and experts improved their efficiency (Time to execute task) based on pre- and post-outcomes; resp. 174,56 ± 71,72(sec) vs. 106,13 ± 34,88(sec); p = 0,005 for intermediates and 155,33 ± 60,76 (sec) vs. 103,83 ± 22,10(sec); p = 0,013 for experts. No further significant improved of instrument handling or tissue manipulation skills were observed (Fig. 1 and 2).

Conclusion: Force metrics representing tissue trauma and risks of intraoperative complications did not improve and remained dangerously high after training on both LS and RS. For RS intermediates and experts improved in Time metric, indicating trainees focus on efficiency and speed, rather than safely handling the tissue. Objective assessment of tissue trauma should be implemented in LS and RS, and outcomes should be evaluated before operating on real patients.

990—ROBOTICS & NEW TECHNIQUES—Technology

USEFULNESS OF NOVEL INFECTION-FREE SELF-ASSEMBLING HEMOSTATIC MATERIAL IN LAPAROSCOPIC SURGERY

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Aim: Hemostasis in laparoscopic surgery is mainly performed with energy devices. However, these devices might cause heat injury to the surrounding tissue. Although emergence of the "soft coagulation" technology has enabled hemostasis with minimal heat injury, the effect on the surrounding tissue cannot be completely avoided. Furthermore, the hemostatic effect with soft coagulation substantially differs among surgeons. It is preferable to use hemostatic material when more reliable tissue protection is needed. Peptide hemostatic agents have received increased attention. Self-assembling peptides are synthetic peptides that undergo gel–sol transformation in response to pH/inorganic salts and do not carry a risk of infection. TDM-623 is the second-generation peptide material that has been improved over the first-generation peptide material (TDM-621), which is currently used as a hemostatic agent in Europe. We have verified the efficacy of TDM-623 in large animal laparotomy and flexible endoscope models. This study was performed to verify the usefulness of TDM-623 in laparoscopic surgery using an oozing splenic injury model.
Methods: Evaluation of the hemostatic effect of TDM-623 in laparoscopic surgery was performed using the spleens of 35-kg female swine in the spine position (n = 12). A bleeding wound was created laparoscopically using a biopsy punch. The hemostatic effect in the acute phase (after 2 min) was evaluated in the TDM group (in which 1 ml of TDM-623 was applied to the wound) and in the coagulation group (in which hemostasis was performed using the soft coagulation mode: 80 W, effect 7, 3 s). Histologic evaluation was performed on resected specimens from each group. Tissue retention, operability, and effect on the surgical field were verified in the TDM group.
Results: The bleeding score was comparable between the two groups. In the laparoscopic bleeding model, a hemostatic effect was achieved in 31 of 44(70%) swine in the TDM group, while 21of 45 (47%) swine in the coagulation group. Histological evaluation confirmed the absence of TDM-associated inflammatory cell infiltration in the TDM group. TDM-623 could also be used during laparoscopic surgery without any technical difficulties.
Conclusion: The second-generation self-assembling peptide (TDM-623) displayed high hemostatic effects in laparoscopic surgery. It has potential usefulness in laparoscopic surgery.

726—ROBOTICS & NEW TECHNIQUES—Technology

OBJECTIVE INTRAOPERATIVE MUSCULOSKELETAL RISK FOR ENDOSCOPIC SURGEONS

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Aims: A member survey of EAES was performed in 2017 on work-related pain and discomfort. Those results differed from many papers on endoscopic surgeons' pain locations, which had reported that the lower-back and neck had a high prevalence of clinically significant pain.
This study examines the relationship between intraoperative postural risk assessed with wearable sensors and the body part discomfort and pain results from the EAES survey. Previous subjective studies on endoscopy have focused on surgeons' upper limb and shoulder pain due to the postures assumed during laparoscopic surgery. However, a recent objective study has found that intraoperative postures that place the surgeon in high-risk neck and lower-back postures.
Methods: Objective intraoperative postures were measured during colorectal, head and neck, hepatobiliary, and general surgery procedures using wearable posture sensors on the surgeon's head, trunk and upper arms, bilaterally. These sensor data were categorized into the percentage of surgical duration in high (3/4) and very high (4/4) RULA risk postures, then averaged by surgical specialty to assess potential musculoskeletal risk.
Results: 49 surgeries were assessed (27 open, 22 laparoscopic) with intraoperative posture sensors. The percentage of time spent in extreme postures, shown as orange (3/4) and red (4/4), for neck, trunk and each shoulder by surgical specialty was categorized (Table). The surgical duration in high-risk postures, especially for the neck (59% of surgical duration) and lower-back (25% of surgical duration) is excessive, matching self-reported pain by EAES members. EAES members self-reported clinically relevant neck (52%) or lower-back (52%) pain immediately after surgery.
Conclusions: Previous studies of endoscopic surgeons had identified the shoulders/upper-back as the primary location of discomfort and pain; however, the EAES survey showed that the neck and lower-back had higher work-related pain scores than other body parts. The objective intraoperative wearable sensor data for work-related musculoskeletal disorders also demonstrated the neck and lower-back had the highest postural risk. Overall, the percentage of time surgeons spend at high musculoskeletal risk is disturbing. These results show that intraoperative postural risk is very high and that interventions are necessary to protect surgeon musculoskeletal health for career longevity.

656—ROBOTICS & NEW TECHNIQUES—Technology

REALISTIC FULL URINARY TRACT PHANTOM FOR ENDOSCOPIC TRAINING

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Aims: The fast development of minimally-invasive surgical instrument requires realistic human-like organ phantom in vitro to optimize medical instrument, simulate surgical procedures and train medical personnel. In this study, we developed a high-resolution full urinary tract model, which consists of the kidney, ureter, bladder, prostate and urethra, based on 3D-printing and injection molding.
Methods: The three-dimensional (3D) digital models of the organs were reconstructed based on high-resolution CT or MRT scans of real human organs. Negative molds were printed by 3D printing using an ultraviolet light curable photopolymer VeroClear® on a 3D printer (Objet 260 Connex, Stratasys, Israel), and polymeric materials were engineered to mimic soft tissues and injection molded in the molds. The method allows high-resolution anatomical structures as well as the use of realistic biomimetic materials that can be imaged, cut, coagulated and sutured. Endoscopic procedures, such as laser lithotripsy and transurethral resection of the prostate (TURP) were simulated in the phantom.
Results: The phantom was validated by multiple medical imaging modalities, including CT, MRT and ultrasound imaging. The images show that the phantom materials behave like real human tissues and detailed anatomical structures are presented down to $\sim$ 0.5 mm resolution. Endoscopic examinations were successfully carried out in the phantom. The fine features of anatomical structures, such as the renal calyces, the blood vessels and the tumors, were clearly observed with high imaging contrast (shown in the figures), making the endoscopic scene very realistic. The hydrogel material of the phantom mimics soft tissue in mechanical, electrical and optical properties. Surgical procedures, such as electrocautery and coagulation, were successfully performed in the phantom, to completely simulate and train endoscopic surgeries.
Conclusions: We present the full urinary tract organ phantom with detailed features and tissue-like soft materials. The organ phantom system is reproducible and identical, thus it enables the realistic simulation of endoscopic surgery and the quantitative evaluation of surgical outcome. It provides a unique opportunity for engineers to optimize endoscopic instruments and for surgeons to improvement endoscopic skills.

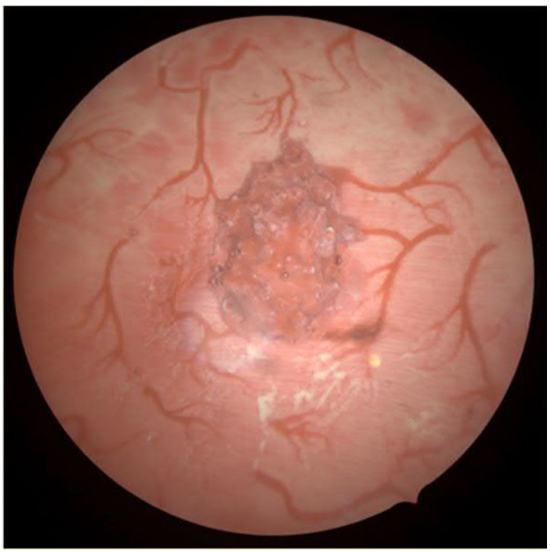

Fig. 1 Endoscopic view of the urinary tract phantom. **a** Submillimeter blood vessels and a tumor in the bladder phantom is imaged by cystoscopy, **b** Upper calyces in the kidney phantom is imaged by flexible ureteroscopy

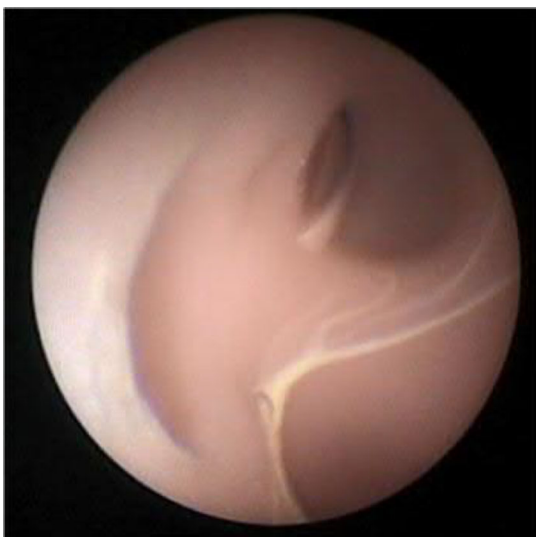

Fig. 2 Endoscopic view of the urinary tract phantom. **a** Submillimeter blood vessels and a tumor in the bladder phantom is imaged by cystoscopy, **b** Upper calyces in the kidney phantom is imaged by flexible ureteroscopy

593—ROBOTICS & NEW TECHNIQUES—Technology

CAN UNIPORTAL VIDEO-ASSISTED THORACOSCOPIC BULLECTOMY BE INDICATED FOR EVERY LOCATED SPONTANEOUS PNEUMOTHORAX?

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Aim: Uniportal video-assisted thoracoscpic surgery (VATS) for spontaneous pneumothorax (SP) has been more widely used recently. In this study, we investigated our initial experiences of the uniportal VATS bullebectomy on the procedure possibility regarding bleb location.

Method: We reviewed 9 cases of uniportal VATS stapler bullectomy for primary SP, performed on patients under 45 years of age, between 2015 and 2019. In principal, a single port of 25 mm on the 5th intercostal space at the anterior axially line was fixed by the silicon wound retractor. Their bullectomies were performed using a simple technique using conventional straight endoscopic instrument, cotton-made dissectors, thoracoscopic Maryland grasping forceps, Endo GIA stapler, and 5-mm thoracoscope. In the case of dissecting adhesion, the energy device was used. Following bullectomy, the stapling line was reinforced with an absorbable polyglycolic acid sheet.

Result: The patients underwent stapler bullectomy for the blebs located in right apical segment, right superior segment, right middle lobe, left apical-posterior segment, and left anterior-basal segment. In every operation, 1–3 sites of lung were wedge-resected with neither additional ports nor open extended incision. Blood losses were negligible and mean operation times was 72.8 $\pm$ 16.65 minites.

The movements of Instruments were limited due to the size of the access port, however all procedures could be accomplished with the ingenious use of the camera handled by an assistant.

Conclusions: A uniportal VATS bullectomy could be indicated for every located bulla in our cases. However, due to the limitations of the procedure, it is believed that other types of VATS are needed to treat other types of bulla.

449—ROBOTICS & NEW TECHNIQUES—Technology

EVALUATION OF THE EFFECT OF 3D IMAGING IN THE EUROPEAN TRAINING IN BASIC LAPAROSCOPIC UROLOGICAL SKILLS (E-BLUS) PROGRAM

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Aims: To analyze the effect in surgical performance of using 3D imaging in the European Training in Basic Laparoscopic Urological Skills (E-BLUS) program and compare it with the use of a traditional imaging system.

Methods: A systematic review with a structured bibliographic search was conducted in the electronic libraries of PubMed and EMBASE until July 10, 2019 and without limitation of year of publication or language. Studies on 3D visualisation technology in laparoscopic urologic surgery, randomised controlled trials and observational comparative studies were included. Studies involving the E-BLUS program were considered for analysis. For each study, the extraction of the relevant data to be analyzed was carried out.

Results: 239 papers were screened and 7 studies were included. All studies were carried out in box trainer with 2 articles also including LESS surgery and the use of the Kymerax (Terumo) device. It was observed a significant reduction of time in peg transfer using the 3D imaging in novice and expert surgeons. Time required for the tasks of "cut a circle", "needle guidance", "clip and cut" and "knot tying" were significantly shorter in all groups of surgeons (novices, intermediates and experts) with 3D vision. 3D vision significantly shortened operative time in vesicoureteral anastomosis in novice and expert surgeons. Regarding errors, only one study presented results during the knot tying performed by experienced surgeons, which were in favor of the 3D imaging system.

Conclusions: Overall, the use of 3D vision leads to better surgical performance in the E-BLUS training program than using traditional 2D imaging systems. It is observed that the use of 3D imaging systems reduced the time required to complete the E-BLUS training tasks. Using 3D vision seems to improve the efficiency of surgeons, mainly in novice surgeons.

380—ROBOTICS & NEW TECHNIQUES—Technology

Multicenter clinical experience of a handheld electromechanical system for various articulating tip laparoscopic instruments

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Introduction: The reduced degrees of freedom (DOF) inherent to non-articulating laparoscopic instruments limited the adoption of minimally invasive surgery and led to multimillion-dollar robotic solutions to solve this issue. We trialed an electromechanical system (HandX, Human Extensions, Israel) designed to combine the advantages of 6 DOF articulating instrument tips common to robotic surgery with those of hand-held laparoscopic instruments.
Methods: In an international, multicenter prospective study, five surgeons at four different hospital sites used the HandX device in a clinical setting. Informed consent was obtained from each patient enrolled in this study. Each surgeon's training and practice data were systematically recorded prior to clinical application. A validated Likert-type assessment tool (System Usability Scale, SUS), and an internally developed physician assessment questionnaire rating ten different factors were completed for each procedure. Each surgeon documented the occurrence of intraoperative or postoperative complications.
Results: Five surgeons specialized in minimally invasive surgery performed 33 procedures (16 female and 17 male patients, average age 58 years, average BMI 27). A grasper was used in 11, a needle holder in 20, and both instruments in 2 interventions.
Laparoscopic procedures included postoperative ventral hernia (n = 9), ventral hernia (n = 1), inguinal hernia (n = 3), cholecystectomy (n = 6), paraesophageal hernia (n = 4, of which 1 revisional), right (n = 5) and left hemicolectomy (n = 1), Tenckhoff catheter implantation (n = 2), diagnostic laparoscopy (n = 1), and inguinal neurectomy (n = 1).
There were no device-related adverse events throughout the various procedures performed.
Prior to the structured training program, one surgeon underwent 2 h of training before animal model training prior to clinical translation. With the development of a structured training program, training times were significantly reduced to around 1 h of standardized introductory training.
The mean SUS score reflected from 33 procedures is 84/100, an above average result. The overall mean physician assessment score ranging from 1 (positive) to 5 (negative) for a total of 11 questions was 1.77 ± 0.34.
Conclusions: Computer-assisted (often called robotic) surgery is gaining popularity due to an increase in the surgeon's manual capabilities. It also opens the door for data collection and artificial intelligence which many authors put forward for the future of surgery. Unfortunately, current computer-assisted surgical systems are bulky and expensive.
This multicenter experience using a compact, cost-effective solution showed the benefit of multi-articulating instrumentation to enhance the surgeon's abilities. With an efficient training program, the device is safe and easy to use, and represents an encouraging tool to enhance minimally invasive surgery applications.

78—ROBOTICS & NEW TECHNIQUES—Technology

IATROGENIC LEFT DIAPHRAGMATIC HERNIA: A ROBOTIC REPAIR

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An elective robotic repair of the diaphragmatic defect has been performed.
The procedure was performed with the DaVinci Xi® platform (Intuitive Surgical, Sunnyvale, USA) under general anaesthesia with the patient in supine position with open legs. The patient was positioned in anti-Trendelenburg position with a minimal rotation (about 10°) to the left.
A robotic docking was performed and four arms were positioned in the abdomen. The robotic instruments were the Permanent Cautery Hook®, Fenestrated Bipolar Forceps®, Cadiere Forceps® and 30° endoscope.
Laparoscopy confirmed the presence of a wide diaphragmatic defect with the complete herniation of the stomach in the thorax and showed the absence of a hiatal hernia. Furthermore, laparoscopy showed the presence of adhesions between the stomach and the diaphragmatic defect.
After an accurate adhesiolysis, the herniated stomach was repositioned in the abdomen. With the exposure of the diaphragmatic defect), we noted that the spleen was attached to the diaphragm and was impossible to position the mesh adequately. Thus, after the detachment of the spleen from the diaphragm, the defect was closed with a running barbed suture. During the suture, an aspirator was used to eliminate all the CO2 from the thorax. An absorbable mesh was applied on the closed diaphragm.
The duration of the procedure was 120 min and no drains were applied neither in the abdomen nor in the thorax.
In the first postoperative day the patient was undergone to a chest X-ray, that confirmed the absence of pneumothorax.
The postoperative period was uneventful and the patient was discharged in the 3 postoperative day.

1152—SOLID ORGANS—Adrenal

LAPAROSCOPIC ADRENALECTOMY - OWN COMPLICATIONS

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During 15-years' experience in laparoscopic adrenalectomy, both transperitoenal and retroperitoneal, I had several complications, including: bleeding from adrenal gland, erroneous pancreatic tail instead of adrenal gland dissection, left hepatic vein injury, clipping of left renal vein branch due to difficulties in left adrenal vein identification. Sharing those video recordings might help others avoid similar problems during laparoscopic adrenalectomy.

1200—SOLID ORGANS—Adrenal

SIMULTANEOUS LAPAROSCOPIC LEFT ADRENALECTOMY AND LEFT HEPATIC RESECTION THE SAME PATIENT. SURGICAL CONSIDERATIONS OF A CASE

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Aim: We report a video of a simultaneous laparoscopic left adrenalectomy for a Cushing syndrome and a hepatic enucleation for a giant hemangioma in the same patient. We describe the preoperative findings, the surgical strategy and we discuss the operative steps.

Methods: A 57 years old female remitted for a left adrenalectomy. The patient was diagnosed with adrenal Cushing's syndrome based on low ACTH levels, disappearance of circadian variation in blood cortisol levels, lack of inhibition by dexamethasone loading, and high urinary cortisol levels. Abdominal CT showed a 45 mm tumor in the left adrenal gland. Additionally a hepatic hemangioma of 67 cm localized in segment II was observed. This finding were confirmed by abdominal MRI and ultrasound. A previous ultrasound demonstrated a of progressive size growth of the hemangioma, so the patients was submitted to a simultaneous laparoscopic adrenalectomy and an hepatic enucleation.

Results: A laparoscopic left adrenalectomy and an atypical hepatic enuclation of the angioma localized in segment II were performed. The postoperative course was uneventful with steroid replacement therapy and patient was discharged on 4th post operative day.

Conclusion: Laparoscopic combined resection are challenging. Exhaustive preoperative study, adequate intra- operative strategy and multidisciplinary approach are needed.

1425—SOLID ORGANS—Adrenal

UTILITY OF INDOCYANINE GREEN FOR INTRAOPERATIVE LOCALIZATION OF VASCULAR RELATIONS OF A RARE CASE OF AN EXTRA-ADRENAL GANGLIONEUROBLASTOMA

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Aims: Ganglioneuroblastoma is a primary malignant tumor of the sympathetic nervous system. It usually occurs in children and is extremely rare in adults. Here, we report a case of an extra-adrenal ganglioneuroblastoma in a 50-year-old woman and the surgical procedure using ICG-enhanced fluorescence imaging for an adequate mapping of the vascular relationship of the tumor during the resection performed by laparoscopic approach.

Methods: A female 50 years old affected by abdminal pain and sick is evaluated in our office. A CT scan is performed that shows a extraadrenal mass of 40x24 mm located near to pancreas and between the left diaphragm pillar and the left adrenal gland and spleen. RM confirmed the relations of thr mass.

Blood concentration of cortisol and dehydroepiandrosterone sulfate were not significantly elevated. Aldosterone was 11 ng/dL and plasma renin concentration was 9.2 mcU/mL. Twenty-four-hour urine studies included vanillylmandelic acid 10.7 mg), metanephrine 116 mcg, normetanephrine 594 mcg and chromogranin which were all found to be normal. Urinary free cortisol was normal too.

Results: Preoperative α-receptor blockade was achieved with prazosin. A laparoscopic approach was performed using an umbilical 11 mm port, 5 mm port in right paraumbilicus position and subxiphoid, and a 12 mm in left paraumbilicus.

An anterior and retropancreatic dissection combined was performed using a Ligasure Maryland (Covidien Medtronic-USA) and a angiographic ICG-enhanced Fluorescence imagen was developed in order to identify the splenic Vein and Common hepatic artery and celiac trunk during the surgical procedure.

Conclusions: In view of its "angiographic" properties, ICG-enhanced fluorescence imaging is useful to facilitate vascular dissection. This has been shown to be helpful under certain conditions when there is reason to suspect the presence of anatomical variations. And allow us to develop safer procedures in complex surgeries.

1357—SOLID ORGANS—Adrenal

LAPAROSCOPIC VS. ROBOTIC ADRENALECTOMY: CLINICAL SERIES FROM TWO REFERRAL ENDOCRINE SURGERY CENTERS

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Introduction: Aim of this study was to compare the results of laparoscopic adrenalectomy (LA) vs. robotic adrenalectomy (RA) performed in two referral endocrine surgery centers.

Methods: Patients who underwent laparoscopic and robotic adrenalectomy between 2012 and 2019 were reviewed retrospectively. A 50 mm cut-off value for tumor diameter was used for subgroup analysis.

Results: A total of 322 patients were included; 211 patients underwent LA, 111 patients underwent RA. Two hundred-forty (74.5%) patients were female. Median age was 50 (21–83) years. Median follow up time was 46 months (3–96). The rate of hormone active tumor was 62.4% (n = 201), and pheochromocytoma was the most common indication for surgery (39.8%) in hormone active patients. The severity of comorbidities was higher in RA according to Charlson index ($p < 0.001$) and the rate of previous abdominal surgery was also higher in RA group ($p = 0.02$). In both groups, 9 patients (2.9%) converted to open surgery due to complications, 4 patients (3.6%) were only converted to laparoscopy in RA group. Mean tumor diameter was 40.7 ± 19.7 mm and groups were homogenous ($p = 0.17$). Mean operative time was longer in the RA group ($p < 0,001$). The rate of intraoperative complication increased drastically in tumors larger than 50 mm ($p < 0.0001$) but postoperative complication rate was similar ($p = 0.27$).

Conclusion: Robotic adrenalectomy is as safe and effective as LA and provides similar outcomes. Furthermore, it may increase the feasibility and success of minimally invasive approaches but tumor size is still an independent factor for the outcomes of both minimally invasive techniques.

1098—SOLID ORGANS—Gynaecology

GHOST ILEOSTOMY IN ANTERIOR RESECTION FOR BOWEL ENDOMETRIOSIS: TECHNICAL DESCRIPTION

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Introduction: Endometriosis affects the bowel in a third of the patients with involvement of the rectum or sigmoid colon in 90% of the cases. After bowel resection, anastomotic leakage is one of the most serious complications, similarly, in women with bowel and vaginal mucosa endometriosis involvement, there is a risk of recto-vaginal fistula. Hence, for lower colorectal anastomosis, the use of protective ileostomy is usually recommended in order to prevent these complications however, we shouldn't neglect stoma related risks such as dehydration, necrosis and reoperation. Ghost ileostomy was described as a safe alternative to prevent complications from anastomotic leakage.
Aim: to demonstrate our application of the "ghost ileostomy" in the setting of laparoscopic segmental bowel resection of a symptomatic bowel endometriosis nodule.
Methods: Technical "step-by-step" surgical video description of a clinical case.
Results/Case: A 32-year-old woman with intense dysmenorrhea, deep dyspareunia, dyschesia, and cyclic rectal bleeding was indicated for endometriosis resection. Extended adhesiolysis to restore the pelvic anatomy and endometriosis lesions excision was performed by a laparoscopic approach with need of a segmental bowel resection. Once the anastomosis was performed, the terminal ileal loop was identified and a window was made in the adjacent mesentery. A "vessel loop" was passed around the ileal loop, brought out of the abdomen through the right iliac fossa port-site incision and fixed to the abdominal wall using non-absorbable stitches. Patient was discharged in the 5th day postoperatively without any complications. The tape was removed 10 days after surgery and the loop dropped back. Two months after the intervention, the patient remains asymptomatic.
Conclusion: Ghost ileostomy is a simple, safe and feasible technique that may have a role when performing low colorectal anastomosis following bowel endometriosis resection.

939—SOLID ORGANS—Gynaecology

STAGE IV EXTERNAL GENITAL ENDOMETRIOSIS WITH INVOLVEMENT OF THE RECTUM AND LEFT URETER, LEFT HYDRONEPHROSIS: A MULTIDISCIPLINARY APPROACH

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Endometriosis is a disease of reproductive-aged women, which can not only cause chronic pelvic pain or infertility, but also affect the pelvic organs that are not directly related to the reproductive system. Involvement in the pathological process of the rectum, bladder or ureter significantly reduces the quality of life of the patient. This disorder can also lead to fatal complications and requires a multidisciplinary approach. The 27-year-old patient admitted to the clinic in October 2019 with complaints of chronic pelvic pain, the presence of nephrostoma, the inability to get pregnant for 4 years. Short anamnesis of the disease is presented below. The patient was failing to conceive for a 4 years: from 2015 to 2019. According to pelvic MRI in September 2019—cystic formation 13x9x13 cm with hemorrhagic content in the left ovary, compression of the lower third of the left ureter with the dilation of the upper part to 13 mm, ill-defined infiltrative tissue, hypointense on T2-weighted images in the retrocervical space involving the wall of the rectum. A left nephrostomy was performed in September 2019. In our clinic, with the participation of a multidisciplinary team (gynecologist, urologist, coloproctologist) in order to preserve ovarian reserve and fertility, the laparoscopic excision of endometriod infiltrate, circular resection of the rectum, resection of the left ureter with ureterocystostomy on the left, resection of the left ovary was performed in October 2019. The duration of the surgery was 245 min, the volume of blood loss - 700 ml. The patient had to stay at the intensive care unit for 16 h. Enteral feeding was initiated on the third day postoperatively. The urethral catheter was removed on day 10. The patient was discharged from the department on the 11-th day after surgery. The nephrostomy catheter was removed after 30 days. Currently, the patient is sent to the center of reproduction for in vitro fertilization. The presented clinical case shows the potential of laparoscopic surgery in the treatment of advanced external genital endometriosis. Maintaining fertility in women of childbearing age and achieving maximum radical surgical treatment is possible only with a multidisciplinary approach.

384—SOLID ORGANS—Gynaecology

LAPAROSCOPIC RESECTION OF RECURRENT CERVICAL CANCER INFILTRATING THE LOW RECTUM

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Aims: This video shows our technique to perform laparoscopic resection of recurrent cervical cancer infiltrating the low rectum.
Methods: The patient is a 51-years-old woman, who underwent an open hysterectomy for a cervical intraepithelial neoplasia stage III 13 years before. During a gynecologic examination and transvaginal ultrasound a 53x48 mm solid pelvic mass was reported. Abdominal MRI confirmed the presence of a 53x51x49 mm solid pelvic mass with irregular margins in direct continuity with rectal wall and vaginal wall. The colonoscopy confirmed a 5 cm stenotic rectal lesion, 8 cm from the anal verge. The pathology report was in keeping with squamous cell carcinoma and confirmed the suspect of a recurrent cervical cancer.
The patient was scheduled for a laparoscopic resection of the tumor with rectal anterior resection. The patient was placed in supine lithotomy position and four trocars were used. After opening left peritoneum, the left ureter was identified and dissected and followed down into the pelvis where it looked extremely attached to the pelvic mass. Subsequently the upper and mid mesorectal dissection was performed and the rectum was divided by means of a surgical stapler. The procedure carried on with the dissection of the right ureter that was attached to the mass. By opening the parietal wall of the vagina, infiltration of the rectal wall and the posterior wall of the vagina by the tumor was confirmed. Therefore, mesorectal dissection was completed up to the level of the pelvic floor and the lower rectum was divided using a surgical stapler, removing en-bloc the pelvic mass, the rectum and vaginal posterior wall.
The specimen was extracted through a Pfannenstiel incision with an endobag.
After perfusion control of sigmoid colon with indocyanine green fluorescence angiography, end–end colo-rectal anastomosis was performed using a circular stapler. Lateral ileostomy was fashioned.
Results: The postoperative course was uneventful and the patient was discharged on postoperative day 6. Histopathological examination reported the presence of squamous cell carcinoma.
Conclusion: Laparoscopic approach to pelvic mass with "en-bloc" resection of adjacent organs is a safe and feasible procedure.

346—SOLID ORGANS—Gynaecology

RESIDUAL INTRAPERITONEAL CARBON DIOXIDE GAS FOLLOWING LAPAROSCOPY FOR ADNEXAL MASS

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Aims: Free residual gas remaining after laparoscopy results in shoulder pain, which may decrease patients' satisfaction with laparoscopy. We sought to analyze the correlation between postoperative residual carbon dioxide gas and shoulder pain and explore the peri- and postoperative factors associated with residual carbon dioxide.
Method: A cohort of 326 patients who underwent laparoscopic adnexal surgery between March 2005 and June 2018 at a teaching hospital in Korea was retrospectively analyzed through a review of the medical records. The enrolled patients were divided into the single-, two-, and three-port groups, according to the number of ports used. The volume of residual carbon dioxide gas was measured as the right volume, the left volume, and the total volume of residual gas using a formula that incorporated measurements obtained on a chest X-ray. Continuous and categorical variables were compared using Student's t-test and the Chi square test, respectively.
Results: The total volume of postoperative residual carbon dioxide gas was significantly different between the single- and two-port groups and between the single- and three-port groups (157.3 ± 179.2 vs. 25.1 ± 92.3 mL and 157.3 ± 179.2 vs. 12.9 ± 36.4 mL, respectively). However, the difference between the two- and three-port groups was not significant. The volume of residual gas and the time to the first passage of gas were positively correlated; the time to the first passage of gas was longer in patients with more residual carbon dioxide. The total volume of residual gas was more correlated with the operative wound pain score than with the shoulder pain score. Additionally, the pre- and postoperative WBC counts, postoperative hospitalization duration, residual carbon dioxide volume, and shoulder pain score were significantly different between patients with and without a drainage tube.
Conclusions: While the volume of residual gas was not correlated with the shoulder pain scores, we found that the volume of residual carbon dioxide gas and the shoulder pain score were lower in patients with a drainage tube than in those without, indicating that a drainage tube could be safely used to decrease both the volume of residual carbon dioxide gas and the shoulder pain score without increasing the risk of postoperative infection.

29—SOLID ORGANS—Gynaecology

ROLE OF LAPAROSCOPIC TECHNIQUES IN THE TREATMENT OF FEMALE GENITAL PATHOLOGY

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Background: Laparoscopy or endoscopically examining the peritoneal cavity was first attempted in 1901 by George Kelling who called this examining procedure "Celioscopy. Laparoscopy provides direct visual access to inner pelvic anatomy without a major abdominal surgery so that anatomy of uterus, ovaries, and fallopian tubes can be studied in more details and abnormalities can be treated at the same time.

Methods: This was a retrospective study which presents the results of laparoscopic treatment of various gynecological diseases in Cantonal hospital Travnik, Bosnia and Herzegovina in the period from 2007 to 2019. Total 295 cases were enroled. All underwent laparoscopic surgery in general anestesia. The results were statistically analyzed.

Results: The total number of patients is 295. The incidence is highest in the age 20–49 with a peak of 30- 39 years (41.35%). Ovarian cyst are most common pathological condition in 43.60%, Infertility in 16.39% and Ectopic pregnancy in 12.13%. The most commonly treatment was cystectomy 40.06%, then chromopertubation with ovarian drilling 18:29% in infertility, and adnexectomy 10.72%.

Conclusions: Laparoscopy involves a minimal damage to body tissues. It is safer than open surgery. Laparoscopic treatment has contributed to faster treatment, faster recovery and reducing the cost of treatment, and thus raise the level of efficiency.

318—SOLID ORGANS—Parathyroid

ENDOSCOPIC PARATHYROIDECTOMY: DAWN OF NEW ERA

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Hyperparathyroidism is one of the most common endocrine disorders, presents with varied manifestations, thereby leading to misdiagnosis and confusion in the initial stages of the disease.

Parathyroidectomy is the only available cure, which has evolved significantly over the past century from open, minimally invasive, video assisted to endoscopic parathyroidectomy.

Our study includes patients whose pre-operative imaging localisation comfirms pathological glands. Tranaxillary & transvestibular parathyroidectomies were performed with intra-operative parathyroid hormone monitoring.

This video explains the two approaches in detail and highlights the criteria for deciding the approach in endoscopic parathyroidectomy for different patient profiles.

474—SOLID ORGANS—Kidney

LAPAROSCOPIC NEPHRECTOMY FOR LIVING KIDNEY DONOR WITH PRIOR LAPAROTOMY

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Background: Laparoscopic nephrectomy for renal transplantation has become a standard operation worldwide since it provides faster recovery and return to the donor's everyday activities.

Method: We present a case of a 68-year-old male, living kidney donor, who had undergone exploratory laparotomy following a car accident one year before laparoscopic nephrectomy. The patient was placed in the typical left decubitus position for nephrectomy. Two 5 mm trocars, and a 10 mm one were placed to the left midclavicular line, between the costal cartilage and the anterior superior iliac spine, in order to achieve triangulation. A 10 mm trocar was placed suprapubically and was replaced by a gel-port for the graft's removal. Laparoscopic nephrectomy was performed, following symphysiolysis. Operative time was three hours. Time of warm ischemia was three minutes.

Results: The recipient presented immediate diuresis. The donor had an uneventful recovery and was discharged four days later.

Conclusions: Laparoscopic approach seems to be safe for live kidney donors, even in cases of prior laparotomy. It is related to less pain, fewer complications and shorter hospitalization. The time of warm ischemia does not seem to affect the graft's function. The donor returned to his everyday activity six days post-operatively.

1285—SOLID ORGANS—Parathyroid

A NEW METHOD IN THE DIAGNOSIS OF NONLOCALIZED PARATHYROID ADENOMAS: EUS

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Aim: Parathyroid adenoma is the underlying etiology in 85% of patients with hyperparathyroidism. Parathyroid adenomas can be treated with focused parathyroid surgery, which is a minimally invasive method, if they can be localized in the preoperative period. In approximately 10% of cases, adenoma cannot be localized by the most commonly used imaging methods such as scintigraphy and ultrasound(US). Endoscopic ultrasound(EUS) is a minimally invasive method and can localize lesions located in the lower part of the neck and in the mediastinum,which are difficult to visualize with standard US. The aim of this study was to present the results of our adenoma localization with EUS in patients diagnosed with primary hyperparathyroidism by the endocrine council of our hospital and whose surgical treatment decision was taken but could not be localized by US and scintigraphic methods.

Methods: All patients with hyperparathyroidism were evaluated in the multidisciplinary endocrine council composed of endocrinology, radiology, pathology, nuclear medicine and general surgery. Patients with primary hyperparathyroidism who are decided to undergo surgical treatment but could not be localized by US and scintigraphy were examined by EUS by an endocrine surgeon. Demographic data, EUS localization results, comparison of surgical localization and EUS localization results, complication rates of EUS and duration of EUS procedure were evaluated.

Results: All 17 patients who could not be localized by US and scintigraphy were female. The mean age was 53.5 years. Adenoma localized by EUS was in the right side in 9 patients and in the left side in 7 patients. No adenoma was detected in one patient (5.8%).Adenoma was in the lower parathyroid area in 13 patients (76%), while parathyroid adenoma with upper localization was detected in only 3 (17%) patients. When surgical exploration results were compared with preoperative EUS localization results, results were consistent in 14 (82.4%) of 16 patients. Two patients (11.7%) had an incorrect localization with EUS, while one patient (5.8%) had no localization. There were no complications.

Conclusion: Focused surgery is a minimally invasive method for the treatment of primary hyperparathyroidism and has good medical and cosmetic results. EUS is a minimally invasive, successful and reliable method in cases that cannot be localized by conventional methods. EUS may be a useful alternative method especially for localization of adenomas located in lower neck and upper mediastinum.

1212—SOLID ORGANS—Parathyroid

FEASIBILITY OF NEAR INFRARED AUTOFLUORESCENCE OF PARATHYROID GLANDS-ROLE IN FOCUSED PARATHYROID SURGERY :SYSTEMATIC REVIEW

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Near infrared autofluorescence based identification of parathyroid glands is non-invasive and label free. In the era of minimally invasive surgery, the removal of only abnormal glands guided by at least two concordant preoperative localizing studies has been suggested. However, preoperative localization of parathyroid glands is not always feasible. Aims: This systematic review aimed to investigate the feasibility of near infrared autofluorescence of parathyroid glands and the role of this label free detection in minimally invasive parathyroid surgery.

Methods: Electronic databases were searched with the search terms 'autofluorescence; ''parathyroidectomy'', ''minimally invasive', 'parathyroid glands' for the time period up to and including December 2019. Full publications, including clinical trials randomized or not, retrospective studies, case series, case reports that provided relevant data met inclusion criteria.

Results: Forty eight possibly relevant studies were identified. Abstracts were reviewed and eight articles were excluded. Forty studies, that met inclusion criteria were retrieved in full text and included in the systematic review. Current evidence suggests that near infrared autofluorescence based detection of parathyroid glands is feasible and leads to successful identification of parathyroid glands in thyroid and parathyroid surgery. Technology needed for the detection of autofluorescence is still expensive. There is only one retrospective study investigating the role of autofluorescence of parathyroid glands in 71 patients with MENI hyperparathyroidism. In this study high rates of false negative and false positive fluorescence were reported. Data are scarce on the feasibility of focused parathyroidectomy based solely on infrared autofluorescence detection of parathyroid glands.

Conclusion: Near infrared autofluorescence based detection of parathyroid gland is feasible. Near infrared autofluorescence of parathyroid glands suggests that minimally invasive parathyroid surgery could be attempted even in the cases that preoperative localization of parathyroid glands has not been performed. It remains to be proved if the above suggestion is justified.

1350—SOLID ORGANS—Spleen

SPLEEN PRESERVATION IN LAPAROSCOPIC SPLENIC HILUM ANEURISM RESECTION

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Aims: Splenic artery aneurisms (SAA) are the most common visceral artery aneurisms, being the 3rd most frequent abdominal aneurism. SAA are more common in women and about 80% are in patients with more than 50 years old. Usually, these aneurysms occur due to increased flow conditions (e.g.: pregnancy, portal hypertension) which lead to irreversible damage of the tunica media. SAA treatment depends on their symptoms and their propensity to rupture. SAA resection is the treatment mainstay. Both SAA aneurismectomy without or with splenic artery ligation, as described in Warshaw's technique, allow the spleen preservation.

The aim of this video is to show a minimally invasive approach for a SAA resection with a spleen sparing technique.

Methods: A 52-years-old woman had an incidentally diagnosed 3 cm SAA at the spleen's hilum. The abdominal tomography scan (CT) showed an SAA with 3 cm in size, without any signs of thrombosis. The CT scan excluded other visceral aneurysms. The patient was proposed for a laparoscopic SAA resection.

This technique uses 4 trocars (1x3mm + 2x5 mm) placed at left costal border and epigastrium. Step-by-step as follows: (i) dissection of spleen ligaments (ii) access to the epiploon retrocavity with splenic artery at pancreas superior border (iii) identification of spleen hilum and SAA (iv) SAA resection.

Results: The post-operative period was uneventful and the patient was discharged home at post-operative day three.

Conclusion: SAA are the most common visceral artery aneurisms and they usually occur in female patients with more than 50 years. Aneurism resection is the treatment of choice, and is indicated in symptomatic patients or due to their propensity to rupture.

Minimally invasive techniques for SAA resection with spleen preservation are feasible and safe, preventing the patient from splenectomy morbidity.

1424—SOLID ORGANS—Spleen

MASSIVE SPLENOMEGALY. ARE THERE LIMITS FOR MINIMALLY INVASIVE APPROACH ACCORDING TO SPLENIC SIZE?

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Background: Laparoscopic splenectomy is the procedure of choice in small and medium-sized spleens. Massive splenomegaly (usually greater than 20 cm or heavier than 2 kg) is a relative contra-indication due to reduced pneumoperitoneum space and increased risk of bleeding and conversion.

Clinical Case: We present the case of a 60 years old man with a diagnosis of Splenic Marginal Zone lymphoma. After multidisciplinary consultation, the patient was proposed for surgical resection.

The spleen size was 237x176x111mm with an estimated volume of 2.715L and an estimated weight of 2851 g. It extended downwards until the sacral promontory.

We performed a laparoscopic splenectomy with an overall duration of 195 min. We used 4 trocars and all the trocars were displaced towards the right of the patient and below the lowest splenic margin. The specimen was removed inside a bag through a supra-pubic incision. The surgery and post-operative period were uneventful and 9 months after surgery the patient is doing well and symptom free.

Conclusion: Laparoscopic splenectomy is feasible and safe even for massive splenomegaly. Some minor adaptations in technique are required. Surgeons should not contra-indicate laparoscopic surgery due to fear of conversion.

1207—SOLID ORGANS—Spleen

LAPAROSCOPIC MANAGEMENT OF SPLENIC CYST : AN EFFORT FOR SPLEEN CONSERVATION

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Splenic cysts can be further classified into parasitic and non-parasitic cysts. Non-parasitic cyst is further subdivided into true and false or pseudocyst. They can be divided into benign or malignant cyst.

Only 800–850 cases have been reported till now in the literature.

Because of similar presentations,it is difficult to differentiate between parasitic and nonparasitic splenic cysts.CT scan remains the investigation of choice.

Since 1980 treatment has progressed from splenectomy to spleen conserving techniques. Because of immunogenic function of spleen,splenic conservation is preferable because of high incidence of overwhelming post splenectomy infection and mortality associated with it .

This presentation emphasises on Laparoscopic indications and techniques of spleen preservation in management of splenic cysts.

1170—SOLID ORGANS—Spleen

LAPAROSCOPIC PARTIAL SPLENECTOMY FOR SPLENIC ABSCESS DUE TO PARVIMONAS MICRA

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Aim: Parvimonas micra is an important oral microbe that has the ability to grow and proliferate within oral biofilms and is involved in periodontal disease, leading to gingival bleeding, gingival recession, alveolar bone loss, and tooth mobility. However, occasionally these normally oral pathogens can cause infections at other sites in the body. To our knowledge, this is the first reported case of splenic abscess due to parvimonas micra.
Case Report: The patient was a 67 years old woman admitted to our hospital for epigastric and left ipocondrium dull abdominal pain and fever. The abdominal contrast-enhanced computed tomography (CT) showed a voluminous splenic abscess (18 x 14 x 18 cm). A chest radiograph and CT scan showed chronic inflammation of the inferior lobe of the left lung, a small amount of fluid in the left chest.
Standard surgical treatment for splenic abscess is antibiotics and drainage. Spleen-preserving options include percutaneous drainage, partial splenectomy, subtotal splenectomy and splenic auto-transplantation. The patient was treated with intravenous antibiotics for 14 days. Because of a persistent abscess on CT scan, she underwent a partial laparoscopic splenectomy.

After pneumoperitoneum, a large splenic abscess of the superior pole of the spleen was found, containing 2 L of frank pus which was aspirated. There was no intra-peritoneal soilage or free perforation. Decision was made for partial splenectomy and the pus was sent for microbiological studies. After marsupialization the infected part of the spleen was then transected with energy device and sent for histopathological analysis.
Results: operative time was 80 min, the operative and postoperative course was uneventful. The splenic pus cultures grew Parvimonas micra. He recovered well post-operatively with defervescence of fever and was discharged well on post-operative day 6th with oral antibiotics. The patient was reviewed in the outpatient clinics 5 weeks after discharge and was noted to have recovered fully.
Conclusions: Spleen-preserving techniques should be used where possible to achieve best outcome in clearing infection and to ensure the immunologic role of the spleen is not compromised.

57—SOLID ORGANS—Spleen

LAPAROSCOPIC SPLENECTOMY IN VERY LOW PLATELET COUNTS

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Background: Chronic idiopathic thrombocytopenic purpura is a rare autoimmune disease characterized by low platelet count resulting in bleeding menifestations. No definitive therapy is available for the cure of disease. With advances in the medical management less number of patients are referred for splenectomy. Such patients characteristically have chronic, drug resistant disease with extremly low platelet counts. Chronic ITP patients with Low platelets who are bleeding are relative contraindication for laparoscopic procedures.
Methods: We present such patient who underwent laparoscopic splenectomy safely. Surgery was performed in the department of surgical discipline, AIIMS, New Delhi. Procedure was performed in right lateral (angled 60 degrres) position. Four ports; 1. Epigastric 5 mm; 2. 5 cm lateral to first port camera port; 3. 5–6 cm lateral to camera port 10 mm working port; 4. Anterior axillary line port 5 mm for assistant.

1161—SOLID ORGANS—Thyroid

SAFETY PROFILE OF ULTRASOUND DISSECTOR IN THYROID SURGERY

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Introduction: Energy devices have become essential in operating theatres but, despite advances in technology, complications could occur. Ultrasonic devices seem to disperse less energy but when activated for longer periods, significant lateral thermal damage could occur. In this study we examined temperature profile of active and passive blade of the new HARMONIC FOCUS + ®(HF +)(Ethicon). To confirm the data achieved we applied the instrument in thyroid surgery during the dissection of the recurrent laryngeal nerve (RLN), evaluating the amplitude and the latency of the electromyographic (EMG) signal.
Method: Ultrasonic device HF + model was used for experimental procedures in laboratory, performed on pig's skin and liver, in order to examine the temperature profile of passive and active blades. For temperature measurement a thermal imaging camera Flyr System B series with a spectral range of 7.5–13 μm and a measurable temperature range from – 20 °C to +120 °C was used.
To evaluate the security profile of the device we utilized intraoperative nerve monitoring (NIM) during the dissection near the RLN, measuring the potential amplitude and latency of the EMG response before and after the nerve dissection.
Results: The active blade heats up faster than the passive one, so increasing the activation times proportionally increases much more its temperature. To obtain active blade temperatures of less than 60 °C the section times must be close to 5 s. With these section times the inactive blade does not exceed 30 °C: this result can be obtained with the power setting between 3 and 4.
The EMG assessment of latency and amplitude showed no statistically significant variation nerve before and after the RLN dissection.
Conclusions: Using the HF + emissivity profiles we demonstrate how the behavior of the inactive blade is profoundly different from the active one, reaching 60 °C only in extreme conditions of use. For a safer use of the instrument and to prevent thermal damage, keep the blade active towards the operator, do not exceed 10 s of activation, use the highest setting power and don't use the instrument as a dissector immediately after its activation.

1099—SOLID ORGANS—Thyroid

TRANSAXILLARY ENDOSCOPIC THYROIDECTOMY: THE BEST APPROACH FOR A TRACHEOSTOMISED PATIENT: CASE REPORT

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Background: With minimally invasive procedures, modern surgeons can access a specific anatomical area from a distance avoiding local incisions. Less surgical morbidity, aesthetic result and lower length of stay are important consequences of the utilization of minimally invasive surgery. However, other less generalized benefits may be of great interest for patients, such as the availability of an alternative access route when conventional surgery may be an extreme technical challenge.
Methods: The authors present a case of a patient with a previous tracheostomy who was submitted to minimally invasive thyroid surgery. This case-report aims to present an endoscopic thyroid technique on a tracheostomised patient for the first time. Possible benefits as well as risks are reviewed.
Case: An 80-year old man with a relevant multinodular unilateral goitre was proposed for hemithyroidectomy. The patient had the necessity of emergent tracheostomy during anaesthesia induction accompanied by a series of complications such as pneumothorax, blood aspiration, infection and severe respiratory insufficiency during hospital stay, including the need for Intensive Unit Care for a total of 22 days. After discharge and proper general recoverying at home, he was referred to our department for thyroid surgery. The patient maintained a fenestrated tracheostomy. A transaxillary endoscopic hemi-thyroidectomy was performed with maintenance of the stoma track. The postoperative course was uneventful.
Conclusion: Transaxillary endoscopic thyroidectomy was an excellent option and proved to be a safe and effective procedure in tracheostomised patients avoiding any complication or delay in complete recovery.

316—SOLID ORGANS—Thyroid

EVOLUTION OF ENDOSCOPIC THYROIDECTOMY

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In this presentation we go through the evolution of endoscopic thyroid surgery and our institute experience with it. Thyroid nodules is one of common endocrine disorders. Incidence is higher in female population with social stigma of neck scar. There is an ascending trend in endoscopic thyroidectomys since last two decades.

Transvestibular and Transaxillary endoscopic thyroidectomy has gained a skyrocketting popularity as they are scarless & pain free surgeries, with recent shift towards transvestibular approach.

We describe in detail the types of mandible and which type is suitable for transvestibular approach.

This study explains the two approaches in detail & highlights the criteria for selection of different patient profiles regarding each approach with special empasis on cosmetic satisfaction score.

1419—UPPER GI—Benign Esophageal disorders

COMPARISON OF ACHALASIA AND ITS MANAGEMENT IN THE ELDERLY AND THE YOUNG

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Aims: To compare outcomes in the management of achalasia between the young (defined as less than 50yrs of age) and the elderly (defined as over 70 years of age).
Methods: A retrospective cohort study of electronic records with patients diagnosed with achalasia within the last 5 years in a single tertiary centre. Age cut offs were determined using local Care of the Elderly referral guidelines.
Results: In the elderly cohort 13 patients underwent an operation and 48 were managed conservatively. For the young 35 patients underwent an operation whilst 6 were managed conservatively. The average duration of complaint was 2 years vs 3.6 years in the elderly operative patient vs the non-operative patient. In the young the duration of complaint was 3.25yrs vs 2.86yrs in the operative vs non-operative patient. In young patients managed non operatively (n = 6) dilatations were the most common intervention (n = 3). In the elderly that were managed conservatively with recorded interventions (n = 9) only 2 patients underwent a dilatation whilst 7 had Botox injections. For young non operative patients there was one complication (recurrence) whilst in the elderly non-operative cohort there were 17 recurrences. For operative elderly patients (n = 13) the average waiting list time was 152 days in the elderly. Of these 11 had a Heller myotomy with a Dor wrap, 1 had an Ivor Lewis and another a laproscopic repair of an endoscopic perforation. The average operative time in the elderly was 134 min with average hospital stay of 2 days. 3 patients experienced complications, urinary retention (n = 2) and leak (n = 1). In the young who underwent an operation the average waiting list time was 83 days. The average operative time in this group was 167 min with an average hospital stay of 2 days. 9 patients experienced a complication (early recurrence being most common n = 4). Complication rates for the operative and non-operative groups within the same age range showed no statistical significance (young $p = 0.633$ and elderly $p = 0.40$ respectively).
Conclusion: There is no significant difference between the operative vs non-operative complication rate within each age range. For patients managed conservatively there are more dilatations in the young compared to the elderly.

1404—UPPER GI—Benign Esophageal disorders

SURGICAL VS NON-SURGICAL MANAGEMENT IN ACHALASIA IN A SINGLE TERTIARY CENTRE

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Aims: To compare outcomes in the management of surgical and non-surgical patients diagnosed with achalasia.
Methods: A retrospective cohort study of electronic records with patients diagnosed with achalasia within the last 5 years in a single tertiary centre.
Results: Analysis of 138 patients revealed 71 patients (average age 50yrs) who underwent an operation to treat achalasia. 33 (46%) of these patients underwent previous interventions before referral for surgery. 48% of these patients presented with dysphagia alone, with an average duration of symptoms of 5.46yrs. Average operative time was 135 min. Two patients underwent an Ivor-Lewis resection for achalasia. Median hospital stay was 1 day. 19 patients experienced complications, with recurrent dysphagia (n = 7) and urinary retention (n = 4) being the most common with an average follow up period of 3 months.
For non-surgical patients (n = 67) the main presentations were of dysphagia (n = 59) and weight loss (n = 9). The average age at presentation was 76yrs old. And the average duration of complaint was 4.5yrs. The most common intervention was dilatation (n = 66) followed by Botox injections (n = 65) and POEM (n = 1). One patient was managed with a PEG. Botox and balloon dilatation both had short lived efficacy with 22 instances of recurrence requiring another non-surgical intervention. Two patients experienced oesophageal perforation after dilatation with one managed conservatively and the other undergoing a laparoscopic repair. The predominant type of achalasia in the surgical cohort was type 2 achalasia (n = 29). In nonoperative patients (n = 36) the predominant achalasia type was type 1 (n = 15). With a p-value of 0.0063 between achalasia types.
Conclusions: We can conclude that surgical management for achalasia in appropriate cases can lead to low recurrence rates and effective resolution of symptoms. However non-surgical options are just as important for frail candidates. There was no statistically significant difference between complication rates in the operative vs non-operative cohorts (p value = 0.250). Further investigations may be helpful in identifying any difference in the response of different achalasia types to different interventions.

1272—UPPER GI—Benign Esophageal disorders

COMPARISON OF THREE METHODS FOR TRANSORAL TREATMENT OF ZENKER'S DIVERTICULUM

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Aims: Transoral treatment of Zenker's diverticulum can be achieved through en-bloc septum division or submucosal cricopharyngeal myotomy. Aim of this study was to compare three transoral techniques: en-bloc septum division by stapling or Thulium laser, and submucosal septum division by hook-knife (Z-POEM).
Methods: A retrospective review of a prospectively collected database of patients who underwent transoral treatment of symptomatic Zenker's diverticulum was performed. The Functional Outcome Swallowing Scale (FOSS) and the MD Anderson Dysphagia Inventory (MDADI) questionnaires were administered to determine severity of dysphagia and quality of life at baseline and during follow-up visits. All operations were carried out under general anesthesia. Statistical analysis was conducted with the software IBM® SPSS® Statistics V23. The paired-samples t-test was used to analyze the scores of the MDADI questionnaire repeated postoperatively.
Results: Between March 2017 and November 2019, 47 patients, 33 males and 14 females, mean age 77.5, were treated at our institution. Demographics and preoperative patient characteristics were comparable, except for the diverticulum size and the Foss score (Table 1). There was no morbidity or mortality. The median follow-up was 12 months (IQR 10). A statistically significant improvement of dysphagia measured by FOSS score and quality of life measured by MDADI score was recorded in all three groups compared to baseline. However, the postoperative MDADI score was significantly higher in patients treated with Thulium laser ($p < 0.001$).
Conclusion: Transoral treatment is effective in elderly patients with small-size (2–3 cm) Zenker diverticulum. The severity of dysphagia score significantly decreased in the three concurrent patient cohorts. Thulium laser was more effective compared to stapling and Z-POEM regarding quality of life outcomes.

883—UPPER GI—Benign Esophageal disorders

PERORAL ENDOSCOPIC STAPLE DIVERTICULOSTOMY IN A TREATMENT OF ZENKER'S DIVERTICULUM

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Aims: In 1885 Wheeler described first successful external excision of Zenker's Diverticulum. In most of the surgical fields minimally invasive treatment more and more becoming the standard. Despite all advantages, minimally invasive treatment of a Zenker's Diverticulum has not become a well-accepted standard. In this video we present a case of peroral endoscopic staple diverticulostomy.
Methods: 74 y.o. woman and a BMI 28 was presented with a history of dysphagia symptoms for a 3 years, regurgitation of food residues, intermittent vomiting, recurrent respiratory infections, diabetes mellitus type 2 controlled by metformin and hypertension.
Completing all necessary tests patient was scheduled for peroral endoscopic staple diverticulostomy.
After general anesthesia with complete muscle relaxation the head of the patient is positioned in the "sniffing" position with minor neck extension and head elevation. Then we introduce Weerda diverticuloscope with direction of the hypopharynx and post-cricoid region, with clear diverticulum pouch visualization. Nasogastric tube was placed, and pouch inspected to identify food remnants.
Placement of traction sutures on the corners of a diverticulum wall was done with automatic suturing device with two 2,0 non absorbable sutures. With a 30 mm endoscopic GI stapler endoscopic staple diverticulostomy with a midline V-shape formation, while endoscopic clips were used for obtaining final hemostasis.
Results: Patient head positioning after general anesthesia was 10 min, procedure time was 30 min, for a total of 40 min OR time. Blood loss was less than 20 cc.
Postoperative pain control with nonopioid painkillers. Liquid diet was started on the p.o. day 1. Nasogastric tube was removed on p.o. day 3. Patient was discharged on p.o. day 4.
Complete recovery was observed at 1- and 3-months follow-up.
Conclusion: Peroral endoscopic staple diverticulostomy is feasible and safe in a centers with developed advanced minimally invasive program in a carefully selected patients.

801—UPPER GI—Benign Esophageal disorders

EFFICIENCY OF MINIINVASIVE TREATMENT OF PATIENTS WITH ESOPHAGEAL VARICES BLEEDING

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The aim of the study was to decrease of mortality rates and improve the outcome of treatment in patients with esophageal varices bleeding.
Methods: The study included 242 patients with esophageal varices bleeding. Total number of men—137 (56.61%), women—105 (43.39%). The average age of patients was 56.8 ± 3.6 years. The source of bleeding was established during endoscopy. All patients received drug therapy—non-selective beta-blockers, hemostatic, antisecretory, infusion, symptomatic. Patients of group 1 (n = 195) received just drug therapy. Patients of group 2 (n = 47) received minimally invasive endoscopic surgical interventions such as endoscopic band ligation of bleeding esophageal varices. Subsequently, to reduce portal hypertension and on purpose to prevent new varices emergence the splenic artery embolization was performed.
Results: The average age of patients in group 1 was 56.0 ± 4.2 years. Using just drug therapy we have stopped bleeding in 152 (77.95%) cases. In all cases at the end of treatment we received improvement of clinical and laboratory indices. 43 patients (22.05%) were died. Duration of treatment was 10.2 ± 2.1 days.
The average age of patients in group 2 was 55.1 ± 5.4 years. Performing of endoscopic band ligation and splenic artery embolization we have stopped bleeding in 41 (87.23%) cases. In all cases at the end of treatment we received improvement of clinical and laboratory indices. 6 patients (12.77%) were died. Duration of treatment was 6.4 ± 2.8 days.
Conclusion: Under the condition of esophageal varices bleeding treatment by performing the combination of endoscopic band ligation and splenic artery embolization in comparison with drug therapy we can see the improvement of patient's condition, decreasing of mortality and duration of treatment.

670—UPPER GI—Benign Esophageal disorders

IMPROVING OESOPHAGOGASTRODUODENOSCOPY QUALITY THROUGH PHOTO-DOCUMENTATION PRACTICES. A SINGLE-CENTRE MULTIFACETED EDUCATIONAL INTERVENTION

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Introduction: Oesophagogastroduodenoscopy (OGD) has become increasingly more standardised to ensure complete examination of the upper gastrointestinal tact. Professional societies have implemented guidelines with strict procedural associated quality indicators to reduce variance and ensure best practice. Photo-documentation has emerged as a useful tool in ascertaining completeness and is now an integral aspect of OGD quality control. The British Society of Gastroenterology recommends systematic acquisition of eight photographs of specific anatomical landmarks: upper oesophagus (UO), lower oesophagus (LO), fundus (FU), gastric body (GB), incisura (IN), antrum (AN) duodenal bulb (DB) and distal duodenum (DD). Our study aims to assess the quality of OGD's by assessing compliance with photo-documentation guidelines. Through the provision of an educational intervention, we additionally aim to improve patient care by increasing compliance best-practice guidelines.
Method: An initial retrospective review of electronic OGD reports was preformed to establish baseline compliance with guidance. This was followed by a four weeklong educational initiative, before re-auditing for a further four weeks to determine effectiveness. Education included both a poster campaign within high visibility areas of the endoscopy suite, and educational sessions delivered within department meetings. A database was created from electronic endoscopic records. Endoscopist-speciality, indication, number of photos, anatomical site photographed and pathology identified were recorded.
Results: 1218 OGD's were reviewed, 1099 before the educational intervention (Group 1) and 119 post (Group 2). A higher average number of landmarks were photo-documented in the Group 2 (4.75 vs. 3.05, 95% CI 1.04- 1.75, $p < 0.001$). The number of OGDs with photo-documentation of the recommended anatomic landmarks in two groups were, group 1: UO 112 (10.19%), LO 722 (65.59%), FU 764 (69.51%), GB 176 (16.01%), IN 10 (0.9%), AN 637 (57.96%), DB 105 (9.55%) and DD 827 (75.25%) and in group 2: UO 59 (29.64%), LO 82 (41.2%), FU 101 (50.75%), GB 51 (25.62%), IN 6 (3.01%), AN 96 (48.24%), DB 64 (32.16%), DD 107 (53.76%). Pathology was reported in 77.16% of group 1 and 89.94% of group 2. No photo was taken of this in 9.55% of group 1 and 1% of group 2.
Conclusion: OGDs are not meeting the quality standards set by best-practice guidelines. A multifaceted educational program was effective in changing practices. As OGD quality is an independent factors affecting patient outcome, we suggest this change be applied to other high volume centres to improve outcomes following OGD.

640—UPPER GI—Benign Esophageal disorders

GASTRO-ESOPHAGEAL REFLUX TEST DECIDING SURGICAL INDICATION AND THE RESULTS OF LAPAROSCOPIC NISSEN FUNDOPLICATION FOR GERD PATIENTS

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Introduction: The indication of laparoscopic anti-reflux surgery for GERD patients is very important in clinical situations. We have established "Reflux Test"as the tool to decide surgical indication for GERD patients.
Surgical Indication: Reflux Test.
At the standing position a patient swallows 300 ml barium solution. After total solution goes into stomach, a patient lies down at the flat position. Then a patient changes the position to left lateral decubitus position, flat position, right lateral decubitus position and flat position again every 10 s in the order. During this procedure, gastro-esophageal reflux was evaluated and assigned to severe, moderate and slight category. If the reflux was observed slightly up to cervical esophagus, the case was assigned to moderate category. The anti-reflux surgery was considered in the moderate and severe categories.
Results: We have performed laparoscopic Nissen procedure in 105 cases. Median follow-up period of this study was 63 months (0–118 months). In 14 cases (13.3%) PPI was restarted before 6 months after the anti-reflux surgery. In 27 cases (25.7%) PPI was restarted after the anti-reflux surgery during the whole follow-up period of this study. The results of the study have shown that the reflux esophagitis was improved obviously after the anti-reflux surgery even in the PPI restarted group ($p < 0.001$).
Conclusion: The results of the laparoscopic Nissen fundoplication were good and satisfied by the patients mostly. The anti-reflux surgery is effective for the patients who really has the obvious reflux in the reflux test.

638—UPPER GI—Benign Esophageal disorders

OESOPHAGEAL BIOPSIES FOR ALL? BIOPSY PRACTICES FALL SHORT OF RECOMMENDATIONS IN EXCLUDING EOSINOPHILIC OESOPHAGITIS IN PATIENTS WITH DYSPHAGIA

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Aims: Eosinophilic oesophagitis (EO) is an immune-mediated chronic oesophageal disease characterised by dysphagia and eosinophil-predominant inflammation histologically. Endoscopic features are non-pathognomonic, therefore British Society of Gastroenterology (BSG) guidelines recommend two-site oesophageal biopsies for patients presenting with dysphagia to exclude EO, if no alternate aetiology is identified.
We aimed to evaluate compliance with the above guidelines and the diagnostic yield of detecting significant eosinophilia from oesophageal biopsies in patients who underwent an OGD for new-onset dysphagia without another apparent cause.
Method: A single-centre, retrospective analysis, between January 2017 and December 2018 was preformed. A database from endoscopy department electronic records was created to include OGD's preformed for new-onset dysphagia. Endoscopy and histology reports were analysed for site, number of biopsies, and final histological diagnosis.
Results: In total 249 OGD's were identified, Female n = 146: Male n = 103, mean age of 63 years (M: 63.5, F: 63.2) and range 16–96 years. 111 (44.78%) patients had a diagnosis of non-obstructive dysphagia, with 135 (55.42%) having luminal findings explaining their dysphagia. 30 (27.02%) patients with non-obstructive dysphagia had biopsies and only 1 patient had 2-site biopsies as per guidance. One patient in either group (0.9% and 0.7%) had a histological diagnosis of EO. Within the biopsied non-obstructive group 90% (n = 27) were normal, 3.3% (n = 1) showed reflux inflammation and 3.3% (n = 1) HSV oesophagitis.
Conclusion(s): Compliance with regards to location and number of biopsies based evidence-based guidance is suboptimal. EO is an uncommon cause of dysphagia within our cohort. We believe that the low prevalence is secondary to insufficient compliance with guidance. Routine biopsies based on consensus recommendations in patients with normal-appearing oesophageal mucosa will prevent EO being underdiagnosed. We recommend a greater awareness and observation of the protocol for obtaining biopsies in OGD's for dysphagia.

625—UPPER GI—Benign Esophageal disorders

OUR PRACTICAL PROCEDURES IN LAPAROSCOPIC NISSEN FUNDOPLICATION FOR GERD PATIENTS

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Introduction: Laparoscopic techniques in anti-reflux surgery for GERD patients are still considered advanced category by many surgeons. We have established easier and practical anti-reflux surgery procedure with less bleeding and less operative time.
Surgical Procedure: Setting. Our 5-trocar setting with patients in the reverse Trendelenburg's position is as follows: 12 mm trocar just below the navel (A), 5 mm trocar at the upper right abdomen for pulling up lateral segment of the liver, 5 mm trocar at the upper right abdomen, 12 mm trocar at the upper left abdomen (B), 5 mm trocar at the middle left abdomen (C).
Step 1. Under laparoscopic view, left part of the lesser omentum was cut with preserving the hepatic branch of vagus nerve. The right crus of the diaphragma has been dissected free from the soft tissue around the stomach and abdominal esophagus. In this step the fascia of the right crus should be preserved and the soft tissue should not been damaged to avoid unnecessary bleeding. After cutting the peritoneum just inside the right crus, the soft tissue was dissected bluntly to left side. Then the inside margin of the left crus of the diaphragma was recognized. In this part, laparoscope uses (A), the assistant uses (B) to pull the stomach to left lower side and the operator's right hand uses (C).
Step 2. The branches of left gastroepiploic vessels and the short gastric vessels were divided with ultrasonic coagulation and dissection device. The left crus of the diaphragma was exposed and the window at posterior side of the abdominal esophagus was widely opened. In this part, laparoscope uses (A) at the beginning of dividing left gastroepiploic vessels, (B) when dividing short gastric vessels.

Step 3. The right and left crus are sutured to reduce the hiatus. From the right side, the fundus of the stomach is grasped through the widely opened window behind the abdominal esophagus. Then the fundus of the stomach is pulled to obtain a 360 degree "stomach-wrap" around the abdominal esophagus. Using 2–0 non-absorbable braided suture, stitches are placed between both gastric flaps.
The Characteristic Features of Our Procedure

1. Simple Nissen fundoplication.
2. No use of bougie device nor taping technique for esophagus.
3. Rotation of scope site.

Results: We have performed this procedure in 107 cases. A favorable outcome without gastro-esophageal reflux was assessed by radiograms performed on 4–5 postoperative day. The patients are mostly satisfied with the postoperative results.

293—UPPER GI—Benign Esophageal disorders

PREDICTION OF BLEEDING RECURRENCE AFTER ENDOSCOPIC MANAGEMENT OF GASTROESOPHAGEAL VARICES

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Introduction: Endoscopic methods are the most commonly used for the treatment and secondary prevention of bleeding in portal hypertension. The likelihood of recurrence according to a number of authors varies from 5–10 to 37–89%. The need to predict the recurrence of bleeding arises. However, the currently known methods do not take into account the performing endoscopic intervention, which is a method of preventing bleeding and influencing the course of the disease.
Material and Methods: Immediate and long-term results of endoscopic sclerotherapy of the esophageal varices were studied. Results of treatment 91 patients, were studied from 2002 to 2016 (mean age was 53.4 ± 1.28 years, men 58 (64%), women 33 (36%)). Class A of cirrhosis (by Child–Pugh) was found in 10 (11%) patients, B—in 40 (44%), C—in 41 (45%). All patients were involved in the program of sclerotherapy of esophageal varices after a previous episode of bleeding from them (secondary prevention). Patients were observed on average for 570 (53; 1769) days (0–3732). Multiple regression analysis using the logit model of binary responses was carried out to calculate the prediction models.
Results: On average, a relapse of bleeding occurred 80.5 (20; 182) days after sclerotherapy (from 0 to 2557 days). Spearman's correlation analysis revealed a statistically significant relationship ($p < 0,05$) between bleeding recurrence and the number of erythrocytes (R = -0.32), the Child–Pugh class of cirrhosis (A,B,C) (R = 0.49), the Child–Pugh score (5–15) (R = 0.54), content of GSH (R = 0.41), Val (R = 0.33), Met (R = 0.26), Thr (R = 0.23), Trp (R = 0.31), Leu (R = 0.3), HPro (R = -0.36). It should be noted that high correlation was observed for the ratio HPro/Pro: R = 0.71. The choice of prognostic indicators was carried out by stepwise inclusion of predictors. Thus, the final version of the regression equation is as follows: Y = exp (− 0.17 + 0.93*Child–Pugh score—106,42*HPro/Pro)/[1 + exp (− 0,17 +0,93*Child–Pugh score—106,42*HPro/Pro)]. If Y is > 0.5, therefore, the patient has a high risk of recurrence of bleeding from varicose veins of the esophagus within 1 year after endoscopic sclerotherapy. The accuracy of the model obtained 89,6%, Se 94.3%, Sp 79.2%, PPV 90.9%, NPV 86.4%, OR 63.3, LR + 4.53, LR- 0.07. The area under the ROC curve is 0.965, which indicates the excellent quality of the predictive model.
Conclusions: Thus, the proposed method is highly informative, effective, available and can be widely used in clinical practice.

1004—UPPER GI—Esophageal cancer

INDOCYANINE GREEN- ENHANCED FLUORESCENCE IN ESOPHAGEAL CANCER: A POTENTIAL TO BE EXPLORED

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ICG (indocvanine green) is a very useful tool in supporting abdominal surgery. This assumption is even more evident if we talk about complex surgery like the esophageal one, preferentially with a minimally invasive approach.the potential of the ICG, however, is not yet fully understood and the ways of use are not yet standardized.
The video shows an esophagectomy according to Ivor-Levis procedure conducted with a totally mini-invasive technique for an adenocarcinoma of Cardias Siewert I treated with preoperative chemoradiotherapy.
During the intervention we wanted to investigate the possibilities of the ICG in identifying the correct lymph node basin, the correct site of lesion and section, the vascularization of the conduit. And anastomosis. Furthermore, support in identifying the bile duct has become evident.

It was not possible to highlight the correct course of the thoracic duct with ICG ignition at the level of the inguinal lymph nodes. In the video proposed, however, there is a clip taken from a different clinical case where the ability to identify the thoracic duct and its closure in case of a leak is shown.

1394—UPPER GI—Esophageal cancer

MANUAL INTRATHORACIC ESOPHAGO-GASTRIC ANASTOMOSIS DURING 2-STAGE TOTALLY MINIMALLY-INVASIVE ESOPHAGECTOMY FOR ESOPHAGEAL CANCER. REPORT OF 80 CASES

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Aims: This is a retrospective analysis of prospectively collected data. 80 consecutive 2-stage totally minimally-invasive esophagectomies for cancer were performed by the same surgical team between September 2016 and March 2019. All operations were technically identical in terms of patient positioning, surgical approach, extent of lymphadenectomy and type of anastomosis formed. The intrathoracic esophago-gastric anastomosis was performed manually in all of the cases, in a two-layer fashion. The primary endpoints were anastomotic leak rate and anastomotic stricture rate, while the secondary endpoints were 30- and 90-day mortality rates.
Methods: Patients with cancer of the distal esophagus and esophago-gastric junction (EGJ) that underwent 2-stage totally minimally-invasive esophagectomy with manual esophago-gastric anastomosis were enrolled in the study cohort.
Results: The study population consists of n = 80 patients. Mean age was 64.6 years. Mean operating time was 420 min and no blood loss > 200 mL was noted. The rate of pulmonary and cardiac complications was 23.75% and 2.5% respectively. Anastomotic leak occurred in n = 2 (2.5%) patients. Anastomotic strictures were seen in 12.5% of cases. 30- and 90-day mortality was 2.5% and 5% respectively.
Conclusions: Manual intrathoracic anastomosis in totally minimally-invasive esophagectomy is the procedure's rate-limiting step; this is believed to be due to the complexity of the anastomosis associated with the thoracoscopic approach. In our study population, it is proven to be a safe and reproducible technique, with promising short- and long-term outcomes.

1389—UPPER GI—Esophageal cancer

MINIMALLY INVASIVE SUBSTERNAL GASTRIC CONDUIT AS ESOPHAGEAL BYPASS FOR LOCALLY ADVANCED MID-ESOPHAGEAL CANCER INVOLVING THE AIRWAY

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Aims: Esophagobronchial fistula can complicate locally advanced esophageal cancer of the mid-esophagus. This complication has been associated with severe respiratory distress and significant mortality. Esophageal bypass has successfully been used as bridge to definitive chemo-radiotherapy. Nevertheless, the use of this procedure has traditionally been palliative and there are no cases regarding the outcomes of esophageal bypass when used with curative intent. Herein, we aim to present a case of a female patient with locally advanced squamous cell esophageal cancer of the mid-esophagus, complicated with esophagobronchial fistula, in which laparoscopic esophageal bypass was offered, with possible curative intent and to further explore the role of this approach in the definite treatment of such cases.
Methods: A 49-year-old female patient presented with T4b mid-esophageal squamous cell carcinoma and esophagobronchial fistula. The patient underwent a 3D assisted, laparoscopic V-shaped retrosternal esophageal bypass using a gastric conduit.
Results: Post-operative course was complicated with anastomotic leak from the esophago-gastric neck anastomosis, which was treated conservatively. Following that, the patient recovered well and chemo-radiotherapy was administrated. After 6 months, she is still alive, with remarkable tumor regression, and free of respiratory distress symptoms.
Conclusions: Laparoscopic 3D-assisted retrosternal esophageal bypass with gastric conduit is a safe and feasible approach in patients with locally advanced mid-esophageal cancer and esophagobronchial fistula. This technique can provide fistula bypass, permits oral feeding and can be used with possible curative intent.

1303—UPPER GI—Esophageal cancer

IS ENDOSCOPIC ULTRASOUND STILL NEEDED IN THE DIAGNOSIS OF OESOPHAGEAL CANCER?

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Aims: Oesophageal cancer is the 8th most common cancer worldwide and remains ominous in terms of prognosis, despite advances in diagnostic modalities and current treatment. Accurate staging is essential to planning treatment options (primarily to assess operability and need for neo-adjuvant therapy). In the UK, NICE (National Institute for Health and Care Excellence) recommends EUS if it 'helps guide ongoing management'. In the UK, most centres offer PET and EUS as staging modalities for patients with oesophageal and GOJ cancers being considered for curative treatment.
We aimed to assess the role of EUS as a staging modality in the treatment of oesophageal cancer in a tertiary Oesophagogastric unit.
Methods: A retrospective analysis of a prospectively maintained database at our Upper GI unit was undertaken. All patients diagnosed with oesophageal cancer between April 2014-April 2019 were identified, and the patients undergoing EUS in the study period were extracted. The data were analysed with regards to the staging as per EUS, CT and PET and to analyse the accuracy and congruency of the EUS staging. We specifically looked at whether the EUS helped to guide the management plan in these patients.
Results: A total of 570 patients were diagnosed with Oesophageal cancer in the study period. Of these 128 patients underwent an EUS for staging. Of these, 16(12.5%) had squamous cell carcinoma, and the rest had adenocarcinoma. The median T stage on EUS was T3. EUS changed the management plan in 7 patients (5.4%). EUS changed the management plan from curative to palliative in 4 patients. In staging, there was an agreeability rate of 51% (65) between EUS and CT. T staging agreeability was 71% (80) between the two modalities and when disagreement occurred, EUS upstaged the T stage in half of the patients (52%).
Conclusion: The role of EUS for loco-regional disease is very accurate, but the addition of EUS in locally advanced tumours may not add additional information to guide management. Our study revealed a modest 5% change in management in patients with oesophageal cancers when EUS was added to the staging of the disease. EUS is limited by cost and expertise and should be tailored to individual patients where it is likely to guide management.

1275—UPPER GI—Esophageal cancer

HYBRID ESOPHAGECTOMY FOR CANCER. OUTCOMES OF 137 CONSECUTIVE CASES

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Aims: Esophagectomy is the mainstay of multidisciplinary treatment in patients with localized esophageal cancer. This surgical procedure is major and associated with significant morbidity and mortality risk. Esophagectomy is traditionally performed by an open approach. Although minimally invasive procedures for benign esophageal conditions have met with widespread acceptance, they have yet to become the standard of care in the treatment of esophageal cancer. We aim to present our initial experience and outcomes of hybrid 2-stage and 3-stage esophagectomy performed for esophageal cancer, in order to support the broader adoption of hybrid minimally-invasive esophagectomy for treating esophageal malignancies.
Methods: During the study period n = 137 consecutive hybrid esophagectomies were performed. The operations were performed by the same surgical team. The hybrid operation performed was either a two-stage esophagectomy (laparoscopy followed by thoracotomy) or a three-stage esophagectomy (thoracotomy followed by laparoscopy and left cervical incision). Clinical and histopathological data were recorded prospectively and retrospectively examined thoroughly. Post-operative complications, histopathological and clinical outcomes were presented.
Results: Over a 42-month period of, n = 126 two-stage and n = 11 three-stage hybrid esophagectomies were performed. Median age was 64 years and most patients were male (n = 117, 85.4%). The majority of patients had esophageal adenocarcinoma (n = 125, 91.33%). Postoperative complications were to respiratory complications (n = 23, 16.78%) and anastomotic leak (n = 13, 9.48%). Median follow-up was 48 months and n = 58 patients (42.34%) died during the follow-up period. Median overall survival (OS) was 58 months and median disease free survival (DFS) was 48 months.
Conclusions: Hybrid esophagectomy is a safe and feasible solution. Patients with esophageal cancer can benefit from a minimally invasive approach, mainly due to its reduced rate of post-operative respiratory complications, while maintaining favorable peri-operative and long-term results. In order to achieve optimal clinical and oncological outcomes, these operations should be performed in centers with a demonstrated expertise in minimally invasive esophageal surgery.

1121—UPPER GI—Esophageal cancer

THE ESOPHAGEAL CANCER SPECIFIC CONTENT SCORE. A NOVEL SCORING SYSTEM FOR ASSESSING THE QUALITY OF INFORMATION ON ESOPHAGEAL CANCER ON THE INTERNET

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Introduction: Increasingly, patients are consulting the internet for medical information, where the quality is highly variable. We must ensure patients are directed towards high quality websites. This is particularly true of esophageal cancer which is often detected at an advanced stage and is frequently fatal.
Aims: We aim to assess the quality of information on esophageal cancer available for patients on the internet.
Methods and Materials: We searched the top 3 search engines for "Esophageal Cancer". We analysed the top 20 websites returned by Google and the top 10 websites returned by Yahoo and Bing. All free, english language websites which did not require a password were included. We excluded paid advertisement websites and websites for medical professionals. Duplicate websites were removed.
Each website was then evaluated using the JAMA benchmarks, DISCERN tool, presence or absence of the Health On The Internet (HON) seal and the Esophageal Cancer Specific Content Score (ECSCS).
Results: The average JAMA score was 2 with only three of the eighteen unique websites scoring the maximum of 4 points (17%). The average DISCERN score was 51.5 (64%) with no website achieving the maximum of 80. The HON seal was present in only 5 websites (28%). The average ECSCS was 9.2 with only two websites achieving the maximum of 12 (11%).
Conclusions: Whilst there are certainly websites providing high quality information for patients in relation to esophageal cancer our study has identified obvious issues. We must ensure that only the highest quality information is available on the internet for patients.

1034—UPPER GI—Esophageal cancer

MODIFIED MCKEOWN MINIMALLY INVASIVE ESOPHAGECTOMY WITH SYNCHRONOUS ABDOMINAL AND CERVICAL STAGES

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Introduction: Esophagectomy remains one of the most difficult operations in surgical gastroenterology, and when performing advanced lymphadenectomy, the complexity, duration, and number of complications increase. There are many unresolved problems: position of the patient on the table, choice of surgical approach, volume of lymphatic dissection, method of forming anastomosis, the need to use a robot, etc.
Materials and Methods: With the experience of more than 40 minimally invasive esophagectomies (MIE) since 2019, the clinic has performed the first robot-assisted operations for benign and malignant diseases of the esophagus. A McKeown MIE was developed with simultaneous abdominal and cervical stages performed by two teams of surgeons. Operations were done in prone and semi-prone positions. Isolation of the esophagus was performed thoracoscopically or robot-assisted from 4 trocars. After the patient flipped onto the back, the laparoscopic stage was started. After mobilization of the stomach along a large curvature with the preservation of the vascular arcade and the right gastro-omental artery, the second team of surgeons have done the approach and mobilization of the esophagus on the neck. By the time the mobilization of the stomach was completed, the esophagus on the neck was crossed. Mini laparotomy was performed 5 cm over an umbilicus, the esophagus and stomach were removed extracorporeally and a graft 3 cm in diameter was formed using linear staplers. Next, a graft was carried out on the neck where a mechanical hardware anastomosis was formed end to end, at the same time abdominal drainage was inserted and mini laparotomic approach was sutured. All patients with esophageal cancer underwent 2S lymph node dissection.
Results: The operation was performed in patients with adenocarcinoma of the lower part of the esophagus (11) and achalasia (4) with advanced megaesophagus. We performed 9 operations thoraco-laparoscopically, 5 were robot-assisted. The developed technique allowed us to reliably ($p < 0.05$) reduce the duration of operations by an average of 39 ± 12 min. The average duration of minimally invasive operations was 385 ± 30 min, robot-assisted operations was done during 410 ± 17 min. There were no fatal outcomes or failure of anastomoses in the postoperative period. The average time in intensive care was 1 day, the average time in the hospital was 6 days (5–8).
Conclusions: Our first experience suggests that the simultaneous execution of the abdominal laparoscopic and cervical stages during McKeown MIE is safe and technically feasible and can reduce the time of the operation. This is especially relevant when performing robot-assisted interventions, which are associated with a common increase in the duration of the operation compared to thoracoscopic MIEs.

896—UPPER GI—Esophageal cancer

HYBRID IVOR LEWIS ESOPHAGECTOMIES

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Aims: Analysis of results of Lewis' operations (LO), studying structure and complications from 2017 to 2019.
Methods: Divided all LO into 2 groups. The 1st group—LO from 2017 to 2018 and the 2nd—LO in 2019.
Results: In the NCI, 131 LO for esophageal gastric junction cancer (107) and esophageal cancer (24) were performed from 2017 to 2019. Of these, 67.1% (88)—open Ivor Lewis esophagectomies (OILE) and 32,9% (43) hybrid (laparoscopic) Ivor Lewis esophagectomies (HILE) operations were performed. R0 resections - 94.6%: HILE - 97,6% and OILE—94.3%.
Group 1. In total, 96 LO were performed. HILE 26% (25) and OILE 74% (71 patients). The overall mortality rate (OMR) were 12.5% (12), of which 16% (4) in the HILE group and 11.2% (8) in the OILE. Complications - 32.3% (31), HILE group - 44% (11), OILE—28.1% (20). Cardiorespiratory complications - 15.6% (15): HILE group - 20% (5); OILE - 14.1% (10). Anastomotic leak - 4.1% (4): HILE group—4% (1), OILE—3.1% (1). Chylothorax—4.1% (4): HILE group—12% (3); OILE—1.4% (1). Other complications: acute postoperative pancreatitis - 1,42% (2) OILE; gastrostasis—0,71% (1) OILE; abdominal bleeding - 0,25% (1) HILE; necrosis of the stomach stump - 0,71% (1) OILE; perforation of the colon diverticula—0,71% (1) OILE; paresis of the upper extremities - 0,25% (1) HILE.

Group 2. In total, 35 LO were performed. HILE - 51.4% (18) and OILE - 17 (48.6%). The OMR were 2.85% (1)—HILE. Complications - 20% (7), HILE group - 22.2% (4), OILE - 17.6% (3). Cardiorespiratory complications - 11.4% (4): HILE group - 11.1% (2), OILE - 11.76% (2). Anastomotic leak rate - 2.85% (1) OILE. Other complications: gastrostasis—2.85% (1) HILE; mesenteric thrombosis - 2.85% (1) HILE.
Conclusions: There are clear trend: an increase in the percentage of HILE in relation to OILE. complication decrease (from 16% to 2.85%) and morbidity (from 44% to 22.2%) in the HILE group, which related to the learning curve associated with especially minimally invasive technique.

786—UPPER GI—Esophageal cancer

HOSPITAL VOLUME AND WEEKEND-DISCHARGE ARE INDICATORS FOR PROLONGED LENGTH OF HOSPITAL STAY AND READMISSION AFTER UNCOMPLICATED OESOPHAGECTOMY

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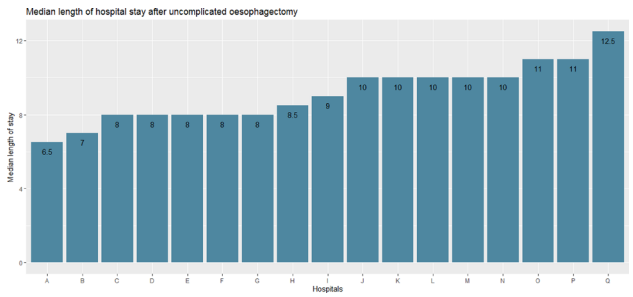
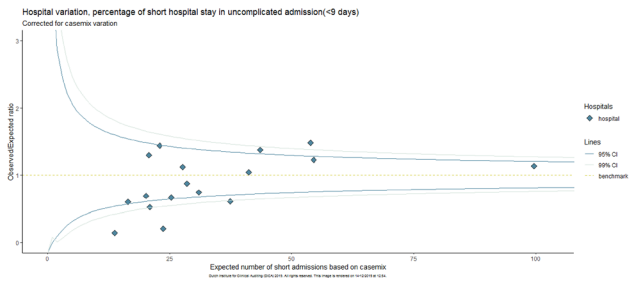
Background and Aims: Oesophagectomy is associated with significant postoperative morbidity with complication rates around 65% in the Netherlands. Postoperative complications lead to prolonged length of hospital stay (LOS). In addition, over 11% of patients are readmitted after oesophagectomy. Due to prolonged LOS and readmission hospital costs increase. Risk factors for prolonged LOS in uncomplicated patients are unknown. Given the increasing focus on value-based health care, we aimed to identify hospital variation in LOS in uncomplicated oesophagectomy patients. In addition, we identified clinical risk factors for prolonged LOS and readmission.

Methods: All patients registered in the Dutch Upper GI Cancer Audit (DUCA) who underwent uncomplicated, curative oesophageal cancer surgery between 2015 and 2018 were included. Primary endpoint was median LOS. Association of patient and treatment characteristics with LOS and readmission was evaluated using multivariable regression analyses after dichotomising LOS around the median. Hospital variation was evaluated using multivariable logistic regression including baseline characteristics; a funnel plot visualised casemix corrected hospital results.

Results: Between 2015 and 2018, 1.007 patients were included from 17 hospitals. Median LOS was 9 days, ranging 6.5 to 12.5 days among hospitals (Fig. 1). In multivariable logistic regression, prolonged LOS was associated with a hospital volume of 20–40 annual oesophagectomies (compared to > 40), transthoracic surgery (versus transhiatal), and non-administration of neoadjuvant chemoradiotherapy. LOS did not differ between open and minimally invasive surgery. After correction for casemix 4 hospitals had significantly longer LOS, and 2 hospitals had significantly shorter LOS (Fig. 2). The overall readmission rate was 6.1%. The readmission rate was 10.2% after discharge during the weekend and 5.5% after a working-day discharge. This difference remained significant after correction for confounders (p = 0.04). There was no association between LOS and readmission, in addition readmission rates were similar after open and minimally invasive procedures.





Conclusion: There is significant hospital variation in LOS after uncomplicated oesophagectomy in the Netherlands, with LOS ranging from 6.5 to 12.5 days. LOS was significantly shorter in high-volume hospitals but did not differ between open and minimally invasive surgery. Short LOS did not lead to more readmissions. However, weekend-discharge is associated with a higher readmission rate.

674—UPPER GI—Esophageal cancer

THORACOSCOPIC RIGHT PARATRACHEAL EXTENDED MEDIASTINAL LYMPHADENECTOMY FOR DISTAL OESOPHAGEAL ADENOCARCINOMA

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Aim: Different types of a mediastinal lymphadenectomy have been described, being the 3-field lymphadenectomy more frequent in Asian countries. In Europe, the standard lymphadenectomy differs between countries and even hospitals. The optimal surgical approach for the treatment of patients with oesophageal adenocarcinoma is still under debate. We suggest that transthoracic esophagectomy with right paratracheal extended 2-field lymphadenectomy may improve the radicality of the resection and thus to increase locoregional tumor control and long-term survival.

Methods: We present a 60 years old male with a distal oesophageal adenocarcinoma T2N1 in Endoscopic ultrasound. Neoadjuvant chemoradiation was chosen in this patient. We performed a three-field thoraco-laparoscopic esophagectomy with an extrended mediastinal lymphadenectomy.

Results: A three-stage minimally invasive esophagectomy (MIE), combined thoracoscopic-laparoscopic esophagectomy with cervical anastomosis, was performed. The prone position for thoracoscopic oesophageal mobilisation was chosen. The exposure obtained was excellent even without the need for a complete lung collapse, thereby obviating the need for a double-lumen endotracheal tube and decreasing respiratory complications. Azygos vein ligation was performed with Echelon 45 mm white cartridge. We use an HARMONIC® Ultrasonic device. Parietal and mediastinal pleura were opened, pulmonary ligament was sectioned. Periesophageal lymph nodes and subcarinal nodes were remove. Right paratracheal lymphadenectomy to achieve an extended lymphadenectomy was performed. After chemoradiation pathological complete response was achieved. 24 lymph nodes were removed without evidence of malignancy.

Conclusion: Transthoracic esophagectomy with right paratracheal extended 2-field lymphadenectomy may be the optimal treatment for oesophageal distal adenocarcinoma.

667—UPPER GI—Esophageal cancer

EARLY EXPERIENCE IN MINIMALLY INVASIVE ESOPHAGECTOMY FOR TREATMENT OF THORACIC ESOPHAGEAL CANCER

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Introduction: Minimally invasive esophagectomy (MIE) has gained popularity in the surgical treatment of esophageal cancer over the past three decades. By introducing minimally invasive techniques, esophageal oncological surgery has advanced in terms of safety, radicality, functional preservation and quality of life post-esophagectomy of the patients.
Material and Method: We present the experience of the Center of Excellence in Esophageal Surgery at Sf. Maria Clinical Hospital regarding total (MIE) through total thoraco-laparoscopic modified McKeown triple approach.
Results: In between January 2015 and December 2019, 17 patients (M) were treated for thoracic esophageal cancer. The average age of patients was 56 years. Most of the esophageal tumors were midthoracic (82,3%), 88,2% were squamous carcinomas and more than a half were moderately differentiated. Most of the esophageal tumors were locally advanced tumors (cT3N1 - 64,7%), 9 patients were staged IIIA. 64,7% of patients received neoadjuvant chemo radiotherapy. The esophageal substitute was represented by the gastric conduit. The intraoperative blood loss was minimal. The average duration of surgical interventions was 300 min. All the surgical interventions were considered with curative intention (R0). The rate of intraoperative complications was 17.6%. The rate of early postoperative complications was 64.3%. Distribution of postoperative complications according to the Clavien-Dindo Classification (0–29.4%, 1–5.8%, 2–5.8%, 3a-17.6%, 3b-11.7%, 4a-0%, 4b-5.8%, 5–23.5%) highlighted the predominance of minor complications. The advantages of MIE observed in the studied group were also related to collaboration with patients in the postoperative period: reduced postoperative pain, improved comfort and early mobilization of the patients.
Conclusions: The early outcomes of using of the minimally invasive approach in treatment of esophageal cancer in our clinic include the reduction of perioperative morbidity, the duration of hospitalization and a faster recovery.
Key words: Minimally invasive esophagectomy, thoracic esophageal cancer, McKeown modified triple approach, total thoraco-laparoscopic approach.

508—UPPER GI—Esophageal cancer

SIGNIFICANCE OF A TRANSMEDIASTINAL RADICAL SURGERY FOR THE ESOPHAGEAL CANCER PATIENTS WITH IMPAIRED RESPIRATORY FUNCTION

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Backgrounds and Aims: Esophageal squamous cell carcinoma requires an extensive mediastinal lymphadenectomy(the gold standard of radical surgery). However, thoracotomy with one-lung ventilation is unavoidable which sometimes limits surgical indications because of patients' impaired pulmonary function. For them, a novel minimally invasive techniques by the transcervical and transhiatal approach, have enabled a transmediastinal approach for esophagectomy. Here, we report on the situation from the introduction of this procedure to the initial stage in our institution.
Patients and Methods: Before starting a transmediastinal approach, we had a cadaver surgical training twice.
9 patients were included(Aug.2018-Dec.2019). Mean age was 69.3 (60–84). Brinkman index (0/1-600/601-1200/1201-, 0/1/5/2 respectively). GOLD 2(n = 3), GOLD 3(n = 5) and GOLD1 (n = 1) with a severe pleural adhesion were included. Patients during entire surgical procedure were in the supine position. Conventional bipulmonary ventilation was kept until the end of surgery. In the first stage, lymph node dissections in the cervical and the abdominal fields were performed simultaneously by two surgical teams. The cervical procedure was performed via a collar incision under mediastinoscopic guidance. Mediastinal spaces below the bronchial bifurcation were dissected and lymphadenectomy along the left recurrent nerve. The abdominal transhiatal procedure was performed via a laparoscopic approach. After a dissection from the cranial and caudal directions merges, laparoscopic reconstruction with a gastric tube conduit and cervical anastomosis was performed. After staying overnight in ICU, patients returned to the general ward and received postoperative management.
Results: Entire operation time was 501 min (412–637), blood loss was 223 ml (60–485). Postoperative pulmonary complication (CD$\geqq$II,III) was 1 and 0cases, respectively. Pulmonary complication including severe pneumonia and exacerbation of pulmonary function was not observed in any cases. Postoperative hospital stay was 29 days (18–39). Transient recurrent laryngeal nerve palsy was observed in 2 cases.
Discussion and Conclusion: Severe pulmonary complication or severe right pleural adhesion lead to a limitation of surgical indication. For such patients, chemoradiotherapy has been the only remaining treatment. Transmediastinal approach may provide a safe and effective cancer treatment for them. Short-time outcome was safe and effective, however, long-term outcome remains to be estimated. Thus, we could start a new procedure for 9 patients without major complications. CST seems to help us an anatomical understanding and usage of interfering forceps. Transmediastinal approach may be useful for patients with impaired respiratory function as an only available surgical treatment. Here, we present this procedure using video including surgical technique.

277—UPPER GI—Esophageal cancer

THE ROLE OF SURGICAL ROBOT IN PREVENTING POSTOPERATIVE COMPLICATIONS AFTER ESOPHAGEAL CANCER SURGERY

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Transthoracic esophagectomy for esophageal cancer is one of the most invasive procedures in surgery for gastrointestinal cancer. Serious complications would occur after esophageal cancer surgery, including anastomotic leakage, vocal cord palsy, and chylothorax. To avoid vocal cord palsy, we are careful to avoid thermal injury and transient traction to the recurrent laryngeal nerves, as well as to keep blood supply to the nerves. To avoid chylothorax, the thoracic duct is preserved unless tumor directly invades to the duct. Surgical robot is useful to achieve these points, since it smoothens the movement of the forceps. We started robotic transthoracic esophagectomy in November 2015, and currently perform robotic transthoracic esophagectomy for cases where T4 is not suspected. We will present our procedure.

Operation is performed in prone position and bilateral ventilation. We insert the camera port into the 7th intercostal space on the posterior axillary line and pneumothorax is maintained at 8 mmHg. We place the port for left hand devices into the 9th intercostal space on the lower scapular angle line, the ports for right hand devices into the 5th intercostal and into the 3rd intercostal lines on the posterior axillary line, and the assistant port into the 6th intercostal line on the middle axillary line. During dissection of the recurrent laryngeal nerve lymph nodes, thin blood vessels are coagulated with the left hand forceps and then dissected with the right hand scissors. Before the layer to dissect becomes obscured by blood, we separate the thoracic duct layer and the left recurrent laryngeal nerve lymph node layer to avoid thoracic duct injury during lymphadenectomy. During left recurrent nerve lymph node dissection, we do not float the left recurrent nerve from the vascular sheath that involves the aortic arch as much as possible. Always try to preserve the capillaries around the nerves.

By December 2019, 17 patients underwent robotic transthoracic esophagectomy for esophageal cancer. The median age was 67 years, 12 men, the median BMI was 20.7 kg/m2, and cStage I/II/III was 8/6/3. Thoracic surgical time was 235 min, blood loss in the thoracic part was small, the number of dissected mediastinal lymph nodes was 18 (all median), and the incidence rates of vocal cord palsy, chylothorax, and anastomotic leakage were 5.9% (1 case), 0%, and 18% (3 cases), respectively.

Robotic transthoracic esophagectomy increases the dissection accuracy by significantly improving the movement of forceps and may dramatically reduce vocal cord palsy even in the introductory period.

31—UPPER GI—Esophageal cancer

THE RACE FOR DIAGNOSIS: REFERRAL PROCESS AND OUTCOMES OF "ONE STOP" CLINIC FOR UPPER GASTROINTESTINAL CANCER

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Background: Prompt diagnosis is vital in modern oncology. The concept of a "one stop" clinic, whereby the patient can undergo a series of investigations and become aware of the likelihood of malignancy on the same day, has been successfully applied in breast surgery but is a novel concept in Upper GI surgery. The aim of the current study is to assess the sensitivity and specificity of diagnosis of the "one-stop" upper GI clinic in our hospital.

Methods: A retrospective analysis of case notes of patients seen in "one-stop" clinic between January 2017 and July 2017, was conducted. Data were collected through a bespoke collection tool.

Results: 254 patients attended the "one stop" clinic (Median age: 68 (IQR: 58.25–77). 12 patients refused to have Oesophageogastroduodenoscopy (OGD), six patients could not have OGD and the records for one patient could not be identified; all 19 were excluded from further analysis. 14 of the remaining 235 patients who were referred to the clinic after pre-screening did not require an OGD. Sensitivity and specificity were 100% and 94.8% respectively while 83.7% of patients were given a diagnosis on the day.

Conclusions: The "one stop" clinic had good specificity and sensitivity and 83.7% of patients were given a diagnosis on the day. Moreover, the pre-screening process successfully identified patients who needed a diagnostic OesophaGastroDuodenoscopy.

1427—UPPER GI—Gastric cancer

LAPAROSCOPIC DISTAL GASTRECTOMY FOR LOCALLY ADVANCED GASTRIC CANCER

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Background: Gastric cancer remains one of the most lethal cancers of the digestive system. Although its prevalence is decreasing worldwide, there are still some areas in Europe with high incidence and increased mortality due to gastric cancer. Laparoscopic resection is currently supported for early gastric cancer but its use in advanced disease is still debated. Despite recent clinical trials supporting the safety and effectiveness of laparoscopic surgery in advanced gastric cancer its use is not yet widespread.

Clinical Case: We present the case of an 83 years-old lady with cardiovascular disease and an early-stage dementia. She was referred due to increasing food intolerance, loss of appetite and weight loss. The upper GI endoscopy revealed an extensive lesion of the antrum and pylorus whose biopsies revealed a poorly cohesive gastric cancer. The staging CT scan revealed some necrotic adenopathies but no metastatic lesions. Due to impending obstruction and overall health state, the patient was proposed for surgical resection with D1 lymphadenectomy.

We performed a laparoscopic sub-total gastrectomy with a Billroth type 2 reconstruction. The surgical specimen revealed a poorly cohesive gastric cancer with 8x6x3cm extending to the adjacent lymph nodes, with 8/25 lymph nodes with metastasis (pT4aN3M0 R0). The post-operative was uneventful, and the patient was discharged home on the 7th POD. The patient resumed full diet after the first month with no complaints and regaining weight.

Conclusion: Minimally invasive surgery allows for easier recovery and diminishes the surgical aggression. Even frail patients might tolerate major abdominal surgery, due to reduced respiratory complications, reduced pain and early ambulation.

1530—UPPER GI—Gastric cancer

LAPAROSCOPIC GASTRECTOMY COMPLICATION-SEVERE PORTAL VEIN BLEEDING

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A 68-year-old man was admitted to the General, Oncologic, Metabolic and Thoracic Surgery Clinic (Military Institute of Medicine in Warsaw) for surgical treatment of gastric cancer. CT scan revealed a focal lesion in right lung, suspected of metastasis. A CT-guided biopsy was performed- lesion without cancer cells.

Gastroscopy Results: In the gastric angle, a crusty ulcer descending into the pylorus was identified; ulcer with no signs of bleeding.

The patient was qualified for surgical treatment. Laparoscopy was performed. Intraoperatively, in the gastric angle, a tumor exceeding the serosa was identified. Lymph nodes in this area were enlarged. Gastrectomy and greater omentum resection were performed. During the lymphadenectomy of the hepatoduodenal ligament massive hemorrhage occurred, originating most likely from the portal vein. Blood loss of about 700 ml. Bleeding site was compressed with a gauze pad and supplied with Veriset hemostatic material. Lymphadenectomy was then performed on the celiac trunk. During lymphadenectomy of the upper edge of the pancreas, the splenic artery was completely dissected (in this case a small vessel with a very tortuous course, about 3–4 mm in diameter). Splenectomy was performed. D2 lymphadenectomy. Roux-en-Y anastomosis.

After the operation patient in serious condition was admitted to the Intensive Care Unit for one day. After stabilizing the patient's condition, he return to the General Surgery Clinic. In the postoperative period, patient's gradual recovery was observed. Patient was discharged home in good general and local condition.

Histopathological examination results. "Adenocarcinoma tubulare exulcerans G2/Lauren: typus intestinalis/totalis parietis ventriculi et telae adiposae periventricularis infiltrans. Emboliae carcinomatosae ramorum vasorum. Lineae excisionis chirurgicae et lymphonoduli regionales sine carcinomate 0/23. Lien accessorius sine atypia.
pT3, pN0; L/V 1; R 0; Stage IIA".

1430—UPPER GI—Gastric cancer

LAPAROSCOPIC MANUAL 3D-ASSISTED ESOPHAGO-JEJUNAL ANASTOMOSIS DURING LAPAROSCOPIC TOTAL GASTRECTOMY FOR CANCER

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Aims: Gastric resection for gastric cancer has been performed laparoscopically since 1992 when Goh et al. performed the first distal gastrectomy for gastric cancer. Following that in June 1993 the first reports of laparoscopic total gastrectomy were published by Azagra et al. Over the years of laparoscopic surgery, several reconstruction techniques of esophago-jejunal anastomosis were cited such as video-assisted techniques, anastomose side-by-side with a linear stapler, circular stapler with the anvil placed transorally, among others. Herein we report our experience of hand-sewn esophago-jejunal anastomosis in two layers with excellent overall results regarding stenosis, anastomotic leak rate, safety, and efficacy.

Methods: After D2 abdominal lymphadenectomy, the abdominal esophagus was mobilized. Reconstruction was made in the Roux-en-Y manner via the retrocolic route. The anastomosis was performed manually in two layers, using PDS 3/0 sutures. First, the posterior outer seromuscular layer was performed between the abdominal esophagus and the jejunal loop, without completely transecting the divided stomach from the esophageal stump. After completion of the outer layer, the specimen was transected. The cut end of the abdominal esophagus was opened with laparoscopic coagulating shears (LCS), and a 2.5 cm hole was made at the antimesenteric side of the jejunum for anastomosis using the LCS. Finally, an end-to-side esophago-jejunal anastomosis was completed with hand-sewn continuous sutures. After completion of the anastomosis, a methylene blue leak test was performed for all patients.

Results: There were no cases that were converted to open surgery. The median suturing time for the hand-sewn esophago-jejunal anastomosis was 55 min (range 40–80 min). Intra-operatively methylene blue leak test was negative in all cases.

Conclusions: Laparoscopic 3D-assisted manual esophago-jejunal anastomosis, during laparoscopic total gastrectomy for cancer, can be performed with excellent short-and long-term results regarding anastomotic leak rate and anastomotic stricture. This method avoids a laparotomy for reconstruction as well as all of the disadvantages associated with other laparoscopic anastomotic techniques.

1133—UPPER GI—Gastric cancer

SHORT TERM OUTCOME OF TOTALLY LAPAROSCOPIC TOTAL GASTRECTOMY COMPARED WITH LAPAROSCOPY-ASSISTED TOTAL GASTRECTOMY: A PROPENSITY SCORE MATCH ANALYSIS

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Background: This study aimed to evaluate the surgical outcome and quality of life (QoL) of totally laparoscopic total gastrectomy (TLTG) compared with laparoscopy-assisted total gastrectomy (LATG) in patients with early gastric cancer.
Methods: We reviewed all patients with early gastric cancer who underwent TLTG (n = 223) with intracorporeal hemi-double stapling including the first case in Seoul National University Hospital between 2011 and 2018, and matched to those who underwent LATG (n = 121) with extracorporeal conventional circular stapling during the same period using 2:1 propensity score matching (PSM). Prospectively collected morbidity within postoperative 1 year were compared between TLTG and LATG groups in conjunction with learning curve. EORTC QLQ-C30, STO22 and OG25 were prospectively surveyed (preoperative, postoperative 3 months, 6 months, and 1 year) for limited patients with informed consent.
Results: PSM using age, sex, BMI, combined resection, pathologic T and N stage revealed the 215 patients in TLTG group and matched 112 patients in LATG group. Grade I pulmonary complication of TLTG group was significantly lower than those of matched LATG group (0.5% vs. 5.4%, p = 0.007). Other operative morbidity including anastomotic complication were not significantly different between matched TLTG and LATG groups. Regarding comprehensive complication index, learning curve of TLTG was overcome at the 26th case after which overall, grade I and II complication were significantly reduced. TLTG group after learning curve (n = 190) also showed significantly lower grade I pulmonary complication than matched LATG group (n = 110) (0.5% vs. 4.5%, p = 0.026). Regarding postoperative QoL, TLTG group (n = 57) revealed significantly less dysphagia (p = 0.018), pain (p = 0.043), eating restriction (p = 0.024), eating (p = 0.026), and odynophagia (p = 0.041) than LATG (n = 17). Multivariate analyses for each QoL item demonstrated that TLTG was the only common independent factor for better QoL.
Conclusions: TLTG reduced grade I pulmonary complication and provided better QoL in terms of eating, odynophagia and pain than LATG without compromising the surgical safety.

1124—UPPER GI—Gastric cancer

DOES PRE-MEDICATION WITH MUCOLYTIC AGENTS IMPROVE MUCOSAL VISUALISATION DURING OESOPHAGOGASTRODUODENOSCOPY, A SYSTEMATIC REVIEW AND META-ANALYSIS

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Introduction: Gastric Cancer (GC) is the fourth most common malignancy worldwide and the second leading cause of cancer-related mortality for both sexes. The gold standard for diagnosing GC is oesophagogastroduodenoscopy (OGD). Excess mucus on the gastric mucosa impairs detection of early GC.
Aim: To synthesise available evidence of the effect of premedication with a mucolytic agent among adults undergoing elective non-therapeutic OGD, compared to placebo or other mucolytic agents, on mucosal visibility during OGD.
Methods: A systematic review was conducted. PubMed, EMBASE, CINAHL, Cochrane central register of controlled trials (CENTRAL) and Web of Science where searched for relevant studies. A random effects meta-analysis was performed to determine the mean difference in total mucosal visibility score (TMVS) between the pooled mucolytic agents and control. Subgroup analyses were performed to determine the mean TMVS difference for simethicone versus control, and the impact of different timings and doses of mucolytic premedication.
Results: 13 studies, involving 11,086 patients, including 6178 females (55.7%), with a mean age of 53.4 were identified and 6 of these were brought forward to meta-analysis. This revealed a mean difference of − 2.69 (95% CI − 3.5, − 1.88. For simethicone, the mean difference was − 2.68 (95% CI − 4.94, − 0.43. A simethicone dose of 133 mg of simethicone was most effective with a mean difference of − 4.22 (95% CI − 5.11, − 3.33. Assessing timing of administration across all mucolytic agents revealed a mean difference for the > 20 min group of − 3.68 (95% CI − 4.77, − 2.59). No adverse events were reported in any included trials.
Conclusions: Regular use of premedication with mucolytic agents prior to routine OGD is associated with improved TMVS with no reported adverse events.

1123—UPPER GI—Gastric cancer

THE INTERNET WILL SEE YOU NOW. ASSESSING THE QUALITY OF INFORMATION ON GASTRIC CANCER ON THE INTERNET

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Introduction: Increasingly, patients are consulting the internet for medical information, where the quality is highly variable. We must ensure patients are directed towards high quality websites. This is particularly true of Gastric Cancer (GC), a topic around which there is much uncertainty for patients and their families.

Aim: We aimed to assess the quality of information on GC available for patients on the internet.

Methods and Materials: We searched the top 3 search engines for "Gastric Cancer". We analysed the top 20 websites returned by Google and the top 10 websites returned by Yahoo and Bing. All free, English language websites which did not require a password were included. We excluded paid advertisement websites and websites for medical professionals. Duplicate websites were removed.

Each website was then evaluated using the JAMA benchmark criteria, DISCERN tool, presence or absence of the Health On The Internet (HON) seal and the Gastric Cancer Specific Content Score (GCSCS).

Results: The average JAMA score was 1.55 with none of the twenty unique websites scoring the maximum of 4 points. The average DISCERN score was 54.8 (68.5%) with no website achieving the maximum of 80. The HON seal was present in only 6 websites (30%). The average GCSCS was 11 with only five websites achieving the maximum score of 13 (25%).

Conclusions: Whilst there are certainly websites providing high quality information for patients in relation to GC our study has identified obvious issues. We must ensure that only the highest quality information is available on the internet for patients.

1109—UPPER GI—Gastric cancer

GASTRIC POLYP EVALUATION DURING OESOPHAGOGASTRODUODENOSCOPY (OGD). ARE WE FOLLOWING THE GUIDELINES?

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Introduction: With the increasing use of endoscopy visually discernable abnormalities of the gastrointestinal tract, including polyps, are being encountered more often. Whilst there have been clear guidelines relating to polyp management in the colon for some time the management of gastric polyps remains controversial. The vast majority of gastric polyps have little or no malignant potential however it is often not possible to discern histological subtypes based solely on endoscopic appearance. As such in 2017 the British Society of Gastroenterology, in their first position paper on quality standards in OGD, recommended that the presence of gastric polyps should be recorded, with the number, size, location and morphology described, and representative biopsies taken.

Aims: To assess our units approach to gastric polyps in light of these new guidelines.

Methods: We retrospectively reviewed all elective OGD reports from January 1st to March 31st 2019. Where gastric polyps were identified we assessed if their number, size, location and morphology were described and if representative biopsies were taken.

Results: 303 OGDs were reviewed. Males comprised 54.46% of the cohort with the average age being 58.8 years. The most common indication was "abdominal pain" (18.8%), followed by dysphagia (14.2%) and anaemia (12.9%). Gastric polyps were identified in 22 of the OGDs (7.3%). Polyp size was not reported in any case whilst location was reported in all cases. Morphology was described in 1 OGD and no representative biopsies were taken in any case.

Conclusions: There remains scope for improvement in our units management of gastric polyps.

768—UPPER GI—Gastric cancer

MINIMALLY INVASIVE APPROACH FOR LOCAL RECURRENCE OF ESOPHAGOJEJUNAL ANASTOMOSIS IN PATIENT WITH PREVIOUS TOTAL GASTRECTOMY

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Introduction: Oesophago-gastric cancer recurrence usually presents as a systemic disease, or both local and systemic. For this reason, it is usually not operable. There are few published data on what should be the best therapeutic option in cases of exclusively local recurrence. We present a rare case of local recurrence, with a completely minimally invasive approach combining laparoscopic and thoracoscopic access.

Materials and Methods: This report describes a case of a 70 year-old male with medical history of type 2 diabetes, hypertension and dyslipidemia, who was diagnosed with gastroesophageal junction tumor Siewert II in 2015. After neoadjuvant chemo-radiotherapy (CROSS TRIAL), he underwent a total gastrectomy and transhiatal distal esophaguectomy with D2 and lower mediastinal lymphadenectomy, with Y-en-Roux reconstruction using a circular mechanical end-to-side esophagueal-jejunal anastomosis by laparoscopic approach. Histopathological results showed an intestinal adenocarcinoma T2N1 with 2/17 positive lymph nodes and free resection margins, without poor prognostic factors.

After a complete recovery and correct outpatient follow-up he is diagnosed of recurrence at the esophagojejunal anastomosis level, with a 3 years disease-free-survival. The PET-CT scan showed FDG hypercaptation of distal retroesophagus suggestive of lymph node metastasis secondary to its baseline process. The endoscopic ultrasound showed an homogeneous hypoechogenic solid mass of 23x15 mm at the level of the esophageal-jejunal anastomosis, with extrinsic infiltration of the wall beyond the muscularis. The mass contacts the pleura and the aorta with a clear separation plane in between. The fine-needle biopsy of the lesion was positive for adenocarcinoma cells. After discuss the case at the multidisciplinary committee, surgical treatment was agreed after neoadjuvant chemo-radiotherapy.

Results: Dissection of previous anastomosis and alimentary limb was performed by a laparoscopic approach. Next, patient was placed in prone position. During que thoracoscopic approach, it was first performed a left pleural resection followed by a resection of previous esophagojejunal anastomosis using a mechanical endo-stapler. A new side-to-side esophageal-jejunal intrathoracic anastomosis was redone. Surgical time was 174 min and there were no incidents during the procedure. Postoperative evolution was satisfactory and patient was discharged on the 6th postoperative day. Histopathological results showed an intestinal without poor prognostic factors, so patient didn't receive adjuvant treatment. Currently he still alive without recurrence.

Conclusions: Minimally invasive surgery, including laparoscopic and thoracoscopic approach, is a feasible option in selected patients with only local recurrence, without systemic involvement, as it can facilitate access to narrow spaces, perform a complex anastomosis, as well as reduces surgical aggression and morbidity.

References

1. Bennett JJ, Gonen M, D'Angelica M, Jaques DP, Brennan MF, Coit DG. Is detection of asymptomatic recurrence after curative resection associated with improved survival in patients with gastric cancer? J Am Coll Surg. 2005;201(4):503–510. https://doi.org/10.1016/j.jamcollsurg.2005.05.033.

2. Banks, Matthew et al. "British Society of Gastroenterology guidelines on the diagnosis and management of patients at risk of gastric adenocarcinoma." Gut vol. 68,9 (2019): 1545–1575. https://doi.org/10.1136/gutjnl-2018-318126.

685—UPPER GI—Gastric cancer

IATROGENIC JEJUNAL PERFORATION - POSSIBLE COMPLICATION OF STENTING OF ESO-JEJUNAL ANASTOMOSIS FISTULAS

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Patient I.G. At 69 years of age, known with Siewert III eso-gastric junction adenocarcinoma, for which he has undergone neoadjuvant radiochemotherapy, he was operated in our clinic, and a total gastrectomy was performed (ypT4ypN1ypM1 stage). On the 7th postoperative day the patient presents acute diffused peritonitis by the eso-jejunal anastomosis fistula for which an umbrella-covered esophageal stent (Flexstent 140/28) is endoscopic inserted and a laparotomy is performed for lavage and drainage. Evolution marked by the persistence of purulent secretions on the subphrenic drains with the externalize of methylene blue on the 19th postoperative day. The endoscopy is repeated and the persistence of the fistula is produced by the migration of the esophageal stent and it is decided to install another esophageal stent (Flexstent 100/24). Favorable evolution until the 37th postoperative day, when the patient presents a febrile syndrome. CT is performed, which raises the suspicion of a jejunal perforation through the distal stent. An endoscopy is performed that confirms the jejunal perforation, the distal stent is extracted and the surgery is effectuated for lavage, drainage and a Foley probe was inserted for the directed drainage of the jejunal perforation. Postoperative evolution was favorable with the healing of the digestive fistulas and the patient was discharged on the 80th postoperative day.

554—UPPER GI—Gastric cancer

CASE REPORT: ENDOSCOPIC DOUBLE PIGTAIL PLACEMENT FOR ESOPHAGEAL-JEJUNAL FISTULA TREATMENT AFTER GASTRECTOMY

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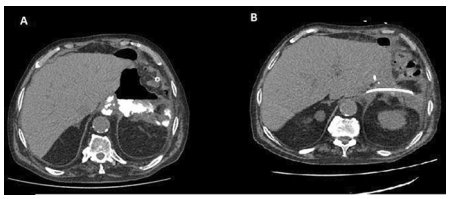
Aim: Anastomotic leakage following gastrectomy (GST) is a significant complication that considerably increases postoperative mortality. In recent years, management has been moving from bridging and closing the leak's orifice toward an approach that uses vacuum therapy or internal drainage, common is the use in post-bariatric gastric fistulas, however few literature data exist for the esophageal-jejunal anastomotic dehiscences GST. (1).

Methods: 80-year-old male patient who was diagnosed bleeding GIST of cardias with relations of contiguity to the spleen (Fig. 1). A GST with end-to-side esophagojejunostomy in Roux-en-Y anastomosis and a splenectomy were performed. In the fourth postoperative day his status suddenly worsened, with fever of 38.2 °C with negative blood colture, loss of appetite, and leukocytosis with neutrophilia. An oral and e.v contrast-enhanced CT was performed which showed an esophago-jejunal anastomotic fistula (Fig. 2a).



Results: A 8.5 Fr, 2-cm lenght double-pigtail (EPT) stent was endoscopically delivered by M.M, through the fistula orifice into the collection. A repeat scan after administration of oral water-soluble contrast performed 10 days after endoscopic procedure revealed the presence of pigtail drainage with an endo-luminal end and an extra-luminal end, with an associated blind-ending cavity of about 3 cm. After one mouth, NE was stopped, and EPT was removed. Feeding orally gradually was restored without recurrence of fistula. (Fig. 2b).

Conclusion: Anstomotic fistula is the most feared complication in gastric surgery, with high mortality rates, especially in elderly patients. Endoscopy plays a major role in the management of leaks. The approaches range from primary to secondary closure techniques, with varying degrees of technical and clinical success and adverse events, generating a lack of consensus regarding the most appropriate endoscopic management. (3) A recent review (4) analyzed 835 patients treated with with EPT, after sleeve gastrectomy. The pooled proportion of successful leak closures was 83.41%. Our case suggested that EPT could be a valid approach to manage the leak after GST, with low rate of complications and a good tolerance by patients. Not negligible is the status of the neoplastic patient, which compromises the feasibility of a second re-intervention, on the contrary an endoscopic drainage allows to treat patients even with low performace status, reducing mortality rates (1,4).

552—UPPER GI—Gastric cancer

LAPAROSCOPIC D2 TOTAL GASTECTOMY WITH CIRCULAR E-J ANASTOMOSIS

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One of the main issues after mininvasive total gastrectomy relate with esophago-jejuno anastomosis. Orringer technique seems to increase leak rate and the anastomosis is placed in mediastinum; hand-sewn technique is really challenging without the robotic assistance. In this video we will present our standardized procedure for reconstruction after total gastrectomy (circular EEA anastomosis) and we will show tips and tricks to make it easy and repeatible.

550—UPPER GI—Gastric cancer

ENDOSCOPY-ASSISTED LAPAROSCOPIC INTRAGASTRIC RESECTION OF EARLY GASTRIC CANCER

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Aims: Hybrid surgery (laparoscopic/endoscopic) has emerged as a less invasive alternative to the conventional laparoscopic approach for the treatment of some gastric lesions in certain patients. The number of published cases is increasing both for benign pathologies and even for the treatment of early adenocarcinomas in selected patients.
Methods: We present the video of a case of an 86-year-old woman who is diagnosed by endoscopy of a gastric lesion located in the incisura angularis. The result of the endoscopic biopsy was severe dysplasia/carcinoma in situ. Given the patient's serious medical history, it was decided to perform a submucosal dissection by intragastric laparoscopy assisted by endoscopy.
Results: The patient was operated, performing a submucosal dissection of the lesion with intragastric laparoscopic instruments assisted by endoscopy. The postoperative course without incidences. The anatomopathological study of the piece reported "well-differentiated adenocarcinoma infiltrating own lamina. Surgical margins free of tumor. T1aNxMx".
Conclusions: The hybrid/collaborative approach associating intragastric laparoscopy and endoscopy is an effective, safe and less invasive alternative for the treatment of gastric lesions in selected patients.

518—UPPER GI—Gastric cancer

SHORT TERM OUTCOMES OF PYLORUS PRESERVING GASTRECTOMY FOR EARLY GASTRIC CANCER: COMPARISON BETWEEN EXTRACORPOREAL AND INTRACORPOREAL GASTROGASTROSTOMY

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Background: Laparoscopy-assisted pylorus-preserving gastrectomy (LAPPG) with a hand-sewn anastomosis via a mini-laparotomy has been widely applied in the treatment of middle-third early gastric cancer (EGC). In this study, we compared surgical outcomes between patients who underwent totally laparoscopic pylorus preserving gastrectomy (TLPPG) with an intracorporeal anastomosis or (LAPPG).
Methods: A retrospective analysis was performed on 257 whom undergone laparoscopic pylorus preserving gastrectomy for cT1N0 between July 2016 and June 2019 at SNUH, Korea; 170 patients underwent extracorporeal (LAPPG) and 87 underwent intracorporeal (TLPPG) anastomosis. In TLPPG the location of the preoperative marking clips was confirmed with intraoperative gastroscopy before transection of the stomach. The intracorporeal anastomosis was performed with either: delta-shaped anastomosis with suture closure of the common enterotomy hole (n = 35), delta-shaped anastomosis with stapled closure of the enterotomy (n = 44) and piercing method (n = 8). The postoperative surgical and oncological outcomes were compared between the two groups included proximal and distal margins, number of resected and metastatic lymph-node, operation time, postoperative stay and postoperative morbidity including delayed gastric emptying (DGE).
Results: The proximal margins was similar in TLPPG and LAPPG group (p = 0. 645).Although the distal margins was shorter in TLPPG group compared to those in LAPPG (3.15 ± 1.84 vs 4.08 ± 2.23, p = 0.044), there were no involved proximal or distal resection margins in both groups. The average resected LN was similar in both groups (35.97 ± 13.6 vs 33.98 ± 12.83, p = 0.387).
Operation time (200.5 ± 43 vs 220.80 ± 46.15, p = 0.197) and postoperative hospital stay (9.41 ± 7.94 vs10.10 ± 6.4, P: 0.973) did not show significant differences. There was no significant differences in terms of surgical complication (19.5% in TLPPG vs. 22.9% in LAPPG, p = 0.532.DGE occurred in 8% of TLPPG compared to 11.8% in LAPPG group with no significant difference (p = 0.358).
Conclusion: TLPPG with an intracorporeal anastomosis was found to be safe and comparable to LAPPG with same postoperative morbidity and oncological safety.

466—UPPER GI—Gastric cancer

INDOCYANINE GREEN APPLICATION IN LYMPH NODE DISSECTION IN LAPAROSCOPIC GASTRECTOMY FOR GASTRIC CANCER

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Aims: The submucosal injection of indocyanine green in laparoscopic gastrectomy may be useful during lymph node dissection for gastric cancer.

Methods: Lymph node dissection in a laparoscopic total gastrectomy was performed after the injection of indocyanine green intraoperatively at tumor location. Assisted by near-infrared imaging (NIR) to evaluate the potential use in the completeness of lymph node dissection.

Results: A laparoscopic total gastrectomy with lymph node dissection of station numbers: 1,2,3,4,5,6,7,8,9,11p and 12 was performed after submucosal injection of 2 ml (0.05 mg/ml) of the indocyanine green solution, by changing the camera to NIR we were able to detect some lymph nodes that were separately removed. After the histological analysis of the specimen 59 lymph nodes were retrieved.

Conclusion: Submucosal injection of indocyanine green may be useful in additional identification of lymph nodes and lymphatic channels during laparoscopic gastrectomy for gastric cancer.

461—UPPER GI—Gastric cancer

LAPAROSCOPIC VS. OPEN GASTRECTOMY FOR THE TREATMENT OF ADVANCED GASTRIC CANCER IN A WESTERN POPULATION: ANALYSIS OF CLINICAL AND ONCOLOGICAL RESULTS

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Background: Laparoscopic gastrectomy (LG) is an established procedure for the treatment of early-stage and distal gastric cancer in Asia. In Western countries, patients tend to have more locally advanced and proximally-located tumors and data of the results of LG are scarce. The objective of this study was to compare the postoperative and oncological outcomes of LG vs. open gastrectomy (OG) for the treatment of advanced gastric cancer in a Western population.

Methods: Single institution retrospective observational study, using data extracted from a prospectively collected database. All consecutive patients who underwent gastrectomy, either open or laparoscopic, due to advanced gastric cancer (defined as $T \geq 2$), from January 2010 to October 2018 at a European tertiary hospital were included. The variables analyzed were the main postoperative complications and oncological outcomes: number of retrieved lymph nodes, disease-free survival (DFS) and overall survival (OS). An intention-to-treat analysis was performed.

Results: A total of 196 patients were included, 140 in the OG group and 56 in the LG group, with a conversion rate of 16.1%. One hundred and twenty-one patients were male (61.7%) and 75 female (38.3%) with a median age of 75.2 years (IQR: 65.8–80.1). The number of retrieved lymph nodes was slightly higher in the LG group, although not statistically significant (median: 22 [IQR: 15–34] vs. 24 [18–29], p: 0.895).

LG did not have statistically significant differences compared to OG in postoperative morbidity (LG vs. OG; 39.3% vs. 42.9%; p: 0.749), anastomosis leak (14.3% vs. 9.3%; p: 0.307), duodenal stump leak (7.1% vs. 1.4%; p: 0.057), or bleeding (8.9% vs. 3.6%; p: 0.152). No statistically significant differences were found in DFS and OS with a median follow-up period of 19.77 months (IQR: 8.03–40.1).

Conclusions: LG, compared to OG, in a Western population is an oncologically safe and feasible procedure for the treatment of advanced gastric cancer, with similar results regarding the main postoperative complications and short-term oncological results.

455—UPPER GI—Gastric cancer

IMPACT OF LAPAROSCOPIC GASTRECTOMY FOR GASTRIC CANCER PATIENTS WITH SARCOPENIA: A PROPENSITY SCORE MATCHING ANALYSIS

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Aims: Sarcopenia worsens the long-term prognosis after surgery for gastric cancer. In this study, we investigated how a minimally invasive surgical technique affects postoperative survival and posttreatment in patients with preoperative sarcopenia.

Methods: Among patients with advanced gastric cancer (beyond p-stage IB) who underwent gastrectomy from April 2008 to October 2018, 171 patients diagnosed with sarcopenia pre-surgery were selected and subsequently divided into either laparoscopy or laparotomy groups. Age, sex, nutritional status, comorbidities, p-stage, surgical procedure, reconstruction, pre- and post-operative chemotherapy, and post-operative complications were adjusted using propensity score matching (PSM) analysis. The primary endpoint was overall survival (OS), while the secondary endpoints were cancer specific survival (CSS), relapse-free survival (RFS), percentage of dose reduction or discontinuation of postoperative adjuvant chemotherapy, weight loss rate up to 6 months after surgery, and muscle mass reduction rate.

Results: Most clinicopathological characteristics differed significantly between the laparoscopy and laparotomy groups. After using PSM, there were 73 cases in both groups with no differences in patient backgrounds. The OS showed a tendency towards poor prognosis in the laparotomy group (HR 1.56, 95% CI 0.94–2.59, $p = 0.088$). For CSS, the laparotomy group had a significantly poorer prognosis (HR 2.54, 95% CI 1.20–5.37, $p = 0.014$). In RFS, the laparotomy group was significantly worse (HR 2.40, 95% CI 1.32–4.35, $p = 0.004$). The completion rate of postoperative adjuvant chemotherapy was significantly lower in the laparotomy group (laparotomy group: 76.0%, laparoscopic group: 94.9%, $p = 0.019$), and there was a tendency for a large proportion of dose reduction or discontinuation (laparotomy group: 28.0%, laparoscopic group: 17.9%, $p = 0.321$). There was no significant difference between the two groups in weight loss and muscle mass loss.

Conclusion: The prognosis for gastric cancer patients with preoperative sarcopenia who underwent laparoscopic surgery was measured to be superior than those who underwent laparotomic surgery. Laparoscopy may improve the continuity of postoperative adjuvant chemotherapy and may increase the duration of non-recurrence and survival.

401—UPPER GI—Gastric cancer

IMPACT OF STENT PLACEMENT IN ESOPHAGOJEJUNAL ANASTOMOTIC LEAKAGE

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Aim: Esophagojejunal anastomotic leakage (EJAL) is a life-threatening complication after total gastrectomy (TG) leading to high morbidity and mortality rates and it traditionally requires surgical treatment. The alternative to surgery is stent placement into the area of partial anastomotic defect with local drainage control. The aim of the investigation was to assess length of hospital stay and mortality rate.

Methods: From November 2017 to November 2019 186 TG were performed in our department. Rate of EJAL was 6,9% (13 patients). We retrospectively randomized patients into two groups: those who underwent surgical treatment and those who underwent stent placement. We assessed EJAL using computed tomography and endoscopy and then we followed particular treatment pathway. 6 (46,1%) patients underwent endoscopic stent placement in the area of defect in anastomosis augmented by local drainage and placement of naso-intestinal tube. Another 7 (53,9%) patients underwent surgical exploration with further external esophagostomy or esophageal stump formation and nutritional jejunostomy.

Results: 2 (28,6%) patents died in group of surgical treatment and 1 (16,7%) patient died after stent placement due to unable of getting control of loco-regional para-anastomotic infectious process. Median hospital stay after treatment of leakage among patients with stent comprised 15,4 days (9–22 days) and 32,8 days (19–40 days) in the group of patients who underwent surgical exploration ($p = 0.05$). Mortality rate comprised 16.7% and 28.6%, respectively.

Conclusion: Treatment of EJAL using stents, naso-intestinal tubes and local drainage control appears to have benefit in patients who developed EJAL. Further studies are needed to develop patient stratification models for stent placement and surgical exploration.

260—UPPER GI—Gastric cancer

SURGICAL ASSESSMENT SYSTEM REFLEXES AND FACILITATES THE DEVELOPING THE SURGICAL SKILLS OF TRAINEES FOR THE LAPAROSCOPIC DISTAL GASTRECTOMY

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Background: Japanese Operative Rating Scale for Laparoscopic Distal Gastrectomy (JORS-LDG) has recently developed for assessing LDG for gastric cancer. This study evaluated assessing the development of surgical skill by JORS-LDG in the initial experience of LDG.

Methods: From 2016 to 2018, 31 cases of LDG were performed by a trainee. The surgical skill of LDG was scored using JORS-LDG (Max 46) by the trainee and an instructor. Thirty-one cases were divided into 3 phases, such as, early phase (EP), middle phase (MP), and late phase (LP).

Results: The median points of JORS-LDG in LP were significantly higher than those in EP (EP: MP: LP = 43.5: 44.3: 45.5, $p = 0.02$). Procedure time and intraoperative bleeding, and the amylase levels in the drainage fluids were correlated with the points of JORS-LDG.

Conclusion: The scoring system of JORS-LDG is a useful tool to assess the surgical performance of trainees in the initial experience of LDG.

220—UPPER GI—Gastric cancer

UNDULATED -DOUBLE TRACT RECONSTRUCTION DESIGNED TO ALLOW MORE FOOD FLOW TO THE REMNANT STOMACH AFTER LAPAROSCOPIC PROXIMAL GASTRECTOMY

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Purpose: Laparoscopic proximal gastrectomy (LPG) is performed as a function-preserving surgery for patients with upper-third gastric cancer. But, if much of the dietary intake passes through the escape route of the jejunum, the functional merits of LPG might be broadly like those after total gastrectomy. We devised undulated double tract reconstruction (U-DTR) for making much and easily dietary intake to the remnant stomach.

Methods: A side-to-side jejunogastrostomy was performed between the posterior wall of remnant stomach and the jejunum 10 cm below esophagojejunostomy, and the common stab incision was also closed by a linear stapler. The jejunogastrostomy was conducted in delta-shaped anastomosis by using only linear staplers. The 15 patients who underwent delta-shaped anastomosis from 2017 to 2018 were retrospectively reviewed. Their surgical and postoperative outcomes, including nutritive conditions, were collected and analyzed compared to the reconstruction that was performed until then.

Results: There were no significant differences in the operative time, and postoperative complication compared to the previous reconstruction. We confirmed a significant difference in bleeding and passing through the remnant stomach. The nutritional indicators level on postoperative year one did not tend to be lower. But, the total weight loss (TWL) and %TWL were significantly a lot. Of course, there was a correlation between differences in jejunogastrostomy and postoperative malnutrition.

Conclusions: This devised method for U-DTR provided patients with improved postoperative nutritional status than before, by allowing more food to pass through the remnant stomach after LPG.

126—UPPER GI—Gastric cancer

PREVENTION OF INTERNAL HERNIA AFTER LAPAROSCOPIC DISTAL GASTRECTOMY FOR GASTRIC CANCER

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Aims: Laparoscopic distal gastrectomy for gastric cancer has been widely performed. The incidences of internal hernia have become a problem. The importance of closure of the mesenteric defect has been well known. We investigated the internal hernia after laparoscopic distal gastrectomy. In particular, we focused on cases of the internal hernia with closure of the mesenteric defect.

Methods: This study retrospectively reviewed 470 consecutive patients who underwent laparoscopic distal gastrectomy for gastric cancer at our institution between January 2008 and December 2016.

Results: Internal hernia occurred for 12 (2.55%) of the 470 patients. We analyzed the clinical data between the patients with and without internal hernia. There was no significant difference between the two groups regarding the characteristics. Operative time and mesenteric defect closure were significantly different factors, $p = 0.032$ and $p < 0.001$ respectively. Although there was no significant difference, blood loss tended to be large in the patients with internal hernia compared to the patients without internal hernia. 365 patients were closed the mesenteric defect. Internal hernia was observed in 3 patients (0.82%) with mesenteric defect closure. Regarding reconstruction, 2 cases were R-Y and 1 case was B-II. There were 2 cases of Petersen's defect hernia and 1 case of jejunojejunal mesenteric defect hernia. In each case, a small hole located in the mesenteric attachment became hernia orifice.

Conclusion: Although the closure of the mesenteric defect can prevent internal hernia, keeping in mind that the internal hernia occurs even in the mesenteric defect closure cases, it is important to securely close the mesenteric defect.

100—UPPER GI—Gastric cancer

ROBOT-ASSISTED TOTAL GASTRECTOMY D2-PLUS USING INDOCYANINE GREEN (ICG)

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Aims: Surgical resection with D2 lymphadenectomy represents the standard treatment for gastric carcinoma. The minimally invasive approach is generally accepted particularly in the EGC. Robotic technology offers advantages over standard laparoscopy especially during lymphadenectomy and esophago-jejunal anastomosis. Sometime a D2-plus lymphadenectomy (8p, 12b, 13, and 14v groups) may be indicated.
Methods and Results: In the period between January 2010 and October 201, 96 robot-assisted gastric surgeries were performed by the same operator: 49 subtotal gastrectomies, 19 total gastrectomies, 18 wedge resections (for GIST), 5 distal gastric resections with construction. BI, 2 total degastro-gastrectomies, 3 total gastrectomies with distal esophagectomy for cardiac neoplasia. D2 lymphectomy was performed in all cases of adenocarcinoma. The average age was 70.8 years (range 42–86 years). In 6 cases it was necessary to convert the intervention with an open technique. The robotic series includes both cases of EGC and advanced tumors.
Clinical Case: the video shows the main steps of two cases of D2-plus lymphadecenctomy a 78-year-old patient with gastric neoplasm of the middle third (diffuse adenocarcinoma with a cell-like component) and 67-years old woman with gastric cancer with previous chemotherapy. The operation was performed with preliminary exploratory laparoscopy and followed by robotic-assisted total gastrectomy; in the second case, 12 h before the procedure we proceed to peri-lesional endoscopic injection, of indocyanine green dye. The video describes the salient steps of removal of the lymph nodes stations: 12 b, 14v, 16a and 10 (splenic hilum). In one case the reconstruction was performed using an intra-corporeal circular stapler with a Y sec Roux loop, in the second case a completely handsewn anastomosis was performed.
Conclusions: The minimally invasive robot-assisted approach, in the treatment of gastric adenocarcinoma, may offer some advantages, compared to laparoscopy especially in total gastrectomy, in the D2 lymphectomy phase.

390—UPPER GI—Gastroduodenal diseases

SINGLE-PORT LAPAROSCOPIC SUBTOTAL DUODENECTOMY WITH DUODENOJEJUNOSTOMY

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A 56-year old man was diagnosed with a duodenal submucosal tumor (SMT) on a routine screening test. Computed tomography scans revealed a 4.6 cm mass possibly originating from the duodenum at the 2nd and 3rd portion. The patient underwent single-port laparoscopic subtotal duodenectomy with duodenojejunostomy through a single transumbilical wound. Operation time was 178 min, and estimated blood loss was less than 30 ml. The patient had semi-fluid diet on postoperative day (POD) 2, and was discharged on POD 4. Pathologic results revealed the SMT to be an extra-adrenal paraganglioma with sufficient surgical margins.

1358—UPPER GI—Gastroduodenal diseases

ROBOT-ASSISTED HIATAL HERNIA REPAIR AS NEW GOLD STANDARD APPROACH FOR SYMPTOMATIC HIATAL HERNIAS: A TECHNICAL REPORT

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Background, Aims: A laparoscopic surgical approach is currently considered to be the gold standard in hiatus hernia repair. The literature shows that robot-assisted Paraesophageal Hernia repair (RA-PEHR) is feasible and safe alternative with lower morbidity and a shorter length in hospital stay in comparison to the conventional laparoscopic approach. The short-term operative and functional outcomes of the RA-PEHR are considered to be similar to laparoscopic hiatal hernia repair.
Methods, Case presentation: We present a case of an 80-year-old female with a 2-year history of cough and dyspnea on exertion. She still experienced symptoms of gastroesophageal reflux disease after starting a proton-pump inhibitor. Computed tomography of the thorax demonstrated a paraesophageal hernia type III in which 75% of the stomach was herniated in the thorax. Preoperative workup included an esophagogastroduodenoscopy, esophageal manometry and pH-metry. A correlation was found between the reflux and cough symptoms. There was an indication for fundoplication.
Results: This video presents a stepwise approach of the RA-PEHR technique. A reduction of the herniated stomach was performed. First the gastrohepatic ligament was opened and we dissected the herniated sac of its mediastinal attachments. A full mobilisation of the fundus was then achieved by dividing the posterior adhesions. Afterwards the esophagus was mobilized by extensive dissection of the crura. A retroesophageal window was created. The crura were closed with interrupted sutures Ethibond 2/0. To complete the procedure a Dor fundoplication was performed.
Conclusion: This video illustrates the benefits of robotic repair for hiatal hernias. One of the main benefits is the three-dimensional view which makes the mobilisation of the esophagus easier and safer with a lower risk of injuring the vagal nerve. We can conclude that RA-PEHR for symptomatic type III hiatal hernia is a feasible alternative for the well-known laparoscopic technique.

1557—UPPER GI—Gastroduodenal diseases

DILEMMA OF MANAGEMENT OF REFLUX POST WEIGHT LOSS SURGERY. IS "AMIR'S DUBAI REPAIR" THE ANSWER?

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Aims: We plan to demonstrate a new surgical technique which is being performed by Professor Amir Nisar to combat GORD (Gastroesophageal reflux disease) in patients post bariatric surgery, specifically sleeve gastrectomy. This subset of the population can no longer benefit from the gold standard of anti-reflux surgery, Nissen Fundoplication and are making up an ever larger percentage of the population. Our current prospective study is tracking the post-operative recovery of our patients to assess the success of the operation using both quantitative and qualitative means.

Method: Surgical technique has been outline in an attached document. Our study method currently includes a meta-analysis of previous research to establish the need for surgical innervation in post bariatric surgery reflux. This meta-analysis focuses on the rise in prevalence of bariatric surgery, the increase incidence of GORD following sleeve gastrectomy and the morbidity associated with Roux-en-Y surgery post bariatric surgery. Our prospective study assessing our patient's outcomes is still in its infancy and 6 month data collection will occur 1 month prior to conference. Results: At this point in time the surgery has been attempted and successfully completed without incidence on 3 patients within the United Arab Emirates. Hospital stay duration, post-operative pain and subsequent outpatient department follow up has all shown positive.

Results: No formal results have been determined.

Conclusion: As a team we have determined a need for advancement in the surgical treatment of patients with GORD following sleeve gastrectomy. At this very early stage Amir's Dubai Repair has shown immense promise in fulfilling this need. More definitive conclusions will be drawn in the coming months.

1502—UPPER GI—Gastroduodenal diseases

CASE REPORT: ADDITIONAL SPLEEN AS GASTRIC TUMOR. LAPAROSCOPIC GASTRIC TUMOR RESECTION

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84-year-old patient diagnosed with gastric tumor (GIST suspected) was admitted to the General, Oncologic, Metabolic and Thoracic Surgery Clinic (Military Institute of Medicine in Warsaw) for surgical treatment. Patient reported severe flatulence after meals and recurrent constipation, shortness of breath after meals and in stressful situations.

CT scan and EUS were made preoperatively. Tumor dimensions: 16x13 mm. Tumor was localised on the smaller curvature of the stomach in antrum.

Additional relevant findings: In the liver, hypodense focal lesions in: S2: 4 x 4 mm, 6 x 6 mm, 10 x 9 mm; S8: 4 x 5 mm. Spleen size 53 x 52 mm, without significant lesions. Small additional spleens, diameter: 21 mm, 14 mm, 12 mm, 11 mm.

In right kidney: hypodense focal lesions: 61 x 46 mm, 22 x 18 mm.

In left kidney: hypodense focal lesions: 18 x 14 mm, 35 x 32 mm.

Using EUS the stomach tumor site was marked with ink. Patient was operated on December 6, 2019 - laparoscopy, gastric tumor resection with sufficient margin of healthy tissue. There were no postoperative complications. The patient was discharged home in good general condition. We received histopatologic examination results. "Gastric tumor: Lien accessorius. Gastritis chronica superficialis."

1423—UPPER GI—Gastroduodenal diseases

SIMULTANEOUS LAPAROSCOPIC AND ENDOSCOPIC APPROACH TO BIG DUODENAL ADENOMA

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Aims: Small bowel adenomas are benign lesions that harbor a substantial malignant potential with an adenoma-carcinoma sequence comparable to that of colorectal cancer.

Resection, either endoscopic or surgical, is the treatment of choice.

The aim of this video is to present a laparoscopic and endoscopic cooperative approach to a big duodenal adenoma.

Methods: A 49-years-old woman presented with post-prandial bloating and abdominal pain with one month of worsening. The upper endoscopy (EGD) and abdominal tomography scan (CT) with oral contrast showed a duodenal sessile polyp (at D3) with 20x25mm in size, which occupied more than a half of the duodenal lumen, without apparent intestinal wall thickening. Lower endoscopy did not show any colonic polyps. The lesion biopsy revealed a low-grade dysplasia adenoma. The patient was proposed for an adenoma resection using a laparoscopic and endoscopic cooperative approach.

This technique uses 5 trocars (2x11mm + 3x5 mm). Step-by-step as follows: (i) abdominal cavity inspection (ii) Cattell-Braasch's maneuver and D2/D3 identification (iii) intra-operative EGD with lesion visualization (iv) duodenotomy and polyp resection (v) duodenal closure and specimen extraction.

Results: The post-operative period was uneventful and the patient was discharged home at post-operative day four. Histopathology confirmed the complete resection of a tubulovillous low-grade dysplasia adenoma.

Conclusion: Small bowel adenomas harbor a significant malignant potential with an adenoma-carcinoma sequence similar to that of colorectal cancer. The mainstay of treatment is endoscopic or local resection. In big duodenal adenomas, where endoscopic excision is not feasible, laparoscopic and endoscopic cooperative approach permits the surgeon to perform a safer local excision with intra-operative exact lesion identification, as well as its relationship with Vater's papilla, without the need of a Whipple's procedure and its associated morbimortality.

1234—UPPER GI—Gastroduodenal diseases

LAPAROSCOPIC RESECTION OF A GASTRIC GIST 7 CM. REPORT OF A CASE

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Aim: Presentation of a case of gastrointestinal stroma tumor located in the stomach, measuring 7 cm, successfully treated by laparoscopic resection.

Case Report: A 79 year old male with no previous abdominal surgeries presented to the outpatient department complaining about fatigue and anemia. During investigation, he underwent upper GI endoscopy which revealed a submucosal tumor of the greater curvature of the stomach. The patient had an abdominal CT scan with no obvious lesions or metastases and an endoscopic ultrasound was scheduled. The biopsies obtained had immunological characteristics of GIST and a laparoscopic wedge resection of the lesion was conducted. The patient had an uncomplicated postoperative period and was discharged on the 5th posteoperative day.

Results: The technique used, the postoperative course, the definitive histopathological findings and reevaluation of the patient during a follow-up of 6 months were recorded.

Conclusion: Complete surgical removal of a gastric GIST is the gold standard of treatment. A wedge resection with R0 margins is the most usual technique. Laparoscopic approach is feasible even in large tumors, as far as a tumor rupture is advocated.

1008—UPPER GI—Gastroduodenal diseases

OPTIMIZATION OF INSUFFLATION AND PRESSURE CONTROL IN THIRD-SPACE ENDOSCOPY

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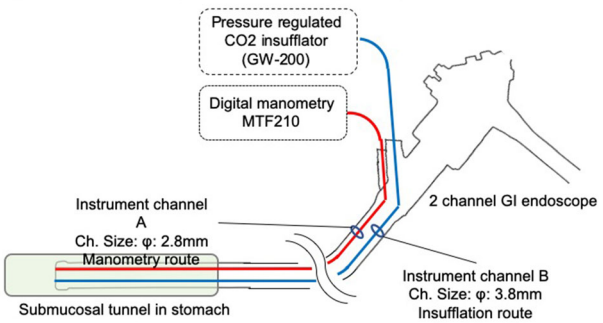
Background: Third-space endoscopy requires a delicate and accurate insufflation technique to secure the endoscopic visualization and maintain the working space. However, optimal endoscopic insufflation parameters for third-space endoscopy have yet to be determined. The aim of this study was to assess: (1) the diversity of endoluminal third-space pressure achieved by the endoscopists' manual insufflation, and (2) the performance of the insufflation settings for third-space endoscopy.
Methods: This was a non-survival animal study using a porcine model (n = 7). A submucosal tunnel was created in the upper posterior wall of the stomach. Using two-channel esophagogastroduodenoscopy (EGD), one channel was used for insufflation and the other was used for pressure measurement (Fig). < Experiment 1 > Endoluminal submucosal tunnel pressure was measured during EGD at 0.25-second intervals for 2 min in a 10-cm submucosal tunnel of a single pig. Seven board-certified endoscopists, in turn, maintained what they considered sufficient exposure for investigation under manual insufflation. < Experiment 2 > The endoluminal submucosal tunnel pressure and the number of insufflations were measured using the pressure-regulated insufflation device; the differences in the submucosal tunnel length (long: 10 cm, short: 4 cm, n = 3) and the insufflation route diameter (large: 3.8 mm, small: 2.2 mm, n = 3) were compared.

Fig. A schema of experimental setting for experiments



Results: < Experiment 1 > Variations in pressure data among the seven endoscopists were observed; additionally, the values fluctuated over time for each individual endoscopist. < Experiment 2 > Longer submucosal tunnels and larger insufflation route diameters lead to stable endoluminal submucosal tunnel pressure. The gap with the preset pressure of the insufflator and endoluminal pressure narrowed (tunnel length: $p < 0.01$, insufflation route diameter: $p < 0.01$), and the required number of insufflations decreased with longer tunnel length and larger route diameter (tunnel length: $p < 0.01$, insufflation route diameter: $p = 0.032$).
Conclusions: The pressure dynamics in third-space endoscopy differed among endoscopists. Longer submucosal tunnels and larger insufflation route diameters lead to stable endoluminal submucosal tunnel pressure and stabilized the submucosal tunnel.

947—UPPER GI—Gastroduodenal diseases

EXPERIMENTAL EVALUATION OF CHANGES IN MUCOSAL NADPH OXIDASE AFTER LOCAL PRP INJECTION IN RATS WITH GASTRIC ULCERS AND HEMORRHAGIC SHOCK

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The aim of the study was to evaluate changes in mucosal NADPH oxidase after local PRP injection in rats with gastric ulcers and hemorrhagic shock in experiment.
Methods: The study was performed on 91 Wistar rats (average weight of animals was 183 ± 16 grams) according to local and international rules for working with experimental animals. We randomly divide all animals in 5 groups: Control Group (n = 7)—intact animals; Comparison Group (n = 21)—gastric ulcer; Group 1 (n = 21)—gastric ulcer + hemorrhagic shock; Group 2 (n = 21)—gastric ulcer + hemorrhagic shock + local injection of 0.1 ml of 0,9% sodium chloride; Group 3 (n = 21)—gastric ulcer + hemorrhagic shock + local injection of 0.1 ml platelet-rich plasma (PRP). Gastric ulcers were modeled using our modification of type 2 acetic acid ulcer model (Susumu Okabe, 2005). Hemorrhagic shock was modeled by 3–3.5 ml blood sampling. On 1st, 7th and 14th day measurement of mucosal NADPH oxidase levels were performed.
Results: In all groups and on all control days of the study, the levels of NADPH oxidase activity were higher than in the control group.
On day 1, NADPH oxidase activity in Groups 1, 2, 3 were significantly higher ($p < 0.05$) than in the Comparison Group. Moreover, the indices in the Groups 1, 2, 3 didn't significantly differ from each other ($p > 0.05$).
On day 7 of the study, we didn't reveal a significant difference in the level of the studied indicator between the Comparison Group and Group 3 ($p < 0.05$), as well as between Groups 1 and 2 ($p > 0.05$). Moreover, in pairwise statistical comparison, the indicators in the Comparison Group and Group 3 were statistically significantly lower than the similar levels in Groups 1 and 2 ($p < 0.05$).
On the day 14, levels of the enzyme activity in Group 3 were significantly lower than levels in all other groups ($p < 0.05$) and approached the indices of the control group.
Conclusions: Local PRP injection in rats with gastric ulcers and hemorrhagic shock allows to reduce oxidative stress in the periulcellular zone.

946—UPPER GI—Gastroduodenal diseases

COMPARISON OF CONSERVATIVE AND ENDOSCOPIC TREATMENT TACTICS IN PATIENTS WITH HIGH RISK OF REBLEEDING OF PEPTIC ULCER HEMORRHAGE

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The aim of the study was to compare of conservative and endoscopic tactics of treatment in patients with high risk of rebleeding after peptic ulcer hemorrhage.
Methods: Analysis of treatment of 270 patients was conducted during the study. 154 cases of patients admitted in a state of hemorrhagic shock were selected. All these patients had a high risk of rebleeding, which was estimated using predictive scales Rockall (minimum score—4). Group 1 includes 45 patients who underwent endoscopic hemostasis. Group 2 includes 101 patients with hemorrhagic shock and treated with drug therapy.
Results: Of the 45 patients of the group 1 endoscopic hemostasis in 31 (68.9%) cases were made during the initial endoscopy and in 14 (31.1%) patients—in second endoscopy. The average time of bleeding recurrence was 1.5 ± 0.4 days. 2 (4.44%) patients were operated on for recurrent bleeding. 3 (2.5%) patients died. The average time spent in the hospital for deceased patients is 1.2 ± 0.6 days. The average treatment time for patients in group 2 was 6.4 ± 2.1 days.
Among patients in group 2, bleeding recurrence was recorded in 34 cases (33.7%). The average time of bleeding recurrence was 1.4 ± 0.6 days. 22 (21.8%) patients were operated on for recurrent bleeding. 16 (15.8%) patients died. The average time spent in the hospital for deceased patients is 1.3 ± 0.4 days. The average treatment time for patients in group 2 was 6.7 ± 1.9 days.
When pairwise comparing the studied parameters, reliably better results of endoscopic treatment were demonstrated.
Conclusions:
1. The development of hemorrhagic shock in patients with peptic ulcer bleeding significantly increases the risk of rebleeding and mortality.
2. The application of endoscopic hemostasis allows to reduce the risk of rebleeding and mortality compared with conservative antiulcer therapy.

834—UPPER GI—Gastroduodenal diseases

LAPAROSCOPIC MANAGEMENT OF ABDOMINAL COCOON

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Peritonitis fibrosa incapsulata is a rare cause of small bowel obstruction with diverse etiology. It is characterized by the encasement of a variable length of the small intestine by a fibrous membrane. It occurs primarily in females with only few reported cases in males. We report the case of a 42-year-old male with a history suggestive of recurrent attacks of small bowel obstruction over a 6-month period, which used to resolve spontaneously or by conservative measures. At presentation, a mildly tender mobile mass was felt in the right lower part of the abdomen. Computed tomography scan of the abdomen showed clusters of small bowel loops encased within a well-delineated sac. The diagnosis was confirmed by diagnostic laparoscopy then Laparoscopic lyses and release of the entrapped bowel was performed. The postoperative period was uneventful. Follow-up over 18 months showed no clinical evidence of recurrence.

741—UPPER GI—Gastroduodenal diseases

DUODENAL CARCINOID: UNUSUAL SITE OF THE UNCOMMON TUOMR (CASE PRESENTATION)

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Introduction: Carcinoid tumours are uncommon well-differentiated neuroendocrine tumours. Account for less than 2% of all gastrointestinal carcinoids. Duodenal carcinoids are seldom associated with carcinoid syndrome.

Aim: The aim of this study was to report a case of duodenal carcinoid tumor in order to increase the awareness of this rare but increasing in frequency entity. So provide knowledge for further understanding of this condition.
Methods: 67 years old man with a past medical history of DM, complaining of difficult swallowing diagnosed as esophagitis and received proton-pump inhibitors. Upper GI endoscope revealed esophagitis and that there is a submucosal lesion in the posterior wall of the 2nd part of duodenum opposite the major papilla. Multiple biopsies were taken from it for histopathological examination that revealed well differentiated neuroendocrine tumor grade I (carcinoid tumor) and confirmatory immunophenotyping was positive for synaptophysin, pan-CK, but Negative for chromogranin A. Ki-67 labeling index 10. PET/CT examination showed the duodenal tumor which measures 6 mm in thickness and 16 mm in length, with no nodal or metastatic lesions detected. Endoscopic ultrasonography showed echogenic soft tissue swelling located at the postro-lateral wall of the second part of the duodenum, involving the mucosa, muscularis mucosa and the submucosal layers while the muscularis propria and serosal layers were free. Endoscopic retrograde cholangiopancreatography was done and a stent was inserted in the common bile duct.
Laparoscopic excision of the mass with safety margin was performed and primary repair with the use of intraoperative endoscopic localization and marking of the tumor.
Results: Histopatholgy of the excised mass revealed neuroendocrine tumor grade 1, excised with free resection margins.
Conclusion: Neuroendocrine tumors arising in the duodenum are rare neoplasms and have a low potential to metastasize. Symptoms are usually nonspecific, many are incidentally found during screening procedures or unrelated operations.
Upper gastrointestinal endoscopy, computerized tomography, and endoscopic ultrasound should be performed to evaluate the tumor size, the level of wall invasion, and the presence of regional or distant lymphatic metastases.
Physicians treating patients presenting with non-specific gastrointestinal symptoms should keep this entity in mind. An early diagnosis establishes the tumor stage and predicts the prognosis, which eventually leads to the appropriate therapeutic management.

706—UPPER GI—Gastroduodenal diseases

MEDIAN ARCUATE LIGAMENT SYNDROME (MALT) OR DUNBAR'S SYNDROME. LAPAROSCOPIC TREATMENT. A CASE REPORT

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Background: Median arcuate ligament syndrome (MALS), is an uncommon condition caused by the abextrinsic compression of the celiac trunk (CT) and celiac ganglion, secondary to an anatomical abnormality of the median arcuate ligament fibers. It is characterized by chronic abdominal pain, postprandial epigastric pain, weight loss, nausea and vomiting. MALS is diagnosed with doppler ultrasonography, TC angiography, MR angiography, gastric tonometry and angiography.

Case Report: We present the case of a 58-year-old woman, already treated by colecistecmy for gallbladder stones, total colectomy for dolico-colon. At the diagnosis he had post-prandial epigastric pain, weight loss and chronic anemia. TC angiography shoed 90% of the celiac trunk and right liver artery that emerged directly from the celiac trunk. She underwent laparoscopic surgery with an arched ligament section. General anesthesia was conducted in a laryngeal mask. Access was different from that described by other authors due to the presence of numerous strict adherences due to previous interventions. The celiac trunk was approached from left to right. The dissection was performed with monopolar and ultrasonic energy. The surgery lasted 4.2 h, with almost zero blood loss. Feeding resumed in the second day.

Conclusion: Laparoscopy can be considered the gold standard for this pathology, but standardization is difficult because of rarity of condition.

693—UPPER GI—Gastroduodenal diseases

BLOCK EXERESIS OF A MESENTERIC CYST: TIPS AND TRICKS

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Mesenteric cysts are a rare and often asymptomatic benign abdominal tumor, that emerge from the mesenteric root of the small bowel. It is not uncommon that these cysts can grow and may compromise different structures.

We present the case of a 48-year-old woman with a past medical history of hypercholesterolemia and surgery history of C-section, who presents to the hospital with chronic abdominal discomfort.

The pain is located in the left paraumbilical region, it is not accompanied by nausea, vomiting or other symptoms, nor by constitutional syndrome. The abdominal examination presents a soft, nontender and nondistended abdomen, slightly painful to deep palpation in the left paraumbilical region, with no evidence of peritoneal irritation, with normoactive bowel sounds.

The abdominal ultrasound evidenced the presence of two abdominal masses, hepatic and retroperitoneal. The study is extended with an MRI that describes a 35 mm hepatic mass in segment VIII compatible with hemangioma and a 40 mm diameter mesenteric cyst in left paramedial location without clear organodependance, to rule out mesothelial cyst vs enteric cyst.

Given the findings, surgical intervention for block excision is decided on a scheduled basis. Intraoperatively we observe that the lesion is in intimate relationship with the inferior mesenteric vessels and the mesenteric root. Block exeresis is performed without any incidents, as shown in the video.

Mesenteric cysts are a rare cause of intra-abdominal mass that we need to consider in the differencial diagnosis. The literature about this dissease is limited, but all agree about the importance of a careful preoperative plan that may avoid complicacions during the surgery. Complete surgical excision is widely considered as the firt line treatment for symptomatic cysts, as it is the only curative treatment.

687—UPPER GI—Gastroduodenal diseases

A RARE EVENT OF ACUTE PANCREATITIS: DUODENAL DUPLICATION

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Introduction: Duodenal duplication represents a rare congenital malformation of the gastrointestinal tract. Duplications of gastrointestinal tract affect 1 in evry 100.000 live births, however just 2–12% of these, are duodenal duplication. Those malformation are diagnosed within childhood, in rare cases they remain asymptomatic until adulthood. In 38% of cases they are usually diagnosed after the age of 20, when patients manifest a nonspecific symptomatology like abdominal pain, dyspepsia, bleeding, impacted bowel and pancreatitis.

Clinical Case Presentation: In this case report we describe the case of a 19 years old woman, at her first event of abdominal pain, located within abdomen's upper quadrant, associated with nausea, vomiting and fever with abdominal resistance and positive Blumberg.

The DEA performed blood exams, that showed an increase of inflammation's indexes and pancreatic enzymes. Abdominal ultrasound presented Douglas' pouch bleeding associated with hypoechoic mass in mesogastrium, therefore the ultrasonography was not diagnostic. By performing an abdomen computerized tomography (TC) with contrast (mdc) was diagnosed a cystic formation at the level of the second duodenal portion, near Vater's ampulla. The patient was hospitalized and, during the following days subjected to an EGDS that showed, at the level of the second duodenal portion, an intraluminal duodenal cystic formation adjoined with the duodenum, wherein Vater's ampulla was opened. At the beginning we performed an endoscopic incision of the mass, complicated by bleeding in the following 12 h. Therefore it was decided to effectuate a laparoscopic excision of the mass after duodenotomy.

Discussion: This article discusses the differents clinical approaches of duodenal duplications and differents therapeutic approaches, both endoscopic and surgical laparoscopy.

Conclusions: Even though, most of the literature indicates an endoscopic treatment to deal with duodenal duplications, nowadays the surgical approach is advised, particularly in treating extraluminal duplications, but it could be applied also for intraluminal ones as our case mentioned above. Laparoscopy thus, represents the most efficient approach, with the lowest complication rate, especially hemorrhagic ones, and with low hospital stay.

642—UPPER GI—Gastroduodenal diseases

THE POSSIBILITY OF A LAPAROSCOPIC APPROACH IN GASTRIC PERFORATION

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Aims: The Helicobacter Pylori eradication therapy and the proton pump inhibitors have decreased the incidence of perforated peptic ulcers. Despite this, the perforated peptic ulcers are a pathology frequent in emergency room that it needs urgent surgical treatment. The objective is to present two cases of gastric perforation treated by surgically laparoscopic approach.
Methods: The case of two smokers men of 56 and 54 years is presented. They go to the emergency room for intense and sudden abdominal pain. On examination, the first patient has regular general condition, tachycardia and abdomen with generalized peritoneal reaction. The second patient has peritoneal reaction in epigastrium. In the abdominal CT, in the first patient abundant pneumoperitoneum, intra-abdominal free fluid and continuity solution in the stomach, is observed. In the second patient, pneumoperitoneum near of stomach is only observed.
Results: In both cases, surgical intervention is performed using laparoscopic approach. In the first patient, it is observed a diffuse purulent peritonitis due to a gastric perforation. In the second patient the peritonitis is located near of stomach, and he has a gastric perforation, too. In both patients, biopsies are taken, primary suture of perforation is performed. There are not complications in the postoperative period.
Conclusions: In case of suspected perforated peptic ulcer, laparoscopy is a good option as diagnostic and therapeutic tool. It allows identify the site and pathology of the perforation, closure of the perforation and peritoneal lavage, just like in open repair but without a large upper abdominal incision. Also, there is not additional mortality risk compared with conventional open repair. Therefore, the approach laparoscopic to treat the peptic ulcer disease is safe and provides some advantages over open surgery.

599—UPPER GI—Gastroduodenal diseases

CLEAN-NET AND INTRAGASTRIC SURGERY: IMPORTANT SURGICAL TECHNIQUES TO PRESERVE THE STOMACH

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Background: Of the tailored surgical techniques for gastric submucosal tumors (GSMT), combined Laparo-Endoscopic Approach to Neoplasms with Non-Exposure Technique (CLEAN-NET) and laparoscopic intragastric surgery (LIGS) are the most performed operations in our hospital. The technical details of these two unique operations are herein demonstrated. Between 2012 and 2019, 362 patients with GSMT underwent surgical treatment in our hospital. Recent statistics shows CLEAN-NET was performed in 39%, and LIGS 37% of the entire series.
Surgical Techniques: In CLEAN-NET, the seromuscular layer around the tumor site is meticulously dissected with a cautery or ultrasonic device, while the mucosa is kept unbroken. Normal saline is injected into the submucosal layer from the peritoneal aspect to avoid perforation. When seromuscular layer is dissected around the tumor, the tumor-containing gastric wall is lifted up, stretching the mucosa, which is then cut and closed with a stapler. Finally, the seromuscular layer is reapproximated by hand-sew suture. For LIGS, construction of a stable approach route is important. We use x-Gate (a multi-channel port), fixed in the skin incision and the anterior wall of the lower body of stomach. In addition, a thin instrument is used via a port in the left upper quadrant. During intragastric procedure a tumor is manually resected with a hook electrode, and the defect of the gastric wall is closed by suturing. After the retrieval of the tumor, the temporary gastrostomy is terminated and closed.
Results: Both operations were stably carried out with an average operation time of 105 min in CLEAN-NET group and 137 min in LIGS group. The mean tumor size was 34.6 mm. Postoperative course was uneventful in all cases. No complications such as delayed empty or stenosis was noted, which could have been caused by the excessive sacrifice of an innocent gastric wall around the disease.
Conclusion: CLEAN-NET and LIGS are as important as occupy about 80% of the entire operations for GSMT in our institute. Both unique operations are performed safely and stably by experienced hands. Both contribute to the preservation of the entire stomach and theoretical rationale for oncological aspect, as they do not expose the tumor to the peritoneal cavity.

428—UPPER GI—Gastroduodenal diseases

LAPAROSCOPIC TREATMENT OF MEDIAN ARCUATE LIGAMENT SYNDROME (MALS) WITH CELIAC TRUNK INJURY

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Median arcuate ligament syndrome (MALS) is a relatively rare condition characterized by abdominal pain attributed to compression of the celiac trunk by the median arcuate ligament. Nowadays laparascopic division of the median arcuate ligament combined with removal of the celiac ganglia leading do decompression of the celiac trunk is the mainstay treatment.

We present a video case of 19 year-old female diagnosed with MALS. She underwent laparoscopic division of the ligament. The video shows the median arcuate ligament release via supragastric approach. During the procedure an injury to celiac trunk occured and was managed laparoscopically. We present the key steps of the procedure and the management of arterial bleeding from celiac trunk.

266—UPPER GI—Gastroduodenal diseases

ENDOSCOPIC MANAGEMENT FOR POSTOPERATIVE GASTROINTESTINAL FISTULAS

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Background: Gastrointestinal fistula still remains surgical challenge. In most cases, the only solution is conservative treatment supported by minimally invasive procedures. The presented study shows successful treatment of chronic gastrointestinal fistulas using endoscopic techniques such as eVAC, endoclips and fibrin sealant.

Material and Method: From September 2018 to November 2019, at the authors' clinic, 6 patients (5 men and 1 woman), aged from to 26 to 70 were treated for chronic fistula of the upper gastrointestinal tract. All fistulas occurred as a result of primary anastomotic leak following elective surgery in 3 patients and after emergency operation in 3 patients respectively. The diameter of the fistula was from 3 to 4 mm to the half of circumference of the anastomosis. Therapy was carried out using eVAC in 5 patients, while in 1 case the fistula was primarily closed with endoclips. Three patients were given fibrin sealant for final closure of the fistula. Simultaneously with endoscopic management a high pressure Redon drainage of the fistula through the external opening was applied. The conservative surgical treatment was combined with enteral immunomodulatory nutrition through a nasojejunal tube according to European Society for Parenteral and Enteral Nutrition (ESPEN).

Results: In 5 patients the fistula was completely closed and in one case a fistula was converted into a high-output stoma. Duration of treatment ranged from 29 to 117 days. One patient developed stroke and pneumonia and needed further treatment in the ICU. There were no complications related to the method of treatment.

Conclusions: Conservative treatment based on endoscopic techniques successfully supplies chronic postoperative gastrointestinal fistulas. Healing with the use of eVAC supported by fibrin sealant and external drainage is an effective, safe and fully controllable method at every stage of therapy.

1415—UPPER GI—Reflux-Achalasia

NISSEN FUNDOPLICATION WITH ROUND LIGAMENT PLASTY FOR THE TREATMENT OF GIANT PARA-ESOPHAGEAL HERNIA

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Background: Laparoscopic surgery is the gold-standard treatment for para-esophageal hernias. Large hernias pose a double challenge, both in achieving a complete reduction of the hernia sac and in completing a tension-free hiatoplasty. The use of synthetic meshes is controversial, due to the potential of esophageal erosion. Round ligament plasty has been suggested as a biologic alternative to reinforce the hiatal suture.

Clinical Case: We present the case of a 66 years-old female patient, complaining of post-prandial fullness and dysphagia for 6 years. She had a known sliding hiatal hernia with previous episodes of gastric volvulus. She was sent to surgical evaluation due to progression of dysphagia. She had no prior history of surgery.

The CT scan revealed a type IV hiatal hernia with an organo-axial gastric volvulus.

The surgery and the post-operative period were uneventful and the patient was discharged on the 2nd post-operative day.

Three months after the surgery the patient was asymptomatic and on full diet, regaining weight and with a significant improvement in her quality of life.

Conclusion: Complete reduction of the hernia sac and round ligament plasty offer a minimally invasive approach to the treatment of giant para-esophageal hernias. Laparoscopic Nissen fundoplication is feasible and secure in these clinical scenarios and all type IV hernia patients should be offered surgical treatment.

1513—UPPER GI—Reflux-Achalasia

LAPAROSCOPIC HELLER MYOTOMY OR PNEUMATIC DILATATION IN ACHALASIA- RESULTS OF A PROSPECTIVE, RANDOMIZED STUDY WITH AT LEAST A DECADE OF FOLLOW UP

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Background and Objectives: The most efficient long-term treatment strategy for achalasia has yet to be established. This study compared the long-term results (> 10 years) after either pneumatic dilatations or laparoscopic myotomy using treatment failure as the primary outcome. Secondary objectives were; the frequency and degree of dysphagia and effects on QoL.

Patients and Methods: Out of the 53 patients with achalasia who were initially randomized to either laparoscopic myotomy with a posterior partial fundoplication (LM) or repetitive pneumatic dilatation (PD), 43 remained for scrutiny after a median observation period of 170 months (LM; n = 20 and PD; n = 23).

Results: At the follow-up of 60 months, ten patients (36%) in the PD group and two patients (8%) in the LM group were classified as treatment failures (p = 0.016). At the latest follow up time point (> 10 years), the corresponding numbers were 13 (57%) and 4 (20%), respectively. The Kaplan Mayer analysis of the cumulative incidence of treatment failure revealed a significant advantage of LM over the dilatation strategy (p = 0,032), Health related QoL assessed by the PGWB and GSRS scores were quite comparable in the study groups with a stable decline over time. Reflux was better controlled in the LM group.

Conclusions: After more than a decade of follow-up, LM reinforces its superiority over repetitive PD treatment strategy in the management of newly diagnosed achalasia.

1414—UPPER GI—Reflux-Achalasia

LATE ESOPHAGEAL PERFORATION AFTER LAPAROSCOPIC HELLER'S MYOTOMY FOR TYPE II ACHALASIA AND LAPAROSCOPIC REPAIR

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Aims: Achalasia is a rare neurodegenerative disease with involvement of the esophagus resulting in absent peristalsis with impaired lower esophageal sphincter relaxation. Laparoscopic Heller's myotomy is considered worldwide as the gold-standard surgical treatment offered to patients with esophageal achalasia, with excellent overall results. Esophageal mucosal perforation after laparoscopic Heller's myotomy can be a devastating complication. We present the case of a 28-year-old male patient that presented with esophageal perforation and acute abdomen eleven days after laparoscopic Heller's myotomy caused to overeating and its successful laparoscopic management.

Methods: A 28-year-old male patient with Type II esophageal achalasia underwent laparoscopic Heller's myotomy. His postoperative course was uneventful and he was discharged a day later. Nine days after discharge, and while he was on a soft diet, acute abdominal pain occurred after overeating. A day later he presented with acute abdomen signs, fever, and impaired renal function. Contrast-enhanced Computed Tomography (CT) scan of the chest and abdomen revealed pneumomediastinum and pneumoperitoneum.

Results: The patient underwent exploratory laparoscopy that esophageal perforation 2 cm above the gastro-esophageal junction was revealed together with upper abdominal peritonitis. After abdominal washout, the 2 mm defect was primary sutured using a 4/0 PDS suture. Following that, an omental flap covered the affected area and drains were placed.

Conclusions: Esophageal perforation after laparoscopic Heller's myotomy for the treatment of esophageal achalasia can be devastating with extreme morbidity and mortality. Late esophageal perforation is not usual, but overeating may contribute significantly. Laparoscopic re-exploration, washout and primary repair can be successful in the management of such cases, as evident in the case we present.

1297—UPPER GI—Reflux-Achalasia

ROBOTIC-ASSISTED VERSUS CONVENTIONAL LAPAROSCOPIC FUNDOPLICATION: 12 YEARS FOLLOW UP OF A RANDOMIZED CONTROLLED TRIAL

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Aims: Numerous reports have addressed the feasibility and safety of using robot-assisted (RALF) and conventional laparoscopic fundoplication (CLF). Long-term follow-up of patient satisfaction and quality of life (QOL) is scarce in direct comparison of the approaches. The aim was to assess long-term disease specific symptoms and QOL in patients with GERD treated with RALF or CLF in the randomized ROLAF trial.
Methods: In the ROLAF trial 40 patients were randomized to RALF and CLF for treatment of GERD between August 2004 and December 2005. Twelve years after surgery, all patients were evaluated with the standardized Gastrointestinal Symptom Rating Scale (GSRS) and the Quality of Life in Reflux and Dyspepsia questionnaire (QOLRAD).
Results: Forty patients received intervention (RALF n = 20, CLF n = 20) and thirty replied to long-term follow-up (RALF n = 15, CLF n = 15). The mean (range) GSRS score was similar for RALF and CLF (2.1 (1.1–3.3) vs. 2.2(1.0–5.9), p = 0.740). There was no significant difference in the reflux syndrome specific subscale for heartburn and acid regurgitation (RALF 1.6 (1.0–5.0); CLF, 1.7 (1.0–4.5), p = 0.818). In addition, there was no difference in QOLRAD score at 12 years´ follow up (RALF 6.4 (2.4–7.0); CLF 6.4 (1.0–7.0), p = 0.656). The sub items of the QOLRAD score as emotional distress, food/drink problems, physical/social functioning, sleep disturbance and vitality were similar in long-term follow-up.
Conclusion: In accordance with previous short-term studies, our long-term results showed no difference between RALF and CLF twelve years after surgery for the postoperative symptom evaluation, patient satisfaction and QOL scores. Noticeable was the high amount of (very) positive feedback about the rare appearance of gastroesophageal reflux disease symptoms and high QOL in this long-term study.

1107—UPPER GI—Reflux-Achalasia

PROSPECTIVE AND RANDOMIZED STUDY IN THE USE OF BARBED SUTURE COMPARED TO CONVENTIONAL SUTURE IN ANTIREFLUX SURGERY. PRELIMINARY RESULTS

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Aims: Introduction of barbed suture in laparoscopic surgery eliminates the need for knotting and reduces surgical time. Its efficacy and safety has been investigated in laparoscopic gastrointestinal surgery; however, there are no studies about safety and effectiveness in Nissen fundoplication. The main purpose of the present study is to compare the results in the use of barbed suture (BS) versus conventional suture (CS) in laparoscopic Nissen fundoplication (LNF).
Materials and Methods: A prospective randomized study was designed, randomizing patients on the type of suture used for hiatorraphy and fundoplication. (Group A: CS; Group B: BS). In this study, patients undergoing LNF * were prospectively analyzed, from February 2015 to November 2019. Data collection included age, sex, BMI, ASA, comorbidities, pre-surgical symptoms, diagnostic tests, operative time and mean stay. Operating time, intra- and postoperative complications, so as postoperative symptoms of BS versus CS fundoplication patients were compared. The mean follow-up period was 28 months for CS group and 26 for BS group.
Results: A total of 133 patients underwent LNF, 63 patients with CS and 70 with BS. There were no differences between the two groups regarding to demographic data and pre-surgical symptoms. In terms of surgical complications (0% BS and 8.7% CS) and post-surgical symptoms (50% BS and 41.3% CS), there were no significant differences ($p < 0.05$). The average stay was similar in both groups. However, the operative time was significantly shorter in the BS group (61 min BS vs. 70 min CS, p = 0.037).
Conclusions: The use of barbed suture in laparoscopic Nissen fundoplication significantly reduces surgical time and simplifies the suture technique without increasing surgical or postoperative complications. Further studies may consolidate the use of this type of suture in laparoscopic gastroesophageal reflux surgery and expand its use in other laparoscopic surgical techniques.

1051—UPPER GI—Reflux-Achalasia

LAPAROSCOPIC REPAIR OF INTRATHORACIC MIGRATION OF THE WRAP IN THE IMMEDIATE POSTOPERATIVE PERIOD AFTER NISSEN FUNDOPLICATION

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Aim: The purpose of this video is to show our experience in the management of intrathoracic wrap herniation through a pleural defect inadvertently produced in the context of laparoscopic Nissen fundoplication, presenting acutely in the immediate postoperative period.
Case Report: We present a case of a 51-year-old female patient with previous history of gastric band withdrawal in 2017 due to intestinal obstruction. With new onset of gastroesophageal reflux symptoms including heartburn and postprandial heaviness, but no dysphagia and good oral tolerance to solids. In the upper gastrointestinal series, a sliding cardias is observed and in the 24-hour pH-metry pathological acid reflux is detected. In accordance with the clinic and diagnostic tests, laparoscopic Nissen fundoplication associated to hiatal herniorrhaphy is scheduled. In the 1st postoperative day the patient reports incoercible abdominal pain, which does not improve with analgesia, vomiting of clear liquids. Abdominal Computerized Tomography is requested with findings suggestive of intrathoracic displacement of the fundoplication and gastric fundus. Urgent exploratory laparoscopy is decided, in which practically all of the stomach is found to have herniated through a pleural defect into the left hemithorax, with no signs of gastric ischemia. Gastric reduction into the abdominal cavity is then achieved by traction, left pleural defect is closed, pillars are closed with Ethibond 0 and a titanium mesh (Tiomesh) is fixed with 2–0 Ethibond, to prevent new gastric displacement gastropexy to the anterior abdominal wall is performed. The patient is discharged after a favourable immediate postoperative period. The patient is reflux-free after 6 months of follow up.
Conclusions: Intrathoracic migration of fundoplication in the immediate postoperative period is a rare but life-threatening complication that may be seen in the early postoperative period and requires urgent surgical intervention. A laparoscopic approach is feasible and with excellent results.

935—UPPER GI—Reflux-Achalasia

LAPAROSCOPIC MANAGEMENT OF LARGE PARAESOPHAGEAL HIATAL HERNIAS: COMPARISON OF SHORT-TERM OUTCOMES WITH TIO2MESH^{TM} VERSUS STANDARD CRURA REPAIR

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Aims: The ideal strategy for repairing laparoscopic paraesophageal hiatal hernias (LPHH) remains controversial because no clear guidelines are given. The aim of this study was to compare short-term outcomes in patients following reinforcement of the hiatus with TiO2Mesh^{TM} versus standard crura repair.
Methods: A retrospective study was performed at Ramon y Cajal University Hospital, Spain from December 2014 to December 2018. Patients who underwent laparoscopic repair of large (> 5 cm) type III hiatal hernia were included. Criteria of exclusion were previously failed hiatus hernia repair and emergency procedures. Patients were stratified into mesh group (TiO2Mesh^{TM}) and non-mesh group (standard crura repair). Study outcomes were investigated, including recurrences, dysphagia and mesh-related complications.
Results: A total of 63 patients, 17 in the mesh group and 46 in the non-mesh group were included. With a median follow-up of 35 months (IQR, 22–47 months), 23 recurrences (36.5%) were identified. Recurrence rate was statistically higher in the non-mesh group (43.5% vs. 17.6%; $p = 0.05$). More intraoperative (23.9% vs. 11.8%), early postoperative complications (13% vs. 5.9%) and revisional surgery (6.5% vs. 5.9%) were found in non-mesh group, but differences were not statistically significance. Four patients (6.3%), all in non-mesh group presented with temporary dysphagia. No mesh-related complications occurred.
Conclusions: TiO2Mesh^{TM} reinforcement can reduce the hernia recurrence rate without mesh-associated complications.

932—UPPER GI—Reflux-Achalasia

THE NEW METHOD OF TENSION-FREE MESH REPAIR FOR GIANT HIATAL HERNIAS

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Aims: For giant paraesophageal hernias, mesh repair is the only option to prevent recurrence, but there is still no ideal prosthesis and technique of its placement to prevent complications. The aim of study was to analyze first results of a new method of tension-free mesh repair of giant hiatal hernias.
Methods: Six patients with giant hiatal hernia underwent laparoscopic repair using the new technique. The mean age was 62 years (52–70). They were 4 women and 2 men. The mean BMI was 24.8 kg/m2 (16.4–30.8). The mean hiatal surface area was 33.9 cm2 (18–60). Round shaped polyester mesh with collagen coating Symbotex (Covidien) measuring 9 or 12 cm was used. The heart-shaped patch was cut out of this mesh. A separate rectangular mesh was cut out as well. This rectangular patch covered upper margin of the implant to enhance it and to prevent erosion of the esophagus. This patch was fixated by Prolene 2–0 suture. The mesh was fixated to the both crura using running non-absorbable V-loc suture (Figs. 1, 2).
Results: There were no conversions and severe technical difficulties. The mean duration of procedure was 3 h (range, 2.5–4). There were no intraoperative complications. The mean duration of hiatoplasty was 35 min (range, 25–40). There were no postoperative complications. There were no symptoms of anatomical and reflux recurrence in a follow-up period of 1–3 months. There were also no complaints of dysphagia. Barium swallow and endoscopy showed no anatomical recurrence and stenosis of esophagus.
Conclusions: 1. The new method of tension-free hiatoplasty using specially fashioned lightweight polyester mesh with collagen coating Symbotex (Covidien) showed feasibility. 2. The immediate results of the new method showed no anatomical recurrences and dysphagia. 3. More cases collection with assessment of long-term results and comparing with other methods are needed.

912—UPPER GI—Reflux-Achalasia

THE NEW TECHNIQUE OF LAPAROSCOPIC HIATAL HERNIA REPAIR FOR PREVENTION OF COMPLICATIONS AND RECURRENCE

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Aims: The technique of hiatal hernia repair is still debateful. For large and giant hernias mesh repair is recommended, but the search for the safest and most effective technique is ongoing. The aim was to access the mid-term results of a new technique called "internal buttress of posterior crural repair".
Methods: From 2017 till 2019, 65 patients with type 1 hiatal hernias with mean distance between crura 4.2 cm (range, 3–5) underwent laparoscopic hiatal repair using the new technique. From them, mid-term results were studied in 43 patients. Mean age was 48.8 (range, 22–78). There were 28 women and 15 men. After dissection of crura, 2 separated rectangular patches of Parietene Progrip mesh (Covidien) measuring 1x1.5–2.5 cm were attached to the posterior surfaces of the crura. The patches were fixated themselves due to special hooks. Then, continuous two-directions suture was placed through both crura along with the patches using non-absorbable V-Loc 2–0 suture (Covidien). The same suture was used for Nissen fundoplication. 3D-laparoscopy was used while suturing (Epic 3DHD system, Wolf).
Results: All the procedures were performed successfully. There were no cases of bleeding from the suturing points, and no crural dehiscence while suturing. The mean duration of suturing facilitated by 3D-laparoscopy was 15 min (range, 10–25 min) for crural repair, and 10 min (range, 8–20 min) for fundoplication. In a mean follow-up period of 7 month (range, 3–12) there were no anatomical recurrences, GERD recurrences and long-term dysphagia studied by questionnaires, endoscopy and barium swallow. Additionally, in 22 patients with follow-up period less than 3 month there were also no dysphagia, and all the patients were satisfied by the immediate results of surgery.
Conclusions: 1. The new technique of posterior buttress of crural repair using small patches of Parietene Progrip mesh and V-loc suture showed feasibility and safety. 2. The use of 3D-laparoscopy facilitates suturing while performing hiatal repair and fundoplication. 3. Mid-term results showed no anatomical recurrences, GERD recurrences and dysphagia. 4. More cases collection and long-term follow-up is needed to prove that the new technique can prevent both recurrence and mesh-related complications.

729—UPPER GI—Reflux-Achalasia

OUTCOMES OF REDO-LAPAROSCOPIC ANTI-REFLUX SURGERY

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The rate of unsatisfactory results after laparoscopic anti-reflux surgery (ARS) is high, especially in patients with large hiatal hernias (HHs). Redo surgery is generally more difficult and followed by worse results then primary surgery.

Aim: To analyze the outcomes of redo-fundoplication in patients with reflux symptoms.

Methods: A total of 1168 patients with HHs were operated in Odessa regional hospital for the period from January 2008 to January 2019. Fifty-four (4.62%) patients underwent redo-operations. The reasons for redo ARS in our patients were HH recurrence, migration of fundoplication wrap, stenosis. Preoperative work-up before redo surgery includes endoscopy and barium swallow or a CT scan to assess all possible anatomical complications. Reflux symptoms and quality of life were assessed using the Gastroesophageal Reflux Disease Health-Related Quality of Life (GERD-HRQL) questionnaire.

Results: All redo-operations were performed laparoscopically. There were no mortality. Complications after redo-surgery were in 6 (11.1%) cases. Two (3.7%) patients experienced gastric perforation, which was recognized and repaired intraoperatively, 1 (1.8%) patient had splenic injury treated by bipolar coagulation, 3 (5.6%) patients had respiratory complications including pneumothorax and pleural effusion. Twenty-two (40.74%) had conversion from Nissen to Toupet, in 4 (7.41%) cases were convertions from Toupet to Nissen. Mesh was used in 35 (64.8%) patients during redo-operations. We used mesh in patients with large size of HH or in case of too fibrotic defect of hiatus to avoid an excessive tension of crurоraphy sutures. At follow up it was found that using of mesh, compared to direct suture alone, for redo-fundoplications was associated with lower risk of recurrence reflux symptoms.

Median GERD-HRQL score was significantly reduced from 27 at baseline to 6 at long term follow-up ($p < 0.01$). Good results reported 51 (94.4%) patients after redo-operations. Three patients were operated in the third time.

Conclusions: Redo laparoscopic ARS is safe and effective if it performed by an experienced surgeon. Use of mesh during reoperation reduce recurrence rate and has a positive effect on quality of life in follow up.

643—UPPER GI—Reflux-Achalasia

RECURRENT HIATAL HERNIA AFTER NISSEN FUNDOPLICATION: LAPAROSCOPIC REDO TREATMENT WITH HIATAL MESH AND TOUPET FUNDOPLICATION

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Background: Redo surgery in patients with recurrent hiatal hernia is a technically demanding intervention. We report the case of a woman with a recurrent hiatal hernia after Nissen fundoplication, in which we performed a laparoscopic approach with the placement of a mesh and a Toupet fundoplication.

Clinical Case: A 78-year-old woman presented at the Emergency Department in March 2019 with persistent vomiting in the last five days, associated to fever in the last two days. The patient had a medical history of diabetes, hypertension, bronchial asthma and a previous Nissen fundoplication in 2017. Physical exploration did not show relevant findings. Blood tests revealed leukocytosis and her chest X-ray demonstrated a bilateral pneumonia suggestive of aspiration. She was hospitalized for antibiotic treatment and dysphagia study.

Upper endoscopy revealed a tortuous esophagus, with the fundoplication at 35 cm from the incisors, and signs of Barrett's esophagus confirmed by biopsy. Barium esophagogram showed an intrathoracic hiatal hernia with slow barium empting, but marked posterior reflux. A thoracoabdominal computerized tomography scan confirmed the hiatal hernia and did not demonstrate any other findings suggestive of neoplastic disease.

With these findings, a laparoscopic redo surgery was carried out. Firstly, both branches of the right crus of the diaphragm were liberated. Posteriorly, the herniated stomach was brought back to its intraabdominal position. The Nissen fundoplication was dissected and sectioned with a 45 mm lineal endostapler. The dissection continued until the His angle was clearly individualized, and then the hernia sac was partially excised. The crus was closed with non-absorbable stiches, and the closure was reinforced with the placement of a large pore polipropilen titanium-coated non-absorbable mesh (TiO2 Mesh^{TM}). Finally, a partial 270 degree posterior fundoplication according to Toupet's technique was confected.

Postoperative course was uneventful and the patient was discharged home on the third postoperative day. Until last visit, she maintains an adequate oral intake without reflux symptoms.

Discussion and Conclusions: Redo surgery in recurrent hiatal hernias is an exigent surgical technique. Some patients might benefit of the placement of a mesh to reinforce the closure of the crural opening. Toupet fundoplication is an alternative in redo surgery for patients that maintain reflux symptoms after a Nissen fundoplication.

534—UPPER GI—Reflux-Achalasia

LAPAROSCOPIC REPAIR OF RIGHT COLON ADENOCARCINOMA AND TRANSHIATAL HERNIATION OF THE TRANSVERSE COLON AFTER ESOPHAGECTOMY

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Aim: Transhiatal herniation of colon is an unusual complication after esophagectomy with gastric pull-up. The incidence of hernia after traditional open esophagectomy has been reported between 0.4% and 6%. Hiatal hernia can develop in the early postesophagectomy stage or as a complication during the late stage. After a minimally invasive esophagectomy, the incidence appears to be slightly higher at 2.7% to 4.5%. The most likely explanation is that there are fewer peritoneal adhesions in minimally invasive approaches. When resecting the oesophagus, the diaphragmatic hiatus often requires widening to allow the conduit to pass freely into the chest and prevent conduit obstruction. However, enlargement of the hiatus to have a larger passage way to avoid undue tension on the conduit as it is pulled up to the neck or upper thorax increases the risk of a hernia developing and allowing abdominal contents to pass into the chest. Colorectal cancer has been synchronously associated in 0.2–1.7% of oesophageal cancer patients. Furthermore, colorectal cancer has been metachronously associated in 1–4.6% of oesophageal cancer patients.
Methods: We present a 77 years old male with an esophageal cancer T1bN0 operated in 2016 through a three-field thoraco-laparoscopic esophagectomy. Two years later and due to lower bleeding a cecum adenocarcinoma was diagnosed in a colonoscopy. Herniation of the transverse colon was identified in a computerized tomography scan.
Results: We performed a laparoscopic hiatal repair with a TiO2-Mesh^{TM} for reinforcement hiatal closure. After that a right colectomy with intracorporeal mechanical side-to-side anastomosis was performed. Operative time was 195 min. The patient received hospital discharge on the seventh postoperative day. The analysis of the expecimen revealed and adenocarcinoma T4N2M0 (Five lymph nodes were affected from 19 removed).
Conclusions: Laparoscopic approach is feasible to repair symptomatic transhiatal herniation of transverse colon after esphagectomy. Situations in which there is no tension free for primary repair, the placement of mesh is considered.

213—UPPER GI—Reflux-Achalasia

THE LAPAROSCOPIC SURGERY FOR LONG REFLUX-INDUCED STRICTURE OF THE ESOPHAGUS WITH DYSPHAGIA AFTER SEVERAL GULLET BUOGIENAGES COURSES

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Gastroesophageal reflux disease (GERD) is a condition reducing the quality of life and being able to cause disorders associated with acid reflux, such as bronchial asthma, Barrett's esophagus and esophageal adenocarcinoma. GERD can also lead to esophagitis with reflux-induced strictures and dysphagia. Reflux-induced strictures are usually located near the gastroesophageal junction. In rare instances esophageal stricture is located on the border of its lower and middle third or higher. This condition can cause problems for some surgeons. We are presenting a case of a 62-year-old man with a diagnosis of GERD confirmed 10 years ago. The clinical features included severe symptoms of acid reflux (heartburn intensifying when reclining, bitter taste in mouth). Complains of difficult swallowing and hypersalivation appeared 5 years ago. There was no esophageal cancer detected during the period of medical examination. The concentric narrowing of the lower third of esophagus up to 20 mm length was found. During the next four years gullet buogienages were performed 4 times with subsequent reduction of dysphagia symptoms. Beneficial effect persisted about three months after gullet buogienages. Co-morbidities were the following: obesity (body mass index—30.2 kg/m^2), hypertension, diabetes mellitus. According to the esophageal roentgenoscopy: esophagus narrowing up to 2 mm in diameter, 20 mm in length visualized at the level of the lower third of the esophagus, suprastenotic dilatation 30 mm in length. In our clinical center there was a laparoscopic longitudinal esophageal myotomy at the level of the stricture in posterior mediastinum (5 mm below the tracheal bifurcation), a Dor (anterior) fundoplication and posterior partial fundoplication without a crurorraphy were performed. The patient had to stay at the intensive care unit for 17 h. Nasogastric tube feeding was required for 3 days, oral sip feeding—on fourth day postoperatively. The patient was discharged within 7 days after the surgery and re-examined by a surgeon in 2 month, with no complains or signs of a recurrence. This case report shows the efficiency and feasibility of the laparoscopic approach as a method of GERD treatment, complicated by reflux-induced esophagus stricture located high in posterior mediastinum.