

SURGERY and SURGICAL ENDOSCOPY

Official Journal of the Slovenian Society for Endoscopic Surgery



**15th CONGRESS
OF SLOVENIAN SOCIETY
FOR ENDOSCOPIC SURGERY**

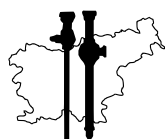
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Surgery and Surgical Endoscopy is a fully open access, peer-reviewed journal that aspires to publish articles relevant to surgery, surgical oncology as well as surgical endoscopy from researchers worldwide. The journal accepts research articles, review-articles, mini-reviews, case reports, short communications, opinions, letters to the editor, symposiums, commentaries and perspectives.

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Slovenian Society for
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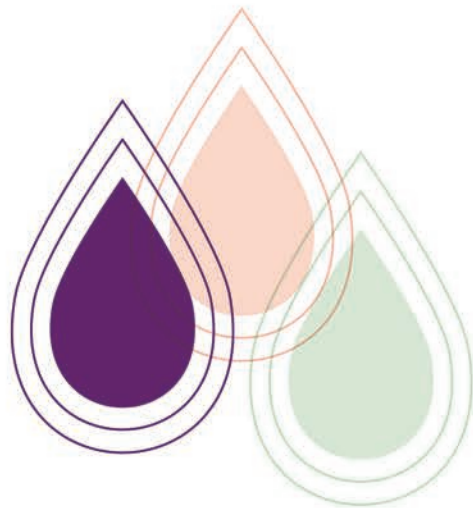
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ORAL PRESENTATIONS

Bariatric and Metabolic Surgery in a Nutshell

Jure Salobir, Tadeja Pintar

University Medical Centre Ljubljana, Ljubljana, Slovenia

Since its beginning in 1960s bariatric surgery saw rapid development. New discoveries enabled us to better understand the pathology of obesity and with it, the processes that make bariatric surgery the most effective treatment of morbid obesity known to date. The basic components of bariatric procedures, namely restriction and malabsorption, were shown to be only a part of a much larger range of physiologic changes leading to sustained weight loss and improvement of numerous diseases associated with obesity and metabolic syndrome. The dramatic improvement seen in comorbidities such as diabetes and hypertension prompted research in systemic effects of bariatric surgery outside weight loss and coined the term metabolic surgery. Amidst the epidemic of obesity bariatric surgery rose to one of the mainstays of surgery. The popularization of bariatric surgery was especially aided by the much-lowered morbidity and mortality seen with the advancement of minimally invasive surgery. Despite its major role in the treatment of morbid obesity, common misconceptions still lead to prejudice against bariatric surgery and discrimination towards bariatric patients. With the knowledge of indications and effects of bariatric surgery we can identify the patients who may benefit from bariatric surgery. As the number of obese population increase, so will the number of patients who undergo bariatric procedures. Understanding of common procedures such as gastric bypass, sleeve gastrectomy, biliopancreatic division with duodenal switch and adjustable gastric banding will enable physicians to appreciate postoperative anatomy and anticipate common complications thus providing a tailored approach to patients in an increasingly obese society.

Metabolic Surgery: Surgical Treatment for T2DM

Tadeja Pintar

University Medical Centre Ljubljana, Ljubljana, Slovenia;
Faculty of Medicine, University of Ljubljana, Slovenia

Metabolic syndrome is defined by insulin resistance resulting in development for hypertension, dyslipidemia, type II diabetes mellitus (T2DM), and low HDL. Bariatric surgery triggers short-term and long-term physiological adaptation mechanisms, that are significantly involved in glucose metabolism resulting in tighter glucose control and/or remission of T2DM altogether. Surgical treatment of T2DM is recommended for patients with inadequately controlled diabetes and a BMI as low as 30 kg/m², or 27.5 kg/m² for Asian individuals also based on efficacy, safety and cost-effectiveness of metabolic surgery. Restriction and malabsorption techniques are more effective for T2DM surgical treatment; the most commonly performed techniques for treatment of T2DM are Roux-en-Y and one-anastomosis gastric by-pass; other techniques include effective BPD (bilio-pancreatic diversion) and SADI (single anastomosis duodenal by-pass). The ability of metabolic surgery to induce prolonged remission of diabetes is defined as non-diabetic glycaemia without the need for ongoing pharmacological treatment. Metabolic surgery procedures are superior to medical treatment of T2DM in the most common determinants, cardiovascular events related to achievement of glycaemic/ metabolic treatment goals designed to reduce micro and macrovascular complications. The goals to minimise cardiovascular morbidity and mortality are at least 7 % reduction of HbA1c, reduction of LDL < 5.6 mmol/l and blood pressure < 130/80 mmHg. The advantages of metabolic surgery over SBT2 drug treatment have been demonstrated in clinical studies. Metabolic surgery is significantly more effective in long-term control of SBT2. In clinical practice and in treatment planning, patients should be ensured that metabolic surgery is properly integrated into the patient treatment

algorithm, taking into account professional recommendations.

SADI-S (Single Anastomosis Duodeno-ileal Bypass with Sleeve Gastrectomy)

Grega Kunst

General Hospital Slovenj Gradec, Slovenia

The single anastomosis duodenal-ileal bypass with sleeve gastrectomy/one anastomosis duodenal switch (SADI-S/OADS) is a relatively new procedure that has been proposed as an alternative to the conventional duodenal switch (DS) procedure. This procedure is meant for super obese patients with BMI over 50 or failed sleeve gastrectomy with weight regain.

From 2019 to 2022 we preformed 21 SADI-S. We evaluated our first ten cases in weight loss, comorbidity resolution and complications. More than one year after the operation excessive weight loss was 72 % (48.7–85.5), average BMI before the operation was 62.8 kg/m² (51.2–78.8) and after one year was 35.5 kg/m², average weight was 187.3 kg (233–157) before the operation and 105.9 kg (87–139) after one year. Three patients had diabetes type 2 before the operation and resolution was complete in all three of them. We had no early complications. SADI-S is a highly efficacious weight loss procedure with significant comorbidity reduction at 1 year. Long-term follow-up is needed, especially around complications and vitamin deficiencies.

Laparoscopic Conversion of One Anastomosis Gastric Bypass to Standard Roux-en-Y Gastric Bypass

Jure Myint

General Hospital Slovenj Gradec, Slovenia

From 2012 to 2020 laparoscopic one anastomosis gastric bypass (LOAGBP) was widely performed procedure for treatment of morbid obesity and metabolic disorders on our department due relative simplicity and effectiveness in terms of excessive weight loss and resolution of comorbidities.

Long term results in literature and our follow-ups results also, showed LOAGBP is associated with greater likelihood of bile reflux problems, GERD and chronic anastomosis with refractory ulcers all of which can adversely affect one's quality of life. In case of unsuccessfully conservative treatment with medications we suggest patients conversion from LOAGBP to RNYGB. From January 2019 to December 2021 30 patients underwent LOAGBP conversion to RNYGB. 29 (97 %) procedures were performed laparoscopically and one laparoscopically assisted. In 3 cases operation was performed as emergency surgery. In those the cause was perforated marginal ulcer. Others cases were performed elective. In cases, where the cause was marginal ulcer with or without perforation we performed "en bloc" resection of GEA end distal part of gastric pouch followed by RNYGB reconstruction. In other cases we performed RNYGB conversion without GEA resection. Postoperative the patients experienced significant improvements with bile reflux problems, resolution of GERD and pain caused by chronic anastomosis and marginal ulcers. There was no postoperative mortality.

Laparoscopic Radical Gastrectomy – Standard of Care in the Treatment of Locally Advanced Gastric Cancer

Miloš Bjelović, Dragan Gunjić

University Hospital for Digestive Surgery, Clinical Center Serbia, Serbia

Several randomized control trials and meta-analysis have confirmed the advantages of laparoscopic surgery in early gastric cancer and there are indications that this may also apply in advanced distal gastric cancer. However, In Western countries, the majority of patients still present with advanced stage of the disease and often with proximal tumor localization.

Study objective was to affirm that radical gastrectomy is safe and effective in the treatment of the locally advanced gastric cancer disresponsible to the tumor localization. The single center, case control study, included 204 patients, in convenience sampling, who underwent gastrectomy with a curative intention for the locally advanced gastric cancer. Out of total number of patients, 102 underwent laparoscopic gastrectomy (LG), and 102 patients underwent open gastrectomy (OG). Primary endpoints were safety endpoints i.e. complication rates, reoperation rates and 30-day mortality rates. Secondary endpoints were efficacy endpoints, including perioperative characteristics and oncological outcomes. Even though the overall complication rate was higher in OG group, compared to LG group (30.4 % and 19.6 % respectively) the difference between groups did not reach statistical significance ($p = 0.075$). No statistically significant difference was identified in reoperation rates and 30-day mortality rates. Time spent in the Intensive Care Unit (ICU) was shorter in the LG group with average value of 1.0 days compared to 1.5 days for the OG group ($p < 0.001$). A statistically significant difference is also observed in the length of hospital stay (10 vs. 11 days) ($p < 0.001$). Although the number of retrieved lymph nodes is oncologically adequate in both groups, the median number is significantly higher in the OG group (35 vs. 29; $p = 0.024$). Resection margins came out

to be negative in 92 % of patients in the LG group and 73.1 % in the OG group ($p < 0.001$). Statistically longer survival rates for the patients in the laparoscopic group, which particularly applies to patients in the most prevalent, third stage of the disease. To check to what extent postoperative complications influence the positive effects of the minimally invasive approach, all patients with Clavien-Dindo grade \geq II were excluded from the survival analysis and further divergence of survival curves was observed. Laparoscopic gastrectomy can be safely performed in patients with locally advanced gastric cancer and accomplish the oncologic standard with short ICU and overall hospital stay. Since postoperative complications could affect overall treatment results and diminish and blur positive effect of minimally invasive approach, further clinical investigations should be focused on the patients with no surgical complications, and clinical practice to cut down the prevalence of complications.

Laparoscopic Resection for Gastric Cancer at UMC Maribor

Tomaž Jagrič, Gaja Hladnik, Rok Kolarič

University Medical Centre Maribor, Slovenia

In the year 2015 the first laparoscopic subtotal gastrectomy for early gastric cancer in Slovenia was performed at the Clinical Department for abdominal and general surgery at the University clinical center Maribor. Since then, we have extended the indication for laparoscopic surgery to advanced gastric cancer. In the present article, we have prepared an overview of the results of laparoscopic gastric cancer operations between the years 2015 and 2021. In the present study 507 patients operated on between 2015 and 2021 were included in the study. Laparoscopic surgery was performed on 79 patients. We have analyzed the patients' distribution of their demographic characteristics as well as the characteristics of the tumors, operations, perioperative course, perioperative morbidity, and mortality. We have analyzed the 30-day readmission rate. Finally, we have compared our results with the most relevant recent randomized controlled studies. The proportion of laparoscopic operations has been increasing steadily since 2015. Currently, almost one-third of the patients have been operated on with the minimally invasive approach. Since 2015 33 (52.4 %) laparoscopic subtotal and 30 (47.6 %) laparoscopic total gastrectomies have been performed. The average age of the operated patients was 68 ± 11 years. Most of the patients had at least one accompanying disease (ASA II 48.3). Perioperative chemotherapy was administered in 44.8 %. The tumors were predominately located in the middle (44.4 %) and distal third of the stomach (54). The average duration of the operations was 300 ± 51 minutes. In 61.5 % there were less than 200 ml of blood loss. A D2 lymphadenectomy was performed in 81 %, with an average number of extracted lymph nodes being 26 ± 12 . Most of the patients had a TNM stage pT3N0M0 and, more than half had a UICC stage of Ib or more. R0 resection was achieved in 96.8 %. Patients were discharged after 14 days,

and in the subgroup of patients without complications patients were discharged after 8 days. Perioperative morbidity was present in 17.7 %, perioperative mortality was 1.2 %. The 30-days readmission rate was 14 %. The quality control and the standardization of the laparoscopic gastric cancer surgery at the Department for abdominal and general surgery at the University clinical center Maribor have provided good results. The quality of the lymphadenectomy, R0 rate, perioperative morbidity, and mortality were comparable to Eastern centers, while the morbidity at our center was significantly lower compared to morbidity that was published in the recent European randomized control trial. Our results confirmed current recommendations that laparoscopic gastric cancer surgery can be safely performed only in experienced high-volume centers.

Anastomosis after Subtotal and Total Gastrectomy in Era of Minimally Invasive Surgery

Dragan Gunjić

University Medical Centre Serbia, Serbia

There is no more question about whether laparoscopic gastrectomy is feasible and safe with the same oncological results as open gastrectomy. It is our goal to achieve reproducible minimally invasive surgical technique to become a standard for treatment of gastric cancer. Performing anastomosis is the most challenging part of the operation on which depends surgical result and whole outcome, after all. In our series of more than one hundred laparoscopic gastrectomies, we tried not to make compromise over the anastomosis technique. The learning curve was long, especially in case of laparoscopic total gastrectomy. All patients were operated in standard dorsal decubitus position and with trocar position adopted from Luketich et al. Standard Roux-en-Y reconstruction after total gastrectomy was circular stapled esophagojejunal anastomosis utilizing double stapling technique with transabdominally inserted anvil (reverse-penetrating technique). In the laparoscopic approach, the insertion site of the stapler is in the left upper abdomen. The continuity of the digestive tube, in the patients with subtotal gastrectomy, was provided by forming retrocolic, inframesocolic hand-sewn gastrojejunal anastomosis (Billroth II reconstruction–Finsterer–Hofmeister modification). Both of the anastomotic techniques provided good functional results, and what is most important, minimal complications. There are many other variations of both anastomosis. Organ-spare operation should be primary target, if it could provide an adequate resection margin, because it is safer to create an anastomosis with serosa on both sides, and also a patient nutritional status after surgery should be a thing that matters. These parameters should not be crucial in making a decision which type of resection will be performed. Only if we are capable to create a safe

reconstruction after total gastrectomy as well as after subtotal gastrectomy, we have clear mind, with no preference, in making decisions and providing the best oncological and surgical outcome for our patients.

Laparoscopic Treatment of Gastric Surgical Conditions – Single Institution Experience and Presentation of Surgical Technique

Suzana Janković, Jakša Filipović-Čugura, Zoran Misir, Goran Glavčić

University Hospital Centre Sestre Milosrdnice, Croatia

Laparoscopic approach to various types of surgery has proven to be safe and effective method. There are numerous advantages of laparoscopic over open surgery in terms of faster postoperative recovery and decreased length of hospital stay. Recent randomized trials and meta-analysis confirmed that laparoscopy is equivalent to open surgery in oncological radicality.

Our institution has introduced laparoscopic surgery for treatment of hiatal hernia, ventricular GIST and gastric cancer. We would like to present our initial experience and surgical techniques.

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Robotic Assisted Gastric Resections

Primož Sever

University Medical Center Ljubljana, Slovenia

Over the past two decades, robotic assisted surgery has witnessed a great rise in its uptake and applications. Desire of all surgeons is to offer greater operative precision that may result in better clinical outcomes without compromising safety and long-term survival of the patient.

Minimally invasive gastric resections should follow the same oncological principles as those accepted for open surgery. In 1994 first laparoscopic assisted gastrectomy was done, followed by first robotic assisted in 2002. Robotic system offers 10–15 times magnification in its three-dimensional perspective, so small anatomical structures can be visualized. The da Vinci system eliminates hand tremors and due to sitting position of surgeon, reduces operator fatigue. With its Motion scaling it offers a surgeon certain finesse that surpasses human capabilities especially combined with Endowrist technology that offers angulation and multiple different directions of the tip of instruments. Additionally its Firefly technology, using ICG-dye, works like night vision goggles that help a surgeon to establish proper vessel control, lymph nodes retrieval and recognizing viable tissue. A meta-analysis of robotic versus open gastrectomy in gastric cancer treatment was published this year involving 11 studies and 6693 patients. Advantages of robotic group were lesser amount of blood loss, lower hospital stay, there was no significant difference in the number of lymph nodes dissected, however the R0 resection was higher. It also showed significantly lower incidence of postoperative complications in robotic group with no significant difference in postoperative mortality. The only disadvantage was longer operative time. A meta-analysis robotic versus laparoscopic gastrectomy for gastric cancer published in 2020 involving 40 studies and 17712 patients also showed a bit longer operating time in robotic group. The advantages of robotic group were lesser amount blood loss, significantly increased number of re-

trieved lymph nodes, lower rate of surgical complications but no significantly different recurrence rate between both groups.

Diagnostic Laparoscopy in Gastric Cancer Treatment

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Diagnostic laparoscopy is a minimally invasive procedure that can be performed in selected cases of patients with gastric cancer. During procedure we can inspect the abdominal cavity for occult metastasis that weren't identified on CT scans, perform peritoneal lavage cytology and use laparoscopic US probe for identifying possible liver metastasis. Diagnostic laparoscopy is indicated in locally advanced gastric cancer for staging and

survival prediction. Accurate staging of gastric cancer is crucial in selecting the appropriate treatment option, whether curative or palliative. With diagnostic laparoscopy we can avoid laparotomy and enable patients faster recovery and early start of chemotherapy. Some countries use repeated diagnostic laparoscopy in evaluation of systemic therapy effects.

Gastrointestinal Stromal Tumours of the Stomach – Updated Treatment Recommendations

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Gastrointestinal stromal tumours (GISTs) are the most common sarcomas occurring in the gastrointestinal tract. 40–60 % arise in the stomach. The initial approach to diagnosis depends on the size of the primary tumour. In localised disease, surgery is the treatment of choice in case R0 resection is expected without major sequelae. In patients with a high risk of recurrence, surgery is followed by adjuvant treatment with imatinib for the duration of 3 years. Preoperative treatment with imatinib is standard of care in patients where

R0 resection without major sequelae is not feasible. Mutational analysis must be performed preoperatively on biopsy material to prevent starting neoadjuvant treatment in patients with imatinib-insensitive mutations. Surgery is performed after 6–12 months of preoperative therapy if R0 or R1 resection becomes feasible. In metastatic disease, surgery can be considered in patients with a good response to imatinib in order to remove the residual disease or in patients with limited progression on a case-by-case basis.

Minimally Invasive Pancreatic Surgery

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Invention of minimally invasive surgery has pushed surgeons to investigate the use of these approaches in pancreatic resections. Laparoscopic pancreatic resections have been shown to be feasible and safe, with rising numbers being reported during the last decade. While laparoscopic distal pancreatectomy has been widely adopted, laparoscopic pancreatoduodenectomy gained slower acceptance due to the complexity of the procedure. Main reason is its relatively easier technical and anatomical considerations. Comparisons with open surgery have shown shorter hospital stay, reduced intraoperative blood loss as well as similar results in terms of oncological adequacy. Due to improved postoperative recovery, shorter median time to adjuvant chemotherapy and equal or even longer overall survival was reported for minimally invasive resections. However, this data often represents single centre or even single surgeon's experience and may not be generally applicable. Moreover, several studies indicated that low patient volume leads to longer hospital stay, higher costs and can negatively impact outcome. It has been shown that the expertise gained in laparoscopic and robotic procedures applied in other gastrointestinal areas does not necessarily assure good outcomes for pancreatic resections. Pancreatic surgery, especially minimally invasive, is associated with a steep learning curve. Experience in robot-assisted pancreatic surgery is increasing and is expected to improve surgical safety, but reports are small in numbers, lacking randomization and are mostly limited to dedicated centres. Importantly, minimally invasive pancreatic surgery must be provided with an advanced degree of expertise and should be performed in referral centres able to guarantee key services. As the performance of minimally invasive pancreatic surgery is gaining popularity, there is need for evidence based practice, what has resulted in important international conference on the topic, which took place in Brazil in 2016.

Questions about long-term oncologic results of minimally invasive pancreatic surgery will have to be resolved in the future. There is ongoing RCT DIPLOMA-2, which will focus on short and long-term oncologic outcomes of laparoscopic and robotic distal pancreatectomies. Longitudinal assessment and realization of minimally invasive pancreatic surgery (LAELAPS-1) was successful training program for distal pancreatectomy which resulted in increasing the number of procedures, larger tumors were resected and conversion rates were lowered. Recently there is great focus on robotic surgery education with stepwise program developed in Pittsburgh. With robust data accumulated and training programs implemented, it can be expected for these surgical techniques to expand.

Laparoscopic Corporocaudal Pancreatectomy with Spleen Preservation

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Video presentation of surgical technique for corporocaudal pancreatectomy because of benign cystic tumor in pancreatic body and literature review of minimally invasive procedures in pancreatic surgery. Detail description of complete surgical approach to pancreas with three port approach, dissection of gastrocolic ligament, gastric suspension, superior and inferior pancreatic margin identification, access to coeliac axis, clockwise preparation of splenic artery and vein, mobilization of pancreatic body and tail, ultra scission transection of the pancreatic tissue, suturing the pancreatic duct and easy specimen extraction via umbilical port incision. Although pancreas is retroperitoneal organ surrounded by complex vascularization which is hard to access through classic laparotomy, laparoscopy approach in skillful hands offers better view, more precise dissection, good bleeding control and exact identification of anatomical structures. Operation time is very similar as in open surgery, hospital stay is shorter with fast and satisfactory patient recovery. Laparoscopic corporocaudal pancreatectomy for benign tumors of pancreas with preservation of spleen and splenic vessels is feasible, secure and superior surgical method comparing to open approach. Crucial fact for secure surgery of the pancreas is good quality surgical training under mentors' supervision.

The Pitfalls Associated with Laparoscopic Major Liver Resections

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Laparoscopic liver resection (LLR) is radically different from open hepatectomy because of the distinct surgical perspective of these two techniques. The lack of a complete hepatic overview and tactile feedback during laparoscopic hepatectomy may result in fatal intraoperative complications despite the advantages of a magnified laparoscopic view and the effects of pneumoperitoneum pressures. This study aims to demonstrate the pitfalls associated with major LLRs.

Consecutive patients who underwent pure LLR between 2008 and 2021 at a single center were retrospectively reviewed. In this video, we demonstrate intraoperative pitfalls associated with different steps of laparoscopic right hemihepatectomy (LRH) and show some tips how to avoid them. A total of 201 consecutive patients underwent pure LLR. The rate of LLRs among liver resections was at 5–10 % until 2015 and reached 50 % in the following years. We performed our first major LLR in 2014 after 7 years of experience with minor LLRs. Major LLRs now represent 17 % of our practice, with 30 hemihepatectomies performed over the last 8 years, with an increasing trend towards the use of this approach. LRH constituted a homogeneous group of major LLRs suitable for critical analysis. We performed 8 LRH and two of them were converted to open liver resection (bleeding and oncological concern). Postoperative complications occurred in two patients, including fluidothorax and bile collection, both treated with ultrasound guided drainage. The mortality in this series of LRHs was zero.

Different scenarios are presented in this video. Anterior approach without mobilization of the right hemiliver in the case of an extremely large hepatocellular carcinoma is demonstrated to avoid any tumor manipulation.

Before embarking on a hilar dissection, the patient's preoperative imaging must be reviewed to acquire comprehensive knowledge of the liver vascular and biliary anatomy and the position of any variant structures. The right portal vein has a typically short extrahepatic course and divides into anterior and posterior sectoral branches. One of the most common variations is trifurcation of the main portal vein into right posterior, right anterior, and left branches instead of the common right portal vein. In this video, the clinical importance of portal trifurcation is emphasized. In case of misinterpretation, extensive bleeding can occur during LRH and if trifurcation is identified in a timely manner, it facilitates the resection in a correct anatomical plane. Vascular inflow control was attempted by extraparenchymal means and a sudden major bleeding from the right portal vein complicated the procedure. Bleeding was successfully managed with vascular clamps. Only after the bleeding was stopped, the procedure was converted to open surgery. Vascular control is technically demanding and delaying the conversion is hazardous. The right hepatic duct was divided intrahepatically during the parenchymal transection. After careful inspection, a bile leak was identified and managed intraoperatively.

Vascular outflow control was attempted. The right hepatic vein was identified at the superior margin of the transection line, dissected out, and suddenly a major bleeding occurred at the site. The bleeding site from right hepatic vein was controlled by an endovascular stapler.

LRH in skillful hands is an alternative to open surgery in selected cases. However, it is a technically demanding and potentially hazardous procedure.

Minimally Invasive Surgery for an Intrahepatic Cholangiocarcinoma

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Intrahepatic cholangiocarcinoma (IHCCA) derives from epithelial cells of biliary tree proximal to second degree bile ducts. Its aggressive biological behavior is associated with 20 % 5-year survival rate. Complete tumor removal with lymphadenectomy offers a hope for a significantly longer survival to a patient. Lower pain, less pulmonary complication, shorter hospitalization and lower blood loss are well known advantages of a minimally invasive surgery. Minimally invasive surgery of liver can be done with laparoscopic and emerging robotic modality. Laparoscopic (LLR) and robotic (RLR) liver resection in a patient with favorable tumor location in liver parenchyma is shown to be safe and ontologically comparable to open procedure. Tumor negative resection margin and adequate liver remnant are key factors for successful liver parenchyma resection. However, role and scale of lymphadenectomy in IHCCA is not yet clearly defined. In era of LLR adequate lymphadenectomy was an Achill heel and main reason for a lack of widespread acceptance in surgical community. A robotic platform allows more efficient lymphadenectomy, compare to laparoscopic approach. Centralization, proper patients selection and learning curve are mandatory for obtaining minimally invasive approach as a method of choice for a treatment of a patient with IHCCA.

Use of Single-Port Technique for Laparoscopic Hepatectomy

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Over the last few decades surgery has become progressively less invasive. In recent years single port technique has been more frequently used for laparoscopic resection both benign and malignant liver lesions. Due to the methods technical challenges, mainly as a result of the loss of triangulation and narrow surgical view, the method is not suitable for every center, surgeon or every patient with liver lesion. Single port laparoscopic technique can be safely applied for left lateral sectionectomy and partial hepatectomy in easy to reach lesions. Further more in hands of experienced minimally invasive hepatobiliary surgeon the technique can also be used to perform major hepatectomies with the resection of more than two segments. In Slovenia single port laparoscopic hepatectomy has been used in the single institution. At University Medical Centre Ljubljana the method was successfully introduced in 2018 and has been since then applied for the treatment of benign and malignant liver lesions in eleven patients. Lesions were chiefly located in the left lateral section or sixth liver segment. The operative time, conversion rate, length of the hospital stay and surgical complications of our centre are comparable to the results of other, larger centres. We performed eleven single port liver hepatectomies (median age 63, range 31 to 79 years). Mean operative time was 97 min. None of the cases was converted to multi port laparoscopic or open surgery. Safe resection margins were obtained in case of malignant disease. The mean hospital stay was 4 days. No major surgical complication or morbidity were noted. As the single port laparoscopic technique is a complex and technically difficult procedure selection of the patients is crucial.

In our experience the method can be safely applied for the left lateral sectionectomy and partial hepatectomy for fifth and sixth liver segments. Both benign and malignant liver lesions can be safely treated with the application of the single port laparoscopic technique.

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The Role of Endoscopic Ultrasound before Cholecystectomy in Patients with Acute Biliary Pancreatitis

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American Society for Gastrointestinal Endoscopy (ASGE) Standard of Practice (SOP) Guideline 2019 removed gallstone pancreatitis as a criterion for early endoscopic retrograde cholangiopancreatography (ERCP). However, most clinicians still assess the risk of choledocholithiasis in patients with acute pancreatitis by using ASGE 2019 criteria although these criteria were not tested specifically in patients with pancreatitis. In this retrospective study we aimed to identify clinical predictors of choledocholithiasis in patients with acute biliary pancreatitis. We also studied the reliability of high and intermediate risk ASGE 2019 predictors of choledocholithiasis in patients with acute biliary pancreatitis. In our hospital, which is a tertiary referral center, all patients with acute biliary pancreatitis (except those with confirmed stones in common bile duct (CBD) with transabdominal US or clinical cholangitis) have performed endoscopic ultrasound (EUS) to confirm or exclude choledocholithiasis before potential ERCP within 24 hours of admission or planned cholecystectomy. Here we studied whether EUS could be avoided in some patients with acute biliary pancreatitis by using ASGE 2019 high or intermediate risk predictors for choledocholithiasis. We thus calculated the proportion of patients with presence or absence specific ASGE 2019 predictor (dilated CBD on transabdominal US, bilirubin level at the time of EUS, increased liver biochemistry, patient's age) according to the EUS result (CBD stone confirmed vs. excluded). Furthermore, we also studied the potential predictive value of improvement of bilirubin and liver biochemistry from the time of admission until the EUS was actually performed. In total we included 73 consecutive patients who were admitted to our hospital due to acute bil-

iary pancreatitis in year 2021 and had performed EUS. EUS was performed at a median of 1 day after admission (interquartile range 0–2 days). EUS confirmed choledocholithiasis in 15/73 (21 %) patients. Among 8 patients with a ASGE high risk criterion (bilirubin > 4 mg/dL + CBD dilatation as assessed by transabdominal US) only 3/8 (37.5 %) had confirmed choledocholithiasis by EUS. Intermediate risk ASGE criteria performed similarly with choledocholithiasis confirmed in 15/60 (25 %), 8/42 (19 %), 5/16 (31 %) ($p = 0.59$) patients with abnormal liver biochemical tests, age > 55 years or dilated CBD by transabdominal US, respectively. Different bilirubin levels were not reliable predictors of choledocholithiasis as patients with low (< 1.81 mg/dL), intermediate (1.81–4 mg/dL) and high (> 4 mg/dL) bilirubin had similar proportions of EUS-confirmed choledocholithiasis (4/22 (18 %), 5/24 (21 %), 6/22 (27 %), respectively ($p = 0.76$). Also, drop of bilirubin by 50 % from admission until EUS examination was not predictive of choledocholithiasis vs. no choledocholithiasis (26 % vs 33 %, $p = 0.69$). In this retrospective cohort of patients with acute biliary pancreatitis ASGE 2019 and biochemical criteria were not reliable tool for prediction of choledocholithiasis. Our findings suggest that EUS should be performed in all patients with acute biliary pancreatitis before ERCP or cholecystectomy.

Recommendations for Surgical Treatment of Acute Cholecystitis

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Acute calculous cholecystitis is a very common surgical emergency. The diagnosis is made on the basis of clinical examination, laboratory tests and imaging techniques. Abdominal ultrasound is the preferred initial imaging technique for the diagnosis of acute calculous cholecystitis. When the diagnosis of acute calculous cholecystitis is made and the surgical treatment is considered, the associated common bile duct stones risk has to be evaluated. When the risk of associated common bile duct stones is moderate or high, the preoperative endoscopic ultrasound has to be performed and in case of confirmed choledocholithiasis, endoscopic retrograde cholangio-pancreatography has to be performed.

Acute calculous cholecystitis usually requires surgical treatment, with the removal of the gallbladder. Cholecystectomy has been widely accepted as an effective treatment of acute cholecystitis. In the past, open cholecystectomy was the preferred operation, but in the modern era with the development of minimally invasive surgery, the laparoscopic cholecystectomy has become the first-line treatment for patients with acute calculous cholecystitis. Laparoscopic cholecystectomy should be avoided in case of septic shock or absolute anaesthesiology contraindications. Previous abdominal surgery is not considered as contraindication for laparoscopic cholecystectomy. Local inflammation, especially in gangrenous and emphysematous cholecystitis, has been considered to increase the risk of bile duct injury, blood loss, operative time, general morbidity and mortality in comparison with open surgery. As technical difficulties usually decrease with experience and improvements in surgical technique and instrumentation, the hesitation to safely perform laparoscopic cholecystectomy in patient with acute gallbladder inflammation has decreased over the years. Recent studies have clearly shown the safety of laparoscopic cholecystectomy in patients with acute cholecystitis.

According to available data, laparoscopic cholecystectomy was associated with a lower complication rate and with a shorter hospital stay. There were no differences in terms of morbidity, operative time and intraoperative blood loss and bile leakage; however, the laparoscopic approach showed a decrease in mortality rate, postoperative hospital stay, wound infection and pneumonia. Moreover, the operative time progressively became shorter.

A special attention is needed in patients with liver cirrhosis, in pregnant patients and in patients over 80 years old. In cases of liver cirrhosis, surgical dissection could be difficult and there is a higher risk of bleeding and other serious complications. Laparoscopic approach should be the first choice for cholecystectomy in Child A and B patients. For patients older than 80 years old, laparoscopic cholecystectomy is suggested in cases of acute cholecystitis. The second reason for non-obstetrical abdominal emergency after appendicitis is acute calculous cholecystitis and the vast majority of studies suggest laparoscopic cholecystectomy for acute cholecystitis until the end of the second trimester.

Difficult laparoscopic cholecystectomy due to acute cholecystitis can be attributed to severe inflammation, obesity, liver cirrhosis, adhesions. In such cases conversion to open surgery is recommended to avoid severe bleeding or bile duct injury. The other options in cases of a "difficult gallbladder" include subtotal cholecystectomy, fundus first cholecystectomy perioperative cholangiogram or a combination of these options.

The timing of laparoscopic cholecystectomy has been a subject of many debates. The World Society of Emergency Surgery guidelines recommend early laparoscopic surgery as soon as possible in the presence of adequate surgical expertise, within 7 days from hospital admission and within 10 days from the onset of symptoms.

In conclusion, early laparoscopic cholecystectomy is considered the recommended treatment for pa-

tients with acute cholecystitis, who are fit to undergo surgery.

Complications of Laparoscopic Cholecystectomy: Gastroenterologist's View

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Bile duct injuries are complication of laparoscopic cholecystectomy and occur in 0.4–1.5 % of cases and can have significant and serious consequences for the patient. According to Strasberg classification, they are classified into types A to E. Several injuries and complex hilar lesions or total transections are not amenable to endoscopic treatment. Biliary and cystic duct leaks represent type A, C and D injuries. Type A and D injuries can be managed by insertion of a plastic biliary stent across the papilla of Vater at the time of ERCP with or without sphincterotomy. The goal is to eliminate the transpapillary pressure gradient and thereby allowing transpapillary bile flow. Typically the stent is removed in two to six weeks if the clinical course is favourable. In case of a refractory bile leak despite plastic stent placement, a fully covered self expanding metal stent placement or n-butyl-2 cyanoacrylate leak occlusion are rescue options. Recently, a placing of a bio-degradable stent is a welcome alternative, as it alleviates the need of a second ERCP. Type C injuries are usually not manageable endoscopically, although novel endoscopic techniques are emerging with excellent success. Type E injuries are the most serious, and when detected during initial procedure, are managed surgically. In case of major bile duct stricture or partially occlusive surgical clip, complication can be managed endoscopically by

dilation and stent placement. Serial dilations and stent exchange/placing of multiple plastic stents are done for a period of 12 months every 3 months. Sphincterotomy is usually performed in such cases to facilitate repeated stent exchanges. If bile duct is completely obliterated or transected, endoscopic treatment is not possible. In case of failure of endoscopic treatment, a surgical approach by creating bilo-enteric anastomosis is a rescue option. Such endoscopy treatment requires experienced ERCP operator and should be performed in a high volume tertiary referral center. Vast majority of bile leaks without bile duct injury is managed endoscopically (over 90 %). Strictures seem to be more difficult to treat with 50–75 % success rate of endoscopic therapy, failure can be at least partly attributed to lower patient compliance due to need of several repeated ERCPs. Bile ducts injuries after laparoscopic cholecystectomy are best managed in an interdisciplinary manner. The preferred method (ERCP, PTC or surgery) depends of location of the injury and local expertise.

Complications After Laparoscopic Cholecystectomy – Surgeon's Perspective

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Since its introduction into the surgeon's armamentarium, laparoscopic cholecystectomy (LC) has become the operation of choice for patients with cholelithiasis and acute cholecystitis. It is associated with earlier mobilisation due to lesser postoperative pain and discomfort, shorter hospital stay, early return to work and better cosmesis with lower hernia rate. However, on occasion, the procedure can be associated with serious and potentially life-threatening complications.

Complications can be divided into:

- general surgical, such as bleeding, inflammation, hernia, etc.,
- procedure-related, e.g. perforation of bowel during trocar insertion,
- biliary complications due to injury to part of the biliary tree.

General surgical and procedure related complications of LC have been reported with a variable incidence. These injuries can range from minor to major injuries of the bowel, bladder, diaphragm or intra-abdominal and have the potential to cause significant morbidity and mortality. In contrast to the biliary complications, they have potential for immediate fatality if not diagnosed and treated in a timely manner. Vascular injuries are the most common ones, and after the complications of anaesthesia, they are the second leading cause of mortality and morbidity in laparoscopic surgery. Bleeding account for up to one third of all major complications seen in LC. The reported incidence of uncontrollable bleeding in LC can be up to 0.3–2 %. Bowel injuries occur due to port insertion, handling of intestine or thermal injury as a consequence of equipment malfunction. They occur in around 0.13 % of LC. Surgical wound infection is a complication that occurs with lower frequency in LC than in open cholecystectomy (1.1 % vs. 4.0 %).

Hernias at the port site are mainly associated with increased BMI, a diameter of the trocar, duration of the surgery, severity of inflammation, widening of the port for extraction of gallbladder, with reported incidence between 0.14 % and 5.4 %.

Biliary complications occurring after LC lead to significant morbidity. Bile collections, fistulae, jaundice, cholangitis, sepsis, and other complications are consequences of bile stasis due to partial or total transection of biliary tree. Re-operation is often required, performed preferably by a specialized HPB surgical team, to reconstruct and drain the biliary tree adequately. Ducto-ductal anastomosis or hepaticojejunostomy are the most common procedures. These injuries are usually not immediately fatal but tend to produce long-term morbidity and loss in life expectancy. Severe bile duct injuries accompanied by lesions of vasculature, can in the worst scenario lead to acute liver failure, which necessitates in liver transplantation. Complications are in majority operator dependent and largely preventable. LC has many advantages over the standard open cholecystectomy: minimal trauma, decreased pain, shorter hospital stay, quick recovery and return to work. However, numerous studies have shown that LC is associated with a higher frequency of complications compared to the standard open cholecystectomy especially including lesions to the common bile duct, injury to the vascular and visceral structures during the application of a Veress needle and trocars.

Complications After Laparoscopic Cholecystectomy – Interventional Radiologists Perspective

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Bile duct injuries are infrequent but serious complications of laparoscopic cholecystectomy. The successful management of these injuries depends on the injury type, the timing of its recognition, and the availability of an experienced hepatobiliary multidisciplinary team. Interventional radiologist is, together with HPB surgeon and gastroenterologist, important part of the hepatobiliary team. Interventional radiology offers a wide array of procedures to manage different complications related to laparoscopic cholecystectomy. Bile duct injuries may lead to bile leakage, intra-abdominal abscesses, cholangitis and development of chronic bile duct strictures. Imaging is important for the initial diagnosis of bile duct injury, assessment of its extent, and guidance of its treatment. Imaging options include ultrasonography and computed tomography as a primary imaging methods and magnetic resonance cholangiopancreatography can be used for better depiction of the biliary tree anatomy. The addition of hepatospecific contrast agent to the MRI examination can help with localizing of the bile duct injury. Percutaneous transhepatic cholangiography is rarely used as a diagnostic tool in modern radiology and is usually performed only during the therapeutic procedure. Various percutaneous interventions are used for the management of postsurgical complications, depending on the type of injury. In the case of biloma or abscess forming a percutaneous imaging guided (CT or US) drainage can be performed. This procedure has a high technical and therapeutic success rate, exceeding 90 %. In the case of bile leaks percutaneous transhepatic biliary drainage can be used if ERCP is technically unfeasible or has not reached the desired result. In the case of biliary strictures, a percutaneous balloon dilation of the stenosis with temporary drain

stent insertion can be used to resolve the stenosis. The new techniques for management of bile duct injuries and duct stenosis include temporary covered stent insertion and biodegradable stent insertions; up to date only small studies have been published with the use of these novel devices but initial results are promising. Percutaneous interventional procedures may be performed for definitive treatment or as adjuncts to definitive surgical repair. The most important aspect for successful treatment of the complications after laparoscopic cholecystectomy remains the choice of the most appropriate procedure and good interdisciplinary collaboration among all the members of the hepatobiliary team.

Emergency Surgery – Challenges in Safe Application of Minimally Invasive Surgery

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Urgent surgical conditions are one of the most significant causes of morbidity and mortality in work capable population. The most common causes of are bleedings, trauma and hollow organ perforation. Many of these conditions are followed by reduced visibility and difficulty in identification of anatomical elements. Only in the past several years had the minimally invasive surgery got a more important place in treatment of acute surgical conditions. Initially limited to exploration and diagnostic, with the improvement of technology and education it is now possible to perform even the more complex operations. Ulcer and liver sutures, as well as more complex operations such as splenectomy and bowel resection can be performed laparoscopically. But still, minimally invasive surgery is not yet a first choice treatment option in treating urgent surgical conditions. Another point of consideration is learning curve as well as high cost of equipment. Some of the more severe cases require urgent surgical exploration so the time frame can be restrictive in choosing the options of treatment for these patients. This review will show some of the most important points in safe application of minimally invasive surgery and what could be done in its more widespread application.

How Do We Follow Guidelines in Acute Appendicitis? – Croatian National Survey

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Although the WSES 2020 guidelines in the management of acute appendicitis comprise all the diagnostic, operative and postoperative issues there is still an impression that the appliance of guidelines needs to increase. Therefore, we carried out the survey among the surgeons in our region in order to evaluate the appliance of the guidelines for the management of acute appendicitis. The survey was sent to the surgeons that perform the laparoscopic appendectomy in 20 hospitals in region. The survey comprised 18 questions: 15 were refereed to clinical practice and 3 questions about the surgeon that filled the survey. The questions dealing with the management of the acute appendicitis included issues about the technical details, diagnosis and the role of antibiotics. The results were generated anonymously without revealing the identity of surgeon and the institution. The only published personal data included the number of surgeons that took part in the survey, the years in active surgical service, the type of the institution where they work and the number of performed laparoscopic appendectomies per year. The 57 surgeons took part in survey. 42.3 % of surgeons work in clinical hospital centers, 31.5 % in clinical hospitals, 24.1 % in county hospitals and one participant is retired. According to the experience in surgical practice: 30.9 % were surgeons for 10–15 years, 27.3 % were 5–10 years, 25.5 % were surgeons less than 5 years and 3.6 % had more than 30 years in surgical practice. The number of performed appendectomies per year was “more than 10” in 83.6 %, “less than 10” 10.9 % and only 5.5 % “less than 5”. The main differences in surgical practice from the WSES 2020 guidelines was found in the few main points: antibiotic appliance, indications for the drain placement and the indication for aspiration or irrigation. On the other hand 83.6 % of surgeon do not use any clinical scoring system in the setting of clinical diagnosis

of acute appendicitis. Guidelines usually present suggested and not obligatory pattern of the practice, especially in our region. However the more accurate appliance could bring to more rational clinical and economic outcome in the management of the acute appendicitis.

Securing the Base of the Appendix During Laparoscopic Appendectomy

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In contrast to classical appendectomy where the appendiceal stump is secured by a single or double ligature, in laparoscopic appendectomy various ways of securing the stump are mentioned. Each of these methods has advantages and disadvantages. Since different possibilities exist for closing the

stump, it is very important to find the optimum method for closure of the appendiceal stump, bearing in mind their simplicity, biocompatibility and price. The aim of this lecture has been to present the problem of securing the base of the appendix during laparoscopic appendectomy.

Development in the Surgical Treatment of Acute Appendicitis Before and After 2015 – A Single Centre Experience

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Acute appendicitis is one of the most common indication for urgent abdominal surgery. Laparoscopic appendectomy has progressively replaced open appendectomy and become the treatment of choice for suspected uncomplicated appendicitis and is strongly recommended for complicated appendicitis.

The aim of the study was to research the implementation of laparoscopy for acute appendicitis after 13th Congress of Slovenian Society for Endoscopic Surgery. A retrospective data analysis of patients who underwent appendectomy in UCC

Maribor in last five years (2016–2021) was performed.

1256 appendectomies for acute appendicitis were performed 702 (56 %) as laparoscopic and 554 (44 %) as open surgeries. In adults (>18years) 602 (64 %) laparoscopic and 342 (36 %) open and in patients older than 10years 701 (60 %) and 554 (40 %), respectively. After 2015 laparoscopic appendectomy was successfully implemented in UCC Maribor. Laparoscopic procedures in adults increased from 3 % before 2015 to 64 % in last 5 years.

Laparoscopic Appendectomies: Report from General Hospital Celje

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Appendectomy is the most commonly performed surgical procedure in emergency surgery globally. The laparoscopic appendectomy is a safe and efficient operative procedure that has clinical advantages over open method (shorter hospital stay, decreased need for postoperative analgesia, early food tolerance, lower rate of wound infection, earlier return to physical activity) against slightly higher hospital costs. Despite the frequency of laparoscopic appendectomy, there is no consensus on the best way how to perform each step. We have used database from PubMed, MEDELINE, EMBASE and the Cochrane Library to compare our results as complication rates, length of hospital stay, as well as in research for ultimate operative technique. In this research we have found that our results (hospital length stay, postoperative intrabdominal abscesses, incision site infection...) are similar to the results published from world renowned hospitals. We also found that operative techniques and instruments used in this procedures in our hospital are up to date with that used in other hospitals.

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The Covid-19 Pandemic and Acute Cholecystitis – Report from the General Hospital Ptuj

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Acute cholecystitis is a common reason for emergency hospital admission in the field of general surgery. The healthcare system, as well as acute and elective medical care was critically impacted by the coronavirus disease 2019 (COVID-19) pandemic, which was caused by a novel coronavirus (SARS-CoV-2). Beginning in March of 2020, hospitals around the world began postponing elective interventions and sometimes even minimizing operative management of emergency general surgery conditions. The aim of our study was to compare the number of acute cholecystitis complications before and during the pandemic. We performed a study that included patients being treated at the Department of Surgery, General hospital Ptuj due to acute cholecystitis. The patients were divided into two groups depending on the period: the pre-pandemic group, managed between January 1st and December 31st, 2018, and the pandemic group, managed between January 1st and December 31st, 2020. One patient was excluded from the study because he refused treatment. The data were collected from the hospital information system. Fifty-three patients were included in our study, 29 of those in 2018 (pre-COVID group) and 24 patients in 2020 (COVID group). Their mean age was 58.2 ± 16.0 years, 27 (50.9 %) were male. No patient has tested positive for SARS-CoV-2. Median symptom duration before the operation for the pre-COVID group was 3.0 (IQR 5.0), for the COVID group 4.0 (IQR 5.0) ($p = 0.689$). Median leucocyte value upon presentation for the pre-COVID group was $11.8 \cdot 10^9/L$ (IQR 5.9), for the COVID group $14.1 \cdot 10^9/L$ (IQR 6.9) ($p = 0.172$). Median CRP value upon presentation for the pre-COVID group was 66.0 mg/L (IQR 124.5), for the COVID group

122.6 mg/L (IQR 249.9) ($p = 0.180$). The pre-COVID group of patients received drainage in 77.2 %, while patients in the COVID group received drainage in 56.5 % ($p = 0.140$). Ten (34.5 %) patients from the pre-COVID group had disease complications, compared to 16 (66.7 %) patients from the COVID group. The difference was statistically significant ($p = 0.02$). Patients from the pre-COVID group had a gangrenous gall bladder in 10.3 %, and had a gangrenous gall bladder with an abscess in 10.3 %, while the COVID group had a gangrenous gall bladder in 20.8 %, gall bladder empyema in 20.8 %, and a gangrenous gall bladder with an empyema in 16.7 %. Our findings suggest that there were more complications in the course of acute cholecystitis during the pandemic of COVID-19 in 2020 than in 2018.

Urgent Laparoscopic Approach to Adhesive Small Bowel Obstruction

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Small bowel obstruction (SBO) accounts for 12–16 % of emergency surgical admissions and 20 % of emergency surgical procedures. Due to the possible risk of bowel ischemia or perforation, urgent evaluation is necessary. Urgent surgery is necessary for patients with clinical or radiological signs suggestive of bowel ischemia. Even with the development of laparoscopic surgery, intraabdominal adhesions remain a significant cause of SBO, accounting for 65 % of cases. Approximately 91–97 % of patients with acute small bowel obstruction (ASBO) have a history of abdominal surgery. In a study of 410 patients diagnosed with SBO, a history of colorectal surgery (24 %), gynecological surgery (22 %), hernia surgery (15 %), and appendectomy was common. A systematic review of 25 studies, however, concluded that the laparoscopic approach reduced the incidence and severity of adhesions compared to laparotomy.

The primary goals in the initial evaluation of patients in whom adhesive small bowel obstruction is suspected are:

- Differentiating between adhesive small bowel obstruction and other causes of bowel obstruction.
- Assessing the need for urgent surgical exploration.
- Identifying and preventing complications from bowel obstruction.

CT scan with oral water-soluble contrast is the preferred technique of imaging in the initial evaluation. Ultrasound and MRI can be useful in specific situations, such as pregnancy or when CT scan is unavailable. Due to the possibility of iatrogenic bowel damage during surgery, only stable patients (without diffuse peritonitis and/or septic shock with suspicion of bowel perforation), with CT scan findings consistent with a clear transi-

tion point and therefore suspected to have a single obstructing adhesive band should be selected. Patients with diffuse SBO distension in the absence of a well-defined transition point and suspected to have diffuse matted adhesions should be initially managed conservatively, including gastrografin challenge.

Inclusion criteria for laparoscopic treatment of adhesive ileus are: adult patients, informed consent, history of previous abdominal intervention, symptoms of intestinal obstruction such as abdominal pain, nausea or vomiting, abdominal distension and absolute constipation initial CT diagnosis of complete ASBO with an identifiable transition point and an anticipated single obstructing band with completely collapsed distal small bowel loops.

The laparoscopic approach to the treatment of adhesive ileus is associated with better postoperative outcomes, shorter hospitalisation, faster oral diet return after surgery, better quality of surgical outcomes, less blood loss during surgery, fewer postoperative infections and lower re-admission and re-operation rates. This is especially true for single adhesions in carefully selected patients. The risk of bowel injuries seems higher in laparoscopic surgery. Therefore, careful selection of patients for laparoscopic surgery is required and other prospective randomized trials are needed to confirm the benefit of laparoscopy in ASBO.

Morbid Obesity – Acute Abdomen and Complications After Bariatric Surgery Procedures

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Increasing number and even different type of BS (bariatric surgery) procedures requires treatment of acute and/or chronic surgical complications in local emergency unit. It is mandatory to take into account the professional and ethical standards of treatment adopted by the associations of bariatric surgery. The altered physiology of various organs dictates a critical preparation for surgery; knowledge of the altered physiological response enables earlier detection of complications after surgery and prompt action.

Abdominal pain in bariatric patients may be caused by complications specific to a particular surgical procedure or by nonspecific complications. General postsurgical complications include surgical site infection (SSI), cholelithiasis, bleeding, and small bowel obstruction. Some other clinical situations might be present non-related to bariatric surgery but related to concomitant diseases prior obesity surgery procedure.

Key points:

- Bariatric patients have high anaesthetic risks and low reserves.
- General surgeons must have appropriate knowledge to manage and understand bariatric procedures and their complications.
- Basic skills and management of acute care bariatric surgery patient is mandatory.
- In patients treated with LAGB surgery, plain abdominal radiology and band position should be assessed, and the band emptied.
- Band slippage is a surgical emergency requiring urgent removal of the band.
- In patients who had laparoscopic gastric bypass, complaints should be evaluated and treated immediately; the patient should never be discharged without consulting a bariatric surgeon.
- There should always be a high suspicion of leak in sleeve gastrectomy patient who is unwell.
- Water soluble contrast imaging (CT + oral water soluble contrast media) should be employed early to locate the leak.
- Gastric balloons might trigger persistent vomiting. Deflation and obstruction can be a serious complication in a patient who is at high anaesthetic risk. It might be related to high intestinal obstruction.
- A bariatric centre should be consulted for all cases showing signs and symptoms suggestive of complications following bariatric surgery, and if possible, the patient should be transferred to the centre early. High standard bariatric care is related to lowering incidence of all over complications rate.

Surgical Treatment of Gastro/Duodenal Perforations – 5 Year Data Analysis From University Medical Center Ljubljana

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Gastro-duodenal perforations are a common pathology in surgical practice. They may be spontaneous or traumatic, where the majority of spontaneous perforations are due to peptic ulcer disease. Other less common causes include malignancy, trauma, iatrogenic injury during medical procedures and chronic use or abuse of drugs. Advancements in the treatment of peptic ulcers and other diseases have significantly reduced the incidence of perforations, but they remain a common cause of an acute abdomen. The mode of management has changed over the past several decades as a result of a better understanding of its common etiologies but remains challenging because many patients present late to the hospital with fully developed peritonitis, sepsis, shock and electrolyte derangements. The treatment of gastro-duodenal perforations is almost in all cases surgical, except when the patient is asymptomatic or unfit for surgery. The gold standard remains the omentoplasty flap closure. However, studies have shown that there is no difference in the outcome in comparison to closing small perforations (<2 cm) with primary suture repair. The development of laparoscopy prompted significant advantages in the management with less postoperative pain, wound infections, faster recovery and no significant differences in postoperative mortality, leak, intra-abdominal abscesses and reoperation. According to the guidelines, the laparoscopic approach is now recommended in all stable patients with small perforations.

To determine the patterns of presentation, mode of management and the outcome of perforations at the Department of Abdominal surgery of University Medical Center Ljubljana, we retrospectively analyzed five-year data (2016–2021) of patients treated for spontaneous gastro-duodenal perforations. Within the analyzed period we operated on

213 patients. There were 135 (63.4 %) males and 78 (36.6 %) females with a median age of 62.2 years. 102 (47.9 %) patients presented less than 24 hours after the onset of symptoms and 82 (38.5 %) had one or more severe comorbidities. 129 (60.6 %) perforations were located pre-pyloric, 58 (27.2 %) involved the duodenal bulb and 26 (12.2 %) were found in other parts of the stomach or duodenum. 77 (36.2 %) were treated with laparoscopic repair and 136 (63.8 %) underwent open surgery. The conversion rate was 7.2 % (6). The combined median length of stay was 13 days and the 30-day mortality rate was 11.3 % (24). All the deceased patients had at least one severe comorbidity. The laparoscopically treated patients had a mean ASA score of 2.1, Boey score of 0.65, perforation diameter of 6.3mm, operating time of 51.2 minutes, re-operating rate of 9.1 % (7), a hospital stay of 9.2 days and 30-days mortality rate 0 % (0). While the patients with open surgery had a mean ASA score of 2.9, Boey score of 1.4, perforation diameter of 12.8mm, operating time of 46.6 minutes, re-operating rate of 14 % (19), a hospital stay of 16 days and 30-day mortality rate 17.4 % (24). In the laparoscopic approach, 10.4 % (8) of the perforations were treated with primary suture repair, 74 % (57) were repaired with primary suturing and omentopexy, 14.3 % (11) with omentoplasty and in 1.3 % (1) other procedures were done. In the open approach, 5.9 % (8) of the perforations were treated with primary suture repair, 9.5 % (13) with primary suture repair and omentopexy, 80.9 % (110) with omentoplasty and 3.7 % (5) with other procedures. There is a clear trend with very good outcomes in treating stable patients with smaller perforations laparoscopically, albeit in unstable patients, who have comorbidities and larger perforations the open approach is still the norm. Later also results in a longer hospital

stay, number of re-operations and 30-day mortality rate. Based on this analysis, one of the most important prognostic factors for the outcome of the

treatment is the status of the patient in terms of the presence of comorbidities, underlying disease and clinical status upon admission.

PIPAC – Pressurized Intraperitoneal Aerosol Chemotherapy

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Peritoneal carcinomatosis is usually associated with a poor overall survival rate often measured in months. Patients are often subjected to symptoms and complications that impact their quality of life. The occurrence of peritoneal carcinomatosis has been shown to significantly decrease overall survival also in patients with liver and/or extraperitoneal metastases from gastrointestinal cancer.

The effectiveness of systemic chemotherapy in peritoneal carcinomatosis is low due to the plasma-peritoneal barrier. To achieve a higher drug concentration in the peritoneal cavity, intraperitoneal chemotherapy has been performed.

Multiple therapeutic approaches have been developed for improved intraabdominal management of peritoneal carcinomatosis. Aggressive cytoreduction followed by hyperthermic intraperitoneal chemotherapy (HIPEC) is currently the only potentially curative option with good results but this multimodal treatment is limited to a few highly selected patients. Pressurized Intra Peritoneal Aerosol Chemotherapy (PIPAC) was introduced as a novel minimally invasive treatment modality for intraperitoneal drug delivery in patients with refractory peritoneal cancer in November 2011.

PIPAC combines the benefits of intraperitoneal administration with pressurized vaporization of the drug to achieve homogenous distribution with deep penetration and increased intra-tumoral concentrations of the drug with low systemic toxicity. Pre-clinical studies showed good penetration of PIPAC into the tumor nodules and good distribution inside

the abdominal cavity. Because of a minimally invasive approach, repetitive application is possible with low morbidity. According to studies, PIPAC is a possible palliative therapy option for patients who are not eligible for cytoreductive surgery and HIPEC.

Surgical complications are rare. Across all types of studies, adverse events occurred after 12–15 % of procedures. The most common events were bowel obstruction (0–5 %), bleeding (0–4 %), and abdominal pain (0–4 %). Whereas no mortality was observed in prospective trials, the mortality in retrospective studies was around 3 %.

Using PIPAC can induce an objective clinical response rate in resistant peritoneal metastasis of ovarian, colorectal, and gastric origins of 62–88, 71–86, and 70–100 percent respectively, and stabilize or improve quality of life.

PIPAC is a feasible, safe, and well-tolerated therapy. PIPAC is a possible palliative therapy option for patients who are not eligible for cytoreductive surgery and HIPEC. Data on objective response and quality of life were encouraging. Cytoreductive surgery and HIPEC can be achieved in strictly selected patients with unresectable peritoneal carcinomatosis at diagnosis after repeated PIPAC treatment with palliative intent. The combination of PIPAC with systemic chemotherapy may offer a greater clinical benefit than standard systemic treatment alone. A prospective PIPAC registry (NCT03210298) and future prospective clinical trials, including a phase III study, should help define the most appropriate indications for PIPAC treatment.

Laparoscopic Partial Adrenalectomy for Aldosteronoma

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Since its first description in 1992, laparoscopic adrenalectomy has become the gold standard for the surgical treatment of most adrenal conditions. We demonstrated the safety and feasibility of the laparoscopic technique in patients with primary hyperaldosteronism caused by solitary aldosteronoma treated by laparoscopic partial adrenalectomy. 13 patients with hyperaldosteronism and a single adrenal adenoma (Conn's syndrome) were treated with laparoscopic partial adrenalectomy. The mean age was 65 years, and the average tumor size was 1.35 cm in diameter. The mean follow-up of our patients for hypertension and local recurrence was 36 months (range 6–72 months).

A transperitoneal approach was used in all patients and all procedures were finished laparoscopically with no major intraoperative or postoperative complication. In all the cases, hypertension improved totally or partially, and no local recurrence was observed. Laparoscopic partial adrenalectomy for aldosterone-producing adenomas is a minimally invasive procedure with a low complication rate and can be performed with good results for patients with small aldosteronomas of the adrenal gland, even with a healthy contralateral adrenal gland.

Prevention of Musculoskeletal Injuries During Endoscopic Procedures by Using Belt-Like Manoeuvring Device with Joystick Capabilities

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Gastrointestinal endoscopy forms a significant proportion of clinicians workloads. However, little attention is given to the ergonomic aspects of endoscopy. Experimental studies showed that forces and loads placed on endoscopists' bodies during procedures place them at risk of occupational injury. The main goal of the study was to show the difference in muscle work and overload during endoscopic procedures by applying belt manoeuvring device with joystick abilities. It is a novelty in the area of endoscopic ergonomics with the intent of risk reduction and prevention of musculoskeletal injuries related to endoscopy. By using surface electromyography muscle potentials were measured in areas of specific muscles of the left hand: Deltoid, Biceps, Triceps, Flexors, Extensors. Potentials were measured with and without the application of belt manoeuvring device. The subject exercised the same basic set of endoscopic manoeuvres and movements for 1 minute, with and without the application of the belt- manoeuvring device. Measured potentials showed that by using belt-like manoeuvring device muscle load on the left upper limb and shoulder significantly decreased. A filter determining muscle work done was applied in software analysis. It showed a significant decrease in muscle work in left extensors, flexors and biceps muscle when using Endojoystick. Subjectively, scope stability was improved. Our data suggest a reduced risk in endoscopy related musculoskeletal injuries and subjective scope stabilisation improvement. Further studies on greater population are in progress.

Ergonomics in Surgery

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Work-related musculoskeletal disorders affect a significant number of surgeons. They are defined as injuries that affect various elements of the musculoskeletal system, such as the tendons, nerves and joints. The most commonly affected regions include the neck, shoulders and lower back and can lead to numerous disease processes such as carpal tunnel syndrome, spinal radiculopathy and rotator cuff disease.

Surgeons practicing minimally invasive procedures appear to be experiencing more work-related musculoskeletal injuries. The disadvantages of minimally invasive surgery are a static position of the neck and back for a long period of time, the arms and shoulders are often in uncomfortable positions. Prolonged static postures are the source of muscle fatigue and are associated with musculoskeletal injuries.

Work-related musculoskeletal disorders are the most common cause of work absenteeism in healthcare workers. They are associated with loss of productivity, increased health care, disabilities and compensation costs. Patient's care can be compromised by reducing the surgeons' dexterity, range of motion, grip strength and proprioception. It has been proposed that ergonomics can facilitate surgeons in the process of altering their everyday practice to alleviate the physical stressors that occupational musculoskeletal disorders and improve their general well-being.

We performed a prospective national cross-sectional study to define the prevalence of occupational musculoskeletal disorders in the population of Slovenian general and abdominal surgeons and analyzed factors associated with its occurrence.

Extraperitoneal Rectal Cancer: Which Technics?

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During last century surgical strategy for rectal cancer moved from Miles' procedure, to Hartmann's, to anterior resection, to total mesorectal excision and finally to laparoscopic surgery.

In an extraordinary acceleration in the last 20 years therapeutic strategy moved towards TAMIS, robotics, watch and wait and TaTME, essentially because of the improvements in techniques, increased diagnostic precision and tailored adjuvant therapy as well.

The upper level of the so called "grey zone" of extraperitoneal rectal cancer has become lower and lower, and if we are using the Rullier's classification we are currently seeing that Miles' procedure has very reduced indications, and when it is the case an extended version should be used.

But is this classification enough to choose the best technics for the best patient? Probably other factors have to be assessed: of course general conditions and continence, but also mesorectum shape and volume and anorectal angle, anatomical patterns that could simplify or worsen the operation.

Currently we can choose between open surgery, laparoscopy, TaTME and robotics, but there is also a return of indications for delayed anastomosis, not only for rescue cases.

Laparoscopy has been proven to be as safe as open surgery, with the limitations due to bulky tumors in narrow pelvis: in such cases a transanal open approach has been used from at least 30 years, and now the TaTME is finally just the video assisted extended indication of an old approach. Some concerns have been raised towards the learning curve for a "reverse" anatomy, with the apparent advantage of a better completeness of mesorectal excision and a possible reduction in anastomotic leakage. Robotics seems to allow a

more precise dissection even in difficult pelvis, even if the linear distal stapling is as difficult as in laparoscopy.

Delayed anastomosis decreases the anastomotic leakage rate in literature, however no clear data have been shown concerning functional results. Finally different studies are showing how any intervention provokes specific fatigue and posture problems to surgeons.

In conclusion, if just 7 years ago I was proposing lap TME for planned colorectal anastomosis and TaTME for planned coloanal anastomosis, with the exception for bulky tumors in narrow pelvis whatever their level, now I think that we should take into account 3 different aspects for each patient:

- tumor distal level and sphincter infiltration, as obvious, and mesorectal thickness and anorectal angle as anatomical landmarks
- pathological response to radiochemotherapy
- pretreatment continence.

On this basis the choice of a fully abdominal approach (laparoscopic or robotic) or of a transanal approach could be proposed, in a tailored way, leaving in my opinion the delayed anastomosis for particular cases, the Hartmann operation for incontinent patients with a sphincter-free tumor, and the extended Miles' procedure for sphincter involving cancers.

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Anastomotic Leakage After Laparoscopic or Open Rectal Cancer Resection – How to Avoid Permanent Stoma

Bojan Krebs, Urška Gajšek, Nuhi Arslani, Stojan Potrč

University Medical Centre Ljubljana

Although many improvements have been made for rectal cancer patients in the last decades regarding operative techniques, oncological treatment and general patient care, postoperative complication rate is still high. One of the most feared one is a problem with anastomosis. Anastomotic leakage after rectal surgery for cancer is quite often and has a high morbidity and a not-so low mortality rate. Failure to rescue is relatively high. Anastomotic leakage has also been connected with increased local recurrence and lower survival rates. Reported leak rates are very variable (from 3 to over 27 %), probably because there is no clear international definition and grading system regarding anastomotic leakage. Most common risk factors for leaks are male sex, ASA (American society of Anesthesiologists) grade, very low anastomosis, neoadjuvant treatment, obesity, and smoking. While anastomotic leaks can be devastating in the early postoperative period, the diagnosis and management of a late or chronic anastomotic leak can represent an even greater challenge. Unfortunately, it is little known about late leaks and the proportion of those which develop into chronic presacral sinus. In most cases, chronic anastomotic leak is diagnosed during preoperative radiographic imaging prior to defunctioning stoma closure. In the worst scenario, the leakage is missed, stoma reversed and the patient readmitted weeks or even months later in poor condition with presacral abscess, osteomyelitis and ongoing sepsis, which could in some cases even be fatal. Regarding to some literature, one third to up to one half of all anastomotic leaks are diagnosed beyond 30 days postoperatively and represent late leakages. A very important factor in understanding late leakage is defunctioning stoma. If the patient has stoma it could alter clinical course, ameliorating symp-

toms, decrease the need for laparotomy and turn early to late leak. Treatment options for late anastomotic leakage are many and vary from simple endoscopic procedures (instillation of fibrin glue, over the scope clip, marsupialisation of sinus tract, negative pressure sponge) to mayor pelvic surgery with oversuturing the leak (transabdominal or transanal), performing a new anastomosis or even abdominoperineal resection. Late anastomotic leak represents a challenge for a rectal surgeon. Clinical symptoms are hard to find especially in patients with defunctioning stoma and management must always be patient dependent.

Laparoscopic Right Hemicolectomy– Oncological Principles and Technical Pitfalls

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Besides significant advances in drug therapy of colon cancer, surgery still remains the first choice of treatment. Traditionally, oncological resection implies removing the sufficient length of colon with tumor and intact mesocolon together with the associated blood and lymph vessels as potential routes of metastatic spread. In addition to conventional surgery for right colon cancer involving D2 lymphadenectomy, in 2009. Hohenberger introduced the principle of central mesocolic excision with central vascular ligation (CME with CVL) which is similar to that of D3 lymph node dissection, advocated by the Japanese Society for Cancer of the Colon and Rectum (JSCCR) in the twentieth century. Today is well known that laparoscopic surgery for colorectal cancer offers faster recovery, less post-operative pain and shorter hospital stay with a long term oncological outcome similar to open surgery. As the noninferiority of laparoscopic versus open techniques has already been established in D2 resections, recent years CME with CVL or D3 concept based on open surgery has been adopted in laparoscopic surgery. Complicated mesenteric dissection and central vascular ligation in laparoscopic surgery is different from that of open surgery and imposes a longer learning curve for the surgeons and a higher surgery-related risk for patients due to the variable surgical anatomy. So far, there are no guidelines who have clearly defined the extent of lymphadenectomy of the radical right colectomy and there are still doubts as to whether CME with CVL can be safely performed by laparoscopic approach. Also there is lack of solid clinical evidence of oncological benefits for radical extended lymphadenectomy, so still remains unclear the need for routinely performing CME with CVL for every patient with right colon

cancer. Awaiting results of ongoing randomised trials, routinely performed extended laparoscopic lymphadenectomy in right colon cancer remains treatment option for selected patients only in experts hands.

Surgical Treatment of the Locally Recurrent Rectal Cancer

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Locally recurrent rectal cancer (LRRC) is one of the greatest challenges in abdominal surgery. It occurs after the completion of the surgical treatment of the primary rectal cancer; however, its complexity requires much higher level of understanding the pelvic anatomy and surgical knowledge than is needed for the treatment of the primary rectal cancer.

The locoregional recurrence rates as well as the observed and cancer-related survival rates showed a considerable interinstitutional and intersurgeon variability. Multivariate analysis confirmed the institution as well as the quality of the specimen and approach of the individual surgeon as significant independent factors influencing locoregional recurrence and survival. In addition to these factors, there is another factor that significantly affects the occurrence of local recurrence and that is the biology of the primary tumor, such as the presence of extramural vascular invasion and/or perineural invasion, presence of the mucinous component, degree of differentiation, number and distribution of affected lymph nodes, involvement of the extramesorectal lymph nodes and so on.

The LRRC appears in the space where the total mesorectal excision has already been performed. Therefore, local spreading pathways as well as surgical approach are completely different from those which are known in the surgical treatment of the primary tumor.

There are several classifications of the LRRC. Only classification proposed by Wanebo takes into account whether LRRC appeared at the anastomotic site or elsewhere. However, LRRC at the anastomotic site is very rare condition, because it appears almost always outside of the bowel due to residual tumor deposits. Classification by Yamada recognizes only three types: localized (affected adjacent organs or connective tissue), sacral inva-

sive type (S3, S4, S5, coccyx or periosteum). Suzuki proposed classification based on degree of fixation (free, fixed but resectable and fixed and not resectable). Guillem proposed classification based on direction of spreading (axial, anterior, posterior or lateral).

The ultimate goal of surgical treatment is monoblock R0 resection. Anything less do not provide any benefit to the patient. Therefore, surgical planning must include removal of the tumor deposits completely surrounded by the layer of the healthy tissue. In the treatment of the LRRC we must include additional layers in the pelvis to obtain the R0 resection. Laterally, these layers include: peritoneum and ureters, vessels, nerves, muscles and bones. Anteriorly: prostate, v. seminales, bladder, uterus and vagina. Posteriorly (and laterally): endopelvic fascia, periosteum and bones. Therefore, surgical procedures always include some kind of pelvic exenteration. After extensive surgical procedure, it is always necessary to reconstruct the pelvic floor, mostly using different flaps or rarely meshes.

Planning of the surgery must be based on high quality MRI images performed in standard planes and sequences as well as in non-standard planes, if necessary.

Therefore, surgery treatment of LRRC should be performed in centers with experience and knowledge with this kind pathology, where all kinds of necessary specialists are available (surgeons, urologists, gynecologists, plastic surgeons, radiologists, pathologists and many others). This treatment also includes neoadjuvant treatment as well as nutritional treatment.

Laparoscopic Surgery of Colorectal Cancer in General Hospital Murska Sobota

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Colorectal cancer is a major health problem worldwide. In Slovenia, it is in third place in terms of frequency, with a declining trend in the last few years. Laparoscopic colorectal resections are standard in the treatment of these patients. They were introduced in the early 1990s. Large studies have shown that laparoscopic surgeries are oncologically equivalent, or better than classical surgical techniques. The short-term advantages of laparoscopy are: less postoperative pain, shorter postoperative intestinal paresis, faster rehabilitation, shorter hospitalization. Long-term advantages are: fewer postoperative hernias, better aesthetic result, better quality of life.

The purpose of the study is to present the 6-year results of operative treatment of colorectal cancer after classical and laparoscopic surgery at the General Hospital Murska Sobota.

We made a retrospective analysis in the period from January 2016 to December 2021. We collected data on the patient's demographic characteristics, type of surgery, tumor location, histological characteristics of the tumor, complications, bed rest, conversions. Depending on the type of surgery, we divided the patients into two groups: laparoscopic and open. In data processing we used the methods of classical statistical analysis. The significance level was 0.05. There were a total of 362 patients. 304 were operated on electively, 58 urgently. 220 men were operated on, 142 women. The laparoscopic group had 144 examinees, 218 were open. A total of 39.8 % of patients underwent laparoscopic surgery. If we analyze only elective operations, then 47.6 % of patients underwent laparoscopic surgery. Tumor location was in 29.5 % ascending colon, 13.8 % transverse colon, 24.5 % descending I sigmoid colon, and 32.2 % rectum. There were no statistically significant differences between groups for these parameters. The TNM classifi-

cation was distributed as follows: T0 tumor had 3 % (11), T1 7 % (25), T2 15 % (54), T3 47 % (170), T4 28 % (102). The difference between the groups according to the distribution of the TNM classification existed but was not statistically significant ($p > 0.05$). Average on 24.8 lymph nodes in all groups were removed. In the laparoscopic group, the average number of lymph nodes removed after surgery was on 23.94 (min 13, max 92), in the open group on 25 (min 10, max 81). The number of positive lymph nodes removed in the open group was 1.83 or 7.32 %. In the laparoscopic group, there were 1.47 or 6.14 % positive lymph nodes. There was no statistically significant difference between groups for the number of removed and positive lymph nodes ($p > 0.05$, $\chi^2 = 1.94$). The percentage of conversions from laparoscopic to open surgery was 13.6 %. The 30-day postoperative morbidity was 13.2 % in the laparoscopic group and 14.5 % in the open-label group. The difference was not statistically significant ($p = 0.672$, χ^2 test). According to the Clavien Dindo scale (CD), we divided patients into those who had surgical treatment of complications ($CD > 3$) and those who did not require surgical reintervention ($CD < 3$). The difference was statistically significant, in the laparoscopic group we had fewer complications $CD < 3$, which did not require surgical treatment ($p < 0.05$, $\chi^2 = 2.37$). We had dehiscence of the anastomosis in 3 % of cases in total, without statistical difference between the groups, but the difference was very close to statistically significant. 30-day mortality was 3.4 % in the open group and 1.1 % in the laparoscopic group, the difference was statistically significant ($p < 0.05$). The average time of hospitalization was 12 days in the open group and 8.5 days in the laparoscopic group. When we examined patients who had complications with surgical reintervention ($CD > 3$), the time of hospitalization in the open group was 8 days in the laparoscopic 5.5 days, the

difference was statistically significant ($p < 0.05$). Laparoscopic colorectal surgery at General Hospital Murska Sobota is a standard procedure with good oncological results. Laparoscopic resections have a shorter hospital stay, lower morbidity, and faster rehabilitation compared to open surgeries. The analysis included a large number of patients

over a period of 6 years, followed by a short time interval. The disadvantage of the study is that it is retrospective, no selection or randomization of patients. Laparoscopic resections due to colorectal cancer are safe, routine procedures with good results that are comparable to published papers in the literature.

Advances in Robotic Colorectal Surgery

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In minimally-invasive right colectomy intracorporeal anastomosis is proven to decrease postoperative complications and to decrease postoperative length of stay when compared to extracorporeal anastomosis. The robotic approach facilitates intracorporeal anastomosis and shortens the time of anastomosis. ICG technology associated with robotics helps in the identification of important anatomic landmarks and for a complete lymphadenectomy.

In left colectomy robotics has not proven yet oncological superiority compared to standard laparoscopy but its characteristics facilitate a safe anastomosis in left colectomy, the dissection in difficult narrow pelvis in LAR, intraluminal rectal surgery and third space surgery like T4 TME in selected scenarios.

In selected groups of patients undergoing robotic colectomy we propose a prospective protocol of 24 hrs discharge after surgery.

Results of Surgical Treatment After Removal of Malignant Polyps in Patients in Svit Program 2014–2016

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Colorectal cancer is one of the most common cancers and as such a good candidate for screening programs. In our country screening program SVIT is running from 2009 and now all men and women aged 50 to 74 years receive invitations for cooperation every two years. Main purpose of the program is reduced mortality through early detection and second is detect and remove adenomas to prevent future progression to cancer. Changed populations also give us new challenges in treatment protocols. One of such challenge is treatment after endoscopic removal of malignant polyps, especially if polyps are resected in piecemeal technique and give pathologist hard work to define radicality of the removal. Such technique is still most usable after endoscopic detecting of removable polyps.

In program SVIT were until 2015 removed 357 resected polyps with carcinoma after positive test at colonoscopy. In all cases pathologists find adenoma with carcinoma and all cases were presented to multidisciplinary council. If data after pathologist review of resected specimen were inconclusive council recommended surgical removal of part of colon or rectum where the polyp was, with intention of radical resection with lymphadenectomy. Operations were done in all hospitals where colorectal surgery is performed chosen by the patient preference. In three-year period from 2012–2014, was operated 63 patients. 42 patients had a malignant polyp in colon and 21 in rectum. Resections follow the location of the malignant polyp site. Classic resection with laparotomy were done in 25 cases, 25 were laparoscopic, 1 laparoscopic with conversion and 6 were robotic. 3 patients get ileostomy and 1 get colostomy at the operation, none of them have adenocarcinoma in specimen. Mean length of stay was 7.75 days. Minor com-

plications rated by Clavien–Dindo have 6 patients and 1 patient after complications die and have no residual adenocarcinoma. In resection specimens were residual adenocarcinoma in 5 cases and in 5 cases there were adenoma on the place of resected malignant polyp. In specimens were average 13.4 lymph nodes and in 2 cases there were 1 positive lymph node. In both cases there were no residual adenocarcinoma in site of resection of malignant polyp. In 1 case there was satellite adenocarcinoma infiltration in serosa with no positive lymph node. All resection borders were negative.

Surgical treatment of patients after endoscopic removed malignant polyp with uncertain radicality due to piecemeal resection gives patient possibility of complete radical resection. But, 91 % of specimen had no adenocarcinoma and in 3.5 % were positive (one) node with no residual adenocarcinoma cells in specimen. Identifying patients which need surgical resection, with all possible complications, is still a challenge in asymptomatic patients in screening process. Probably artificial intelligence system will give us possibility of more precise decisions for additional surgical treatment after endoscopic removal of malignant polyps.

Diverticulitis in the Frail Elderly Patients

Predrag Andrejević

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Today's society is dealing with an ageing population. WHO estimates that the number of people over sixty years old will nearly double by 2050 when compared to 2015. Increased longevity does not come without a price – both to the patient and to the medical and healthcare industries. Increasing age is associated with increased co-morbidities and a spectrum of decreasing levels of independence and functionality. Thus the elderly population represents a special subgroup within the adult population with its own unique set of needs. This leads one to question: how equipped are we in dealing with an ageing population? Moreover, the ageing population creates both medical and ethical dilemmas, especially in the context of medical conditions affecting patients' cognition and mental capacity. Keeping this in mind, the approach to dealing with acute surgical conditions in the elderly population may not be the same as for the rest of the adult population. We aim to discuss the current updates in the management of diverticulitis in elderly frail patients.

Robotic Versus Laparoscopic Method in Colorectal Surgery

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Minimally invasive approach has gained interest in the treatment of patients with colorectal cancer. The purpose of this study is to analyze the differences between laparoscopy and robotics for colorectal cancer in terms of oncologic and clinical outcomes in an initial experience. We present our initial observations and results of robotic operations of the large intestine with special regard to the patient undergoing robotic surgery of the colon, rectum cancer and compare to the laparoscopic approach.

The first totally robotic-assisted resection of rectum cancer in our department in Slovenia (single docking system) was performed in May 2014. The last patient in 2020 was operated on before the outbreak of SARS-CoV-2 virus infection, and then no robotic operations were performed. Due to the lack of staff, we only carried out emergency operations. Retrospectively we analyzed 85 patients operated robotically, (49 % female, 51 % male). The average age was 63.5 years. 62 % had ASA classification II, colorectal carcinoma were presented in 76 % patients, the others had diverticulosis and benign diseases. 62 % had carcinoma of rectum and rectosigma. Retrospectively we analyzed 110 laparoscopic operations as well (64 % male, 36 % female), the average age was 65.5 years. 40 % of the patients had ASA classification III. Adenocarcinoma were presented in 75 % patients, the others had diverticulosis and benign diseases. The degree of differentiation of the tumor (gradus II) in laparoscopic method was presented in 67 % patients, while in robotic method was presented in 68 % patients. According to the TNM classification in both methods was dominated stage T3 (laparoscopic 44 %, robotic 46 %). Stage N0 for lymph nodes was in laparoscopically operated patients 54 %, in robotically operated patients was 40 %. T1 and T2 tumor were presented in 26 % in the robotic operated patients, 23 % patients operated laparoscopically.

The most common localization in laparoscopic operations was cancer of cecum and colon ascendens (45 %), in the robotic was rectum (22 %) and rectosigma (40 %).

In all patients radical resection has been done. The average number of isolated lymph nodes in the robotic method was 19 while in laparoscopic method was 15.5. The hospitalization was shorter in robotic operated patients (average 7.3 days), on the other hand the time of the robotic operations was longer than laparoscopic operations. Intraoperative blood loss was in the robotic method smaller (50–120 ml) in comparison with laparoscopic method (100–300 ml). Conversion to open surgery was in robotic method lower (4.5 %) than in laparoscopic method (7 %). Laparoscopic method has more frequent complications 9 (10.3 %) while robotic method 4 (9 %). In 10 years follow up 9 laparoscopically operated died (10.3 %), (5 due to cardiovascular disease, 4 due to progression of disease). In this period 3 robotically operated patients died (6 %), one due to progression of disease, the others due to cardiovascular disease. The most common operation was right hemicolectomy (46 %) by laparoscopic procedure, in the robotic method was anterior resection of rectum (54 %). RCS is a promising technique and is safe and effective alternative to LCS for colorectal surgery. The advantages of RCS include reduced EBLs, lower conversion rates and shorter times to recovery of bowel function. Further studies are required to define the financial effects of RCS and the effects of RCS on long-term oncologic outcomes.

Robotic Colorectal Surgery at University Medical Centre Ljubljana

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Robotic surgical systems were designed to overcome the limitations of laparoscopic surgery, offering better visualisation with three-dimensional magnified view and stable camera platform, stabilization of tremors and greater dexterity of movements. Moreover, they also improve the ergonomics, possibly reducing fatigue of the operating surgeon. Key drawbacks include loss of haptic control, longer operative time and above all, increased financial costs.

Shortly after the introduction of robotic platforms, surgeons have begun to utilize robotic surgery for management of colorectal diseases and the number of procedures performed annually has steadily increased. The evolution and usage of robotic platform is well illustrated by bibliometric data, as more and more manuscripts are being published each year, from feasibility studies to case series and reviews, and, finally, more and more multi-centre trials. The abundance of published research clearly shows, how robotic assisted surgery has gained acceptance not only in the field of colorectal surgery, but across many surgical specialities.

Safety of our patients and quality of surgical care was of outmost importance when we implemented a new robotic abdominal program in 2020. Hence, treatment results were not to be compromised. Consequently, only patients with colon and upper rectal cancer were operated at first, because we deemed middle and low rectal cancers not suitable at the beginning of the new program, due to technical demands of pelvic surgery. Our robotic program gradually evolved and we started to perform low rectal and gastric resections as well, just recently we started to implement robotic approach to complex ventral hernia repair. Since the start of the program we performed 200 different robotic operations.

Herein we present outcome analysis of 136 robotic colorectal resections, consecutively operated in 2020 and 2021. There were 65 female and 71 male patients, respectively, with the average age being 68 years. 107 patients (79 %) were operated on for malignant disease, while 29 patients (21 %) were referred to surgery for several benign conditions (IBD, adenoma, diverticulosis). In majority of the patients, 66, a right colectomy was performed. There were also 44 sigmoid or rectosigmoid resections, 14 low rectal resections, 9 left colectomies and 3 Miles' proctectomies. Three patients had to be converted to open surgery. Postoperative complications were stratified according to the Clavien Dindo (CD) classification system. Accordingly, severe morbidity was identified when at least CD grade III or more occurred. In vast majority of the operated patients, there were either no complications (CD 0, 110 patients) or patients had CD 1 or CD 2 grade of complications (23 patients). There were 3 patients with severe morbidity. Two of them were due to anastomotic leakage and both patients had to be reoperated with laparoscopic ileostomy fashioned. Afterwards, both of these patients recovered uneventfully. The third patient with CD grade > III complication unfortunately died several days after the uneventful robotic sigmoid resection due to acute thrombosis of superior mesenteric artery and coeliac axis not amenable neither to endoscopic or surgical treatment. On average, patients were discharged on day 6 after the operation.

Based on the results, it is appropriate to conclude, that our program is safe, results in equivalent postoperative results compared to classic laparoscopy or open approach and is even associated with decreased conversion rates in regards to laparoscopy. The continuity of the program is also established, as we are performing at least two robotic procedures every week.

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Colorectal Stenting – A Gastroenterologist's View

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Large-bowel obstruction caused by advanced colonic cancer occurs in around 10 % of colonic cancer patients. Relief of obstruction is possible by surgery either by decompressing stoma or by resection of the tumour and primary anastomosis. Alternatively, a self expanding metal stent (SEMS) can be placed in an emergency colonoscopy. European guidelines (ESGE) recommend SEMS placement as the preferred treatment for the palliation of malignant colonic obstruction for unresectable cancer. Studies have shown lower morbidity, mortality and fewer stomas in the short term and no difference in long term survival or progression free survival for this indication. Chemotherapy in patients with SEMS safe, however antiangiogenic therapy (bevacuzumab) is associated with an increased risk of early and late perforation. Most patients however, can be treated without these drugs. For patients with an obstruction resectable cancer SEMS can be placed as a bridge to surgery. This way the surgery can be performed electively, without colon obstruction and with a patient which is not acutely ill. This strategy is associated with fewer postoperative complications, lower chance of temporary and permanent stoma, higher primary direct anastomosis rate and no difference in short term and long-term mortality. However, there is a significant chance of perforation during SEMS placement and these patients have higher local and systemic recurrence rates – despite this long-term survival and long-term disease-free survival do not seem to be affected. This strategy may therefore be preferable for elderly patients. A temporary decompressing stoma is also a valid option as an alternative to emergency resection.

SEMS placement in the right colon is more challenging and requires more experience, but studies have show similar results to SEMS placement in the left colon and similar benefits compared to surgery in the palliative setting. SEMS placement

in distal rectal obstruction should be avoided because of a high chance of pain, tenesmus and incontinence.

Colonic stenting can be considered in extracolonic malignancy, however technical and clinical success rates are lower than for primary colon cancer. Non-malignant (diverticular disease) obstruction and angulated strictures are with lower successful decompression chance and higher perforation rates

Colorectal Stenting – A Surgeon's View

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Patients with stage IV colorectal cancer represent a difficult segment for treatment because of their limited life expectancy and poor general state that makes any aggressive interventions hazardous if not pointless in the light of their limited life expectancy. The most common complication is the rectal obstruction, which represents a surgical emergency, exposing often frail and disease stricken patients to a dangerous operation. Most commonly, a diverting loop colonostomy is performed. But even such a small surgical procedure has been reported to carry a high morbidity. Recently the self-expanding stents have been introduced as a valid alternative to surgery in palliative setting and as a method of bridging until resection. From 2013 we performed stenting in 66 patients with colorectal carcinoma either to resolve obstruction or as bridging method. We analyzed the morbidity and mortality of procedures, length and the costs of the hospital stay, and the survival of patients treated. At first we used fluoroscopic guidance for stent placement but later we adopted endoscopic guided stent placement. Technical success of the stent placement was determined endoscopically and radiologically. A successful stent placement was defined as fully deployed stent, extending at least 2 cm over proximal and distal end of the stricture. The position was additionally verified endoscopically immediately after stent placement. Clinical success was defined as colonic decompression within 24 h after the procedure. The patients were regularly examined postoperatively at outpatient visits.

Surgical treatment has long been the gold standard of care for alleviation of symptoms in unresectable rectal cancer. But reports have consistently shown that it has an unacceptable procedure-related morbidity and mortality. This notion has prompted the search for alternative treatment methods, and resulted in the use of self-expandable metallic stents since the mid-1990s. Complications of stenting have been documented. We report some

of them as perforation of bowel, stent migration and stent insufficiency. Although using self expanding metal stents has been validated as a safe and effective alternative in palliative setting and as a bridging method until resection. The additional lower costs of the treatment compared to surgical procedure make the stents even a more attractive option.

Surgery for Bowel Endometriosis

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Bowel endometriosis (BE) is a specific type of a deep infiltrating endometriosis in which the bowel wall is infiltrated by the endometriosis tissue. The most common location is rectosigmoid. It mostly occurs during the reproductive period and causes bowel-related specific symptoms connected to menstruation, pelvic pain, and dyspareunia. The impact of BE on infertility is still unknown.

The first laparoscopic-assisted segmental bowel resection was made at University Medical Centre Ljubljana in 2002. Since then around 500 patients with BE were diagnosed in our centre. The disease has become more recognizable among doctors and patients after the introduction of the Daily center for endometriosis (DCE) in clinical practice in 2013.

We perform in-depth diagnostics of the disease and coordinate various profiles of physicians of the interdisciplinary team for endometriosis to treat patients. Last but not least, the data obtained from the DCE enable statistical evaluation of our work. The retrospective analysis of our data shows how diagnostic and therapeutical methods changed over two decades to less invasive. Since most cases of BE were diagnosed by endoscopic rectal ultrasound until 2015, later most of the diagnoses were made by vaginal ultrasound. Progress has also been seen in the surgical technique. Low anterior bowel resection was replaced by segmental resection with shorter resects sizes and the complication rate has decreased over the years. A retrospective analysis of data from patients with BE who were diagnosed in the years 2002–2022 at the Department of Obstetrics and Gynecology, UMC Ljubljana was done. Between 2002 and 2013, a laparoscopic partial rectal resection was performed in 117 patients, and laparoscopic disk resection was performed in 4 cases with deep infiltrating endometriosis. The laparoscopic procedure was converted to formal laparotomy in 4 patients. Postoperative complications included 7 cases of

anastomotic leakage, intra-abdominal bleeding in 3 cases, and 3 cases of postoperative infection. Between 2014 and 2021, 366 cases of BE were diagnosed. 177 laparoscopic surgeries were performed. Partial rectal resection was performed in 105 patients, shavings were performed in 32 cases with deep infiltrating endometriosis. The laparoscopic procedure was converted to formal laparotomy in 1 patient. Postoperative complications included 4 cases of anastomotic leakage and 2 cases of postoperative infection and 1 case of ureter injury during the surgery. Advanced vaginal ultrasound diagnostics improves accurate BE detection. Enhanced laparoscopic surgical technique in which the size of the bowel resection is minimized is becoming a safe procedure when performed in the tertiary endometriosis dedicated center with an endometriosis interdisciplinary team of laparoscopic colorectal surgeon and a gynecologist.

Bowel Anastomosis Leakage Following Endometriosis Surgery: Risk Factors and Prevention Techniques

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Bowel endometriosis is defined as the presence of endometrial-like glands and stroma infiltrating the bowel wall. It affects 5 % to 12 % of patients with deep infiltrating endometriosis. The therapeutic options include nodulectomy (shaving, mucosal skinning, discoidal resection) and segmental resection. When surgery is indicated, amongst other challenges, anastomotic leakage (AL) appears as a major life-threatening complication. It affects around 1–2 % of segmental resections. Anastomosis leakage is a heterogeneous pathology by definition, but severe in its nature, causing severe morbidity, re-admissions, re-operations, extended hospital stay, lower quality of life and up to 15 % mortality. Diagnosis frequently encompasses clinical, biochemical and imaging exams. Majority of the studies published on this topic come from colorectal surgeons' experience in oncological patients. This is relevant, since colorectal oncology patients usually have a different demographic to the young, healthy patients in the endometriosis setting. Evidence-based analysis recommend the following peri-operative modifiable measures: the use of either stapler or handsewn (single layer closure) anastomosis construction, intra-operative use of air leak test to check the mechanical integrity of anastomotic line, systematic use of drainage, application of further preventive interventions (protective or ghost ileostomy) when the nodule is located under 8 cm from the anal verge and in high-risk patients, closure of the vagina before performing bowel resection (when colpotomy is required), systematic use of non-absorbable oral antibiotics one day before surgery and performing partial mesorectal resection near the bowel wall. Temporary defunctioning stomas may decrease the morbidity and clinical consequences of the leakage in over 65 % of low colorectal anas-

tomosis, but are associated with significant side effects that must be balanced against the risk of leakage. The treatment, considering the benign nature of endometriosis, must always be tailored according to the patient's disease, desires and expectations, with comprehensive case-by-case selection and patient counselling.

Importance of Ultrasound Examination for Planning Surgery in Patients with Endometriosis

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In the last few decades, non-invasive preoperative diagnosis of endometriosis has been made possible by advances in imaging techniques. Transvaginal ultrasound is the most accessible and relatively affordable technique that is well tolerated by women. There is an expert consensus on how a detailed pelvic ultrasound examination for the detection of endometriosis should be conducted. Studies have shown that advanced ultrasound examination is comparable in accuracy and may be superior to MRI examination in mapping deep infiltrating endometriosis. Severity of endometriosis as assessed by ultrasound has been shown to have good concordance with laparoscopy.

Ultrasound results can be used together with clinical signs and symptoms to triage women for expectant, medical or surgical management. Ultrasound is commonly used to 'map' the disease by describing the size and location of endometriotic lesions. This information is crucial for surgical planning and counselling women about risks associated with surgery. It is well known that ovarian endometriomas can be reliably diagnosed using ultrasound, but studies have also shown that ultrasound mapping of pelvic endometriosis is accurate and reproducible when performed by an appropriately trained examiner. Hence, bowel endometriosis, rectovaginal nodules, uterosacral, bladder and ureteral nodules can be diagnosed with high accuracy. The success of surgery for deep pelvic endometriosis is highly dependent on the expertise and training of the operating surgeon. Hence, comprehensive preoperative imaging is critical in appropriate counselling and referral of women with severe endometriosis to tertiary care centres where they can be adequately managed. On the other hand, less severe cases could be

managed at local hospitals, but each woman with suspected severe endometriosis should receive comprehensive preoperative imaging diagnostics before planning surgery.

A Multidisciplinary Approach to the Therapy of Women with Pelvic Organ Prolapse

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Pelvic floor dysfunctions are frequently seen in women. The pelvic floor in women is for easier management divided into three compartments: anterior (bladder and urethra), middle (vagina and uterus), and posterior compartment (rectum and anus). Because of the compartmentalization the patient is usually referred to the specialist according to specific problem in the specific compartment. The patients with problems of the anterior compartment are usually sent to urologist, the middle compartment to the gynaecologist and the posterior to the colorectal surgeon. However pelvic floor prolapse is frequently multi compartmental disease it doesn't involve only one compartment. For this reason, but it is also mandatory to consider the pelvic organ system as a single anatomical and functional unit requiring a shared and integrated multidisciplinary approach from a team composed by different specialist. Not only the three above mentioned specialists are contributing to the diagnosis and treatment but also others like radiologist, neurologist, psychiatrist and others. This approach allows to evaluate all the pelvic compartments simultaneously and try to treat concomitant diseases. The treatment plan should be done so the patient is optimally treated. The approach can be laparoscopic or from the perineum, in rare cases through laparotomy. In rare cases a single foreign material for the laparoscopic reconstruction of multicompartiment disease of the pelvic floor can be used.

Current Status of Laparoscopic and Robotic Ventral Mesh Rectopexy for Rectal Prolapse Treatment

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Rectal prolapse is a debilitating condition affecting mostly older female patients. Many surgical procedures have been developed for treatment of rectal prolapse, with transabdominal techniques generally being regarded as more effective compared to perineal techniques. Laparoscopic ventral mesh rectopexy has been introduced to clinical practice in 2004 by D'Hoore as a modified minimal invasive version of the open Orr-Loygue technique and has soon become the most popular transabdominal surgical treatment option with many European colorectal surgeons due to the reported positive clinical outcomes and favorable profile of associated morbidity. With broad introduction of robotic surgery to colorectal clinical practice the robotic ventral mesh rectopexy has been proposed by many surgeons as a new treatment of choice in rectal prolapse patients due to its presumed technical superiority compared to laparoscopic approach. While final evidence is still lacking, it seems that both techniques have comparable clinical outcomes with the robotic technique being associated with longer operative time, slightly shorter hospital stay and possibly higher treatment costs.

Surgery for Posterior Pelvic Compartment Disorders – MIS or Other Options?

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Pelvic floor disorders (PFD) are a common name for different types of pelvic organ disfunction and/or different degrees of pelvic organ prolapse. Clinical presentation of PFD has many faces and often presents as a disfunction of defecation, urination and internal or open genital organ prolapse in female. Pelvic pain and sexual disfunction is often present. Obstructed defecation is one of leading symptoms in patients in proctology practice. Disfunctions can lead to seriously disturbed psycho-social behavior. PFD can affect up to 60 % of female population after 50y. Vaginal delivery is a major risk factor, but young nulliparous females and male patients can develop PFD as well. Careful anamnesis is crucial for diagnosis. Clinical examination should consist of DRE, vaginal inspection, recto and proctoscopy. Pelvic floor asymmetry, scars, hypermobility and external prolapse can be seen. Different calculating systems are used to define severity of symptoms. Dynamic perineal and 3D-endoanal US, conventional and MR defecography, anal manometry and EMG or other special investigations are used to precisely define correct diagnosis and to measure the degree of PFD. Current treatment is primarily conservative and very effective in more than 80 % of cases. Conservative treatment consists of lifestyle changes, dietary consultation and physical rehabilitation by a specialist pelvic floor physiotherapists and nurses. Surgical therapy is indicated in up to 10 to 15 % of patients. Major indications for surgery are open prolapse, failure of conservative measures and importantly disturbed psycho-social life. The aim of surgery is to correct disturbed functional anatomy of the pelvis. Surgery, either a pexy or resection can be performed perineally or transabdominally. Rectal prolapse and obstipation are

one of the leading symptoms in patients seen in Iatros MC. Up to 900 patients per year, with one or both diagnoses, are referred. During the work up, current international guidelines are followed. Disease related history, vaginal deliveries, defecation habits and ODS symptoms are investigated. Questions about fecal incontinence, incomplete evacuation, bowel prolapse, time and frequency of defecation are discussed, followed by clinical examination, inspection and DRE, recto and proctoscopy, to find any signs of full thickness or mucosal (internal) rectal prolapse. In clinical presence of symptomatic rectal prolapse, internal protocol is followed in Iatros MC. All symptomatic patients are referred for pelvic floor US (endoanal, endovaginal and perineal), conventional or MR defecography, some do transit time investigation or CT colonography. Colonoscopy and other clinical examinations (anal manometry, pelvic EMG, uro-gynecology and urology consult) are selectively indicated. During diagnostic work-up patients are sent to in-house conservative treatment, which constitutes of dietary consultation, physical rehabilitation, laxative prescription, and lifestyle support. Majority can improve and reduce their symptoms so that further therapy is not needed. Internal multidisciplinary team discuss patients with ongoing symptoms for potential surgical treatment. Detailed discussion of possible results and complications is in place since the surgery is a functional one. Procedures without resection, such as rectocele repair, LVM-RP (Laparoscopic ventral mesh rectopexy) and Delorme procedure, can be performed as a day surgery cases in Iatros MC. Patients for LVMRP with comorbidities, reoperations and resection surgeries are referred to Izola General hospital.

From October 2017 to Feb 2022 114 patients were operated all together for different PFD, majority (94 %) for rectal prolapse, 110 female and 4 male, median age 61 y (29 – 94y). Indication for surgery was open rectal prolapse in 10 patients (9 %), 97 (85 %) patients had internal rectal prolapse with different degrees of uterovaginal prolapse, rectocele, enterocele and pelvic floor descent, 7 (6 %) had symptomatic rectocele. In 77 (67 %) patients laparoscopic mesh anterior recto(colpo) pexy was performed, 6 (5 %) Altemeier resections for open prolapse, rectocele repair in 7 (6 %), concomitant segmental colonic resection was performed in two, Delorme procedure was done in 20 (17 %) patients in this period. Three patients were reoperated due to failure of previous LVMRP, one from our series. All described surgical procedures were performed according to description in the literature. There were 6 (5 %) postoperative complications which needed surgical reintervention. One in Altemeier, one in Delorme group and 4 (5 %) in LVMRP group. One revision of bleeding from the port side was needed, one postoperative abscess and two adhesions in the early postoperative course were operated, one bladder perforation was done during dissection and primarily treated by direct suture with no consequences. There was no postoperative mortality. Average hospitalization of hospitalized patients was 3.8 days. 46 (40 %) of patients were operated as a day surgery cases. No mesh related complication was noticed. Delorme group had nearly 100 % of early FI, which resolved in 3 to 6 months. Functional results are 100 % in patients with open prolapse. Nearly 80 % of patients in other groups are satisfied with the result. Main objective improvement is ease and shortened time of defecation. Few patients describe no improvement. There is no long term fecal incontinence in follow up. Two patients presented with recurrence of open prolapse after one and four years, one was successfully reoperated laparoscopically. Pelvic floor disorders, rectal prolapse being one of the most embarrassing, are complex. Surgical correction of rectal prolapse is the last choice in treatment options. In our institution all possible treatment modalities are offered, including mesh rectopexy and resection surgeries in collaboration with surgical department of Izola General hospital. LVMRP, Delorme procedure and rectocele repair can be safely performed as a day surgery case with careful selection of the patients and established clinical protocols. Surgical results are comparable with results reported in the liter-

ature in the majority of patients with selection of the right patient for the right procedure.

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VAAFT (Video Assisted Anal Fistula Treatment) for Complex Perianal Fistulas

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University Hospital Rijeka, Croatia

The aim of this observational study was to show success of VAAFT (video assisted anal fistula treatment) technique in treatment of complex anal fistulas. We still do not have one standardized procedure to treat complex anal fistulas. One of worst complications that can follow inappropriate treatment of these, is some type of fecal incontinence. To avoid this possible complication many sphincter preserving techniques have been developed and VAAFT is one of them as the only one that enables direct visualisation and operation of anal fistula from inside fistula tract using specially designed equipment. In our institution in period from 2016 to 2022 we have operated more than 350 patients using VAAFT technique solely or in combination with other sphincter preserving techniques such as LIFT (ligation of intersphincteric fistula tract), RAF (rectal advancement flap). Primary healing rate following operation was approximately 80 %. Median primary healing rate was six weeks (range 3 weeks – 16 weeks). There were no serious intra or postoperative complications. VAAFT technique gives very good postoperative results according to healing rate, recurrence and possible complications, especially when it is used in combination with other sphincter preserving techniques. Other advantages are also avoidance of large operative wounds, low postoperative pain, faster return to everyday activities and what is most important there is no risk of postoperative fecal incontinence. Further multicentric randomized studies are needed to confirm the success of this procedure.

Management of Complex Fistulas in Patients with Crohn's Disease

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Perianal fistulas have a negative impact on the quality of life in part of the patients with Crohn's disease. Although some fistulas can be healed by modern medical treatment, surgery retains a crucial role in treatment of these patients. While incision of associated abscesses and placement of setons are the basis of surgical treatment in the acute setting, many different surgical techniques are available and are continuously being developed for the definitive management of complex perianal fistulas. Endorectal advancement flap and LIFT are currently regarded as the most effective among conventional surgical techniques. The application of mesenchymal stem cells is emerging as a new management option with promising results specifically developed for treatment of fistulas in Crohn's disease. Close collaboration of gastroenterologists and surgeons seems to be critical to optimize treatment outcomes in these patients. However, despite all efforts some of the patients will still either have to live with their perianal fistulas or even face rectal amputation due to the debilitating course of their perineal disease.

Definitive Draining Seton Placement as Long-Term Therapy for Complex Anal Fistulae in Crohn's Disease

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Perianal fistulizing Crohn's disease appears in one third of patients. It is a predictor of poor long-term outcome and has a substantial effect on patient quality of life. Before biologic therapy is introduced perineal sepsis must be controlled. Non-cutting drainage seton placement is an accepted treatment and can be used as a definitive therapy. Long-term success of draining seton placement before the introduction of biologic therapy was assessed. Primary end point was clinical response after one year of seton placement and was defined as lack of pain, swelling, redness, fluid discharge and abscess recurrence. The study cohort of 6 patients included 4 males and 2 females with median age 27.5 (range; 25–46) years. All setons were placed for the first time, five patients had one and one two setons. No seton dislodgement was described. There was no redness, swelling, pain or abscess recurrence. The fluid discharge was substantially decreased in all cases and completely vanished in two. One patient required fecal diversion. All of them were on biologic postoperatively. Long-term draining seton management with the combination of biologic therapy is an effective option for complex anal fistulae in Crohn's disease with clinical improvement of perianal sepsis. However, complete healing is not expected.

High-Resolution Anoscopy

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Anal carcinoma represents a rare malignancy of the gastrointestinal tract, however, its incidence has risen over the past few decades. The incidence is particularly high among men who have sex with men and in immunocompromised patients, including patients with HIV infection and patients after solid organ transplantation. Another notable predisposed group are women diagnosed with cervical cancer. Anal cancer is associated with HPV infection which can also manifest itself as anal warts and anal dysplasia. Carcinogenesis is similar as is in cervical cancer and involves low-grade and high-grade dysplasia before advancing to invasive cancer. Anal and cervical cancer are both preventable with HPV vaccination as primary prevention, and with cytology, colposcopy or anoscopy as secondary prevention.

High-resolution anoscopy allows us to detect dysplastic and cancerous lesions of the anal canal and it also allows us to guide treatment of the lesions. High-resolution anoscopy includes magnification of the anal canal and, along with acetic acid and Lugol's solution, is used to visualize, biopsy and even treat lesions. Currently, there are no generally accepted guidelines for screening the susceptible population, also, the method is new and as such it is not well known among medical practitioners and patients. High-resolution anoscopy is also the method of choice to screen patients with confirmed anal cancer who underwent treatment and are in remission.

Presacral Tumors: To Intervene or Not? Whom and When? Do We Know How?

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Presacral (retrorectal) tumors are mostly developmental cysts and are rare congenital tumors. The incidence of these tumors in the general population is unknown. The majority of reports are from tertiary centers and do not represent the true incidence of these tumors. Congenital lesions are the most common presacral lesions accounting for up to 70 % of all lesions. These include developmental cysts (epidermoid cysts, dermoid cysts, enterogenous cysts, tailgut cysts, and teratomas), chordomas, and anterior meningoceles. Most patients with retrorectal tumors present with no symptoms and are detected during vaginal or digital rectal examination or radiological diagnostics due to other health problems or routine checkups. Surgical removal is usually advised even in asymptomatic patients as there is a risk of malignant alternation (up to 7 % or even higher). Patients with comorbidities or the ones rejecting surgical interventions are followed clinically and radiologically (most often MRI). There are some exemptions to be more alert with, like inflammation or fistulas, increasing symptoms, growing or altering cyst and not the last Currarino syndrome (partial sacral agenesis with intact first sacral vertebra, presacral mass and anorectal malformation) which is often unrecognized. Detailed diagnostics, preparation and patient evaluation is very important before the surgery. The posterior surgical approach is advantageous, rarely abdominal or combined abdominal and posterior is used. After facing the technical and anatomical challenges of tumor removal, there is a requirement of optimum wound healing in the area usually daily contaminated. In subgroup of cases with fistulation type the planning of wound closure and care is even more important. The posterior approach with primary wound closure is the choice of treatment for most of the presacral developmental cysts. With tumors located on the level of levator muscle or

cranially, abdominal or combined approach is used. At our department we do surgery on six to fifteen cases per year on average. Up to now there were no complications registered. There are few interesting cases to be presented (fistulant presacral tailgut cyst unrecognized for 15 years, woman with Currarino syndrome after multiple surgeries unrecognized for 30 years, man with malignant presacral development cyst causing pelvic pain and fecal incontinence...). With optimal timing, selection of the patient and surgical technique, best outcome is achieved. In our healthcare system there is room for improvement with recognizing, diagnosing and treating patients with this entity

Venerology as an Integral Part of the Curriculum of Specialization in General/Abdominal Surgery

Boštjan Mlakar

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Anal receptive intercourse is not only common among men who have sex with men (MSM), but also an increasing practice among heterosexual couples. Patients with anorectal symptoms or lesions that occur days, weeks or even months after receptive anal sex, are often referred to general/abdominal surgeon who often does not have enough knowledge about sexually transmitted infections (STI). Lack of knowledge, lack of STI diagnostic tests/swabs, high testing costs, avoiding taking history of sexual practices, stigma associated with anal sex and homosexuality etc., these are numerous factors that contribute to the fact that some patients get incorrect diagnosis, are treated incorrectly or late. Symptoms of STIs are often nonspecific and latent, mimic other more common proctological diseases and make diagnoses challenging. When we are evaluating a patient with an anorectal STI (for example with anal warts), it is important to remember that coinfection is common and other most common STIs (HIV, syphilis, rectal gonorrhea, chlamydia) have to be excluded or treated if present, otherwise it may happen that we will operate anorectal warts in a patient who is not aware of HIV infection or is not on antiretroviral therapy, which can cause problems with wounds healing, similarly healing will be worse in the case of untreated rectal gonorrhea or chlamydia. It is also wrong if we operate condylomata lata caused by *Treponema pallidum* (syphilis), as they can be mistaken for more common warts (condylomata accuminata) caused by Human papilloma viruses (HPV). HPV induced anal pathology (condylomata accuminata, Mb. Bowen, anal squamous cell carcinoma) is the most common STI in a colorectal surgeon practice. A high index of suspicion for HPV induced malignancy should maintain in immunocompromised patients, patients older than 40 years, those exhibiting large, atypical or

pigmented lesions, women with HPV related gynecological pathology in the past and patients with lesions that are refractory to treatment. Preventive anal cytology is recommended in the most at risk group for anal cancer, which is HIV positive MSM. Histology of all atypical anal skin lesions or rectal ulcers or polyps should be done, because clinical presentation of HPV induced carcinoma in situ is very diverse. On the other hand, we should not rely solely on histology in the case of proctitis. Rectal gonorrhea, chlamydial proctitis, LGV proctitis, lower-gastrointestinal syphilis, and herpetic proctitis can be misdiagnosed as inflammatory bowel disease (IBD) even if histology was taken. In all cases of proctitis we should also think about STI and taking sexual history to avoid misdiagnosis because clinical, proctoscopic and pathological features of STI associated proctitis and IBD appear to be indistinguishable. In MSM we should always perform rectal swab testing at least for gonorrhea and chlamydia. In all cases where there is a delay in healing after perianal abscesses and fistula in ano operations we should also consider the possibility of STI. Not only from my clinical experience, but as well as from many reports of mistreatment and diagnosis delay in anorectal STI, we can conclude that general/abdominal surgeons are not prepared to the increasing trends of receptive anal sex in population and consequent anorectal STI pathology. We should consider including some basic venerology education in a curriculum of general/abdominal surgery specialisation. One or two visits at outpatient clinic for STI at dermatovenerology clinic where resident in general/abdominal surgery will become familiar with STI testing protocols and will later present a seminar about anorectal STI at the department of general/abdominal surgery, could increase knowledge and awareness of venerology problems in anorectal region.

Implantation of A.M.I.® Soft Anal Band System is Minimal Invasive Procedure – Experience From General Hospital Slovenj Gradec

Janez Pucelj

General Hospital Slovenj Gradec, Slovenia

Fecal incontinence affects both women and men of all ages, and can dramatically impair their quality of life. This may lead to severe mental disorders, which then may result in isolation and depression. Many operative procedures for treatment fecal incontinence were suggested in last few decades, but none of them gives superior results. The A.M.I. Soft Anal Band is a long-term implant for the treatment of faecal incontinence in adults. In General hospital Slovenj Gradec is this operation – implantation of soft anal band performed since 2017. 10 patients were operated. Patients were carefully selected. Excluding criteria: chronic inflammatory bowel syndroms, therapy-resistant diarrhoea, irrigation therapy, receptive anal intercourse, pregnancy, inverse acne, tight fibrotic anal canal, psychiatric disorders. Wide diagnostic was performed to exclude other cause of incontinence (cancer, diarrhoea, etc.) The conservative therapy was indicated after the evaluation of primary diagnosis of severe fecal incontinence. Conservative therapy (physiotherapy with biofeedback) was by majority of patients successful. Those by whom the conservative therapy was unsuccessful and the quality of life was still suboptimal and were willing toward the operative treatment, were selected candidates for this operation. Data were analyzed retrospectively. 10 operations were successfully performed (9 female, 1 male), Average age 61.8 years (43 years – 74 years). Postoperative complications occurred in 3 patients (1 surgical, 2 technical). One patient was reoperated, because of inappropriate size of soft anal band. The next patient had problems with the implantat, because 4 months after the operation the tube had fall down from the anal band valve. Besides had this patient big hematoma in device area. Reoperation with corection of implantat and hematoma evacuation

was performed successfully. By third patient was damage of anal canal unintentionally performed by first operation, but the second operation after 5 monts was sucessful. In 2 patients was performed explantation. In 1 patient difficulties arouse because of chonical obstipation. Daily consumation of laxative was indicated. This patient developed decubitus with periprotetical inflammation, fistula and exposure of prothesis. Explantation of the device was 11 months after the implantation. The other patient used device for 10 months and was very satisfied with the function. Suddenly the patient got massive pain in the anal area. The cause was not established, but the explantation was performed due to safety reasons. 4 months after the explantation the patient chose for anus praeter.

In two patients is quality of life with device still suboptimal. By one patient is problem chronical obstipation and the explantation is in plan. The other patient complain for inadequat function of device, defecation is still not under control, but does not want the explantation. In the early postoperative time was no problem with wound infection, postoperative pain is minimal. Problems with obstipation were resolved after conservative treatment. In 6 patients is function of device good and they are still satisfied with the results of the operation. The implantation of A.M.I. Soft Anal Band System is surgical procedure with low perioperative pain and morbidity. The future reserch will show if chronical obstipation is a contraindication for operative procedure. Some complications occure because the performing surgeon was still in first part of learnin curve, although the complications have showned where the weak points are. The operative technik was evaluated and improvements were implemented.

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Pred predpisovanjem preberite celoten povzetek glavnih značilnosti zdravila (SmPC).

Ime zdravila: Alofisel 5 milijonov celic/ml suspenzija za injiciranje. **Kakovostna in količinska sestava:** Darvadstrocel so razmnožene človeške alogenske mezenhimske odrasle matične celice, pridobljene iz maščobnega tkiva. Ena viala vsebuje suspenzijo 30 milijonov celic v 6 ml raztopine, kar ustreza koncentraciji 5 milijonov celic/ml. **Terapevtske indikacije:** Zdravilo Alofisel je indicirano za zdravljenje zapletenih perianalnih fistul pri odraslih bolnikih z neaktivno/blago aktivno luminalno Crohnovo boleznijo, kadar se fistule neustrezno odzivajo na vsaj eno konvencionalno ali biološko terapijo. Pred uporabo zdravila Alofisel je treba obvezno pripraviti fistule. **Odmerjanje in način uporabe:** Zdravilo Alofisel sme dajati samo zdravnik specialist z izkušnjami pri diagnosticiranju in zdravljenju bolezni, za katere je zdravilo Alofisel indicirano. En odmerek zdravila Alofisel vsebuje 120 milijonov celic, dobavljenih v 4 vialah. Ena viala vsebuje 30 milijonov celic v 6 ml suspenzije. Za zdravljenje največ dveh notranjih odprtih in največ treh zunanjskih odprtih je treba uporabiti celotno vsebino 4 vial. Z odmerkom 120 milijonov celic je mogoče zdraviti največ tri trakte fistule, ki se odpirajo v perianalno območje. Učinkovitost in varnost večkratne uporabe zdravila Alofisel ni bila dokazana. **Starejši bolniki, jetrna ali ledvična okvara:** podatki o uporabi pri starejši populaciji so omejeni, podatki o uporabi pri bolnikih z jetrno ali ledvično okvaro niso na voljo vendar glede na celično naravo darvadstrocela in lokalno pot uporabe ni pričakovati, da bi se profil koristi in tveganja darvadstrocela pri teh bolnikih razlikoval od tistega, ki so ga opazili pri ostalih bolnikih. Prilagoditev odmerka pri starejših bolnikih ali bolnikih z jetrno ali ledvično okvaro ni potrebna. **Pediatrična populacija:** varnost in učinkovitost darvadstrocela pri otrocih in mladostnikih, starih od 0 do 17 let, še nista bili dokazani. Podatkov ni na voljo. **Kontraindikacije:** Preobčutljivost na zdravilo, goveji serum ali katero koli pomožno snov. **Posebna opozorila in previdnostni ukrepi:** **Sledljivost:** z namenom izboljšanja sledljivosti bioloških zdravil je treba jasno zabeležiti ime in številko serije uporabljene zdravila. Zdravilo Alofisel lahko vsebuje sledi benzilpenicilina in streptomocina. To je treba upoštevati pri bolnikih z znano preobčutljivostjo na te skupine antibiotikov. Lokalna anestezija ni priporočljiva, ker učinek lokalnih anestetikov na injicirane celice ni znan. Injiciranje katere koli druge snovi, razen 0,9 odstotne raztopine natrijevega klorida (9 mg/ml), v traktih fistule ni dovoljeno pred, med ali po injiciranju zdravila Alofisel. Zdravilo Alofisel je indicirano samo za injiciranje v tkivo traktov fistule. Zdravilo Alofisel se ne sme dajati z iglo, tanjšo od 22G. Zdravilo Alofisel je terapija z živimi matičnimi celicami, zato ga ni mogoče sterilizirati. Po uporabi je treba bolnike spremljati glede morebitnih znakov okužbe. **Reakcije na pripravo:** priprava fistul je povezana s proktalgijo in bolečino pri postopku. **Medsebojno delovanje z drugimi zdravili in druge oblike interakcij:** Študij medsebojnega delovanja *in vivo* niso izvedli. Študije medsebojnega delovanja *in vitro* so pokazale, da prisotnost klinično pomembnih koncentracij konvencionalnih zdravil za Crohnovo bolezen ne vpliva na viabilnost celic in imunomodulacijsko delovanje zdravila Alofisel. Injiciranje katere koli druge snovi, razen 0,9 odstotne raztopine natrijevega klorida (9 mg/ml), v traktih fistule in uporaba lokalne anestezije nista priporočljiva, ker učinek na injicirane celice ni znan. **Plodnost, nosečnost in dojenje:** **Nosečnost:** podatkov o uporabi darvadstrocela pri nosečnicah ni. Uporaba darvadstrocela ni priporočena pri nosečnicah in pri ženskah v rodni dobi, ki ne uporabljajo kontracepcije. **Dojenje:** kot previdnostni ukrep se uporaba darvadstrocela med dojenjem ne priporoča. **Plodnost:** Podatkov ni na voljo. **Neželeni učinki:** Najpogostejši neželeni dogodki, ki so se pojavili med zdravljenjem, so bili analni abscesi, proktalgija in analna fistula. **Za podroben profil neželenih učinkov zdravila Alofisel in medsebojno delovanje z drugimi zdravili glejte celoten povzetek glavnih značilnosti zdravila.** O katerem koli domnevnem neželenem učinku zdravila morate poročati na Javno agencijo Republike Slovenije za zdravila in medicinske pripomočke, Sektor za farmakovigilanco, Nacionalni center za farmakovigilanco, Slovenčeva ulica 22, SI-1000 Ljubljana, Tel: +386 (0)8 2000 500, Faks: +386 (0)8 2000 510, e-pošta: h-farmakovigilanca@jazmp.si, spletna stran: www.jazmp.si. **Rok uporabnosti:** 72 ur. **Posebna navodila za shranjevanje:** Shranjujte pri temperaturi od 15° C do 25° C. Zdravilo do uporabe ves čas shranjujte v zunanji škatli in v transportnem vsebniku, da ohranite potrebno temperaturo. Vsebnik pri shranjevanju zaščitite pred toploto in neposrednimi viri svetlobe. Ne shranjujte ga v hladilniku in ne zamrzujte ga. Ne obsevajte ali drugače sterilizirajte. **Imetnik dovoljenja za promet z zdravilom:** Takeda Pharma A/S, Delta Park 45, 2665 Vällensbaek Strand, Danska. **Datum revizije besedila:** 30. november 2020. **Datum priprave informacije:** april 2021. **Režim izdaje zdravila:** H. **Dodatne informacije so na voljo pri:** Takeda Pharmaceuticals d.o.o., Bleiweisova cesta 30, Ljubljana, tel: 059 082 480. **SAMO ZA STROKOVNO JAVNOST.**

¹ Povzetek glavnih značilnosti zdravila Alofisel, november 2020; Podrobne informacije o zdravilu so objavljene na spletni strani Evropske agencije za zdravila <http://www.ema.europa.eu>.

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Datum priprave materiala: november 2021

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Minimally Invasive Surgical Procedures for Inguinal and Ventral Hernia

Jurij Gorjanc

Hospital of the Brothers of St. John of God, St. Veit/Glan, Austria

In the era of tailored approach in hernia repair, the term “minimally invasive techniques for ventral and inguinal hernia repairs” is not clearly defined. For most reports, it is the less invasive way of entering deeper layers of abdominal wall (length of skin incision), for many it is the limited extent of deeper preparation with same final outcome, sometimes it is the surgical site infection rate (wound complications), some papers claim it is the average length of hospital stay and early return to work that should define minimal invasivity. Literature review of laparoscopic procedures and open techniques with reduced or short incision for ventral and inguinal hernia operations has been performed in order to understand the present situation in this fast growing segment of surgery. Inguinal hernia can successfully be managed with TAPP or TEP instead of open repair. However, open repairs with short skin incisions, like mostly performed minimally invasive Lichtenstein procedure (length of incision only 3–4 cm), is possible without compromising the method. This facilitates day surgery management in Lichtenstein repair. For ventral hernia, laparoscopic intraperitoneal onlay mesh procedure (IPOM or IPOM+) seemed to be “a game changer” at its birth, mainly due to reduced need of tissue preparation. As the method is followed by intraabdominal mesh placement, numerous new techniques that promote extraperitoneal mesh position have slowed down IPOM spread-out nowadays, not to forget good primary indications for its use in selected cases. LARDA and LIRA techniques can be understood as a transition from intraperitoneal to underlay and sublay techniques. Minimally invasive sublay procedures like MILOS and e-MILOS represent reasonable evolution with less postoperative morbidity and better cosmesis. The same is true for the techniques eTEP, TARM, TES, TEA and TESAR. As rectus diastasis is getting more importance as adjunct diagnosis in patients with midline

hernias, techniques like REPA, SCOLA, TESLAR, EaLAR, MILAR and THT stappled Rives Stoppa appeared. Last but not least, robotic era seems to bring not only a very sophisticated new tool into hernia world but also may robotic hernia repairs represent an important step in the learning curve towards demanding intraabdominal procedures. There is a great variety of different minimal invasive hernia repairs available nowadays and new techniques are still coming. It seems impossible for a general surgeon to know and perform them all. However, in the era of patient-centric decision making for finding best surgical technique, each surgeon should tend towards improving his repertoire with at least some of established minimally invasive techniques.

Robotic Assisted Hernia Surgery – Early Experience at University Medical Center Ljubljana

Andraž Hubad

University Medical Centre Ljubljana, Slovenia

Robotic hernia surgery has been rapidly developing in recent years. In experienced centers throughout the world even the most complex hernia cases are operated on robotically with great success. Nonetheless achieving efficiency in robotic hernia surgery is not without its perils. There is a steep learning curve and only with sufficient proficiency can the patient reap the – whole benefits of robotic hernia surgery. The surgeons learning curve is observed and analyzed in many publications but the reality of the matter is that the whole team needs to adapt to this novel hernia repair technique in order to achieve success. The increased cost of the robotic platform against other treatment modalities also poses a challenging dilemma that needs to be addressed.

At University Medical Center Ljubljana we decided to implement the robotic hernia program – the decision was made after obtaining support from our department and promised the help from AB medica – the distributors from DaVinci Robot – Intuitive.

Initial enthusiasm for the robotic hernia program at our institution was fostered after a trip to Melle Belgium for the 2nd EHS Discovery Course on Robotic Abdominal Wall Surgery at ORSI academy in Melle which was organized by the EHS (European Hernia Society) and Intuitive in June of 2021. Speakers such as Filip Muysoms (EHS president) and Inan Ihsan and others presented the strategies and theoretical backgrounds for robotic hernia repairs which was then followed by a hands-on robotic hernia repair experience on an animal model at ORSI academy.

It was emphasized that a structured program with progressive difficulty of hernia repair, preferentially with the help of an experienced tutor, is rec-

ommended for a rapid transition along the learning curve. We were fortunate enough that with the help of AB medica an excellent experienced tutor was recruited. An invitation was secured from Dr Micaela Piccoli from Ospedale Sant'Agostino Estense in Modena to observe her team at work repairing hernias with the DaVinci Xi robotic platform in September of 2021. In the following weeks she then took her team to Ljubljana to tutor us in the first ventral hernias. The collaboration was successful with all 4 cases completed flawlessly.

Robotic hernia repair is the natural progression of the laparoscopic hernia repair techniques with both techniques being in the broader category of minimally invasive hernia surgery. The most commonly cited benefits of minimally invasive hernia surgery are lower rates of infections and shorter hospital stay. Enhanced robotic dexterity, superior vision and other robotic advantages widen the specter of hernias amenable to minimally invasive repair. In the hands of experienced robotic surgeons even the most complex hernias can be successfully repaired in this manner.

Progressive complexity of hernias is scheduled for the next cases with the final goal being a robotic TAR procedure.

Laparoscopic Inguinal Hernia Repair as a Day Surgery Practice

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Inguinal hernia repair is probably the most commonly performed general surgery procedure worldwide. TAPP surgery can be considered a gold standard in inguinal hernia repair. According to European guidelines, inguinal hernia surgery should be considered as a day-case surgery whenever possible. Up to 300 hernia operations are performed each year in Iatros Medical Center. In our clinic the standard TAPP laparoscopic technique as a day surgery is performed. Since May 2020, we have been actively collaborating with the Herniamed registry to follow up results of hernia repair. Between Sept 2020 and Feb 2022, according to data entered in Herniamed registry, 72 patients (69 male and 3 female) were operated, using the TAPP technique. 21 to 86 years old underwent 100 hernioplasty (44 unilateral inguinal hernias and 27 bilateral inguinal hernias), 35 hernias were direct (medial), and 65 hernias were indirect (lateral), 92 primary and 8 recurrent hernias. Prophylactic antibiotics were given as a single preoperative dose. Patients were operated by three experienced surgeons. All the patients were operated on under general anesthesia as day surgery cases. A Strict clinical protocol is followed for day surgery practice. The median age of patients was 53 years old, ASA 1–3. Participants were followed-up at 7 days and 12 months. There was no recurrence during follow-up of 2 to 17 months. Subsequent follow-up will be five years after the surgery. One patient was diagnosed with postoperative dysesthesia in the right leg-dermatome L3, managed conservatively. Seven patients were diagnosed with acute pain (VAS 1–3) 7 days after surgery, two patients had a postoperative seroma and five patients had a hematoma around the ports, managed conservatively. Our experience and practice from abroad (UK, France and USA) show us that day-surgery is

as safe as an overnight stay in laparoscopic hernia repair under a strict clinical protocol of a day surgery practice. Low postoperative complications rates were found in our series.

Totally Extraperitoneal (TEP) Versus Transabdominal Preperitoneal (TAPP) Laparoscopic Techniques for Hernia Inguinal Repair

Radenko Koprivica, Sanjanin Perišić, Jelko Čopi, Jernej Šadl

General Hospital Murska Sobota, Slovenia

Totally extraperitoneal (TEP) and transabdominal preperitoneal repair (TAPP) are standard techniques of laparoscopic approach of groin hernia repair. Many studies compare clinical efficacy between TEP and TAPP technique. Which is the best approach? The choice of technique of hernia inguinal repair is still controversial. To compare our result in last two years in laparoscopic hernia inguinal repair in short term follow-up. This study is retrospective analysis of patients database with TEP and TAPP hernia inguinal repair between January 2020 to December 2021. Patients demographic profile, hernia characteristic and clinical outcomes included in database. We performed two groups patients: TEP groups and TAPP groups. The primary endpoint included: mesh and peritoneum fixation, operative time, intra and postoperative complication, hospital stay and conversion rate. The secondary outcomes were recurrence rates, acute and chronic pain. The follow-up time was 6 months. The results were processed by the methods of classical statistic analysis. The significance level was 0.05. A total of 121 patients divide into two groups: TEP group had 50 patients and TAPP group had 71. There were 113 men and 8 women. The average age is 53.67 years. The American Society of Anesthesiologists Physical Status Classification System (ASA) had ASA I 61, ASA II 55 and ASA III 35 patients. There were 62 right and 59 left inguinal hernias. Bilateral hernias were 47, unilateral 74. There were 13 % (16) recurrent hernias after Lichtenstein hernioplasty. The size of the hernia measured according to the criteria of the European Hernia Society (EHS) was L1/M1 43 or 35.5 %, L2/M2 51 or 42.2 % and L3/M3 27 or 22.3 %. There was no statistically sig-

nificant difference by groups for age, ASA classification, hernia size, and location. We fixed the mesh in 83.5 % (101) with glue, in 8.25 % (10) we gave a self-fixing mesh and in 8.25 % (10) cases we did not fix the mesh. We used lightweight titanium mesh in 91.75 % of cases. There was no statistically significant difference between TEP and TAPP groups in the method of mesh fixation and mesh type ($p > 0.05$). In the TAPP group, we closed the peritoneum in 59.2 % (42) cases with glue, in 33.8 % (24) it was sutured and in 7 % (5) suturing and gluing was done. Operative time of unilateral hernia surgery in the TEP group is 28 min, in the TAPP 60 min. In bilateral hernia, the operation time of TEP group is 50 min, TAPP group 105 min. The difference was statistically significant between the groups in both cases ($p < 0.05$). The time of hospitalization is the same in both groups and is one day. Intraoperative complications were similarly distributed in both groups, without statistical significance (hemorrhage TEP 2, TAPP group 2, peritoneal lacerations TEP 7, TAPP 6). There was no conversion to another type of operation in both groups (TEP 0, TAPP 0). Postoperatively, we had groin seroma in 5 % (6) of cases (TEP group 3, TAPP 3), testicular hematoma in 4.1 % (5) of patients (TEP 2, TAPP 3), and acute pain up to 30 days after surgery in 5 % (6) patients (TEP 3, TAPP 3). There was no statistically significant difference in the occurrence of these postoperative complications ($p > 0.05$). Chronic pain was present in TEP group 2 and in TAPP group 2 patients, a total of 4 or 3.3 %, with no statistically significant difference. Hernia recurrence was present in 3 patients or 2.5 %, without statistical difference by groups (TEP 1, TAPP 2) ($p > 0.05$). TEP and TAPP have

similar complication, acute and chronic pain and recurrence rates. TEP and TAPP is in excellent technique of laparoscopic inguinal hernia repair with acceptable complications. TEP has the advantage that the peritoneal cavity is not breached. However

it is more difficult to master when compared with TAPP. In conclusion, the choice of the technique should be based on the surgeon's skills, hospital practice, education and experience.

Laparoscopic Hernia Surgery at UMC Ljubljana

Boštjan Plešnik

University Medical Centre Ljubljana, Slovenia

The laparoscopic approach to inguinal hernia repair is safe and feasible technique. In comparison to conventional tension free mesh hernia repair, its main advantages are fast return to normal activities, decreased incidence of wound infection and less postoperative pain. In years 2020 and 2021 we performed 428 inguinal and femoral hernia repairs, the latter group contributing only 18 cases. Laparoscopic approach was used in 26.3 % of inguinal hernia and 27.8 % of femoral hernia cases. Transabdominal preperitoneal technique was used in all reviewed laparoscopic cases. An interesting rise in emergency hernia repair operations can be observed in 2021 (34.7 %) when compared to year 2020 (21.9 %), which might be the consequence of specific epidemiologic situation. Further in the text only laparoscopic hernia repair cases are discussed. Patient's age distribution was comparable in inguinal and femoral hernia groups with 56.3 years and 57.4 years, respectively. Great difference was observed in sex distribution: all patients with femoral hernias were females, on the other hand a great majority (87 %) of inguinal hernia cases were repaired in male patients. Regarding to American Society of Anesthesiologists (ASA) classification 47.8 % of patients were classified as ASA 2, 38 % as ASA 1 and 14.2 % as ASA 3 patients. All ASA 4 patients were rather operated in conventional Lichtenstein tension free technique. Mean length

of hospitalization in laparoscopic hernia repair in our center was 1.8 days, which is less than in open surgical technique group (2.7 days). Shorter hospitalization is likely partially due to less invasive laparoscopic technique which causes less pain and enables faster recovery to everyday activities. Another important factor that cannot be overlooked is the fact that patients operated in laparoscopic way in general have less comorbidities and were more often operated in elective manner (87.1 %). Open inguinal hernia repair on the other hand was in 33.7 % performed in emergency situation which often resulted in segmental resection of incarcerated bowel. Laparoscopic inguinal hernia repair in UMC Ljubljana proved to be safe technique with 1.9 % of complication during hospitalization, fortunately all cases were without fatal outcome.

Laparoscopic and Open Hernia Repair at the Department of General and Abdominal Surgery at General Hospital Slovenj Gradec in the Last 10 Years

Zala Čas, Aljoša Škapin

General Hospital Slovenj Gradec, Slovenia

The beginnings of TAPP approach at the Department of General and Abdominal Surgery of the General Hospital Slovenj Gradec go back to 2012. In the last 10 years, our surgeons made almost 3000 elective hernioplasties, in 20 % of which TAPP approach was used. There has been significant increase: in 2012, 7 % of operations were performed with TAPP approach, compared to 56 % in 2021. We use modern 3D laparoscopic technology, meshes in bigger sizes than in 2012, usually fixed with fibrin glue. The most cases of using TAPP approach include female, recidive and bilateral hernias. All of our 10 surgeons are highly experienced in classical open repair of primary inguinal hernia, but 6 of us also in TAPP approach. We educate our resident surgeons; in year 2019 we organized hands-on workshop with different hernia repair techniques. Results of using TAPP approach are good, with minimal number of minor complications.

Laparoscopic Hernia Surgery in General Hospital Celje

Matej Štante

General Hospital Celje, Slovenia

It passed many years, when we started with laparoscopic inguinal hernia repair, we have used TAPP and TEP technic. In recent years we have expanded laparoscopic hernia surgery on ventral, postoperative and Spigelian hernias, we have used IPOM (PLUS) and TAPP PLUS technic.

In last four years 193 patients with hernia were treated in our facility using laparoscopic methods. Of 170 patients with inguinal hernia 165 underwent TAPP and 5 TEP. These techics were used primarily for the repair of recurrent hernia and bilateral hernias, we used its also for younger and phisically active people. 16 patients underwent IPOM PLUS and 7 patients TAPP PLUS technic

for ventral, pooperative, umbilical and Spigelian hernias. We did not have major complications during and after surgery (2.5 % recurrence, prolonged pain in 3.6 %, 1 case of umbilical port inflammation for inguinal hernia repair, 2 pooperative seromas)

Obstacles to the Implementation of Laparoscopic Hernia Surgery

Irena Plahuta, Tomislav Magdalenic, Špela Turk, Žan Mavc, Arpad Ivanecz, Stojan Potrč

University Medical Centre Maribor, Slovenia

Surgeons remain divided about the usefulness of laparoscopic surgery to repair hernias. Half of the surgeons in the survey offer it selectively, and the other half never perform it laparoscopically. Of these, 70 % believe that the benefits of laparoscopy are minimal, 59 % said they do not have the necessary training, and 26 % are interested in

learning. This reveals a knowledge gap that could be addressed through educational programs.

Impacting outcomes in colorectal surgery

Demonstrated in clinical studies



1.8%
anastomotic
leak rate

Herzig D, Ogilvie J, Chudzinski A, et al.
Assessment of a circular powered stapler for creation of anastomosis in left-sided colorectal surgery: A prospective cohort study.

Int J Surg. 2020;84:140-146.

- Ethicon-sponsored study
- Prospective, single cohort study
- Multi-site, multi-country
- 12 institutions across Belgium, Germany, Spain, UK and US



168 patients treated with ECHELON CIRCULAR™ Powered Stapler

- >50% smoking
- >40% with hypertension
- >35% with BMI ≥ 30
- >60% with rectal anastomoses
- >40% colorectal cancer
- >30% diverticulitis



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1.7%
anastomotic
leak rate

Pla-Martí V, Martín-Arévalo J, Moro-Valdezate D, et al.
Impact of the novel powered circular stapler on risk of anastomotic leakage in colorectal anastomosis: A propensity score-matched study

Tech Coloproctol. 2020; doi:10.1007/s10151-020-02338-y

- Independent clinical study
- Retrospective analysis of a prospective database, double cohort study
- 1 institution in Spain

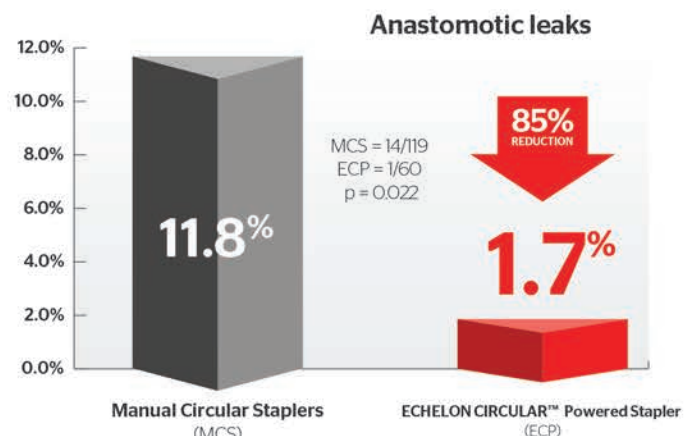


179 patients post-propensity score matching

- 60 patients treated with ECHELON CIRCULAR™ Powered Stapler
- 119 patients treated with manual circular stapler

Anastomosis level and preoperative characteristics:

- 51% middle rectum
- 50% upper rectum
- ~70% colorectal cancer



POSTERS SESSION

Case Report of a Patient with Intra-Abdominal Testicular Torsion Presenting as Acute Appendicitis

Jovana Bekić, Miha Petrič

University Medical Centre Ljubljana

Intra-abdominal testicular torsion is a rare event and there have been only about 70 cases described in literature so far, most of which were associated with testicular malignancy. Cryptorchidism is a risk factor for developing testicular cancer and for this reason it is suggested to do orchidopexy surgery during early childhood years. European Association of Urology guidelines suggest doing laparoscopic exploration to locate the testis in patients with intra-abdominal testicle. It is important to consider testicular torsion as cause for acute abdomen in male patients that present to the physicians office and have undescended testes. We present a case of a 57-year old male with intra-abdominal testicular torsion. He presented as a one-day lower right abdominal pain, nausea and history typical for acute appendicitis. On physical exam, pain was localised in right low abdominal area without sings of local tenderness. Abdominal ultrasound showed possible mucocele of the appendix. Due to diagnostic uncertainty, computer tomography (CT) scan was performed. CT scan showed normal appendix with sings of a Meckel's diverticulum inflammation with a small fluid collection. Laboratory results showed raised white blood count and elevated c-reactive protein. After short preoperative evaluation, laparoscopic exploration of abdominal cavity was performed. We found normal small and large intestines, absence of a Meckel's diverticulum and a normal appendix. In the anatomical area of right iliac fossa we discovered a whitish round mass that looked like testis. At that point we inspected the scrotum and found absence of the right testicle. After consultation with urological consultant, we performed laparoscopic orchiectomy due to sings of torsion and malignant potential of cryptorchidism. The patient was discharged from the hospital on the

first postoperative day. Histology report confirmed undescended testis without any malignant growth. In patients with lower abdominal pain with history and physical exam that show undescended testis we should consider intra-abdominal testicular torsion. It is suggested we do laparoscopy in such cases.

Extended Totally Extraperitoneal Repair (eTEP) for Ventral Hernias: First Experiences

Goran Glavčić, Zoran Misir, Suzana Janković, Jakša Filipović-Čugura

University Hospital Center Sestre Milosrdnice, Croatia

Following certain inventions in laparoscopic ventral hernia repair procedures, there has been an increase in efforts to perform the technique where a mesh is placed in retromuscular space – Totally Extraperitoneal approach (eTEP). Early studies show good results with less postoperative issues in selected cases. We will show our initial use of the technique and the first results.

Cavitron Ultrasonic Surgical Aspirator (CUSA) for Liver Cancer Resection – Is There an Influence on Tumor Cells Spread?

Benjamin Hadžialjević, Mihajlo Djokić

University Medical Centre Ljubljana, Slovenia

Liver cancer is the fifth most common cancer and the second most frequent cause of cancer-related death globally. The by far most common primary malignant neoplasm is hepatocellular carcinoma followed by intrahepatic cholangiocarcinoma. Complete surgical resection with negative surgical margins (R0 resection) is the treatment of choice with highest long-term survival. Specific instruments have been developed over the years, mainly to minimize excessive blood loss during the liver transection. The most commonly used are Harmonic Scalpel, Ligasure and Cavitron Ultrasonic Surgical Aspirator (CUSA). With CUSA, the liver parenchyma tissue is fragmented using ultrasonic energy and aspirated. Thus, consequently exposed vascular and ductal structures can be ligated or clipped. On one hand, hemostasis has greatly improved, however on the other, little is known whether these instruments have an influence on tumor cells seeding. The study will be conducted at the Department of Abdominal surgery at University Medical Center Ljubljana, investigating the presence of tumor cells in CUSA aspirate following the liver resection of the malignant liver lesions. The study will be designed as a prospective longitudinal clinical study. It will include liver cancer patients older than 18 years who will undergo liver resection with CUSA. Samples from CUSA aspirate will be taken during the surgery, appropriately processed and cryopreserved. After the inclusion phase we will analyze these samples using flow cytometry. We will determine the presence of tumor cells, their size and viability. The patients will be followed according to guidelines. We will observe progression-free survival and overall survival. The control group will be a historic group of patients

who underwent liver resection with other resection techniques. As aspirate of CUSA represents a local tumor environment it could prove a great contribution in understanding mechanisms of tumor cells seeding during liver surgery. Therefore, the aim of the study is to determine the presence of tumor cells in aspirate and question the histologically determined R0-R1 resection. Moreover, if we could prove that tumor cells in CUSA aspirate are viable, we will have a better understanding on tumor cells seeding in correlation with imaging modalities during the follow-up.

Is Technology Guiding Us to Better Results of Surgery: A Case Report of Patient with Renal Tumor

Jošt Janša, Simon Hawlina

University Medical Centre Ljubljana

Partial nephrectomy is a common surgical procedure used for small renal tumors. Robot-assisted laparoscopic partial nephrectomy is currently considered as the accepted method of performing partial nephrectomy. In case of patients presenting with haematuria, we need to exclude the possibility of transitional cell carcinoma, because they require different treatment method (nephroureterectomy).

We are presenting a case of a 34-year old male who was referred to our hospital because of haematuria. We performed cystoscopy and CT scan. CT scan showed $21 \times 19 \times 20$ mm renal tumor, most probably renal cell carcinoma. Because of tumor's proximity to the renal pelvis, we presented the case to our radiologists at a multidisciplinary meeting, they confirmed that the tumor looked like renal cell carcinoma. We also took 3 samples of urine for cytology, all of them were negative for transitional cell carcinoma. We decided to perform a robot-assisted partial nephrectomy. During the procedure we used intraoperative ultrasound for localising the tumor, since the tumor was inside the parenchyma. The ultrasound showed us the tumor with the papillary mass extending into the renal pelvis, suspected for transitional cell carcinoma. Because of the uncertainty of the tumor type we decided to use all intraoperative diagnostic procedures possible.

We performed a flexible ureteroscopy in order to see the mass in the renal pelvis. The procedure was quite challenging because of the lateral decubitus position of the patient and poor visibility because of haematuria. A flexible ureteroscope was guided with the use of the ultrasound towards the tumor mass. The mass showed to be a coagulum, therefore we decided to proceed with partial nephrecto-

my. The next step was clamping the artery. Since there were two arteries and the main one of the two was more easily accessible, we clamped the main artery and checked the ischemia using the ICG, which showed ischemia to be sufficient, so we removed the tumor without clamping the other artery. Patient was released from the hospital the first day after surgery. Histology later showed that renal mass was a hematoma. With the use of intraoperative diagnostic tools we avoided nephroureterectomy in a young patient. The use of intraoperative ureteroscopy is a valuable diagnostic procedure, which can be used during surgery for uncertain tumor types. The use of technology on this case shows how technology is guiding us to better results of surgery.

Small Intestinal Bacterial Overgrowth in Patients Who Underwent Bariatric Bypass Surgery with Focus on Symptoms and Liver Injury

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² University Medical Centre Ljubljana, Slovenia

Bariatric bypass surgery (BBS) may cause undesirable gastrointestinal symptoms due to small intestinal bacterial overgrowth (SIBO), which is a common complication after BBS. SIBO is also involved in the pathogenesis of non – alcoholic fatty liver disease (NAFLD). The aim of the research was to evaluate the prevalence of SIBO after BBS and compare symptoms, eating patterns and general health between SIBO positive and negative patients. The aim was also to concentrate on the liver injury and presence of NAFLD in SIBO positive patients. A total of 55 patients after BBS who underwent glucose breathing test (GBT) (25 g/200 mL) were included. Anthropometric data, comorbidities, symptoms, therapy, eating patterns, preoperative weight loss and general health were analysed with a questionnaire. During BBS liver biopsies were taken and NAFLD activity scores (NAS) were evaluated in 45 patients and liver biochemical tests and basal insulin were analysed. Of the 44 women and 11 men included, GBT was positive in 23 (41.8 %) of patients. A positive test was associated with lactose intolerance ($p = 0.027$), diabetes 1/2 ($p = 0.037$), common use of antibiotics as a child ($p = 0.010$), problems after drinking milk ($p = 0.013$), worsening of symptoms after eating fibres ($p = 0.019$). Mean NAS in SIBO positive group ($n = 18$) was 3.33, in SIBO negative group ($n = 27$) was 3.00. We propose mandatory testing for SIBO after BBS, firstly due to systemic effect and connection with NAFLD, that might worsen in positive patients and secondly clinical presentation is similar to altered gut solely due to the surgery. Treating SIBO is connected to highly improved quality of life after such procedures.

Small Intestinal Bacterial Overgrowth (SIBO) in Patients Who Underwent Total Gastrectomy, Pancreaticoduodenectomy and Total Pancreatectomy

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Small intestinal bacterial overgrowth (SIBO) is common after total gastrectomy (TG), reaching up to 96.2 % in some studies. Available evidence assessing the prevalence of SIBO in patients who underwent pancreaticoduodenectomy and total pancreatectomy (TP) is limited. SIBO can be asymptomatic but is also connected with intermittent diarrhea, abdominal symptoms, steatorrhea, malabsorption of vitamins and/or micro-nutrients, weight loss, which are also common findings in patients after TG, pancreaticoduodenectomy and TP. The aim of the research was to evaluate the prevalence of SIBO in patients who underwent total gastrectomy, pancreaticoduodenectomy and total pancreatectomy. The aim was also to compare symptoms, eating patterns and general health between SIBO positive and SIBO negative group to predict the incidence of complications and treatment interventions. A total of 22 patients after total gastrectomy and 16 patients after pancreaticoduodenectomy and total pancreatectomy who underwent glucose breathing test (GBT) (25 g/200 mL) were included. Anthropometric data, symptoms, eating patterns and general health were analyzed with a questionnaire. Of the 7 women and 15 men included in the total gastrectomy group SIBO was identified in 14 (63.6 %) of cases. A positive GBT was associated with problems after taking probiotics ($p = 0.016$), experiencing more pain ($p = 0.046$) and anxious behaviour ($p = 0.015$). Of the 9 women and 7 men included in pancreaticoduodenectomy and total pancreatectomy group SIBO was identified in 10 (62.5 %) of cases. A positive GBT was associated with frequency of defecation

($p = 0.017$), bloating and flatulence ($p = 0.004$), diarrhea ($p = 0.025$), fatigue ($p = 0.043$), vitamin D deficiency ($p = 0.017$), using antibiotics as adults ($p = 0.011$), diabetes ($p = 0.008$), post-operative chemotherapy ($p = 0.043$). Mandatory testing for SIBO after such procedures is necessary, firstly due to systemic effect, secondly clinical presentation does not differ significantly from altered gut solely and lastly due to highly improved life quality after treating it.

A Rare Presentation of Retroperitoneal Leiomyoma in Colon Cancer Patient – A Case Report

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We present a case of a 45-year-old patient with an adenocarcinoma of the splenic flexure and CT signs of two nodules measuring about 2 cm in the para-aortic region in the region of the inferior mesenteric artery. A laparoscopic transverse colectomy was performed together with the dissection of para-aortic nodules. The postoperative course was uneventful. She was discharged on the seventh postoperative day. Histologic evaluation showed a moderately differentiated adenocarcinoma (G2, pT3 N0 M0, R0). The largest para-aortic nodules were identified as leiomyoma with adjacent reactive lymph nodes. She was referred to the oncologic department for further treatment of adenocarcinoma. Extrauterine presentation of leiomyoma is exceedingly rare. Several pathologic mechanisms are postulated in their development and may include hematogenous or lymphatic spread. Due to rarity of the condition, only a high level of clinical suspicion enables us to pursue an accurate diagnosis and it should be raised in patients with a history of uterine leiomyoma. Diagnosis may be aided using magnetic resonance imaging and biopsy.

Ventricular Lavage for Paediatric Haematocephalus Treatment – A Report of Newly Established Operative Technique

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Posthemorrhagic hydrocephalus in the setting of intraventricular haemorrhage is a frequent problem especially in preterm infants and remains the cause of severe neurological impairment. Despite advances in intensive neonatal care, intraventricular haemorrhage in neonates is the cause of severe neurological impairment and cognitive delay, mainly due to primary cerebral tissue damage resulting from haemorrhage and also due to increased intracranial pressure that the posthaemorrhagic hydrocephalus may cause. Many techniques have been used to treat intraventricular haemorrhage, ranging from fibrinolytic agents to drainages and endoscopic surgery. The technique of neuroendoscopic lavage enables a partial or complete hematoma evacuation in addition to haematocephalus washing. This method allows the hematoma to be reduced or removed in a short time without extensive surgery or introduction of fibrinolytic drugs, thus preventing the intraventricular inflammatory reactions that occur in response to hematoma degradation products. We describe a neonate with haematocephalus, who was successfully treated with the neuroendoscopic ventricular lavage.

Endoscopic Third Ventriculostomy is an Effective Treatment for Obstructive Hydrocephalus in Adults: Our Experience

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The endoscopic third ventriculostomy (ETV) is a neuroendoscopical procedure that represents an appropriate alternative to extracranial shunting. By fenestrating the floor of the third ventricle, it is possible to establish a free flow of cerebrospinal fluid (CSF) from the ventricles to the subarachnoid space. The ETV offers a more physiological solution and a chance at a shunt-free life for children and adults with hydrocephalus. The main indication for this operation is obstructive hydrocephalus. Besides, it may also be useful in patients with other types of hydrocephalus. The aim was to review the efficacy of ETV in adult patients with obstructive hydrocephalus that were treated at the University medical centre Ljubljana. From 2018 to 2021, 18 patients were included in the study (47 % women and 53 % men, the average age was 63 years, range 39 to 85 years). The MRI and CT were used as diagnostic methods and neurological evaluation was done before the procedure. In included patients, the ETV was a safe and effective treatment in 65 % of cases. The rest, 35 % of patients, were treated with ventriculoperitoneal drainage (VPD). The neurological evaluation of gait and cognitive function showed improvement in all ETV-treated patients and 45 % of VSD treated patients. The rest were treated symptomatically. We have observed no major complications in the ETV group. Minor complications included drowsiness after the procedure which waned after a few hours. The ETV was effective for obstructive hydrocephalus treatment in 65 % of all cases. However, the overall success rate of the procedure varies and could be approved by the correct pre-operative patient selection. This treatment is also effective in children and we are planning to introduce the technique in this group of patients in the future.



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