

Abstracts presented at the 13th European Colorectal Congress (#ECCStGallen), 1-5.12.2019, St.Gallen, Switzerland

M. Adamina^{1,2} · On Behalf of #ECCStGallen Scientific Committee

¹Winterthur, Switzerland

²University of Basel, Faculty of Medicine, Basel, Switzerland

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The 13th European Colorectal Congress of St.Gallen took place from Sunday 1.12.2019 to Thursday 5.12.2019. Over 1'050 registered participants from 75 countries enjoyed 46 Expert Lectures for another successful #ColorectalSurgeryWeek. One in ten participants submitted an abstract and 92 submissions were selected for presentation at the congress.

The abstracts of all presented posters are printed below. Of those, an international jury (president Justin Davies, Cambridge, UK) selected the 3 best submissions and awarded the Poster Prize of EUR 2'000 on stage to Dr. Min Jung Kim from Seoul, Republic of Korea for her work on “**Oncological Impact of Lateral Lymph Node Dissection After Preoperative Chemoradiotherapy in Patients with Rectal Cancer**”.

Rosie McDonald, Leicester UK was ranked second with her work on “In patients undergoing emergency resectional colorectal cancer surgery small bite closure of the midline wound is associated with significantly lower rates of incisional herniae”, whereas Joseph Borucki, Norwich UK was third with his paper on “Risk and consequences of dehydration following colorectal cancer resectino with defunctioning ileostomy. A systematic review and meta-analysis”.

Congratulations to all abstracts authors, in particular to the 3 best submissions and to the Abstract Prize Winner Dr. Min Jung Kim.

{Correspondence Author}

Michel Adamina, MD, PD, MSc, EMBA
HSG, FEBS, FASCRS
Chief of Colorectal Surgery
Departement of Surgery
Kantonsspital Winterthur
8401 Winterthur
Switzerland
Tel. +41 52 266 20 40
michel.adamina@gmail.com
www.colorectalsurgery.eu
@MichelAdamina



A NOVEL WAY TO CLASSIFY THE HEMORRHOIDAL DISEASE: THE BPRST STAGING AND ITS USE ON CLINICAL PRACTICE

Carlos Walter Sobrado Junior, Carlos de Almeida Obregon, Lucas Faraco Sobrado, Afonso Henrique da Silva e Sousa Junior, Sérgio Carlos Nahas, Ivan Cecconello

Hospital das Clínicas da Faculdade de Medicina da Universidade de São Paulo

Background/Aim Present an updated classification for symptomatic hemorrhoids, which not only guides the treatment of internal hemorrhoids but also the treatment of external components. In addition, this new classification includes new treatment alternatives created over the last few years. **Methods** Over the past 7 years, the authors have developed a new method for classifying internal and external hemorrhoids, and applied it in a longitudinal observational study to compare it with the most commonly used classification (proposed by John C. Goligher in 1980). It analyzed 149 consecutive patients with symptomatic hemorrhoids treated between March 2011 and November 2013 and aimed to evaluate the association between the Goligher's classification and our proposed BPRST classification. **Results** Both classifications had a statistically significant association with the adopted management strategies. However, the BPRST classification tended to have fewer management discrepancies when each stage of disease was individually analyzed. **Conclusion** Although there is much disagreement about how the classification of hemorrhoid disease should be updated, it is accepted that some kind of revision is needed. The BPRST method showed a strong association with the management that should be adopted for each stage of the disease. Further studies are needed for its validation, but the current results are encouraging.

EFFICACY OF PREOPERATIVE CHEMOTHERAPY FOR LATERAL LYMPH NODE METASTASIS OF RECTAL CANCER

Junichi Hasegawa, Mitsuyoshi Tei, Tae Matsumura, Toshinori Sueda, Yukihiro Yoshikawa, Chikato Koga, Masaki Wakasugi, Hiromichi Miyagaki, Ryohei Kawabata, Masanori Tsujie

Osaka Rosai Hospital

Aim To investigate how neoadjuvant chemotherapy (NAC) have been able to sterilize lateral lymph node (LLN) metastasis of locally advanced rectal cancer (LARC). **Methods** Thirty-eight patients with locally advanced rectal cancer who received NAC between Feb. 2010 and Jan. 2018 were examined. Ten patients received XELOX (capecitabine plus oxaliplatin), 14 patients XELOX plus bevacizumab (Bmab) and 14 patients XELOXIRI (capecitabine, oxaliplatin plus irinotecan) as NAC. Regarding LLN involvement, any adenopathy that measured more than 7 mm or displayed a margin irregularity or internal heterogeneity on the axial view of pretreatment CT and/or MRI was considered as a malignant lymph node. **Results** Median age was 62.5 (46–77), and 31 patients were male. The completion rate of NAC was 89.5% (34/38). The four patients (10.5%) withdrew from the protocol after 2–3 cycles of NAC. The reasons for treatment discontinuation were severe adverse events (bleeding, abscess formation, stricture formation, and neutropenia).

All patients underwent R0 resection. TME with lateral lymph node dissection (LLND) was performed in 12 patients, and 2 (16.7%) of these patients were pathologically diagnosed as positive for LLN metastasis. The pCR rate was 7.9% (3/38). The follow-up period ranged from 4 to 112 months (median 62 months). The 5-year disease-free survival and overall survival rate was 75.0 and 92.0%, respectively. A multivariate analysis showed that only histological response to NAC had independent impact on the relapse free survival. There has been no cancer-specific recurrences in good responders. Three (7.9%) in 38 patients developed local recurrences in the lateral pelvic area where LLND had not been undergone. **Conclusion** Although LLN metastasis could not be eradicated completely by NAC alone, TME with selective LLND following NAC seems effective and valid for good responder to NAC among the patients with LARC.

SARCOPENIA IS NEGATIVELY ASSOCIATED WITH LONG-TERM OUTCOMES IN OBSTRUCTIVE COLORECTAL CANCER

Chul Seung Lee¹, Yoon Suk Lee¹, Do Sang Lee¹, Daeyoun David Won², In Kyu Lee¹

¹Seoul St. Mary's Hospital, The Catholic University of Korea; ²Songdo Hospital

Aim Sarcopenia is a body composition biomarker that reflects patient frailty. It has been associated with both short-term postoperative and long-term oncologic outcomes. However, the clinical significance of sarcopenia in colorectal cancer obstruction has not yet been described. The present study aimed to determine the short and long-term oncologic impacts of sarcopenia in obstructive colorectal cancer. **Methods** A total of 249 patients with obstructive colon cancer were included between January 2004 and December 2013. In the initial staging computed tomography (CT), sarcopenia and visceral obesity were identified by measuring the muscle and visceral fat areas at the third lumbar vertebra level. Both short-term postoperative and long-term oncologic outcomes were analyzed. **Results** Among the included patients, 96 (38.6%) had sarcopenia. Sarcopenia patients were significantly older than non-sarcopenia patients (66.9 ± 13.1 vs 61.7 ± 11.0 years, $p < 0.001$). During the follow-up period, 57 recurrence events (22.9%) were observed. Patients with sarcopenia showed significantly shorter DFS than that in patients without sarcopenia (hazard ratio [HR] 1.746, 95% confidence interval [CI] 1.035–2.945, $p = 0.034$). Visceral adiposity tended to show a difference but did not reach statistical significance (HR 0.574, CI 0.994–1.016, $p = 0.072$). BMI and neutrophil–lymphocyte ratio (NLR), which represents systemic inflammation, were not associated with DFS ($p = 0.349$ and 0.444 , respectively). Sarcopenia patients showed a significantly shorter OS than that of non-sarcopenia patients ($p = 0.049$; Fig. 2). Visceral adiposity tended to show a difference but did not reach statistical significance (HR 0.41, CI 0.16–1.04, $p = 0.0534$). BMI and NLR were not associated with OS ($p = 0.190$ and 0.477 , respectively). **Conclusion** In obstructive colorectal cancer, sarcopenia was a significant clinical factor associated with both overall and disease-free survival. However, there were no significant differences in short-term complications. Future prospective studies should incorporate body composition data in patient risk assessment and oncologic prediction tools.

INCORPORATING FLUORESCENCE IMAGING IN A SENHANCE™ SURGICAL ROBOTIC SYSTEM DURING A SIGMOID COLECTOMY FOR DIVERTICULAR DISEASE

Ibrahim Darwich, Dietmar Stephan, Marc Klöckner-Lang, Michael Scheidt, Frank Willeke

St. Marienkrankenhaus Siegen

Aim Robotic assisted sigmoid colectomy for diverticular disease using the Senhance™ Surgical Robotic System has been shown to be feasible (Darwich et al. J Robotic Surg 2019). While there is clinical evidence supporting the use of fluorescence imaging in assessing bowel perfusion and determining the level of bowel transection (Ris et al. Br J Surg 2018), data has been published showing the incorporation of this imaging technique in robotic assisted colorectal surgery (Jafari et al. Surg Endosc 2013). We describe here the first case of combining indocyanin green (ICG)-enhanced fluorescence with the Senhance™ robot during a sigmoid colectomy for diverticular disease. **Methods** An 81 years old female patient (BMI 27 kg/m²) with stenotic diverticular disease of the sigmoid colon underwent a robotic assisted sigmoid colectomy using the Senhance™ Surgical Robotic System. Bowel perfusion was assessed prior to and after fashioning the anastomosis using a PINPOINT® Endoscopic Fluorescence Imaging System (Stryker, USA) under i.v. administered indocyanin green. A specially designed adapter provided compatibility between the PINPOINT® endoscope and the robotic arm. **Results** A close to the colon dissection of the sigmoid was performed in order to preserve the inferior mesenteric artery (Masoni et al. Surg Endosc 2013). The robotic procedure complied with the standard technique utilized at our department. The specimen was extracted via an incision in the left iliac region following rectal transection below the sacral promontory. Once the surgeon had marked the intended level of transection of the proximal colon, the anesthesiologist was instructed to administer 7.5 mg of ICG intravenously. The SPY Portable Handheld Imaging System (Stryker) was utilized under ambient light to assess bowel perfusion. Fluorescence was observed 19s after ICG administration. The demarcation line of fluorescence matched the marked level of intended bowel transection. A second assessment of the bowel perfusion followed after fashioning the double-stapled anastomosis, this time utilizing the PINPOINT® endoscope while administering another i.v. Bolus of 7.5 mg ICG. Excellent perfusion of the anastomosis was observed. The postoperative course was uneventful. The patient was discharged on day 8 after surgery. **Conclusion** Incorporating fluorescence imaging technology in a Senhance™ surgical robotic system provides a feasible and easy method to assess bowel perfusion during robotic colorectal surgery.

SURGICAL AND ONCOLOGIC OUTCOMES OF ROBOTIC RESECTION FOR SIGMOID AND RECTAL CANCER: A ANALYSIS OF 109 PATIENTS FROM A SINGLE CENTER IN CHINA

Zhizhong Pan, Jianhong Peng, Junzhong Lin, Jinghua Tang, Yuan Li, Lingheng Kong, Xueying Li

Sun Yat-sen University Cancer Center

Aim Robotic colorectal resection has been increasingly performed in recent years. The safety and feasibility of its application has also been demonstrated in Europe and US. However, limited studies have presented clinical data for patients with colorectal cancer (CRC)

receiving robotic surgery in China. The aim of this study is to present short-term clinical outcomes of robotic surgery and further confirm its safety and feasibility in Chinese CRC patients. **Methods** The clinical data of 109 consecutive CRC patients received robotic surgery at Sun Yat-sen University Cancer Center between June 2016 and May 2019 were retrospectively reviewed. Patient characteristics, tumor trait, treatment details, complications, pathologic details, survival status were evaluated. **Results** Among 109 patients, 35 (32.1%) had sigmoid cancer and 74 (67.9%) had rectal cancer. Thirty-seven (33.9%) patients underwent preoperative CRT. Ten (9.2%) patients underwent sigmoidectomy, 38 (34.9%) underwent high anterior resection (HAR), 45 (41.3%) underwent low anterior resection (LAR), and 16 (14.7%) underwent abdominoperineal resection (APR). The median surgery procedure time was 270 min (range 120–465 min). Pathologically complete resection was achieved in all patients. There was no post-operative mortality. Eleven (10.1%) patients occurred complications, including 3 (2.8%) anastomotic leakage, 1 (0.9%) anastomotic bleeding, 1 (0.9%) pelvic hemorrhage, 4 (3.7%) intestinal obstruction, 2 (1.8%) chyle leakage, and 1 (0.9%) poor wound healing. At a median follow-up of 17 months (range 1–37 months), there were 1 (0.9) patients developed local recurrence and 5 (4.6) developed distant metastasis with one death due to disease progression. **Conclusion** Our results suggest that robotic surgery is technically feasible and safe for Chinese CRC patients, especially for the rectal cancer receiving preoperative CRT in that the robotic laparoscope with large magnification is able to show a clear surgical space for tumor resection in the case of mesorectal edema.

HYDROGEN PEROXIDE AND METHYLENE BLUE COCKTAIL: A LOW COST ALTERNATIVE TO MAGNETIC RESONANCE FISTULOGRAPHY

Tushar Subhadarshan Mishra¹, Pankaj Kumar², Siddhant Sarthak²

¹AIIIMS; ²All India Institute of Medical Sciences, Bhubaneswar

Background Delineation of the fistulous tract with its ramification and identification of the internal and external openings make the cornerstone of successful management of any fistula. Fistulography or magnetic resonance (MR) fistulography are frequently used towards this end, but have the demerit of radiation exposure or additional cost. Methylene blue has traditionally been used for defining the fistulous tracts during surgery or clinical examination; however, it may fail to establish some parts of the tract and at times the internal opening, as some part of the tract may be kinked or choked with debris. **Aim** We describe a novel technique of delineation of the fistulous tract using a cocktail of methylene blue and diluted hydrogen peroxide which we found was effective and to compare its sensitivity with the other existing imaging techniques when was done for the diagnosis of a fistula in ano. **Methods** A methylene blue and hydrogen peroxide cocktail aided clinical examination was done in every case, instead of the routine digital rectal examination and proctoscopy. The sensitivity of this novel method of examination was retrospectively compared with the sensitivity of other imaging procedures like that of fistulography and MR fistulography, when they were done for the purpose of diagnosis. **Results** The clinical examination with the aid of this novel technique was done in 157 cases, in this study. The tract could be accurately delineated in 96% cases with a sensitivity of 96.79% and a confidence interval of 92.68–98.95% and with a positive predictive value of 100%. MR fistulography, on the other hand, had 100% cases in detection of the tract and 95.65% sensitivity in finding the internal opening with a confidence interval of 85.16–99.47 and a positive predictive value of 100%. The sensitivity of fistulography was only 37% for the detection of the length of the tract and 62% of

the internal opening. **Conclusion** The sensitivity of this new technique for the internal opening is comparable to that of the MR fistulography and much better than the preoperative fistulography. It has the added advantage of having almost zero cost besides stains the fistulous tract, which acts as a realtime guide to the direction of the fistulous tract, thus being a dynamic and real time guide to the surgery.

PROMISING RESULTS OF A NEW TREATMENT IN PATIENTS WITH BOWEL OBSTRUCTION IN COLORECTAL SURGERY

Milad Fahim, Lea Dijkstra, Charlotte van Kessel, Diederik Smeeing, Akje Braakma, Wouter Derksen, Anke Smits

St. Antonius Hospital

Aim Bowel obstruction increases risk of emergency surgery and leads to suboptimal physical and nutritional condition. Preventing emergency surgery and prehabilitation might improve outcomes. This pilot study aimed to examine the effect of a multimodal obstruction protocol for bowel obstruction patients on the risk of emergency surgery and postoperative morbidity and mortality. **Methods** All bowel obstruction patients treated according to the obstruction protocol in the period 2013–2017 were included in this uncontrolled observational cohort study. Benign and malignant causes of bowel obstruction were included. The protocol consisted of: 1. specific dietary adjustments to reduce prestenotic dilatation, 2. oral laxatives and 3. prehabilitation. Emergency surgery and postoperative morbidity and mortality rates were compared to known rates from the literature. **Results** Sixty-one patients were included: 44 (72%) were treated for colorectal cancer and 17 (28%) for Crohn's disease or diverticulitis. Four patients (7%) underwent emergency surgery. Primary anastomosis was constructed in 49 out of 57 elective patients (86%). Severe complications (Clavien–Dindo \geq III) occurred in four patients (7%). No bowel perforation, anastomotic leakages or 30-day mortality was observed. These rates were much lower than rates reported in the literature after surgery for colorectal cancer (3% bowel perforation, 8% anastomotic leakage, 4% 30-day mortality, 15% severe complications) and benign disease (30-day mortality 17%, severe complications 7%). **Conclusion** Using the obstruction protocol in patients with bowel obstruction reduced emergency surgery and postoperative morbidity and mortality in this pilot study. This protocol seems to be a viable and efficient alternative to emergency surgery.

PHARMACOLOGIC PROPERTIES OF OXALIPLATIN-LOADED CHEMICALLY CROSS-LINKED HYDROGELS FOR PREVENTION OF POSTOPERATIVE ABDOMINAL ADHESION TO USE COLORECTAL CANCER SURGERIES

Eun Jung Park, Jee Eun Lee, Sharif MD Abuzara, Sung-Joo Hwang, Seung Hyuk Baik

Yonsei University

Aim Postoperative intra-abdominal adhesion is a common complication following colorectal surgeries. Nowadays, biodegradable hydrogels derived from natural polysaccharides is regarded as ideal materials to prevent postoperative adhesion in peritoneum. In this study, we aimed to demonstrate the synthetic procedure of HA and

CMCNa based cross-linked hydrogels loaded with oxaliplatin and evaluate pharmacologic characteristics as well as in vivo intra-abdominal anti-adhesion barrier efficiency. **Methods** A chemically cross-linked hydrogel composed of HA and CMCNa was synthesized through the used of adipic dihydrazide (ADH) as a cross linker and 1-ethyl-3-(3-dimethylaminopropyl)carbodiimide (EDC) as a carboxyl activating agent with longer duration and oxaliplatin is dispersed in hydrogel to preparation anti-adhesion barrier with anticancer effect. Carboxyl group of HA and CMC was made cross-linked hydrogel by forming amide bond with ADH as a cross linker. The compositions of HA and CMCNa were varied: HA:CMCNa = 1:1, 1:2, 1:5, 2:1, and 5:1. After the synthesis, the microstructure, rheology, and degradation behavior of hydrogels were evaluated. Sustained release of oxaliplatin was observed from hydrogels compared that from solutions, which release drugs through diffusion, following the Higuchi and Korsmeyer-Peppas models. In vivo Sprague–Dawley (SD) rats models were used to evaluate the efficacy of the anti-adhesive effects in the HA-CMCNa = 1:1, HACMCNa = 1:2, and HA-CMCNa = 2:1 hydrogels. **Results** The structure of cross-linked hydrogel was a porous structure as the ratio of HA increases. The viscosity was increased when the ratio of HA was increased. The dissolution rate of oxaliplatin dispersed in hydrogel was from 57 to 65%, which was related to the degradation of hydrogel. In case of the HA-CMCNa = 1:1, 1:2, 2:1, these were showed similar degradation rate, and sustained for about 60 h. In vivo experiment showed a low degradation rate, HA-CMCNa = 2:1 hydrogel with high anti-adhesion effect. The postoperative anti-adhesion study using SD rats showed that the synthetic hydrogels significantly prevented intra-abdominal adhesion with a slower release of oxaliplatin compared to the control group. **Conclusion** It is concluded that hydrogel synthesized using HA and CMC sodium had biocompatibility and anti-adhesive effects with slow-releasing oxaliplatin. These results can be helpful for the development of sustained-releasing anticancer drugs with anti-adhesive effects.

HOW DO I TO DO IT: LASER SINUS PILONIDALIS PROCEDURE (SiLaC™)

Claus Blumberg¹, Uwe Johannes Roblick²

¹Chirurgische Praxis und Enddarmpraxis Lübeck;

²Agaplesion Diakonieklinikum Hamburg, Hamburg, Germany

Aim Pit picking is a new minimal invasive therapy for pilonidal cyst (PNS) treatment. Sinus laser ablation of pilonidal cyst (SiLaC™) is the complementary laser treatment of the subcutaneous fistula track and the abscess cavity in order to improve the surgical outcome. **Methods** For sinus laser ablation of pilonidal cyst (SiLaC™) the subcutaneous fistula track and the abscess cavity are treated with an 360° laser probe with a wavelength of 1470 nm and a power of 8 W. The procedure is done in day surgery under local anaesthesia. In our clinic the postoperative examinations are on day 1, 2 weeks and 6 weeks after the operation (including photo documentation). Pain was recorded by using a 10-point visual analog scale (VAS) in which 0 represents no pain and 10 represents severe pain. The patients satisfaction with the procedure/the outcome were evaluated by questionnaire. The operation time in minutes and the duration of laser intervention (in seconds) were recorded. **Results** A total of 42 patients (39 male, 3 female) underwent the laser treatment for pilonidal cyst (second mean age was 23 years. Mean operation time was 12 min (8–24 min). Mean time of laser use was 118 s. Primary healing was seen in 87% of the patients after 6 weeks combined with a high patient rate of satisfaction with the operative result. This is due to the minimally invasive procedure resulting in small wounds and thus less

pain after the operation. All patient were able to work at the fourth day after the operation and able to back to normal life. After instruction, all patients were able to care for the cleaning and dressing of their small wounds. **Conclusion** Sinus laser ablation of pilonidal cysts (SiLaC™) is a fast, save and minimally invasive procedure with good primary healing, less pain and a high patients satisfaction. It is a day surgical procedure and has the potential to evolve to the standard surgical procedure for treatment of pilonidal cysts.

SURGICAL LOCAL RESECTION TECHNIQUES FOR T1 RECTAL CANCER

Gabie de Jong¹, Eelco de Graaf²

¹Rijnstate Hospital Arnhem, The Netherlands; ²IJsselland Hospital, Capelle a/d IJssel, The Netherlands

Aim Since the development of transanal surgical resections of rectal lesions, multiple new techniques and surgical platforms have been developed. Some major breakthroughs and many smaller adaptations have resulted in a confusing jungle of possibilities. In this review article all available local surgical procedures for T1 rectal lesions are discussed. **Methods** First an overview of recommendations reported in international guidelines is given. Next, a systematic literature search on technical considerations for decision-making, like technical success rate, perioperative considerations and complication rates is performed. Finally the authors discuss the extent of the excision based on the limited available literature and expert opinion. **Results** Thirty-five articles were selected for the current analysis. With respect to the surgical techniques that can be used, roughly three categories can be distinguished; transanal excision, transanal surgery using endoscopy and transanal surgery using endoscopy with resection of lymph nodes. Within these categories many variations have been identified and explained. With respect to the extent of the excision four variables of interest are addressed: the estimated depth of tumor growth, the location of the tumor, the circumferential growth of the tumor and the potential disadvantages for future surgery. **Conclusion** The current literature review provides a good overview that might help in decision making within a field where many options are available with their own (dis) advantages. However, it also brings to the surface that there is a lack of high quality evidence to prove any superiority. There seems to be a general consensus on some key principles for surgical local excisions like the need for a full thickness, monobloc excision without tumor fragmentation. With respect to technical considerations the authors found that there seems to be sufficient data to support that transanal excision has a higher risk on fragmented or irradical resection than transanal resections using endoscopy.

FREQUENCY OF CONVERSION FROM LAPAROSCOPIC TO OPEN CHOLECYSTECTOMY

Mohammad Ummair North Cumbria University Hospital

Aim This study aims to determine the frequency of conversion from laparoscopic to open cholecystectomy in elective cases, and, the factors/reasons/rationale resulting in a conversion. **Methods** A retrospective study conducted in Northwest general hospital, Peshawar, Pakistan. Patients over the age of 20 with a diagnosis of cholelithiasis and no contraindication for general anesthesia were included, from September 2012 till April 2018. Patients with pathologically detected malignancies or gallbladder polyps, cirrhosis, massive ascites, and bleeding diathesis, were excluded from the study. **Results** A total of

531 patients were included in the study. The mean age was 48.82 years with a standard deviation of 15.06 years. Of the 521 patients, 115 (21.7%) were male and 416 (78.3%) were female. 54 (10.2%) patients were converted to open cholecystectomy. From the results, it was observed that the conversion rate in males (20.8%) was comparatively higher than the conversion rates in females (7.2%). In addition, it was noted that laparoscopic cholecystectomy was converted to open procedure more often in patients over 50 years of age (35) as compared to patients under 50 years of age (19). The rationale for the conversions were severe adhesions (20), gall bladder empyema/gangrene (15), anomalous anatomy of the biliary tree (10), gall bladder perforation (05) and mucocele gallbladder (04). **Conclusion** Various conversion rates have been reported in literature ranging from 2.7 to 19%. It is also noted that the rate of conversion is higher in developing countries when compared with developed countries. The probable reasons for high conversion rates in Asian and developing countries might be due to a lack of availability of latest laparoscopes, lack of proper training in new/advanced laparoscopic techniques or lack of trained staff to assist surgeons. An overall conversion rate of 10% from laparoscopic to open cholecystectomy was observed in this study (10.2%) which is similar to the conversion rates observed in other developing countries. The most common reasons for conversions were adhesions, gall bladder empyema, anomalous anatomy of the biliary tree, gall bladder perforation and mucocele gall bladder. Age and gender were two factors that were observed to influence/predict conversions; conversions were more likely to be performed in people above the age of 50 than those below 50 and in males more so than in comparison with females.

ANASTOMOTIC LEAKAGE RATE BELOW 2% IN COLORECTAL SURGERY: JUST A DREAM?

Jonas Herzberg¹, Sharam Khadem¹, Human Honarpisheh¹, Salman Guraya², Tim Strate¹

¹Krankenhaus Reinbek; ²College of Medicine University of Sharjah United Arab Emirates

Aim Despite innovation in surgical technologies, anastomotic leakage (AL) after colorectal surgery is still a common complication leading to increased morbidity and mortality. Several studies have shown various risk factors but the reported AL-rate remains high with a range from 4 to 11%. This study reports the results of a multi-disciplinary perioperative approach for a fail-safe colorectal surgery to make for a maximum risk control. **Methods** This retrospective study recruited all patients who underwent colorectal surgery during July 2014–December 2018 in the Department of Surgery Hospital Reinbek St. Adolf-Stift, Germany. All elective and emergency admissions with a colorectal resection and primary anastomosis were recruited. All patients were treated according to a “Fail-safe” checklist, including for example preoperative bowel preparation, complete mobilization of the hemicolon and standardized anastomosis and postoperative nutrition. **Results** A total of 1.296 colorectal resections including 709 (54.7%) laparoscopic procedures were performed. In 966 patients a primary anastomosis was done. An AL occurred in 17 patients (1.76%). There was no significant difference between open or laparoscopic approach in the AL-group (9 vs. 8 patients). **Conclusion** This data shows that an AL-rate below 2% in colorectal surgery is not just a dream but possible, using an uncompromised application of a multimodal strictly standardized approach according to the “fail-safe” concept.

FORTIFICATION OF INTESTINAL ANASTOMOSES USING NANOFIBROUS MATERIALS

Jachym Rosendorf¹, Jana Horakova², Marketa Klicova², Richard Palek¹, Lenka Cervenkova³, Tomas Kural⁴, Petr Hosek³, Vladislav Treska¹, David Lukas², Vaclav Liska⁵

¹Faculty of Medicine in Pilsen, Charles University, Czech Republic;

²Faculty of Textile Engineering, Technical University in Liberec, Czech Republic; ³Biomedical Center, Faculty of Medicine in Pilsen, Charles University, Czech Republic; ⁴Unive

Aim Anastomotic leakage is a severe complication in colorectal surgery. It can be a reason for reoperation together with intestinal passage blockage due to formation of peritoneal adhesions. Many materials as local prevention of these complications have been studied, none of which are nowadays routinely used in clinical practice. Nanofabrics proved to promote healing in various applications. We decided to study their impact on anastomotic healing and formation of peritoneal adhesions. **Methods** We performed an experiment on 24 piglets. We constructed 3 hand sutured end-to-end anastomoses on the small intestine of each pig. We covered the anastomoses with a sheet of polycaprolactone nanofibrous material in the first experimental group, with a sheet of copolymer of polylactic acid with polycaprolactone nanofibrous material in the second one and no fortifying material was used in the Control group. The animals were sacrificed after 3 weeks of observation. Clinical, biochemical and macroscopic signs of anastomotic leakage or intestinal obstruction were monitored, the quality of the scar tissue was assessed histologically, and a newly developed scoring system was employed to evaluate the presence of adhesions. **Results** The material is easy to manipulate with. There was no mortality or major morbidity in our groups. No statistically significant difference was found between the groups in the level of peritoneal adhesions or the quality of healing of the anastomoses. **Conclusion** We created a new adhesion scoring system. The material appears to be safe however needs to be studied further in different settings to gain more distinguishable results. Two subsequent projects with adjusted materials have been performed already with promising results.

INTESTINAL AND BOWEL INJURY IN ABDOMINAL TRAUMA

Jachym Rosendorf¹, Richard Palek², Vaclav Liska², Vladislav Treska²

¹Medical School, Charles University and University Hospital Pilsen;

²Faculty of Medicine in Pilsen, Charles University, Czech Republic

Aim Hollow viscus injuries (HVI) appear in abdominal trauma in less than 1%. The major cause of these are automotive accidents, often resulting in polytrauma. Isolated HVI is rare and its diagnostics is challenging as we till today lack both sufficiently specific and sensitive markers. A possible delayed surgical intervention can occur especially in cases of blunt abdominal trauma. The time factor seems to be very important for the patients outcome. We aimed to evaluate the time factor importancy and imaging methods reliability. **Methods** We performed a retrograde study on a set of patients who underwent a laparotomy for abdominal trauma having an injury with either the small intestine or the bowel in the faculty hospital in Pilsen in years

2008–2017. We searched for the mechanism of the trauma, parameters like sex, age, comorbidities, associated injuries, diagnostic methods and their results, time elapsed between the moment of admission till the laparotomy, type and severity of the HVI, surgical procedures performed, complications, length of the stay in the hospital etc. We analysed the data using standard statistical methods. **Results** We collected a set of 41 patients, 30 men and 11 women (6–68 years). The most frequent mechanism in our set is an automotive accident. The HVI was diagnosed by CT scan in 17 patients, only once by ultrasound and 23 times not by any imaging method but in the operating room. The average time elapsed from the admission to the operating room was 214 min (immediate to 2580 min). There were 17 cases of small intestine injury, 14 cases of bowel injury and 9 cases of combined injury. Six of the patients died. **Conclusion** We collected and analysed a set of 41 patients, which displays a broad spectrum of patients with different trauma severity, surgical approach and outcome. We consider the surprisingly low sensitivity of CT scan for HVI as the most significant result.

GRACILOPLASTY AS AN EFFECTIVE TREATMENT FOR PASSIVE FECAL INCONTINENCE

Coen Baeten

GHZ; Gouda

Aim We analyzed the effectivity and safety of the non-dynamic graciloplasty in a specific group of patients. This group of patients experienced passive fecal incontinence and remarkably in all these patients the ventral side of the anus, also called the perineal body, could nearly be moved to the pubic bone. In order to strengthen the ventral side of the anus, they were treated with a non-dynamic graciloplasty. **Methods** We retrospectively studied the charts of all patients receiving a non-dynamic graciloplasty from November 2015 until June 2018. A total of 39 graciloplasties were performed. Patients were included according the following criteria: (1) female; (2) passive fecal loss not due to an anal mucosal prolapse; (3) lack of closure of the anal canal with a ventral side of the anus that could nearly be moved to the pubic bone; (4) treated with a non-dynamic graciloplasty. The primary outcome of this study was the success rate, defined as a reduction of more than 70% of the complaints of passive fecal loss 3 months after surgery. Secondly, we studied the safety of the procedure evaluating the complications within 30 days after surgery. **Results** 29 patients met the inclusion criteria. The success rate of this study was 86%, as 25 patients had more than 70% reduction of their passive fecal loss 3 months after surgery. Nine patients experienced a complication within 30 days after surgery. Most frequent complications were retention bladder and surgical site infection. One patient experienced a major complication and needed a colostoma after a rectal perforation. Of 25 patients with combined complaints of passive fecal loss and urge incontinence, 11 patients maintained having complaints of urge. One patient with isolated passive fecal loss pre-operatively even developed complaints of urge incontinence postoperatively. **Conclusion** The graciloplasty is an effective and a safe treatment for passive fecal loss in this specific group of patients. Differentiation based on subtypes of fecal incontinence is of utmost importance for a specific patient-oriented approach in the treatment of fecal incontinence.

THE CRITICAL ROLE OF HISTOLOGY REPORTING AND SAFEGUARDING MEASURES TO PROVIDE EXTENDED THROMBOEMBOLIC PROPHYLAXIS TO PATIENTS UNDERGOING MAJOR COLORECTAL CANCER SURGERY

Asif MACHHADA, Yasser Abdul-Aal Maidstone and Tunbridge Wells NHS Trust

Aim 1. To identify if failure to identify new cancer diagnoses is a contributing factor to shortfalls in compliance. 2. To develop additional safeguarding measures such as a new postoperative proforma in addition to trust-wide education. 3. To encourage other trusts to perform similar audits to improve nationwide compliance with NICE guidance. **Methods** 1. An initial 12-month retrospective study on theatre records identifying open and laparoscopic abdominal explorations, in addition to listed bowel resections, performed in the emergency setting. 2. Inpatient durations and prescriptions were obtained from discharge reports. Pre- and peri-operative histopathology were used to identify existing or new cancer diagnoses, respectively. 3. To exclude patients with bleeding diathesis, hepatic or renal failure, further analyses were then made using previous clinical records including imaging and blood sciences. 4. A second 5-month study to establish the impact of measures such as histology report verification prior to discharge and trust-wide education. **Results** 1. Perioperative sampling time was significantly shorter than the duration of postoperative stay (5.4 days, Student's *t* test, $p < 0.01$). 2. This was with no significant difference ($p > 0.2$, one-way ANOVA with Sidak's) in reporting time between groups. 3. With the implementation of safeguarding measures, the overall extended VTE provision improved dramatically from 61 to 93%. 4. Patients with newly confirmed malignancy on peri-operative histopathology reports prior to discharge improved from 36 to 100%. **Conclusion** Postsurgical inpatients will usually receive VTE prophylaxis during their hospital stay based on simply being a surgical inpatient. The real issue is upon discharge of the hospital when it is often not added to the discharge prescription. Both cancer and major surgery are independent risk factors for pulmonary embolism and deep vein thrombosis. A systematic approach whereby histology reports are verified to identify new cancer diagnoses, therefore, has the potential to significantly improve postoperative care.

INDOCYANINE GREEN (ICG) FLUORESCENCE IMAGING IN LAPAROSCOPIC COLON SURGERY

Jan Moravík, Jan Rejholec, Pavel Timoshin

Krajská zdravotní a.s. - Nemocnice Děčín o.z.

Aim In recent years, it has been increasingly talked about the possibility of directly peroperatively objectifying blood supply to the anastomosis. The possibility of verifying the perfusion of anastomosis peroperatively due to fluorescence angiography after application of ICG (indocyanin green) seems to be the most useful. **Methods** Most studies report a reduction in the incidence of anastomotic leakage, when using ICG fluorescence angiography. However, we did not find any stronger data evaluating the possibility of using ICG angiography to evaluate anastomotic perfusion on a colon surgery. Therefore, we decided to evaluate this possibility in our own prospective study in 2018. A total of 57 patients indicated for elective colonic resection were enrolled within 12 months. Patients with rectosigmoidum or

rectal resection were not included. **Results** There were 31 men and 24 women in our group. Average BMI 28.92, with a maximum of 56 and a minimum of 18. Average age of 62.7, with a maximum of 82 and a minimum of 24 years. Laparoscopically completed 54 operations (94.7%). Conversion was necessary in two patients (3.5%) and primarily one patient was operated on as open surgery. Right hemicolectomy was performed in 30 patients (52.6%), ileocecal resection 3 × (5.3%), left hemicolectomy 8 × (14.0%), sigmoid resection 16 × (28.1%). Complete intracorporeal anastomosis was reconstructed in 52 cases (91.2%). Stapler anastomosis was also reported in 52 cases (91.2%). ICG was given to the peripheral venous entry at a dose of 12.5 mg. The mean time to evaluate fluorescence since intravenous ICG administration was 23.0 s, with a maximum of 45 s and a minimum of 10 s. In either case, we did not have to move the prepared oral resection line. In all cases, the surgeon correctly assessed adequate blood supply to the bowel. We did not have to remodel anastomosis already due to poor perfusion. In all cases, the anastomosis perfusion was assessed to be adequate by ICG fluorescence angiography. In this group we reported an anastomosis leak in two patients, i.e. 3.5%. In one case it was a laparoscopic sigmoid resection and once it was a sigmoid resection where conversion to open surgery was necessary. **Conclusion** Since we did not change the resection plan in our group due to ICG angiography, the routine use of ICG fluorescent angiography in elective colonic resections is questionable. The use of ICG fluorescent angiography in colonic resections will be indicated in selected cases.

TRANSANAL ENDOSCOPIC OPERATION (T.E.O): 115 CASES REPORT IN A SINGLE CENTER

Arantxa Arruabarrena Oyarbide, Asier Martín López, Irene Aramendia García, Ibai Otegi Altolagirre, María Jesús Busto Vicente, Igor Novo Sukia, Maitane Larrañaga Zabaleta, Antonio Uranga Goikoetxea, Marta Clemares De Lama, Jose María Erro Azcarate

Osi Goierri Alto Urola Hospital

Aim Transanal minimally invasive techniques (TEM/TEO/TAMIS) has become the treatment of choice of rectal benign tumours and rectal cancer at early stages (T1) with similar survival rates but lower morbidity. **Methods** Retrospective review of a prospectively collected database was performed of all patients who underwent TEO at Zumarraga Hospital (February 2011–March 2019). Rigid rectoscopy, magnetic resonance and endorectal ultrasound was done in all patients in order to establish strict inclusion criteria. The surgery was performed by two surgeons with the transanal endoscopic operation platform (TEO, Karl Storz). Recurrence and surveillance was calculated by Kaplan–Meier statistical analysis. **Results** 115 patients were operated: the average age of the patients was 69 (43–90); 79 (60%) of the patients were male and 36 (40%) female. Final pathology was benign in 46 (40%) and malignant in 69 (60%): 63 pT1 (5 pT1sm2, 1 pT1sm3), 3 pT2, 2 extraordinary patients with complete pathological response after neoadjuvant chemotherapy that refused any stoma a local excision was done, and 1 final case in elderly patient with ypT2R2 with palliative purpose. The median tumour size was 3 cm (1–9 cm). The length from anal verge was less than 5 cm (30%), 5–10 cm (40%) and 10–17 cm (30%). The pneumorectum allowed the ascent of the lesion (rectoscopy-TEO less than 5 cm: 0.68 cm/more than 5 cm: 0.58 cm = $p = 0.014$) being feasible the

technique in lower rectoanal canal and rectosigmoid junction. In all cases we did full thickness resection and closed the rectal defect with reabsorbable suture (V-loc). Median hospital stay was 2 days (1–16). The global morbidity was 4.35% (5 Clavien–Dindo IIIb (3 hemorrhages: 1 arterial embolization, 2 endoscopic sclerosis, 1 dilatation after stenosis and 1 abscess cavity that required Pezzer tube introduction). Perforation in the peritoneal cavity was not considered as a complication. After a median follow-up of 30 months (range 1–60), occurred 2 recurrences (1.73%): one case we repeated TEO, the other pT1sm2 (radiotherapy and Miles). In 3 cases pT2, new surgery was done (low anterior resection) and the specimen showed no remaining lesion either ganglionic malignancy in the lymphadenectomy. In 2 elderly patients (pT2 at 3 cm from anal verge) with informed consent nothing more was done. No mortality was observed. **Conclusion** TEO is a safe, feasible technique with minimal morbidity and good oncological results in rectal initial cancer even in lower and upper rectum.

EARLY AND MEDIUM-TERM RESULTS AFTER LHP PROCEDURES IN DIFFERENT CASES OF HEMORRHOID DISEASE. RESULTS OF 4-YEAR PROSPECTIVE SINGLE CENTER COHORT STUDY OF 966 CASES

Aigars Martinsons¹, Inga Melbarde-Gorkusa², Ints Bruneniekš²

¹SIA RRAIM Clinic for Laser Surgery Riga LATVIA; ²Clinic for Laser Surgery Riga LATVIA

Aim Estimation of the early and medium term results after LHP treatment of hemorrhoids in different cases of the disease after LHP procedure in comparison with LHP another co-interventions. **Methods** In period from 01.01.2014 to 01.01.2019, 966 patients were treated in our clinic (stage II–IV). The inclusion criteria were signed informed consent, commitment to participate in the study, possibility to perform the treatment in day care setting. 811 patients were included. All patients were treated in day care setting, mainly under general anesthesia with presacral blockage. The early and mean term (2 months) results after treatment were compared between “pure” LHP procedure group (laser vaporization, mucopexy—if necessary) and “combined” group (additional skintagotomy, fissure treatment, superficial fistulotomy, polypectomy). The 10 point pain score, visual analog score and amount of opiate pills were calculated to estimate the pain, the type, rate, time of complications, the simple life quality score and patient’s satisfaction were analyzed. **Results** All patients were discharged in same day, the mean in-hospital time were 4.1 h with no difference between groups. The maximal pain was ascertained after 3–4 days, significantly higher in complicated group (2.4 v/s 3.6 pts). After 2 weeks the pain scores were without any difference. There were no early (48 h) complications in both groups. The postoperative bleeding was ascertained in 64 (8%) cases. 26 (4%) patients were admitted to emergency room, 8 were hospitalized, and 6 operated as urgent mainly due to bleeding (no difference between groups). In 24 (3%) patients the septic complications developed. From them surgical fistula treatment was performed 8 cases (4 complex fistulas—treated in hospital setting). There were no data functional problems in both groups. In “simple” LHP group more patients demanded the skintagotomy after complete healing 97 (12%) v/s 57 (7%). The overall satisfaction and final life-quality was equal. **Conclusion** The LHP is safe, accessible for day care treatment, with good patient satisfaction. Based on our data we can recommend this procedure also in complex cases simultaneously with other co-interventions (fistula treatment, skintagotomy etc.).

PERIOPERATIVE ASSESSMENT OF ICG IN COLORECTAL ANASTOMOSES

Sigurd Folkvord, Ole Helmer Sjø, Gro Wiedswang, Hege Rustad

Oslo University Hospital

Aim Anastomotic leakage (AL) remains the most challenging complication following colorectal resections. Insufficient vascular perfusion is considered to be one of the main causes of AL. Indocyanin green (ICG) can be used to visualize blood supply to bowel segment in the anastomosis. We wanted to explore the use of intraoperative ICG in laparoscopic colorectal resections to disclose if this procedure change surgical strategy and AL frequency. **Methods** During the registration period of 7 months in 2017 and 8 months in 2019, 46 laparoscopic operations with primary anastomosis were prospectively registered (17 right-sided colectomies, 2 left-sided colectomies, 11 sigmoid resections, 14 rectum resections and 2 colectomies). ICG 0.2 mg/kg was injected after vessel ligation (to decide level of resection) and after established anastomosis. Scope, camera and xenon light source from Karl Storz (n = 19), Olympus (n = 22) and Intuitive (robot-assisted rectal resection n = 5) were used. **Results** Intraoperative time consumption for the ICG procedure was median 5 min (range 3–15 min). One patient had postoperatively anaphylaxis; otherwise no side-effects were registered. In one sigmoid resection ICG showed good perfusion, but upon cutting the bowel the circulation was poor and ICG examination was considered misleading. ICG caused change in surgical strategy in 5 patients [extended resection (2), laparotomy and extended resection (1), less resection than planned (2)]. The surgeon considered ICG useful in 40 of the operations, and not useful in two cases. 2/46 (4.3%) patients had AL; 76 year old woman (BMI 15, used corticosteroid) with ileorectal anastomosis, re-operated day 10 disclosing a small hole in a well perfused and tensionless anastomosis. 67 year old man with low anterior rectal resection re-operated postoperative day 4 revealing small bowel herniation under the anastomosis causing tension. Thus, none of the AL was caused by poor blood supply. In 2018 we had no ICG available at our institution reporting an AL frequency of 6.2% in laparoscopic colon resections (n = 81) and 5.1% (n = 39) in rectum resections. **Conclusion** The ICG procedure can change surgical strategy and may reduce AL caused by poor blood supply to the anastomosis.

QUASI-ELECTIVE LEFT COLECTOMY AFTER STENTING FOR OBSTRUCTIVE CANCER YIELDS TO COMPARABLE ONCOLOGIC OUTCOME TO FULL-ELECTIVE OPERATION

Nicolò Tamini¹, Marco Ceresoli¹, Simone Alde¹, Luca Nespoli², Luca Gianotti², Marco Braga², Massimo Oldani¹

¹Asst Monza - Ospedale San Gerardo; ²Università degli studi di Milano Bicocca

Aim In the past decade, self-expandable metal stent (SEMS) placement has been proposed as an alternative to emergency resection for obstructing left colon cancer creating a bridge to quasi-elective operations. The aim of this study was to evaluate long terms oncological outcomes of patients who underwent colon resection after SEMS placement or elective operations with comparable cancer stages. **Methods** Starting from the year 2008, all patients admitted to the Department of Surgery of the San Gerardo Hospital—Milano-Bicocca University, Monza, Italy, with a diagnosis of colorectal

cancer were collected prospectively. Baseline, surgical, endoscopic, oncologic, and follow-up characteristics of all patients were entered by sanitary personnel in an electronic database. For the aim of the study, we retrospectively selected patients with the following characteristics: (1) left sided colon cancer; (2) cancer stages I–III. Exclusion criteria were: (1) palliative surgery; (2) emergency operation. For the purpose of the study, we stratified patients into two groups: (A) full-elective left colon resection and (B) quasi-elective left colon resection, defined as surgery performed after SEMS placement for obstructive colon cancer. **Results** From 2008 to 2017 190 patients with stages I–II–III left or sigmoid cancer were submitted to an elective colorectal resection at our hospital. In the same period 53 patients with colonic obstruction due to a stages I–II–III left side or sigmoid cancer were treated with the insertion of a SEMS with a BTS strategy. Postoperative comorbidities were comparable between two groups. After a mean follow up of 51 and 54 months respectively 16 (15.1%) patients in elective groups and 10 (18.9%) in stent group had a recurrence. Disease free survival and overall survival did not reach the median; both were similar between the two study groups. **Conclusion** Patients underwent SEMS positioning as a bridge to elective curative surgery has no differences in terms of postoperative morbidity and oncological prognosis if compared to patients presenting with non-obstructive left colon cancer detected by routine screening program.

COLON CANCER SURGERY: DOES PREOPERATIVE BLOOD TRANSFUSION AFFECT SHORT-TERM POSTOPERATIVE OUTCOMES?

Nicolò Tamini¹, Giuseppe Deghi², Marco Braga², Luca Gianotti², Luca Nespoli²

¹Asst Monza - Ospedale San Gerardo; ²Università degli studi di Milano bicocca

Aim While perioperative red blood cell transfusion has been widely associated with poor surgical outcomes, few studies focused specifically on preoperative transfusional risk-to-benefit ratio. Aim of the present study is to evaluate the effects of preoperative red blood cell transfusion on short term surgical outcomes in a cohort of anemic colon cancer patients. **Methods** Moderate and severe anemic patients undergoing colectomy for cancer were selected from a single institution prospectively collected database. Patients were divided into two groups based on receipt of preoperative transfusion and then univariate and multivariate analyses were used to compare perioperative outcomes between transfused and non-transfused patient. **Results** 271 patients with moderate or severe anemia were identified. A total of 93 patients (34.3%) were preoperatively transfused with a median of two units of packed red blood-cells per patient (IQR range 2–4). The overall morbidity rate did not differed significantly between the two groups (35.5% vs 36.2%, $p = 0.63$), while an increased incidence of major morbidity (Clavien-Dindo grade > 3a) was observed in transfused patients with respect to non-transfused patients (14% vs 6.2% respectively; odds ratio [OR] 2.47; 95% confidence interval [CI] 1.06–5.75; $p = 0.03$). The increase in major morbidity was confirmed by multivariate analysis, adjusted for potential confounders (OR 3.45; 95% CI 1.32–9.04; $p = 0.01$). **Conclusion** Preoperative blood transfusions is an independently risk factor for severe postoperative complications in patients affected by colon cancer presenting with moderate to severe anemia. Further studies has to be designed to establish an optimal preoperative transfusional cut-off in order to optimize postoperative outcomes and balance clinical costs.

ELECTIVE COLONIC RESECTION FOR COLORECTAL CARCINOMA: 10 YEARS EXPERIENCE

Pavel Timoshin, Jan Moravík, Jan Rejcholec

Regional Health Ltd., Hospital Decin, Czech Republic

Aim Over the past decade, the penetration of mini-invasive surgery has been increasing. Over time, mini-invasive surgery has also established itself in colorectal surgery. **Methods** In our presentation we retrospectively compare the results of elective operations for colorectal cancer performed in our department. We compare the set of patients operated in two time periods. From 1.1.2008 to 31.12.2012 with a group of patients operated from 1.1.2013 to 31.12.2018. **Results** From 1.1.2008 to 31.12.2012, 67 elective sigma resections were performed at our department. Laparoscopically completed 47 operations (70.15%). Conversions to open surgery 9 × (13.43%). Primarily, 11 patients (16.42%) were operated on as an open surgery. In the newer group from 1.1.2013 to 31.12.2018 114 patients were operated. Laparoscopically, 97 operations (85.09%), 11 × conversions (9.65%) and open 6 × operations (5.26%) were completed. In the older group there were no complications in 44 patients (65.67%) and in the newer group 84 patients (73.68%). Anastomotic leak was in the older group 3 × (4.47%), in the newer group 4 × (3.50%). From 1.1.2008 to 31.12.2012, 76 elective right colectomies were performed. Laparoscopically completed 45 operations (59.21%). Conversions to open surgery 11 × (14.47%). As open surgery 20 patients were operated (26.32%). In a newer group from 1.1.2013 to 31.12.2018, right colectomy was performed 110 times. Laparoscopically, 91 cases (59.21%), 15 × conversions (13.64%) and open 4 × (3.64%). In the older group there were no complications in 36 patients (47.37%) and in the newer group 63 patients (57.27%). The anastomotic leak was in the older group 5 × (6.57%), in the newer group 5 × (4.54%). **Conclusion** In the group of patients operated on during the last 5 years, the proportion of mini-invasive surgeries performed in our department is increasing. When comparing the results, there is a clear decrease in perioperative morbidity and anastomotic leakage in the group of the last 5 years compared to the group of patients previously operated. Increased use of mini-invasive surgery and adherence to Fast Track principles contribute to improving the results.

STEM CELL THERAPY (DARVADSTROCEL) FOR TREATMENT-REFRACTORY COMPLEX PERIANAL FISTULAS IN PATIENTS WITH CROHN'S DISEASE: 2-YEAR EFFICACY AND SAFETY DATA

Antonino Spinelli¹, Damián García-Olmo², Gert Van Assche³, Jean-Frederic Colombel⁴, Walter Reinisch⁵, Daniel C. Baumgart⁶, Willem Bemelman⁷, Axel Dignass⁸, Maria Nachury⁹, Marc Ferrante³, Andre D'Hoore¹⁰, Jean C. Grimaud¹¹, Fernando De la Portilla¹², Eran

¹Humanitas Clinical and Research Center, Rozzano, Milan, Italy;

²Hospital Universitario Fundación Jiménez Díaz, Madrid, Spain;

³University Hospitals Leuven, KU Leuven, Leuven, Belgium; ⁴Icahn School of Medicine at Mount Sinai, New York, New York

Background/Aim Darvadstrocel (DVS) is an expanded, allogeneic, adipose-derived, mesenchymal stem cell therapy indicated for treating complex perianal fistulas (CPAF) in Crohn's disease (CD). In the pivotal ADMIRE CD (NCT01541579) phase 3 study, significantly more patients treated with DVS vs the control arm achieved combined remission at Week 24. An extended follow-up to reassess patients 2 years post-treatment was introduced later in the study via protocol

amendment. **Methods** ADMIRE CD was a two-arm, randomised, double-blind, controlled study; CD patients with refractory CPAF received 1 local injection of 120 million DVS cells + standard of care (SOC) in the DVS arm, or placebo + SOC in the control arm. Patients who completed Week 52 and were enrolled at the time of protocol amendment had the option to participate in the extended follow-up to Week 104. Analysis of the subpopulation of patients who entered Week 104 was conducted. Endpoints of this analysis included clinical remission (closure of all treated external openings draining at baseline despite gentle finger compression) and changes in Perianal Disease Activity Index (PDAI). Treatment-emergent serious adverse events (TESAEs) were assessed. Data were recorded during hospital follow-up visits. **Results** Forty patients entered the extended follow-up. Treatment arms were imbalanced (DVS $n = 25$; control $n = 15$). Baseline characteristics in this subpopulation were similar to those of the full study population. At Week 104, 14 patients (56%) in the DVS arm were in clinical remission vs 6 patients (40%) in the control arm. The PDAI total score compared to baseline in the DVS arm improved by 2.6 points vs 1.3 points in control. From baseline to Week 104 there were 7 TESAEs reported, 5 in the DVS arm and 2 in control. None were considered as related to DVS. **Conclusion** The proportion of patients in clinical remission at 2 years of follow-up after administration of DVS or placebo in this patient subpopulation (56% vs 40%) was comparable to the remission rates in patients who completed Week 52. No new safety signals emerged. Alongside previously reported data, these findings suggest DVS maintains efficacy in treating CPAF. Due to the high rate of patients lost to follow-up resulting in limited sample size and arm imbalance, results should be interpreted with caution.

TRANSANAL TOTAL MESORECTUM EXCISION: EXPERIENCE AFTER 21 CASES

Stanislas Laurent, Marie-Julie Lardinois, Catalin Maris

CHR Verviers

Aim Transanal total mesorectum excision is widely accepted in the literature for the treatment of low (less than 2 cm upper than pectineal line) and middle (between 2 and 5 cm upper than pectineal line) rectal tumour. Through this paper, we would like to present our short-term outcomes and oncological results after 21 cases. **Methods** Between February 2016 and January 2019, we proceed to 21 TaTME with discharge ostomy for low and middle rectal tumour. Information about the patients were collected and demographic data, specimen quality and perioperative outcomes were analysed. An assessment of the quality of life was realized at least 6 months after ostomy reintegration using the EQ-5D-3L QOL test and the LARS score test. **Results** For 3 years, 21 patients underwent TaTME. 38% of the patients had a low rectum tumour while 62% had a tumour of the middle rectum. Metastasis were found in 3 cases during the preoperative assessment. 17 patients (80%) were eligible for a neoadjuvant treatment (45 Gy, 25 fractions and 5-FU concomitant chemotherapy). We practiced 17 procedures by laparoscopy and for the other cases, laparotomy was chosen due to the patient histories. 16 patients had a lateral ileostomy and 5 had a colostomy which were all reintegrated averagely 4 months after the surgery without complications. Concerning the specimen analysis, only 2 patients (10%) had a circumferential resection margin shorter than 3 mm. During the first month after surgery, 6 patients (28%) suffered from partial anastomotic leakage, treated by Endosponge for 3 of them and by surgery

for one. For 3 years, we had no local recurrence, two distant recurrences and no mortality imputable to the operation. 6 months minimum after the reintegration, we interviewed the patients and received 18 answers (2 patients were dead meanwhile and 1 suffered from a severe stroke): On a scale from 0 to 10, the average quality of life was 7.5. 5 patients didn't suffer from LARS, 7 patients suffered from minor LARS and 6 of them suffered from major LARS but all those patients described an amelioration of the symptoms. No loss of erection was imputable to surgery. **Conclusion** Evaluation of our above outcomes shows that TaTME is a safe and feasible procedure for low and middle rectal tumour, with good oncologic results and acceptable postoperative course. However, an analysis of more cases is essential to confirm our results.

THE NOVEL GATEKEEPER™ AND SPHINKEEPER™ FOR FAECAL INCONTINENCE: LONG TERM RESULTS FROM THE FIRST AUSTRALIAN TRIAL

Madhu Bhamidipaty, David Lam, Basil D'Souza, James Keck, Eugene Ong

St Vincent's Hospital Melbourne

Aim To assess the long term continence, quality of life (QOL) outcomes, and safety profile for the new artificial Gatekeeper™/Sphinkeeper™ anal prosthesis for faecal incontinence (FI). **Methods** This was a prospective non-randomized clinical trial commenced in 2016. St Mark's continence and faecal incontinence quality of life (FIQOL) scores were obtained prior to prosthesis insertion. Pre-operative endoanal ultrasound (EAUS) was obtained, along with ultrasounds at 1, 3 and 12 months post insertion. Questionnaires were sent out subsequently for long term follow up for both St Marks and FIQOL scores. Statistical analysis was performed using SPSS. **Results** In total, there were 16 Gatekeeper™ and 6 Sphinkeeper™ insertions. 22 patients were used for technique analysis, 86% of patients provided data for continence long term analysis and 82% for long term FIQOL measures. Median time from insertion to follow up was 32.0 months (IQR 26.0–36.0 months). Median operating time was 22.5 and 39 min for the Gatekeeper™ and Sphinkeeper™, respectively. Median St Marks continence score improved significantly from 17 to 15, ($p = 0.010$). FIQOL measures did not improve in any of the 4 domains. Preliminary analysis suggested > 25% of pellets injected have migrated. Post-defecatory leakage was the most common complaint. One patient had a delayed return to theatre for irritation/sepsis. **Conclusion** Data from the first Australian trial suggests that the insertion of the Gatekeeper™/Sphinkeeper™ is a low risk, simple and safe procedure with some improvement in long term continence scores.

PANENTERITIS AFTER COLECTOMY FOR ULCERATIVE COLITIS: CASE REPORT AND LITERATURE REVIEW

Federica Gonella, Francesco Danese, Paolo Massucco, Michela Mineccia, Marco Palisi, Valentina Gentile, Alessandro Ferrero

Azienda Ospedaliera Ordine Mauriziano di Torino

Aim Intestinal involvement in ulcerative colitis (UC) is generally limited to colon and rectum. We describe the rare case of a boy that

developed life-threatening ulcerative enteritis after colectomy for UC. **Methods** A 25 years old boy affected by short course UC underwent total colectomy in urgent setting for septic shock. Histology confirmed ulcerative colitis with high inflammatory activity. Post-operative course was characterized by elevated ileostomy output (3000–10,000 ml/day), fever, abdominal pain and anemia. Clinical status was highly compromised by hydro-electrolytes loss, requiring subintensive monitoring and prolonged i.v. infusions. After exclusion of surgical complications, infectious and immunological causes, patient underwent ileoscopy, that showed diffuse ileitis with superficial erosions and fragile mucosa. Histological analyses revealed an active chronic inflammatory process, interpreted as ileal localization of UC. Patient was then treated with high dose i.v. steroid treatment, obtaining good response. Oral diet was progressively introduced and, 15 days later, methylprednisolone was stopped. Patient was discharged with mesalazine therapy and anti-diarrheal drugs. 8 months after first operation, patient underwent proctectomy with ileo-J-pouch reconstruction and, 2 months later, ileostomy reversal. **Results** The described case represents the rare pathology known as enteritis UC-related, developing after colectomy. It can involve duodenum, jejunum or ileum, where are found pathognomonic lesions of UC. On 58 cases described, 21 are reported by Japanese authors. Etiology hypotheses comprehend immunological, genetic and environmental factors, enhanced by surgical operation. Clinical presentation can vary from severe forms to mild ones. All reported cases respond well to steroid or immunosuppressive therapy. Follow up is important since recurrences are not infrequent. **Conclusion** Even if rare, panenteritis should be suspected when UC typical symptoms develop after colectomy, in order to avoid therapeutic delay. Excluded differential diagnoses as infectious, ischemic, toxic and immunological disorders, ulcerative enteritis can be detected by endoscopic biopsies and then treated with immunosuppressive agents.

ADIPOSE-DERIVED STEM CELL THERAPY FOR PERIANAL FISTULAS IN CROHN'S DISEASE: A SINGLE-CENTER EXPERIENCE

Daniela Cabalzar-Wondberg, Luc Biedermann, Philipp Schreiner, Gerhard Rogler, Matthias Turina

University Hospital Zurich

Aim The treatment of perianal fistulas in patients with Crohn's disease (CD) is challenging. Recently, stem cell therapy has been introduced as an innovative option after failure of "conventional" treatment according to the results of the ADMIRE trial, revealing a success rate with complete healing of 56% after 52 weeks. Following the approval of Darvadstrocel by Swissmedic in January 2019, we herein report the results of the first series of patients treated at our academic center. **Methods** A total of 7 patients with complex perianal Crohn's fistulas were treated with local injection of 120 million allogenic adipose-derived stem cells. Four injections with 30 million stem cells each was performed with two injections around the internal opening and the other two given around the fistula canal. In preparation, pelvic MRI and fistula conditioning with seton loop placement was performed at least 6 weeks preoperatively. The postoperative follow-ups were scheduled 1, 2, 4, 6, 12, 26 and 52 weeks postoperatively. **Results** Patients were between 25 and 82 years old (mean 39 years; 6 male, 1 female). Two patients were smokers. Patients had a median duration of CD of 15 years (range 2–24 years) and suffered

from perianal fistulas for an average 8 years (range 2–17 years). The fistulas showed either an inter-/trans- or suprasphincteric course and 1–3 fistulas were treated per patient. The current follow-up time ranges between 6 and 30 weeks. Postoperatively, all patients had rapid improvement of symptoms (3–4 days) and secretions from the wound usually stopped after a few days. In 2 patients, fistula healing was found 4 weeks postoperatively, in another 2 patients the fistulas healed after 6 weeks. Currently there are 5 patients with healed fistulas. One patient has developed repeated abscesses and is considered a treatment failure. Another patient shows improvement of symptoms but without healing of the fistula at 6 weeks. **Conclusion** Our initial experience of seven patients treated with Darvadstrocel for perianal CD fistulas shows promising results with full healing in five patients. Long-term results have yet to be awaited, and the logistics of the administration are demanding. However, based on our current results Darvadstrocel appears to be a promising therapeutic approach for CD patients with complex and refractory perianal fistulas.

SURGICAL SITE INFECTIONS IN COLORECTAL SURGERY: APPROPRIATENESS OF PROPHYLACTIC AND EMPIRICAL ANTIBIOTICS BASED ON CULTURE SENSITIVITY RESULTS

Hsien-Lin Sim, Surendra Kumar Mantoo

Khoo Teck Puat Hospital

Aim Surgical site infections (SSIs) are an important cause of morbidity and mortality in colorectal surgery patients. Rising antimicrobial resistance has an implication on the effective treatment choices that should be used. This retrospective audit assessed the predominant microbes which are grown in SSIs in colorectal surgery and their respective susceptibilities to the various available antibiotics in a single institution in Singapore. This was then cross-referenced to the antibiotic prophylaxis and empirical treatment policies in the hospital to determine their appropriateness and make recommendations if necessary. **Methods** 111 patients were identified to have SSIs according to the definition by the Centre for Disease Control and Prevention, USA. The institution's electronic health records were accessed to obtain the relevant information including but not limited to their wound cultures and antibiotics prescribed. This was then collated, stratified and reorganized into an antibiogram based on the most common microbe groups. **Results** The most common microbes which grew on SSI included the Enterobacteriaceae family (*Escherichia coli*, *Klebsiella pneumoniae*, Enterobacteria Cloacae), gram positive bacteria, *Pseudomonas aeruginosa* and anaerobes. There was no significant variation in the growth of these microbial groups across type of surgery, surgical approach, urgency of surgery and type of SSI. The antibiogram showed an overall low susceptibility (< 20%) to Augmentin throughout the various types of SSI. While there was a consistently high susceptibility (> 75%) throughout the various types of SSIs to aminoglycosides, quinolones and macrolides tested. 82.6% of patients were on Augmentin prophylaxis. 48.2% of patients were started on an Augmentin only empirical regimen upon diagnosis. **Conclusion** There is a low rate of susceptibility to Augmentin in the microbes growing on SSIs. Antimicrobial susceptibilities suggest an alternative empirical regimen such as gentamicin and metronidazole or ciprofloxacin and metronidazole. Further prospective studies should be performed to confirm their efficacy.

TRANSANAL ENDOSCOPIC OPERATION (TEO): ¿ IS IT FEASIBLE FOR POLYP RESECTION IN RECTOSIGMOID JUNCTION?

Arantxa Arruabarrena Oyarbide, Asier Martín López, Irene Aramendia García, Ibai Otegi Altolagirre, Maitane Larrañaga Zabaleta, Igor Novo Sukia, Maria Jesus Busto Vicente, Antonio Uranga Goikoetxea, Marta Clemares DE Lama, Jose María Erro Azcarate

Osi Goierri Alto Urola Hospital

Aim Transanal endoscopic microsurgery (TEO) seems to be technically difficult for polyp resection in upper rectum and rectosigmoid junction. When it is possible, full thickness resection is oncologically better than endoscopic conventional resection. **Methods** Descriptive video of a single case with full thickness resection of a rectal polyp in rectosigmoid junction. **Results** 64 years old male patient underwent TEO for a pseudopedunculated villous polyp of 2.5 cm discovered after screening colonoscopy. The flexible endoscopy described the lesion at 12 cm from anal verge but the rigid rectoscope, as usual, diverged the distance to 15 cm from the anus. The preoperative studies allowed a transanal resection (magnetic resonance: polypoid tumour without deep invasion and no pathological adenopathies and CT scan with no distant metastases). Under general anesthesia and deep relaxation with rocuronium perfusion and after colorectal preparation the patient was operated in 100 min. We introduced the largest longitude of TEO (20 cm) in prone position and full thickness resection with 1 cm macroscopic margin was marked. The aperture into de abdominal cavity was necessary and was not considered as a complication. In this case, we used two knots before resection in order to avoid the ascent of the cranial flap and facilitate the suture after resection. Harmonic scalpel allowed an excellent hemostase and we finished the suture with 2 continues with reabsorbible suture (V-Loc 3/0). Once we opened the peritoneal cavity the pression disorders marked the suture really challenging, that is why we systematically close all the defects in TEO in order to improve the learning curve for this tumours located in upper rectum. The anatomopathological analysis showed a tubulovillous adenoma with mild displace with no borders affected and good histological prognosis. The patient had no morbidity and was discharged home in 2 days. In our serie of TEO (n: 115 from 2011 trough 2019) 34 (30%) patients required transanal excision in upper rectum (10–18 cm). **Conclusion** TEO in upper rectum and rectosigmoid junction may be challenging but is feasible and full thickness specimen is oncologically better than endoscopic mucosectomy.

WHICH SIDE IS BETTER? COMPARISON OF ONCOLOGICAL OUTCOMES AND DIFFERENCE BETWEEN LEFT-SIDE AND RIGHT-SIDE OF COLORECTAL CANCER: ALGERIAN BI-CENTRIC STUDY

Mourad Abid, Fayçal Chaib Eddour¹, Mourad Brahimi¹, Brahim Ouadfel¹, Zakia Korjani¹, Rabeh Bouzouagh¹, Zohir Benabdelhafidh¹, Ahmed Hammani²

¹Anti cancer center - Batna - Algeria; ²Clinique Debussy, CPMC, Algiers

Aim There are embryonic, anatomical, and histological differences between right colon (RCC) and left colon (LCC) cancers. Many studies have sought to determine survival and prognosis based on the location of the tumor. This study compares clinical-pathological

features and oncologic findings between RCC and LCC. **Methods** This is a bi-centric retrospective study. The data collection of patients undergoing curative resection for RCC and LCC was made over a period from July 2004 to December 2015. **Results** Of the 353 patients, 156 operated for RCC or 44%, and 197 operated for LCC or 56%. No significant difference in age, gender or surgery delays. It is noted that LCC were diagnosed at a later stage. RCC had more carcinoma type poorly differentiated. The survival curves are practically superimposable over a 36-month follow-up (59%), beyond, and up to 96 months, survival after a LCC is 49%, higher than that of the RCC at 43%. LCC have better survival for stage I cancers (p = 0.01). **Conclusion** The many findings regarding the differences between right and left colon cancers should have an impact on the screening and treatment of colon cancer. We found that right and left colon cancers are different in terms of clinical presentation, histology, and oncologic outcomes. RCC cancers are more aggressive and are associated with poorer results. Appropriate specialized treatment related to the localization of colon cancer is necessary.

PRESENTATION AND MANAGEMENT OF DELAYED ANASTOMOTIC LEAKS FOLLOWING ANTERIOR RESECTION FOR RECTAL CANCER

Yvonne Ying Ru Ng, Cherylin Wan Pei Fu

Singapore General Hospital

Background/aim Anastomotic leakage after anterior resection is associated with significant morbidity and mortality. As most literature focuses on early postoperative leaks, delayed anastomotic leak (DAL) occurring more than 6 months after the primary surgery is not well studied. Our study aims to determine the incidence of DAL after oncological anterior resection (AR) for rectal cancer, and to evaluate factors that are associated with its occurrence. **Methods** A retrospective study was performed of all patients undergoing oncological colorectal resection with primary anastomosis between January 2000 and October 2017 under the Department of Colorectal Surgery at Singapore General Hospital. DAL was defined as a new onset clinical or radiological leak occurring more than 6 months after initial surgery. Demographic data, surgical details, time to diagnosis of DAL, presenting symptoms, methods of diagnosis and treatment were analysed. **Results** A total of 2177 oncological ARs were performed between January 2000 and October 2017. The incidence of DAL was 1.1% (n = 24). Median time to discovery of DAL was 31.5 (range 7–157) months. Twenty patients (83%) had an ultralow AR, and the remaining four had a low AR. All patients had anastomosis performed with a circular stapler and a defunctioning stoma upfront. Twenty-one patients (92%) received radiotherapy, of which 7 had neoadjuvant while 14 had adjuvant radiotherapy. Sixteen patients (67%) presented with symptoms, of which 12 had perianal or perineal sepsis and 4 had abdominal or back pain. Eight patients were asymptomatic and had presacral abscesses identified radiologically. Fourteen patients (64%) required surgical reintervention of which 11 patients ended up with a permanent stoma. **Conclusion** DAL following anterior resection for rectal cancer whilst uncommon can result in significant morbidity requiring surgical reintervention and permanent stoma creation. Radiotherapy especially in the adjuvant setting is significantly associated with DAL and needs to be recognized during consideration of rectal cancer management.

THE EFFICACY OF US GUIDED LASER TREATMENT OF PILONIDAL DISEASE (SiLaC)

Ints Bruneniks, Aigars Martinsons¹

¹*SIA RRAIM Clinic for Laser Surgery Riga LATVIA*

Aim There are a lot of treatment methods for pilonidal disease with different results, recurrence and complication rates. One of the choices is sinus pilonidalis laser closure (SiLaC). Usually diagnostic of disease is done during surgeon's visit, sometimes with introducing the probe into the tracts. In reality diagnostic is blind without fistula tract branch visualization. The real situation can be recognized only during the surgery. For diagnostic of sinus pilonidalis abscesses, branches length and enlargement in our practice the ultrasound device was used. **Methods** In the first appointment patients are having an ultrasound investigation of sinus pilonidalis fistula tracts. According to the results of US investigation patients are divided in 2 groups: more than 4 cm and less than 4 cm long fistula tracts. Longer fistulas went to SiLaC procedure with 1740 nm laser, others to pit picking procedure. US device was used also in control visits to recognize the first signs of recurrence. **Results** Patients (n = 84) with fistula tract in length more than 4 cm went to SiLaC procedure under regional anesthesia. 9 patients had different reconstructive sinus pilonidalis operations before. Primary and secondary openings were excised and fistula tracts were closed with laser 1740 nm. Two weeks after procedure a big amount of discharges were in 6 patients but complains disappeared after antibiotic therapy. Two weeks after procedure signs of recurrence in ultrasound investigation were in 8 patients, they went to pit picking procedure in local anesthesia. Two months after procedure recurrence were in 4 cases, they needed reoperations (2 SiLaC, 1 pit picking, 1 wide excision with marsupialization). Patients (n = 106) with fistula tract in length less than 4 cm went to pit picking procedure under local anesthesia in surgeon's office. 24 patients had recurrence; they went to pit re-picking. To prevent possibility of recurrence US diagnostic was performed in early as well as in late postoperative period. **Conclusion** Combination of SiLaC and pit picking procedures is minimal invasive method of treatment for sinus pilonidalis with short hospital stay, minimal incapacity of work and excellent cosmetic effect. US gives opportunity to choose right procedure and prevent recurrence in early and late postoperative period.

THE PRONE JACKKNIFE POSITION FIRST ABDOMINOPERINEAL EXCISION FOLLOWED BY TWO TEAMS APPROACH WITH TATME: NEW STANDARDIZED TECHNIQUE FOR ACHIEVING THE PATHOLOGICAL CRM NEGATIVE SPECIMEN

Madoka Hamada, Yuki Matsui, Fusao Sumiyama, Toshinori Kobayashi, Yuki Matsumi, Hisanori Miki, Mitsugu Sekimoto, Mitsuaki Ishida, Hiroaki Kurokawa

Kansai Medical University Hospital

Aim Several studies of extralevator abdominoperineal excision resulted in disappointing outcomes not only of 3-year local recurrence rate but also of postoperative complications as compared with standard APE. In order to design incision line of levator ani transected in combination for the negative pCRM according to the MRI T2 images, we present prone jackknife position first APE (pfAPE) followed by two teams approach with TaTME. **Methods** Firstly, the operation is

started at the perineal part in the prone jackknife position. An incision and dissection of in the subcutaneous fat for exposing all around the outer surface of the levator muscle is performed according to the Holm's procedure. After disarticulating the coccyx, the range of incision line of levator ani is adjusted according to the findings of MRI T2 images. For the anterior tumor, puborectalis sling is exposed as anterior as possible, which is incised and reach the lateral side of the prostate or vaginal wall. The dissection plane at the lateral side is extended cranially and caudally and the entire posterior surface of the anterior organs is exposed. This procedure makes it possible to avoid injury of urethra and vaginal wall as possible. Connecting the dissection plane into the perianal incision, the specimen can be lifted up, and we can reach the peritoneal reflection in most of the cases. Secondary, we changed the posture to the lithotomy position. Finally, using the two teams approach with TaTME, the specimen was extracted through the perineal side under the assistance of laparoscopic surgery. **Results** From February 2014 to July 2019, 22 cases of low rectal cancer underwent APE with curative intent. Nine cases of APE by "the up to bottom laparoscopic surgery", 8 cases by the TaTME with lithotomy position and 5 patients by the pfAPE. Age, gender, BMI, tumor distance from the anal verge, cT, pCRM value, operation time, blood loss were not significantly different. Two cases of "the up to bottom laparoscopic surgery" group and one case of the TaTME with lithotomy position group were pCRM positive (≤ 1 mm) that had anterior lesions. All cases of the pfAPE group were pCRM negative (> 1 mm). **Conclusion** pfAPE enable us to control the resection range of the levator ani muscle under direct vision. It can be standardized to achieve pCRM negative specimen with APE, especially for the anterior lesions.

SMALL BITES TECHNIQUE FOR CLOSURE OF EMERGENCY LAPAROTOMY

Jane Hornsby, James Royle¹

¹*Sunderland Royal Hospital*

Aim Small bites technique for closure of laparotomy wounds has been extensively described. However, there is no primary evidence for the use of small bites technique for closure of emergency laparotomies. The aim of this study is to compare the outcomes of using small bites technique and standard practice to close emergency midline laparotomies. **Methods** All patients had their operations at Sunderland Royal Hospital. Patients were collected from the National Emergency Laparotomy Audit database and data was collected retrospectively from the electronic record. Consecutive cases since the onset of use of small bites technique were used. An equal number of cases using a non-small bites technique were used. Patients who had laparoscopic colorectal resections and small bowel resections where a midline incision was used for the extraction site were included. Patients were excluded if they had a transverse incision or previous incisional hernia. The primary outcome measure was clinical and radiological evidence of midline incisional hernia. Secondary outcomes were wound infection and wound dehiscence. **Results** Sixty-seven patients had emergency laparotomies using small bites technique, and 68 patients had standard practice including continuous mass closure and other methods or fascial closure. In the small bites cohort no patients had wound infection or dehiscence. Mean follow up was 11 months and 3.2% had clinical evidence of midline incisional hernia at follow up. Forty patients had an abdominal CT scan following their surgery, of which one demonstrated a midline inci-

sional hernia. The mean time between emergency laparotomy and the CT scan was 10 months. In the standard practice cohort, five patients (7.3%) were treated for wound infections, one of which had superficial dehiscence. The mean follow up was 11 months and 8.8% of patients had clinical evidence of midline incisional hernia at follow up. Thirty-four patients had a CT scan following their surgery, of which 5 demonstrated a midline incisional hernia. The mean time between emergency laparotomy and the CT scan was 14 months. **Conclusion** In this study, we have demonstrated that small bites technique can be used for the closure of emergency midline laparotomy wounds, and is associated with lower rates of wound infection and incisional hernia. It has several limitations, and further work should be done to mitigate these limitations.

POST-COLECTOMY ILEITIS IN PATIENTS WITH ULCERATIVE COLITIS: A DIAGNOSTIC CHALLENGE

Ramez Antakia, Laurence Toquero, Suzy Lishman, Rohit Makhija

Peterborough City Hospital

Aim Post-colectomy ileitis is an unrecognised yet common challenging disease entity described in the literature in patients with ulcerative colitis (UC). Reported incidence varies, with some authors feeling that it is under-recognised with high re-operative rates and associated mortality as high as 25%. We adopted multidisciplinary approach including patient's preference and close follow-up. **Methods** We present a case series of four patients (age range 26–55 years) with post-colectomy ileitis in patients with established histological diagnosis of UC at least 1 year prior to diagnosis of post-colectomy ileitis. **Results** Despite escalation of medical therapy, these symptomatic UC patients underwent subtotal colectomy with end ileostomy and were discharged with a tapering steroid regimen. Each patient represented back to the emergency department either acutely (2–4 weeks) or chronically (months–years) with severe abdominal pain and/or high output stoma with or without bleeding. Computed tomography with IV contrast of abdomen and pelvis was initially performed in each patient to look for possible intra-abdominal collection or complicated recurrent disease. Ileoscopy was performed via the stoma and ileal mucosa demonstrated severe erythema and ulceration. Three patients required re-laparotomies, with two requiring further small bowel resection. Histology revealed multiple patches of necrosis and perforation but no evidence of granulomas. In each case, a diagnosis of post-colectomy ileitis was made. Both patients who underwent further small bowel resection responded well to steroid therapy with total parenteral nutrition (TPN) and remain on endoscopic surveillance of their disease. Symptomatic control/remission was achieved with systematic and local steroid therapy in the remaining two patients. **Conclusion** Post-colectomy ileitis should be considered as a differential in UC patients who represent after surgery with persistent abdominal symptoms. Steroid therapy with TPN is the mainstay of treatment in these patients to address their underlying nutritional needs especially those requiring multiple emergency laparotomies. Reconsideration of the diagnosis of Crohn's disease should be undertaken with histological and radiological investigations. Multi-disciplinary approach in making the diagnosis and subsequent management is mandatory. These findings have only been reported in relatively small case series and need better assessment in a RCT setting.

IS RADIOFREQUENCY ABLATION FOR HAEMORRHOIDS PROCEDURE [RAFAELO®] EFFECTIVE TREATMENT FOR THIRD DEGREE HAEMORRHOIDS?: EARLY POSITIVE RESULTS

Deya Marzouk¹, Chris Dalmon², Maria Duckworth²

¹East Kent Hospitals University NHS Foundation Trust; ²Benenden Hospital

Aim The aim of this small pilot study was to determine whether radiofrequency ablation of haemorrhoids can improve haemorrhoidal symptoms in patients with prolapsing large third-degree haemorrhoids. **Methods** A total of 9 patients [M:F 4:5] with 3rd-degree haemorrhoids, had the Rafaelo® procedure over 4 months period. The procedure was performed under light general anaesthetic. Patients' preoperative symptoms [bleeding, prolapse, irritation and pain], as well as relief of symptoms postoperatively, postoperative discomfort, date of return to normal daily activities and satisfaction with treatment, were recorded. **Results** The median age of the patients was 63 years [range 21–75]. All patients presented with anorectal bleeding, prolapsed haemorrhoids and or perianal irritation. Two patients had circumferential haemorrhoids, 4 had 2nd and 3rd-degree haemorrhoids at multiple sites and 3 had a single site prolapsed 3rd-degree haemorrhoids. RFA was used in 2–5 haemorrhoidal sites [median 3]. Median follow-up was 12 weeks [range 6–16]. Postoperative discomfort was non-existent or minimal in all patients [0–2/10 VAS]. Median time to return to normal daily activity was 3 [range 2–7] days. All patients were satisfied with the result. No short-term recurrent bleeding or anal discomfort were reported. Particularly surprising was the shrinkage in external component, especially in the 2 patients with circumferential haemorrhoids. **Conclusion** All patients in this study requested the Rafaelo procedure. All were made aware of alternative treatment options [leaflets and clinic discussion] and told that the procedure will not remove their haemorrhoidal skin component. Radiofrequency ablation seems to be effective in relieving symptoms from large third-degree haemorrhoids and is associated with minimal postoperative pain and a high degree of satisfaction in the short term. This is largely due to controlling patients' expectations before the surgery regarding the persistence of the haemorrhoidal skin component. A longer follow-up would verify whether these benefits are sustained overtime or not.

DIVERTING ILEOSTOMY IN ROBOTIC RECTAL RESECTION

Jan Rejholec¹, Jan Moravík¹, Pavel Timoshin², Roman Maleček³, Otto Johanides³

¹KZ a.s. - Děčín Hospital o.z., Center of Robotic Surgery, Regional Healthcare a.s. Ústí n.L.; ²Regional Health Ltd., Hospital Decin, Czech Republic; ³Regional Health Ltd., Masaryk Hospital Ústí nad Labem, Czech Republic

Aim The authors retrospectively evaluate data from their own set of robotic resections for rectal cancer in connection with performed diverting ileostomy in the period from 2009 to the end of 2018. It evaluates the indications for its implementation, surgical and metabolic postoperative complications, the number of embedded ileostomies and the solution of the leak in the ileostomy performed.

Methods The Center of robotic surgery KZ a.s 297 operations for rectal cancer were performed, anastomosis was established in 268 cases in the period from January 2009 to December 2018. Protective ileostomy was constructed in 143 cases, all after performing TEM for mid or lower rectal cancer. **Results** Concerning patients with constructed ileostomy, there were 91 men and 52 women. At the Age of 19 up to 47 years, there were 91 men and 52 women. In this group with protective ileostomy, the anastomotic leak was 18.9%. Complications of ileostomy occurred in 17.5% of patients and metabolic complications in 9.1%. Surgery was required by 7.69% of patients with ileostomy. Closing of ileostomy was performed in 87.4% of patients, ranging from 2 weeks from surgery to 27 months. Complications associated with closing of ileostomy occurred in 10.4%. There were ileus states and anastomosis dehiscence. The occurrence of hernia in scar after ileostomy was 7.2% in this group. **Conclusion** These figures are relatively dramatic, however, when using ileostomy during leakage, the patient has a complication localized to the small pelvis, without the presence of diffuse peritonitis and the development of septic state. Therefore, we could always solve the leakage with a transanal approach using Endo Sponge. By the time we find clear prediction of anastomotic leakage, protective ileostomy will be an integral part of robotic rectal surgery.

ADENOCARCINOMA OF THE COLON: SURVIVAL OUTCOMES AND PATTERNS OF FAILURE

Ashwin de Souza, Sriniket Raghavan, Preethi Shetty, Shankar Malpangudi, Vikas Ostwal, Anant Ramaswamy, Avanish Saklani

Tata Memorial Centre

Aim Survival outcomes following radically treated adenocarcinoma of the colon are not only influenced by the stage at presentation but also by the histological subtype. Metachronous peritoneal metastasis probably represents the most difficult metastatic subsite to achieve long term control. Identifying factors that predict peritoneal recurrence may aid in the management of these patients with high risk for recurrence. **Methods** This is a retrospective analysis of a prospectively maintained database at a single, tertiary-referral cancer centre. All patients undergoing elective, curative resection for primary, non-metastatic adenocarcinoma of the colon from June 2013 to Aug 2017 were analysed. Adjuvant treatment of 6 months of 5-FU based chemotherapy was offered to patients of high risk stage 2 and all stage 3 disease. **Results** A total of 578 patients met the inclusion criteria and were analysed. The mean age was 52.5 years with 68% male. 85 patients underwent a minimally invasive resection with a conversion rate of 5.8%. 30-day morbidity (grade 3/4) and mortality was 8.4% and 1.03%, respectively. Pathological examination of the resected specimen revealed 32 (5.5%) with signet ring morphology and 8 (1.4%), 434 (75.1%) and 136 (23.5%) with well (WD), moderately (MD) and poorly (PD) differentiated tumors, respectively. Owing to the small number of WD tumours, both WD and MD tumours were analysed as a single group. There were 11.6%, 49.1% and 39.3% with stage I, 2 and 3 disease respectively. 55.8% of PD tumours presented in Stage 3 (non PD-34.2%; $p < 0.001$) and had a significantly higher number of positive nodes ($p < 0.001$). At a median follow up of 35.4 months, the 3-year disease free survival (DFS) and overall survival (OS) for PD Vs non-PD tumours was 70.1% Vs 84.7% ($p < 0.001$), and 83.5% Vs 93.5% ($p = 0.003$), respectively. Of the 94 patients (16.3%) with recurrent disease, peritoneum was the most common subsite (37.2%) followed by liver (21.3%). PD tumours were more likely to have peritoneal recurrence (11.02% vs 4.5% $p = 0.005$). **Conclusion** Peritoneal disease is the most common site of recurrence following radically treated adenocarcinoma of the colon.

Poorly differentiated and signet ring tumors present at a more advanced stage, are associated with poorer DFS and OS and are more likely to recur in the peritoneum.

NEOADJUVANT CHEMO-RADIOTHERAPY FOR LOCALLY ADVANCED COLON CANCER: A REVIEW OF THE LITERATURE

Nikolaos Mitroudis¹, Kleanthis Giannoulis², Dimitrios Giakoustidis², Konstantinos Fortounis¹, Christos Papavasileiou¹, Constantinos Spanos²

¹Ist Surgical Department, Papageorgiou Hospital; ²Ist Surgical Department, Aristotelian University, Thessaloniki, Greece

Aim Preoperative therapy (radiotherapy and/or chemotherapy) has not yet been established as routine therapy for colon cancer, as it has in rectal cancer. However, several case reports and series of patients with locally advanced colon cancer managed with chemo-radiotherapy prior to surgery have been published. The aim of this article is to perform a review of the literature on neoadjuvant therapy in colon cancer with regards to its safety and efficacy. **Methods** A retrospective review on PubMed using the MeSH headings “Locally advanced AND colon cancer AND neoadjuvant”, “Stage II and Stage III AND colon cancer AND neoadjuvant” and “Multivisceral resection AND colon cancer AND neoadjuvant” was performed. Ten articles regarding preoperative treatment in patients with (advanced) colon cancer, six retrospective and four prospective studies were identified. These articles were studied in terms of the safety of preoperative treatment and its effect on the primary tumor and the regional lymph nodes. Finally, we also focused on long-term results, such as overall survival and recurrence rates. **Results** Preoperative therapy may be safe enough and well tolerated. At the same time, possibility of obstruction and/or perforation of the colon during the neo-adjuvant therapy was not found to be significant. Preoperative therapy has also a positive impact on the tumor itself and on the regional lymph nodes. These factors altogether seem to have a favorable effect on overall survival and local or distant recurrence. **Conclusion** Preoperative chemo-radiotherapy may have a positive impact in select patients with locally advanced colon cancer. We are anticipating the results of multicentre randomized prospective studies, such as the FOxTROT trial, to confirm our impression and to specify the neoadjuvant regimen and the stage of colon cancer appropriate for such therapies.

FACTORS ASSOCIATED WITH DELAYED DIAGNOSIS OF CRC IN A LOW RISK RESOURCE CONSTRAINED DEVELOPING COUNTRY

Tabish Chawla, Jibran Abbasy

Aga khan university Hospital Karachi Pakistan

Aim CRC diagnosis has been featured either for delay in referrals or difficulty in the access to specialized services, diagnostic exams, and the disregard of symptoms on the part of the health team or the patients. The aim of this study was to identify the factors responsible for delayed diagnosis of colorectal cancer. Identifying factors of delayed presentation we can try to eliminate those factors to detect disease earlier to improve outcomes. **Methods** This descriptive cross sectional study was conducted in Section of General Surgery, and

Department of Oncology, Aga Khan University Hospital Karachi, from February 2019 till August 2019. All male and female patients, age ranging from 18 to 90 years, diagnosed to have colorectal cancer stage 3 and 4 were included. Data collection was done after approval of ethical review committee and after taking informed consent in non-probability convenient sampling, by retrieving medical records numbers from the health information system tumor registry. Data was also be collected from the surgery and oncology clinic. Questionnaire was filled by data collectors via telephonic or direct interviewing of the patients. SPSS software version: 20 was used for data analysis.

Results Total number of patients were 141 with median age of 53.67 ± 16.1 STD, 68% were male with 13.5% of population had + family history, 68% of population were belongs to urban area, 72% were stage 3 and 27% were stage 4 were recruited in this study duration mostly rectal tumors approximately 81%. After the assessment of the factors responsible for delayed diagnosis of Colorectal Cancer, most frequent factor found was lack of screening awareness 127 (90.1%) followed by, symptoms recognition 65 (46.1%), lack of availability of resources i.e. 45 (31.9%), physician's judgment error 41 (29.1%).

Conclusion The delay, which is a criterion of health care quality, should be prevented and reduced as far as possible in order to avoid the psychologically negative impact it may cause to patients. Numerous studies have shown that treatment delay is associated with certain clinical factors in CRC, but the present study identified screening awareness is one the major factor responsible for the delay in this part of the world followed by recognition of the symptoms and physician's judgment error. By educating general population and health care provider about the screening and symptoms of early disease we can help in detecting diseases earlier hence reducing morbidity and mortality by early treatment.

RENAL METASTASIS FROM AN ANAL SQUAMOUS CELL CARCINOMA: CASE REPORT

Laure-Méline Piotet, Antonino Sgroi¹, Guillaume Zufferey¹, Gilles Herren¹, Pierre Fournier¹, Olivier Tobler¹, Fabio Butti¹, Reza Djaffarian¹, Anne-Claude Georges¹

¹GHOL

Aim Squamous cell carcinoma (SCC) of the anal canal is a rare tumor highly correlated with human papillomavirus. It accounts for approximately 4% of all digestive system malignancies. Distant metastases are rare and occur in 5–15% of patients. The most common sites are lungs, liver, extrapelvic lymph nodes and bone. We hereby present a case of a rare metastasis in the kidney from an anal SCC, treated with radiotherapy.

Results The patient is an 83 years old female that was diagnosed with a SCC of the anal canal (cT3 N2 M0, HPV 16 positive) and was initially treated with chemoradiotherapy with success. Pelvis MRI and PET-CT, performed at the end of treatment, have shown no sign of residual tumor. After 1 year, a follow-up MRI has highlighted the presence of a necrotic nodule invading the upper rectal roof, the posterior vaginal wall and the left levator ani. Profound biopsies have confirmed the recurrence of the anal SCC. A salvage abdominal perineal resection (APR) has been performed without post-operative complications. Due to the appearance of a macro-hematuria 5 months after the surgery, an abdominal CT showed a mass on the left kidney with indistinct margins, a suspicious retro-peritoneal adenopathy, and a liver metastasis. The renal mass is thought to be a primary renal tumor or a lymphoma. In

this context, we performed biopsies whose histological and immunohistochemical staining matched with the initial anal SCC. This lesion was initially treated with radiotherapy, while the liver metastasis has benefited from a stereotaxic radiotherapy. Three months later, follow-up abdominal CT has demonstrated a progression of the disease with signs of peritoneal carcinomatosis, appearance of a second liver metastasis and growth of the renal metastasis with extra-renal extension. Taking in consideration the age of the patient and the extension of the cancer, it was decided to begin a palliative chemotherapy with the agreement of the patient.

Conclusion We report the first case of renal metastasis by anal SCC. Despite the sparse case reports and literature reviews regarding the treatment of distant metastasis, radiotherapy and chemotherapy might be the only therapeutic options for the moment.

RANKED THIRD IN COMPETITION OF THE BEST ECC POSTER 2019

RISK AND CONSEQUENCES OF DEHYDRATION FOLLOWING COLORECTAL CANCER RESECTION WITH DEFUNCTIONING ILEOSTOMY? A SYSTEMATIC REVIEW AND META-ANALYSIS

Joseph Borucki¹, Sarah Schlaeger², James Hernon¹, Adam Stearns¹

¹Norfolk and Norwich University Hospitals NHS Foundation Trust; ²Technical University Munich

Background/Aim Defunctioning ileostomy is commonly performed during colorectal resections but comes with potential risk of dehydration and acute kidney injury, the impact of this which remains poorly defined. This systematic review aims to assess dehydration-related morbidity from defunctioning ileostomy and the short to medium term consequences of this.

Methods The review was registered with PROSPERO (CRD42019135695). MEDLINE via Ovid, Embase Via Ovid, CENTRAL and Clinical trials.gov were searched for studies that evaluated dehydration, renal function and dehydration-related morbidity in patients who had undergone diverting ileostomy formation as part of colorectal cancer resection. Studies were selected, data was extracted and were assessed for quality by two independent reviewers. Rates of dehydration and risk ratios were pooled using a random effects model. Ileostomy morbidity directly attributable to dehydration and renal function were addressed narratively.

Results Of 1714 screened papers, 20 studies were selected for inclusion (10,414 patients, of which 3277 had ileostomy). Data were pooled and rate of clinically significant dehydration was 10.17% (95% CI 6.29–14.78%), relative risk compared to no ileostomy was 3.18 (95% CI 2.31–4.39) longer term trends in kidney function were assessed in three papers which all demonstrated progressive renal impairment persisting beyond the initial insult. Consequences included unplanned readmission, delay or non-commencement of adjuvant chemotherapy and chronic kidney disease development.

Conclusion Clinically significant dehydration is common following defunctioning ileostomy and leads to considerable short and medium-term morbidity. There is limited evidence for acute kidney injury as a consequence, however this has been poorly defined. This paper adds weight to the argument that defunctioning ileostomy is not a low-cost intervention and where possible alternatives should be considered.

RANKED SECOND IN COMPETITION OF THE BEST ECC POSTER 2019

IN PATIENTS UNDERGOING EMERGENCY RESECTIONAL COLORECTAL CANCER SURGERY SMALL BITE CLOSURE OF THE MIDLINE WOUND IS ASSOCIATED WITH SIGNIFICANTLY LOWER RATES OF INCISIONAL HERNIAE

Rosie McDonald¹, Alastair Brookes², Andrew Miller¹

¹Leicester Royal Infirmary; ²Walsall Manor Hospital

Aim Incisional hernia (IH) rates following abdominal surgery are reported to be < 40%. For the patients, the implications are associated morbidity and an impact on quality of life. For the NHS, management of IH is costly with high recurrence rates being observed in those proceeding on to surgical repair. Whilst the cause of IH is multifactorial, the only modifiable factor for the surgeon is wound closure technique. Historical data from our unit showed an IH rate of 31.1% at 3 years following emergency resectional colorectal cancer surgery. The small bite closure technique was adopted by a single surgeon (ASM) in 2014. This study examines the IH rate following the introduction of this technique. **Methods** Prospectively collated demographic data on patients undergoing emergency surgery by ASM between August 2014 and August 2019 were analysed. All patients had a midline incision closed using a small bite technique (single layer, continuous 2/0 PDS, stitch: wound length ratio of > 4:1, short stitch length). Radiological evidence of incisional hernia was gathered from cross sectional imaging. **Results** A total of 72 cases were identified (6 deaths, 4 lost to follow up). 62 cases are included in the analysis.

Table 1. Patient demographics:

All figures median (range)	
Number (M:F)	62 (31:31)
Age (yrs)	68 (20-92)
ASA	3
BMI	29.7(18-56)
P-Possum	5.6 (0.2-87)
WL:SL Ratio	6.92 (4.14-20.44)
Follow up months	37 (5-62)

Table 2. Incisional herniae details:

Year of follow up	IH rates - number of patients (%)
1 year	0 (0)
2 year	2 (3.2)
3 year	5 (8)

There were no patients with full thickness abdominal wall dehiscence. **Conclusion** Incisional hernia rate at 3 years following small bite closure of midline wounds performed for emergency resection of colorectal cancer was 8%. This represents a significant reduction from the 31.1% observed in our unit previously. Whilst we acknowledge that this single surgeon outcome data is compared to collective unit data we believe that this simple technique could be easily adopted by all surgeons, with the aim of reducing incisional hernia rates. Small bite closure of midline abdominal wounds should be the standard of

care; the learning curve is short, no additional consumables are required and there is a demonstrable reduction in IH rates from which both the patient and their healthcare system benefits.

LEUKOCYTE AND PLATELET-RICH FIBRIN (L-PRF) FOR ANASTOMOTIC LEAK PREVENTION AFTER COLORECTAL SURGERY

José Vivanco¹, Misael Ocares¹, Juan Alvarado¹, Claudio Benavides², Christian König¹, Gino Caselli³

¹University of Concepción; ²hospital Guillermo Grant Benavente de Concepción.; ³Universidad de Concepción

Aim Despite attempts to diminish clinical anastomotic leaks after colorectal surgery, the incidence reported is still around 4–20%. Leukocyte and Platelet-Rich Fibrin (L-PRF) is a platelet concentrated that has promising experimental animal studies when applied as a biological autologous graft in these anastomoses. It has a theoretical benefit to prevent anastomotic leakage. The L-PRF trial was initiated to evaluate the feasibility of applying L-PRF on a human colorectal anastomosis and to compare the incidence of anastomotic leak. **Methods** This RCT was performed in a teaching hospital from Chile, approved by ethics committee. Patients undergoing elective left colectomy and mechanical anastomosis over peritoneal reflection where eligible. Included patients where randomized to the L-PRF and control group. L-PRF was obtained by Choukroun's protocol, previously reported. The primary outcome was clinical anastomotic leakage during hospitalization requiring invasive treatment. **Results** Between March 2018 and June 2019, 50 patients from Guillermo Grant Benavente Hospital, Concepción, Chile, complying with the inclusion criteria were included in this study, 25 in L-PRF group and 25 in the control group. Anastomotic leakage was diagnosed in 4 patients (8%), 3 in control group (12%) and 1 in PRF-L group (4%), with no statistically significant differences ($p = 0.3595$). No statistically significant difference in terms of hospital stay was found. Mortality was 2%, corresponding to one patient. There was no mortality in the L-PRF group. **Conclusion** The present study is the first RCT using L-PRF on human colorectal anastomosis. This material may be applied to diminish anastomotic leaks. Our study could not demonstrate this benefit in a statistical way, which encourage our group to continue with a multicenter collaboration. Extracting and applying L-PRF is a safe and reproducible technique, that needs to be further studied in order to determine the real implication for colorectal surgical patients.

OUTCOME OF PATIENTS UNDERGOING EMERGENCY SURGERY FOR COLORECTAL CANCER IN A DISTRICT HOSPITAL

Joana Pimenta, Vera Pedro, André Pacheco, Ricardo Escrevente, Luis Pereira, Fátima Caratão

Unidade Local de Saúde do Baixo Alentejo

Aim Colorectal cancer is the third most common malignancy in men and the second most common malignancy in women. Emergency colorectal surgery, for obstruction, perforation or haemorrhage, has a direct impact on results with higher postoperative complication and mortality rates—reaching 33.6–64% and 20–34%, respectively. **Methods** A retrospective single centre study was conducted including

patients who underwent emergency surgery for colorectal cancer during the period between 2010 and 2017. **Results** A total of 108 patients were included. The median age was 76.5 years, and about 66% were males. Obstruction was the most prevalent presentation (79.6%). The most common sites of neoplasia were the sigmoid (34.3%) and the right colon (29.6%). Resection with primary anastomosis was performed in 52.8% of patients. The most frequent clinical stages were IV (36.1%) and III (30.6%). 40 patients (37%) had some form of postoperative complication. Clavien-Dindo grades 3 and 4 were the most frequent. The in-hospital mortality was 27.8%, and the 30-day mortality was 26.9%. **Conclusion** Emergency colorectal cancer surgery carries significant morbidity and mortality. The postoperative mortality rate in our series is within the described literature. Recognition of the increasing rate of postoperative complications may help minimise the detrimental impact of this event on overall outcomes.

WINNER OF THE ECC POSTER PRIZE 2019

ONCOLOGICAL IMPACT OF LATERAL LYMPH NODE DISSECTION AFTER PREOPERATIVE CHEMORADIOTHERAPY IN PATIENTS WITH RECTAL CANCER

Min Jung Kim¹, George J Chang², Mi Kyung Song³, Sung Chan Park³, Dae Kyung Sohn³, Hee Jin Chang³, Dae Yong Kim³, Ji Won Park¹, Seung-Yong Jeong¹, Jae Hwan Oh³

¹Seoul National University College of Medicine, Seoul, Republic of Korea; ²University of Texas MD Anderson Cancer Center, Houston, Texas, USA; ³Research Institute and Hospital, National Cancer Center, Goyang, Gyeonggi, Republic of Korea

Aim To evaluate the oncologic benefits and survival following lateral lymph node dissection (LLND) in patients with enlarged lateral lymph nodes (LN) according to preoperative chemoradiotherapy (PCRT) responsiveness. **Methods** Patients who underwent PCRT for rectal cancer were classified into four groups: (A and B) total mesorectal excision (TME)-only without enlarged lateral LN, (C) TME-only with enlarged lateral LN, and (D) TME-LLND with enlarged lateral LN. Patients without enlarged lateral LN were included as controls. Local recurrence (LR), relapse-free survival (RFS), and overall survival (OS) were assessed. **Results** In control patients, LR, RFS, and OS did not differ between operative periods. In patients with enlarged lateral LN, reduced LR and higher RFS were observed among LLND patients vs. those who did not (5.39% vs. 20.13%, $p = 0.0013$ for 3-year LR; 77.11% vs. 65.83%, $p = 0.0436$ for 3-year RFS). Among patients with enlarged lateral LN, the 3-year OS was 87.64% in the TME-only group and 93.53% in the TME with LLND group ($p = 0.0670$). Subgroup analysis of patients responsive to PCRT, indicated LR was significantly lower in the LLND group than in the TME-only group ($p = 0.0442$), but there were no significant differences in RFS ($p = 0.1375$) and OS ($p = 0.2122$). Furthermore, for patients unresponsive to PCRT, additional LLND significantly reduced LR ($p = 0.0024$) and prolonged RFS ($p = 0.0027$). **Conclusion** LLND reduced LR and improved RFS in patients with rectal cancer with enlarged lateral LN. LLND was a significant factor affecting LR among patients responsive to PCRT and both LR and RFS in unresponsive patients.

OUTCOMES OF MULTIVISCERAL RESECTION IN COLON CANCER: A PROPENSITY-MATCHED ANALYSIS

Preethi S Shetty, Ashwin L Desouza, Shankar Malpangudi, Sriniket Raghavan, Anant Ramaswamy, Avanish Saklani, Vikas Ostwal

Tata Memorial Hospital

Background/Aim Nearly 10% of non-metastatic, colon cancers are T4b at presentation. R0 resection entails removal of adjacent organs en-masse, potentially increasing the morbidity of the procedure. Multi-visceral resection (MVR), though challenging, offers the only curative option. This study aims to determine the perioperative and survival outcomes of patients undergoing MVR at a high volume, tertiary cancer center in South Asia. **Methods** This is a propensity score matched, retrospective analysis of a prospectively maintained database of patients undergoing curative resection for primary non-metastatic adenocarcinoma of the colon from June 2013 to August 2017. The propensity scores were matched for age, stage and gender in a 1:1 ratio and were analyzed as two groups viz. with or without MVR. The perioperative outcomes, patterns of recurrence, disease free survival (DFS) and overall survival (OS) were compared. **Results** The median age was 57 years. In the MVR group, duodenum was the most common adjacent organ resected (18.1%), followed by anterior abdominal wall (16%), Gerota's fascia (10.6%) and small bowel (10.6%). Two or more organs were resected in 18.1% undergoing MVR. Although MVR was associated with higher mean intraoperative blood loss [MVR 705 ml (SD \pm 559 ml) vs Non-MVR 379 ml (SD \pm 290 ml)] and longer hospital stay [MVR 12.5 days (SD \pm 7.5) vs Non-MVR 9.6 days (SD \pm 6)], there was no difference in post-operative morbidity (MVR 45.1% vs Non-MVR 33.5% $p = 0.24$). R0 resection rates (MVR 95.7% vs Non-MVR 98.9%) and recurrence patterns were also similar. Though the median DFS was similar in both groups [MVR 58 months (95% CI 51–64 months) vs Non-MVR 49 months (95% CI 43–54 months); $p = 0.264$], there was trend towards improved median OS for the MVR group [MVR 67 months (95% CI 63–71) vs Non-MVR 57 months (95% CI 52–63); $p = 0.058$]. On Cox-regression analysis, MVR showed a trend towards improved OS [HR $-$ 0.45 (95% CI 0.19–1.01); $p = 0.065$]. **Conclusion** MVR for clinical T4b colonic adenocarcinoma can be performed with comparable morbidity. Survival outcomes are similar between MVR and non-MVR resections when matched for stage. Surgery is therefore indicated in all such cases where an R0 resection can be achieved.

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

Hiroya Kuroyanagi, Shuichiro Matoba, Shigeo Toda, Yutaka Hanaoka, Kousuke Hiramatsu, Kousuke Hiramatsu, Kousuke Hiramatsu, Rikiya Sato

Toranomon Hospital

Aim As for the treatment for lower rectal cancer, lateral pelvic lymph node dissection (LPLD) becomes mainstream in Japan, but neoadjuvant radiotherapy (NART) and following total mesorectal excision (TME) is mainstream in the Western countries. The JCOG 0212 trial showed incidence of pathological lateral pelvic lymph node (LPLN)

metastasis is only 7% among the patients without swollen lymph node greater than 10 mm. Therefore it may be over-surgery to perform bilateral LPLD for all patients with advanced low rectal cancer, so we have been performed NART for clinical stage II or III low rectal cancer since 2010. LPLD is selectively performed only for the side of a swollen lymph node defined as 7 mm or larger in long axis. **Methods** Patients who undergone NART followed laparoscopic surgery for lower rectal cancer in our hospital between April 2010 and December 2015 were included in this study. Long-course CRT (45 Gy) is generally selected, however short-course RT (25 Gy) is chosen depending on individual circumstances. LPLD was performed even for the patients whose LPLN was decreased after long-course CRT. All procedures are performed laparoscopically. We performed using 5 port and a 10 mm flexible scope. Furthermore, based on pretreatment imaging, they divided into two groups by the long axis of lateral pelvic lymph node (LPLN), the group of less than 7 mm or the group 7 mm and more than 7 mm, and reviewed especially for local recurrence(LR) retrospectively. **Results** There were 161 cases of NART followed laparoscopic surgery. The group of less than 7 mm was 98 cases and the group 7 mm and more than 7 mm was 63 cases. LPLD was performed for 61 patients, but 2 didn't undergone LPLD due to severe complications. Median age was 64. Median operative time and blood loss was 351 min and 68 ml. Pathological stages included 9 years p Stage 0, 56 Stage I, 61 years p Stage II, 53 years p Stage III. LPLN lymph node metastasis was proven in 19 patients. There were 18 cases of postoperative complications greater than Clavien-Dindo grade II. Recurrence was detected in 34 patients during the median follow-up of 57 months. Overall LR was detected in 9 cases (5.6%). LR of the group of less than 7 mm were only 3 cases (3.1%), the other group were 6 cases (9.5%). Therefore omitting LPLND for the group of less than 7 mm is acceptable. **Conclusion** Our treatment strategy is safe and oncologically feasible.

SIGNET VS NON-SIGNET ADENOCARCINOMA RECTUM: IS THERE ARE SURVIVAL DIFFERENCE ? A PROPENSITY MATCHED ANALYSIS

Preethi S Shetty, Ashwin L Desouza, Vikas Ostwal, Reena Engineer, Munita Menon, Avanish Saklani

Tata Memorial Hospital

Background/Aim Signet ring rectal carcinoma (SRCC) is an extremely rare variant of adenocarcinoma of rectum and accounts for 1% of all colorectal patients worldwide. However it is known to be associated with poor prognosis and has increased risk of recurrence when compared to the non-signet cell histology. Through this study we aim to determine if patients with SRCC differ in survival outcomes compared to non-SRCC. **Methods** This is a propensity matched analysis of the prospectively maintained database of primary rectal adenocarcinoma patients operated with curative intent between January 2013 and November 2018. The patterns of recurrence, recurrence free survival and overall survival analysis data were computed. **Results** During the period of January 2013–November 2018, 1769 primary rectal adenocarcinoma patients were operated. Amongst these SRCC were 96 (5.4%). The propensity scores were matched for age, stage and gender in a 1:2 ratio. 282 matched pairs were analyzed and compared as 2 groups—SRCC and non SRCC histology. The peritoneal recurrences were 15.4% in the signet group compared to 5.9% in the non-signet group. Similarly the local recurrences were more common 25.3% vs. 9.1% respectively among

the two groups. Distant recurrences were however more often seen in the non signet group (12.6% vs. 22.2% respectively). The disease free survival were 36 months (95% CI 29–42) and 49 months (95% CI 44–53) for signet and non-signet histology respectively ($p = 0.005$). The overall survival was 63 months (95% CI 57–68) and 68 months (95% CI 65–71) respectively ($p = 0.32$). **Conclusion** There is an increased risk of peritoneal and local recurrences and statistically significant recurrence free survival in patients with signet ring histology of rectal adenocarcinoma. A more aggressive treatment strategy such as prophylactic intra-peritoneal chemotherapy maybe hence benefit these patients, although prospective studies need to be performed to establish this.

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

Amarvir Bilkhu, Mark Steward, Jonathan Robinson

Bradford Teaching Hospitals NHS Foundation Trust

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

CYTOKINE-MAPPING IN COLORECTAL-CANCER. THERAPEUTIC INTERVENTION

Eva Kovacs-Benke

Background/Aim Colorectal cancer (CRC) is the third most prevalent cancer worldwide presenting a progressive process from cancer cells up to metastasis. Cytokines: As a subtype of Growth Factors they are important components in the steps of this process. For specific therapeutic targets is essential to clear their specific function(s) in different tumour stages: (1) Cytokines produced by cancer cells create optimal growth conditions within the tumour microenvironment, (2) Cytokines secreted by stromal cells may influence the behaviour of malignant cells. Faecal Calprotectin: It is a non-invasive marker of intestinal/colonic inflammation. Gut Microbiota: There is an association between colorectal cancer and gut microbiota. **Methods** The following parameters will be measured in patients with histological diagnosed colorectal cancer in different tumour stages (TNM I–IV): (A) For mapping of the cytokines in serum; Tumour Necrosis Factors (α , β), Interleukin-1 (α , β), Interleukin-6, Interleukin-10, Interleukin-12, Interleukin-17, Interleukin-23 and Vascular Endothelial Growth Factor; (B) Faecal Calprotectin; (C) Gut Microbiota-qualitative and quantitative-; (D) Questionnaire: Anamnesis/Dietary factors/Eating patterns. **Results** Objective: (●) Alteration of the Cytokines, Faecal Calprotectin, Gut Microbiota in different tumour stages; (●) Which of the measured Cytokines is most potent in different tumour stage(s)?; (●) Correlation between Cytokines; (●) Correlation of the Cytokines with Faecal Calprotectin and Gut Microbiota; (●) Correlation of the measured Parameters with Laboratory-Parameters and Tumour Stages. **Conclusion** Therapeutic Intervention: There are two important pathways against tumours: (A) The inhibition of the tumour cell proliferation (cytostatic effect), (B) The induction of the death of tumour cells (cytotoxic effect). Specific-Targeted Therapy/Principle: (1) Using antibody against each Cytokine having pathological effect(s) in the relevant tumour stage, (2) When the Cytokine induces the synthesis of other Cytokine(s) and the inducer and the induced Cytokine(s) have the same (similar) pathological effect(s), then specific monoclonal antibody will be used against only the inducer-cytokine, leading to the abolishment of the pathological effect(s) of the induced cytokine too. The cancer-associated Cytokine Network may represent a new way in the cancer therapy.

PREOPERATIVE DIAGNOSIS OF REGIONAL LYMPH NODE METASTASIS OF COLON CANCER BY CONTRAST-ENHANCED ULTRASONOGRAPHY

Ken Imaizumi¹, Shigenori Homma¹, Mutsumi Nishida², Hiroki Matsui¹, Yoichi Miyaoka¹, Nobuki Ichikawa¹, Tadashi Yoshida¹, Akinobu Taketomi¹

¹Hokkaido University Graduate school of Medicine; ²Hokkaido University Hospital

Background/Aim Accurate preoperative diagnosis of regional lymph node metastasis (RLNM) of colon cancer, which has a significant impact on a patient's prognosis, is important for determining treatment strategies. Contrast-enhanced ultrasonography (CEUS) could be useful in the preoperative diagnosis of RLNM because of detecting the lymph node vessel structure and evaluating the enhanced pattern. There has been no report of the diagnosis for RLNM of colon cancer using CEUS. We aimed to evaluate the usefulness of CEUS compared to that of computed tomography (CT) in assessing the number of

lymph nodes involved in RLNM of colon cancer. **Methods** This was a retrospective, observational, single-center study of patients diagnosed with pathological RLNM. We included patients who had undergone radical surgery for clinical stage 0-III RLNM diagnosed by CT and CEUS preoperatively between March 2012 and February 2019. The correlation coefficient was calculated by Spearman's rank correlation test. **Results** We included 49 patients: 24 male (49%) and 25 female (51%), with a median age of 70 years (range 39–91). The location of colon cancer locations was as follows: 8 (16%), cecum; 9 (18%), ascending colon; 6 (12%), transverse colon; 2 (4%), descending colon; 10 (20%), sigmoid colon; and 14 (29%), recto-sigmoid colon. The median number of pathological RLNM lesions was 2 (range 1–15). There were 30 patients (61%) with multiple RLNM (> 2). The correlation coefficient between the number of RLNM on imaging diagnosis by CT and CEUS, and that on pathological diagnosis was 0.303 and 0.412, respectively. CEUS diagnosis demonstrated a stronger correlation with the pathological diagnosis than with CT diagnosis. For the preoperative diagnosis of multiple RLNM, CEUS revealed higher sensitivity and accuracy than did CT (CT vs. CEUS; sensitivity: 0.367 vs. 0.767, specificity: 0.947 vs. 0.684, accuracy: 0.592 vs. 0.735, respectively). **Conclusion** Compared with CT, CEUS showed a stronger correlation between the number of RLNM on imaging diagnosis and that on pathological diagnosis and had a higher accuracy for detecting multiple RLNM. Therefore, when evaluating RLNM of colon cancer, CEUS may yield a more accurate preoperative diagnosis of multiple RLNM. We consider that this result contributes to the development of neoadjuvant treatment for colon cancer patients with multiple RLNM preoperatively.

APPLICATIONS OF INDOCYANINE GREEN ENHANCED FLUORESCENCE IN LAPAROSCOPIC COLORECTAL RESECTIONS

Giorgio Bianchi¹, Lorenzo Casali², Christian Franzini², Caterina Santi², Alessio Rollo², Alfredo Annicchiarico¹, Vincenzo Violi²

¹Azienda Ospedaliero-Universitaria di Parma; ²Unità Operativa di Chirurgia Generale, Dipartimento Chirurgico, Ospedale di Vaio, Fidenza (PR)

Background/Aim Recently, indocyanine green (ICG) fluorescence has been introduced in laparoscopic colorectal surgery to provide detailed anatomical information. The aim of our study is the application of ICG imaging during laparoscopic colorectal resections: to identify sentinel lymph node, for studying its prognostic value on nodal status, to facilitate vascular dissection when vascular anatomy of the tumor site is unclear and to assess anastomotic perfusion to reduce the risk of anastomotic leak. **Methods** After tumor identification 5 ml of ICG solution (0.3 mg/kg) is subserosal peritumoral injected. A Full HD IMAGE1 S camera, switching to NIR mode, in about 10 min displays fluorescence: the SLN is identified and the SLN biopsy (SLNB) is performed. When tumor is in difficult site, as hepatic or splenic flexure, 5 ml of ICG solution (0.3 mg/kg) is intravenous injected. In about 30–50 s a real-time angiography of tumor area is obtained; on this guide vascular dissection and pedicle ligation is performed. After anastomosis, another 5 ml of ICG solution is injected to confirm anastomotic perfusion. If there is an ischemic area, a new anastomosis is performed. **Results** From November 2016, 96 patients were enrolled: 32 left colectomy, 48 right colectomy, 5 transverse resections, 10 resections of splenic flexure and 1 rectal anterior resection. In 11 cases, intraoperative angiography led to the identification of vascular anatomy. In three cases the anastomotic perfusion wasn't good and the surgical strategy was changed. Five postoperative complications occurred, of which

two anastomotic leak, due to a mechanical problem. From November 2017, 56 patients were enrolled to perform the SLNB: 30 right colectomy, 16 left colectomy, 3 transverse resection, 6 splenic flexure resections and 1 rectal anterior resection. The SLN was identified in 51 cases. 25 cases were found to be N0 to the conventional examination and were subjected to ultrastaging. **Conclusion** ICG-enhanced fluorescence imaging is a safe, cheap and effective tool to increase visualization during surgery. It's recommended to reduce the incidence of anastomotic leak, to facilitate the assessment of vascularization in order to perform oncological resections, and to perform the SLNB to study its clinical role on nodal status and for the SLN ultrastaging in order to identify the micrometastases.

ICG ANGIOGRAPHY ASSESSMENT OF ANASTOMOTIC PERFUSION IN ANTERIOR RECTAL RESECTION FOR RECTAL ADENOCARCINOMA

Plamen Ivanov, Dimitar Penchev, Ventsislav Mutafchiyski, Georgi Kotashev, Georgi Popivanov

Military Medical Academy Sofia

Background/Aim In the last few years indocyanine green was commonly used for bowel blood perfusion assessment intraoperatively in order to prevent ischemical related anastomotic leakage. Despite the trend and widespread of an idea currently we don't have any strong data about the effectiveness of the methodology. The method seems to be safe without any harm for the patient and few side effects reported. The aim of the study is to present our initial experience and local protocol for application of indocyanine green fluorescent angiography intraoperatively for bowel perfusion evaluation in rectal cancer surgery. **Methods** For the period between 01.12.2017 and 01.09.2019 in the department of Endoscopic endocrine surgery and coloproctology at Military Medical Academy—Sofia have been performed 35 anterior rectal resections with primary anastomoses for rectal adenocarcinoma with indocyanine green for intraoperative evaluation of bowel perfusion. We used Verdyne® with intravenous bolus dose of 0.2 mg/kg diluted in 10 ml NaCl 0.9%. First applications were performed before bowel transection and the second were admitted after anastomosis. Intensity of fluorescent light in the bowel is compared with terminal ileum as a reference of good perfusion. If perfusion is unsatisfactory until 180 s we applied a second dosage before anastomosis takedown or changed resection lines. **Results** We didn't observe any adverse events or complications, related to indocyanine green dye. Mean delayed operative time related to ICG assessment was 4.3 ± 0.6 min in the series. Average time of visible perfusion in the group was 64 ± 6 s with mean maximum intensity on the 74 ± 8 s. In two cases proximal resection end showed unsatisfactory fluorescent intensity that lead to change proximal resection margins in well perfused area. No anastomosis reinforcement after second application of ICG was reported. There are no incidence of anastomotic leakage in the reported study group. **Conclusion** Intraoperative fluorescent angiography for bowel perfusion assessment in colorectal cancer is feasible and safe method, that seems to have no drawbacks. Further data is needed to bring more and strong evidence in the field. Standardization of the technique and clear protocol is mandatory for daily application of the method. Future well designed randomized control trials maybe will answer the question about the real benefit and the value of anastomotic leakage prevention.

COLORECTAL NIGHTMARES: STRATEGY AND MANAGEMENT OF ANASTOMOTIC LEAKAGE AFTER ANTERIOR RECTAL RESECTION

Dimitar Penchev, Plamen Ivanov, Ventsislav Mutafchiyski, Georgi Kotashev, Georgi Popivanov

Military Medical Academy Sofia

Background/Aim Despite technical advances in rectal cancer surgery, complications still occur. There is no doubt that the most devastating complication in rectal cancer surgery is anastomotic leakage. Early diagnosis and appropriate treatment choice lead to less morbidity and better outcome. The aim of the study is to present and discuss all available treatment algorithms for anastomotic leakage after anterior rectal resection in rectal cancer patients. **Methods** Study is designed as single center retrospective observational study. In the study are included patients with anastomotic leakage after anterior rectal resection diagnosed with rectal adenocarcinoma. For a 4-year period—between 2015 and 2018 in the department of endoscopic surgery in Military Medical Academy Sofia are diagnosed 186 patients with adenocarcinoma of the rectum and treated with anterior rectal resection. Nineteen of them are included into analyses because of the anastomotic leakage. All data is extracted from the past medical records from the hospital electronic registry. For the statistical analysis software of SPSS v19.0 was used with descriptive methods. **Results** Incidence of anastomotic leakage in the 3-year period in our department was 10%, with an average overall complication rate up to 32% according to the Clavien and Dindo classification, without mortality. All anastomotic leakages are grouped according to the ACRCs classification—10% of them are grade A, 58%—grade C and the rest are grade B. Eight of the patients are treated with relaparoscopy or relaparotomy with lavage, drainage and stoma. Three of them were treated only with lavage and drainage. Five of the patients were treated with endo-vac therapy and two of them with only conservative antibiotic therapy. One of them was converted in abdominoperineal resection after anastomotic leakage, following anterior rectal resection. Open laparotomy was needed in two cases. Free of stoma rate after minimum of 1 year follow-up was reported to be estimated in 89% of them. Anastomotic leakage increased significantly morbidity, including severe sepsis and septic shock and prolonged hospital stay with the need of intensive care. **Conclusion** Anastomotic leakage is still common challenge in front of every colorectal surgeon. Classification of the leakage is the key for better understanding and treatment selection. Anastomotic leakage increases morbidity and prolongs the hospital stay, including stay in intensive care unit

MIXED NEUROENDOCRINE NON-NEUROENDOCRINE NEOPLASMS. AN UNCHARTED TUMOR ENTITY

Aris Plastiras¹, Zanneta Lysikatou², Alike Rompou², Emmanouil Gontikakis², Dimitrios Korkolis²

¹General Hospital AGIOS SAVVAS, Greece; ²Department of Surgical Oncology, "Saint Savvas" Anticancer Hospital, Athens, Greece

Background/Aim Mixed neuroendocrine-non-neuroendocrine neoplasm is a heterogeneous rare neoplasm referred to less than 1% of all gastrointestinal neoplasms in all organs. MiNEN definition (2017) consists both non-neuroendocrine and neuroendocrine components in

a fracture of at least $\geq 30\%$ of the lesion for both of them. They usually are highly aggressive neoplasms with poor prognosis and that is why they shouldn't be managed as classical neuroendocrine neoplasms. The wide application of immunohistochemistry to the study of tumours has led these neoplasms to become an entity. We aim to support that 30% for each component is not gold standard and not proven. **Methods** We present a retrospective study from a specialized surgical oncology department in the biggest cancer referral centre in Greece. All patients who were diagnosed with colorectal MiNENs from August 2005 to August 2019 were included in our data. Histology was confirmed by immunohistochemistry lab studies, and grading was calculated using MIB score. Regarding that pathologists were not familiar with this kind of entity we extract from our data patients' reports using terms "synaptophysin", "chromogranin", "neuroendocrine", and "mixed". In our research demographics, pathological characteristics, management strategies and prognosis were analysed. **Results** Seven patients with colorectal MiNENs were included in the study. The age of these ranged from 57 to 87 years with a mean age of 72.7 years. Four patients were male (57.14%) and three were female (42.86%). Two patients had a tumor in the rectum, one in the anus, one in the sigmoid colon, one in the appendix, and two in the ascending colon. The sigmoid tumor had a collision tumor pattern. In one case neoadjuvant therapy was given to the adenocarcinoma lesion. In preoperative biopsies—only in one case the mixed tumor was revealed. All cases were non-functional but symptomatic. In two specimens of borderline MiNEN metastases were identified from neuroendocrine component. **Conclusion** Colorectal MiNEN is a rare aggressive tumor lacking of specific guidelines pre and postoperatively. The 30% criteria are insignificant, as treatment should be based on the most aggressive component. In our sample size we aim to contribute to the limited data series of MiNENs in order to underline the importance of this new classified neoplasms. Our data analysis suggests that 30% components treatment strategy for each lesion should be reconsidered. Pathologists should evaluate specimens as possible MiNENs more often.

LAPAROSCOPIC COLORECTAL RESECTION FOR CANCER: SHORT-TERM RESULTS WITH 301 CONSECUTIVE CASES IN A NATIONAL CANCER INSTITUTE

Dimitrios Korkolis, Aris Plastiras, Dimitrios Ballalis, Kostas Damalas, Zanneta Lysikatou, Aliki Rompou, Iliana Kougia, George Koulouriwtis, Eleni Mpalamou, Emmanouil Gontikakis

Department of Surgical Oncology, "Saint Savvas" Anticancer Hospital, Athens, Greece

Background/Aim The purpose of this study is to present the initial experience with laparoscopic resection for colorectal cancer in the Hellenic Cancer Institute, "Saint Savvas" Hospital, Athens, GREECE. **Methods** All cases were performed by the same dedicated surgical colorectal team. From 2012 to 2019, 301 laparoscopic resections for colorectal cancer were performed. These were 178 men and 123 women with a median age 65 years and a median BMI 28.5. Fifteen patients underwent total colectomy, 95 low anterior resection (LAR), 30 abdominoperineal resection (APR), 90 left-sigmoid and 71 right hemicolectomies. Temporary loop-ileostomy was used in 67% of LAR. All resections were performed with 4–5 trocars and a medial-to lateral technique using ultrasound energy. For right colon cases, high ligation of the ileocolic pedicle and the right branch of the middle colic vessels, was achieved. For left and rectal cases, high ligation of the inferior mesenteric vessels with splenic flexure

mobilization, were always performed. In right colon cases an extracorporeal ileotransverse, "Barcelona-type" anastomosis was performed. In left cases an end-to-end or end-to-side anastomosis with the circular stapler, was mainly chosen. **Results** Mean operative time was 130 (70–180) min. Conversion to open rate was 6% (18 pts) in the initial 100 cases and 0% in the remaining. Mean blood transfusion was < 100 cc. The mean length of the surgical specimen was 25 cm for right, 25 cm for left and 34 cm for rectal tumors. Mean number of harvested lymph nodes for right and left cases was 27 and 18, respectively. 30-day mortality was 0%. Morbidity rate was 10.6%. These were 9 patients with bowel obstruction and 8 patients with clinical anastomotic leak that needed reoperation. In addition, 15 patients had postoperative wound infection. Overall length of hospital stay was 5 (3–14) days. **Conclusion** Over the last decade, there was a stepwise increase in the use of laparoscopic resection for colorectal cancer. These short-term results in 301 consecutive patients suggest that a dedicated and well trained colorectal team, a thorough standardization of the surgical technique, as well as the use of modern technology, minimize postoperative morbidity and mortality and result in a significant decrease of hospital stay.

TME WITHOUT PROTECTIVE ILEOSTOMY THIRTY YEARS EXPERIENCES ONE'S SURGEON

Jozef Korcek, Andrej Lazorisak, Tomas Jankovic

Faculty hospital Nitra

Background/Aim Low anterior resection (LAR) is the procedure of choice for mid- and low rectal cancer. High leakage rates (1–24%) are reported in the colorectal anastomosis. Several studies have shown decreased clinical anastomotic leak rates and reduced need for re-intervention when a defunctioning loop ileostomy (DLI) has been created. A DLI in LAR reduces the incidence and morbidity of an anastomotic leakage, but complications related to the stoma may occur. We compare stoma-associated complications during the stoma period and after stoma reversal with postoperative course in patients after TME and colorectal anastomosis without protective ileostomy with transanal transanastomotic perturbation. **Methods** A retrospective analysis of low sided rectal cancer patients operated with TME in conjunction with defunctioning loop ileostomy according to literature and retrospective analysis of my own set of 844 patients after LAR without preoperative radiation therapy and 1005 patients after preoperative neoadjuvant chemoradiation therapy without protective ileostomy. **Results** Sixty-six percent of the patients with protective ileostomy suffered from minor or major stoma-associated morbidity. The complication rate was significantly related to the stoma time. Twenty-nine percent had at least one episode of dehydration, leading to readmittance in half of the cases. Elderly patients were more prone to develop dehydration. Dehydration most commonly occurred early in the postoperative period. Forty percent patients had some complication associated with the reversal. In my set of 1849 patients after TME and colorectal anastomosis without protective ileostomy with transanal transanastomotic perturbation we recorded 1.1% clinical anastomotic leakage. **Conclusion** This study indicates high morbidity associated with defunctioning loop ileostomy. Protective ostomies in low rectal anastomoses have proved to be the only preventive measure for reducing morbidity and mortality rates for anastomotic leakage. Data suggest that the stoma time should be limited to reduce complications. Monitoring and early stoma reversal should be considered in elderly patients. However, creation means subsequent closure, which must not be considered a minor procedure but an operation with possibly significant complications, including death.

“AUTOLOGOUS ADIPOSE-DERIVED STEM CELLS AND PLATELETS CONCENTRATES FOR THE TREATMENT OF COMPLEX PERIANAL FISTULAS”

Roberta Tutino, Sebastiano Bonventre, Giuseppe Lo Re, Eliana Gulotta, Simone Di Franco, Giuseppina Mazzola, Leonel Kamdem, Giorgio Stassi, Gianfranco Cocorullo, Gaspare Gulotta

University of Palermo

Background/Aim Complex perianal fistulas represent a major challenge for modern surgery aimed to the integrity of organs and function. The use of mesenchymal stem cells in complex perianal fistulas have been assessed by phase I and II clinical trials with 70% success rates although data not confirmed by a phase III study showing heterogeneous results. The addition of platelets concentrates (PC) as source of growth factors, anti-inflammatory molecules and scaffold function can improve the results. The aim of the present study is to evaluate the percentage of healing, reduction of secretion and improvement in QoL after inoculum of ADSC plus PC in complex perianal fistulas. **Methods** Adult patients with complex perianal fistulas. Patients underwent colo-rectal examination, an SF-36 questionnaire on QoL and a fecal incontinence score; a morphological study with contrast enhanced MR and a functional study using an anorectal manometry with 3D reconstruction. After recruitment patients were treated with ADSC plus CP after fistula tract identification, curettage of the tract and internal orifice closure. The clinical-instrumental follow-up is performed at 8 weeks, 6 months and 1 year after surgery. We consider as healed patients who will no longer present secretion through the external orifice and with absence of > 2 cm collections directly related to the fistula measured with MR. Exclusion criteria: Uncomplicated fistulas, pregnancy, Crohn's disease and ulcerative colitis, HCV, HBV, HIV, neoplasms, autoimmune diseases, tuberculosis, psychiatric disorders, in treatment with immunosuppressive or cytotoxic drugs. **Results** We recruited 18 patient suffering complex perianal fistulas. A seton was positioned in each fistula tract. After clinical audit 2 patients were excluded due to exclusions criteria; in 2 patients a fistulotomy was affordable and performed; 3 patients refused the treatment; one patients opted for a VAAFT. We performed the procedure in five patients and actually have a 2 months follow-up on four patients that don't present secretions from the external orifices. **Conclusion** The use of ADSC plus CP in patients with complex perianal fistulas could offer a new therapeutic option that ensures the integrity of the sphincters, continence and QoL. This could reduce the healthcare costs related to the repeated treatments as well as those associated with incontinence management.

THE BURDEN OF MALIGNANT OBSTRUCTION

Sara Fernandes, Ana Freire Gomes, Teresa Pereira, Fernando Aldeia, João Coutinho

Centro Hospitalar Lisboa Norte

Background/Aim Up to 20% of patients with colon cancer present with symptoms of acute obstruction, increasing mortality and morbidity. Our objective is to evaluate the differences between obstructive right-sided versus left-sided colon cancers concerning patients, tumor characteristics and surgical outcomes. **Methods** All consecutive patients who underwent emergency surgical management for obstructive colon cancer in our Department, between January 2017 and December 2018, were included. The follow-up until

September 2019 was considered. **Results** In 24 months, 97 patients underwent surgery for colon obstruction, 77% (75) of those from cancer. There were 30 right-sided lesions, 30 left sided lesions, 4 both sided synchronous lesions and 11 on extra-colic organs. In both right and left sided colon groups the ratio women/men were similar. The mean age was 69 (range 29–89) years on the right colon and 76 (range 34–97) on left colon group. Most were ASA III and IV (35% and 19%, respectively) with no disparities between groups. In these 60 patients, obstruction was the initial symptom in 82% (inaugural diagnosis). In 18% the diagnosis was known (10% of local recurrence, 3% under chemotherapy, 3% during staging and only 2% were fully diagnosed and waiting for surgery). Resection rate in right-sided lesions was 70% (21), with 61% (13) of primary anastomosis. On left sided lesions, the resection rate was 67% (20) with only 25% (5) primary anastomosis; stoma formation was chosen in 83% (25) of patients, 32% being deviation stomas for unresectable disease. There were no significant differences between the groups concerning pathological findings, with 100% R0 resections. 40% of all the patients were stage IV. Morbidity was not related to tumor's side or performing of primary anastomosis, but with the comorbidities and clinical condition at presentation. Morbidity rate was 26%, 32% of those for surgical causes. Mortality rate was 22% (13), most related with non-surgical complications. We estimate that overall survival will be drastically reduced, but our mean 16 months (range 6–33) of follow up, in witch we have 79% (36) survival, isn't enough for definite assessment. The burden is also economical with 45% of otherwise not needed adjuvant chemotherapy, 7% of subsequent surgery and 22% of not intended definitive stomas. **Conclusion** Besides the rate of stomas, there are not significant differences in right versus left sided occluded tumors. Only less than 1% were enrolled in cancer screening program and it must to be improved.

10 YEARS EXPERIENCE IN ADULT INTUSSUSCEPTION

Ana Freire Gomes, Sara Fernandes, Teresa Pereira, Fernando Aldeia, João Coutinho

Centro Hospitalar Lisboa Norte

Background/Aim Adult intussusception (AI) represents 5% of all cases of intussusception and accounts for only 1–5% of intestinal obstructions in adults. Symptoms are nonspecific making preoperative diagnosis difficult. However, thanks to the increasing use of abdominal imaging, this entity is becoming more identified. Almost 90% of AI is secondary to a pathologic condition. Due to a significant risk of associated malignancy, most of the cases require definitive treatment. The extent of resection, and whether the intussusception, should only be reduced remains controversial. **Methods** A retrospective review of patients aged > 18 years with a diagnosis of intestinal intussusception was made from 2009 to 2019. Data concerning clinical features, diagnosis, management and histopathology were collected. **Results** Twenty-one patients with adult intussusceptions underwent surgery, 52.4% had acute symptoms, 19% had subacute symptoms, 19% had chronic symptoms and 9.5% were asymptomatic. 52.4% of the symptomatic patients presented with intestinal obstruction. The majority (76.2%) were diagnosed preoperatively using abdominal ultrasonography and computed tomography. The others were diagnosed with colonoscopy and intra-operatively. There were 11 ileocolic, 6 enteric, 3 colocolonic and one sigmoidorectal intussusceptions. 20 patients were submitted to resection and 1 intussusception was simply reduced. Among the patients submitted to resection, primary anastomosis was done in 85% and the rest ended with stoma. 66.7% of the intussusceptions were associated with a tumor, of which 33.4% were malignant. Overall morbidity rate was

33.3% (Clavien-Dindo II 57.1%; I 28.6%; IIIb 14.3%). We report just one case of mortality, in a patient with an extensive colocolonic intussusception due to a congenital malformation of the cecum. No anastomosis leakage occurred. **Conclusion** AI is a rare entity. About half of our patients with AIs presented with acute symptoms and had intestinal obstructions to various extents. CT is the most effective and accurate diagnostic technique. Most AIs have an underlying pathological cause; hence, most authors agree that surgery is mandatory.

WHICH IS THE ROLE OF HYPERBARIC OXYGEN THERAPY (HBOT) IN THE TREATMENT OF FOURNIER'S GANGRENE?

Roberta Tutino, Francesco Colli, Giovanna Rizzo, Gianfranco Cocorullo, Gaspare Gulotta

University of Palermo

Background/Aim Fournier's gangrene comprises all necrotizing fasciitis of the perineum, including the genitalia, in both sexes and at all ages, regardless of the aetiology, with or without proven infection. The surgical debridement associated with broad spectrum antimicrobial therapy is the mainstay treatment but the local poor supply of blood, the infection and the damage to the blood vessels or a combination of these factors can delay the healing. Moreover, an adequate debridement can cause a great loss of tissue whose healing process can take long time. Thus, the disease needs long hospital stays and, despite all, has high mortality rate. The aim of our study is to investigate the improvement offered by HBOT in the treatment of Fournier's gangrene. **Methods** We retrospectively evaluated patients admitted to the O.U. of General surgery and emergency of the University hospital of Palermo from January 2011 to November 2018. Demographic data, admission characteristics, management and treatment were collected for each patient by patients' charts. Length of hospital stay and 30-day mortality were recorded. **Results** Empiric broad spectrum antibiotic therapy had been always administered and successively modified accordingly to the results of the samples. The average length of antibiotic therapy was 22 days. HBOT was offered to 13 (56.5%) patients using a scheduled session of 60 min daily. An HBOT related adverse event was reported. The average length of hospital stay was 26 days (SD 17.9; CI 3–72). Hospital stay was longer in patients treated with HBOT [mean 11 (CI 0.50–21.89) vs 25 (CI 18.02–31.97); $p = 0.0214$]. Mortality occurred in three (13.1%) patients, two of whom treated with HBOT. Mortality is not statistically related to sex ($p = 0.209$), BMI ($p = 0.538$), renal failure ($p = 1.000$), diabetes ($p = 0.496$), age > 65 years old ($p = 0.559$), simplified FGSI > 2 ($p = 0.058$), higher ASA scores (≥ 4) ($p = 0.470$), symptoms lasting since more than 72 h ($p = 0.2809$), Irinec > 6 ($p = 0.508$), Irinec > 9 ($p = 1.000$), HBOT ($p = 1.000$), need of colostomy ($p = 0.066$), several operations ($p = 1.000$), several operations plus HBOT ($p = 1$). The delay between admission and surgical operation is statistically related to mortality, 1.7 days (CI 0.9–3.5) in survivals vs 6.8 days (CI 3.5–13.4) in death patients ($p = 0.001$). **Conclusion** In our study patients treated with HBOT showed a longer hospital stay and the treatment seems don't reduce mortality. The only factor related to the prognosis was a delay between admission and surgical debridement.

LIFT PROCEDURE FOR TRANSSPHINCTERIC FISTULA: A FEASIBLE OPTION FOR PRIMARY AND RECURRENT FISTULAS. A SINGLE CENTER EXPERIENCE AND REVIEW

Sander Van Hoof, Els Van Dessel, Peter Cools

GZA Hospitals Antwerp Belgium

Background/Aim Fistulas are a well-known phenomenon within surgical practice. The development of an absolute surgical solution with minimal recurrence and morbidity has been a constant challenge. Ligation of the intersphincteric fistula tract (LIFT) however is a sphincter sparing technique that provides complete resolution of the transsphincteric fistula as well as minimizing recurrence and fecal incontinence. Our goal is to evaluate the efficacy of LIFT for primary and recurrent fistulas. **Methods** A retrospective case study was performed at our hospital where 25 patients with either cryptoglandular or IBD-related fistulas underwent a LIFT procedure between 2015 and 2019. Demographic data as well as primary outcome during the follow-up period were collected. A systematic literature review was conducted using PubMed with terms [ANAL FISTULA] [TREATMENT] [LIFT] [LIGATION OF INTERSPHINCTERIC FISTULA]. Primary outcome associated with surgical modifications were investigated. **Results** 4 out of 25 patients presented with early failure (84% primary success rate) after a median follow-up period of 7 months. The median time until recurrence was 105 days. 1 patient development a recurrent fistula while 3 others had persistent fistulae. The success rate after RE-LIFT was 100%. 28 case studies were included and were divided in 3 groups depending on technical variation of the used LIFT technique. The primary success rate was between 57 and 94.4% for the LIFT group. 40–94% in the LIFT + group and 75–80% in the mLIFT group. **Conclusion** LIFT is a feasible treatment option for primary as well as recurrent fistulas, with excellent though varying success rates. The procedure is safe and carries a low morbidity risk. The conclusions however are mostly subjective due to technical variations of the technique and the heterogeneous data used in either pro- and retrospective case control studies.

EARLY RECTAL CANCER: TRANSANAL-MICROSURGERY IN COMBINATION WITH SUBMUCOSAL DISSECTION

Josef Widmann¹, Andrea Dal Borgo¹, Alois Habicher¹, Kurt Leitner¹, Andrea Pagani¹, Carlo Conati², Michael Mammig¹

¹Krankenhaus Brixen Chirurgie; ²Kankenhaus Brixen Chirurgie

Background/Aim Early rectal cancer—transanal-microsurgery in combination with submucosal dissection: a new approach (TEM-ESD) for successful treatment of early rectal cancer and giant adenoma of the Rectum. **Background** Since the introduction of the regional colon-screening program the number of detected giant adenomas and initial-stage colon/rectal cancers rose up exponentially. To establish the adequate individual therapeutic strategy has a deep impact on both, patients quality of life and life expectance. An adequate patient selection, in respect of the oncological principles could offer the possibility of local resection options defining a Status of Low Risk and thus avoiding evtl. mutilating surgical strategies. **Methods** Transanal-Endoscopic—Microsurgery (TEM) and the Submucosal Dissection (ESD) are both validated techniques focusing

on the local treatment of rectal tumors. TEM-ESD offers the advantages of both the methods: easy handling with enbloc resection in the oncologically right plane. An accurate patient selection using endoscopy, transanal sonography and MRI is mandatory. N = 39 patients with rectal tumors were selected for local treatment therapy; One-third of them (n = 11) had malignoma, two-thirds (n = 22) had giant benign adenomas. TEM-ESD was performed in n = 27 cases, while in n = 6 cases the conventional transanal approach was only feasible. **Results** No mortality, low morbidity (12%) and 2.5 days hospitalisation time are encouraging; En bloc resection rate of 85%, R0-resection rate of 74% and overall (benign and malign) local recurrence rate of 27% could be improved much more by better patient selection and acting on learning curve. N = 2 patients necessitate a radicalisation surgery without any variation of the type of surgery with good clinical and oncological result. **Conclusion** Transanal endoscopic microsurgery and endoscopic submucosal dissection are both validated techniques; the combination of these two techniques allows to perform a local excision in a selected group of patients with rectal neoplasm easily and in the correct anatomical plane. This results in a good clinical and oncological outcome, avoiding sometimes mutilating radical surgical procedures.

OUTCOMES AND QUALITY OF LIFE ASSESSMENT AFTER PROCTOCOLECTOMY WITH ILEOANAL POUCH OR END ILEOSTOMY

Joana Bárto¹, Rita Barroca¹, Filipa Tare², João Maciel¹, Luís D'Orey Manoel¹, Manuel Limbert¹, Nuno Abecasis¹

¹Instituto Portugues de Oncologia de Lisboa Francisco Gentil;
²Hospital Dr. José Maria Grande - Portalegre

Background/Aim The surgical treatment for familial adenomatous polyposis (FAP), ulcerative colitis (UC) or synchronous colorectal cancers may involve a proctocolectomy with ileoanal pouch (IAP) or end ileostomy. Both treatment results in similar control of disease but differ in terms of patient experience and daily functioning. The aim of the study is to evaluate outcomes and access quality of life after proctocolectomy with IAP or end ileostomy in our Institution. **Methods** Retrospective study of patients who underwent proctocolectomy with IAP or end ileostomy for FAP and other polyposis, UC or synchronous colorectal cancers in our Institution from August 2007 until January 2019. We evaluated postoperative morbidity and mortality. Quality of life was evaluated using the questionnaires EORTC QLQ-C29, EORTC QLQ-C30 and LARS, validated for Portuguese. Statistical analysis performed with SPSS 23. **Results** During the study period, 63 patients underwent proctocolectomy, 47 (76.4%) with IAP and 16 (25.4%) with end ileostomy. Patients were mainly male (57.1%) with a medium age of 47 years. Major indications were FAP (47.6%), other polyposis (22.2%), UC (14.3%) and synchronous colorectal cancers (11.1%). Thirty patients (47.6%) had associated cancer. During the medium follow up of 39 months (p2510–p7560), we report an 82.5% morbidity rate, mainly with postoperative complications (73.1%), such as surgical-site infections (17.5%) and ileal pouch-anal anastomosis leak (12.7%); and 14.3% mortality rate (1 case of postoperative septic shock; 8 due to cancer progression). Forty-five patients (86.5%) have completed questionnaires. Medium LARS score was 25. Regarding QLQ C29 and C30, the average overall quality of life was 55.9% and functional param-

eters were high (> 70%). Concerning symptoms, patients over 65 years-old presented more fecal incontinence after IAP (p = 0044) and women more urinary incontinence (p = 0034) and abdominal pain (p = 0026). Compared to ileostomy, those with IAP presented more abdominal pain (p = 0000) and constipation (p = 0010). There were no statistically significant differences between these two groups regarding overall quality of life, functional status or other symptoms. **Conclusion** Proctocolectomy is a good option for patients with FAP or UC. Despite study limitations, both proctocolectomy with IAP or end ileostomy appear equivalent in terms of overall quality of life.

RESULTS AFTER 5 YEARS OF WATCH AND WAIT (WW) STRATEGY FOR PATIENTS WITH RECTAL ADENOCARCINOMA

Joana Bárto¹, Andre Caiado, Rita Barroca, Rodrigo Oom, João Maciel, Luís D'Orey Manoel, Manuel Limbert, Isadora Rosa

Instituto Portugues de Oncologia de Lisboa Francisco Gentil

Background/Aim The standard treatment for locally advanced rectal adenocarcinoma (ADC) is neoadjuvant (chemo)radiotherapy (CRT) followed by surgery. However, this approach is associated with high morbidity (urinary and sexual dysfunction, fecal incontinence and permanent colostomy) and mortality. Many series reported the benefit of neoadjuvant CRT to downstage, with reported rates of 20% of pathological complete responses (pCR). Multiple cohort series introduced the watch and wait (WW) Strategy for patients with clinical complete response (cCR) or clinical near complete response after neoadjuvant CRT with rates of local regrowth of 7–33% within the first 2 years, which can be treated with salvage surgery. This strategy was introduced in the protocol of our Institution (Oncology Center) in 2014. The aim of the study is to evaluate the results of patients included in WW in our Institution. **Methods** Retrospective study with prospective data of patients with rectal ADC included in WW from November 2014 until August 2019. cCR was considered after imaging (pelvic magnetic resonance imaging), endoscopic and digital rectal examination confirmation of no residual disease 8–16 weeks after neoadjuvant CRT. Patients with local regrowth were proposed for surgery. **Results** During the study period, of 418 patients with resectable rectal ADC, 142 (34%) with low rectal cancers were proposed for neoadjuvant CRT with curative intent. Twenty-two (15.5%) were included in WW: 21 with cCR; 1 with clinical near complete response. Patients were mainly male (59.1%) with a medium age of 69 years. During the medium follow up of 20.5 months (p2510–p7535.5), 7 patients (31.8%) presented local regrowth after a median of 11 months and 6 underwent surgery (1 refused surgery) with 0% pCR. We report 1 case of mortality in a patient with local regrowth with distant disease (liver and lung) after 21.9 months. The remaining patients with regrowth are alive, 5 without disease and 1 with local disease. Five-year overall survival was 95.5%. **Conclusion** Patients with cCR after neoadjuvant CRT may avoid surgery and its associated morbidity. The WW strategy seems safe, with most local regrowths being treated with salvage surgery. Local regrowths occurs mostly during the first 2 years, emphasizing the importance of a systematic surveillance.

COSTS OF STOMA MANAGEMENT AFTER DIVERTING OSTOMY IN RECTAL CANCER PATIENTS

Benjamin Geisler¹, Jan Pietzsch², Gerd Gottschalk³, Niels Komen⁴

¹Wing Tech Inc., Menlo Park, CA, U.S.A.; Massachusetts General Hospital/Harvard Medical School, Boston, MA, U.S.A.; ²Wing Tech Inc., Menlo Park, CA, U.S.A.; ³GERD Consulting, Kreuzau, Germany; ⁴University Hospital Antwerp, University of Antwerp

Background/Aim Diverting ostomy care after rectal adenocarcinoma resection is associated with a substantial cost burden. Our objective was to assess the per-patient costs associated with management of temporary or permanent diverting stoma for mid- and low rectal adenocarcinoma patients undergoing sphincter-preserving resection in Germany. **Methods** In a decision-analytic model, we followed a cohort of 63-year old patients (range 50–80) of whom 60% were male, based on a retrospective analysis of $n = 125$ patients status post sphincter-preserving resection. Lifetime survival was projected based on calibration to 3-year survival data from a recent rectal cancer-specific European registry using German life tables. Monthly stoma care as well as reversal costs were based on current reimbursement amounts by German public payers. We assumed that 88% (95% confidence interval [CI] 81%; 93%) of stomas would be reversed, based on retrospective study data. No costs of stoma-related adverse events were considered. Costs were discounted at 3% per year as per German guidelines for health-economic analysis. Sensitivity analysis was performed to evaluate the effect of changes in assumptions. **Results** Aggregate lifetime cost of stoma care and potential reversal were €7400. For patients in whom the stoma was reversed, costs were €6488, while costs for a stoma patient who would not undergo stoma takedown surgery were €14,090. Varying the takedown rate by the 95% CI led to aggregate costs between €7020 and €7932. Varying age led to costs between €5909 (for 80-year old patients) and €8876 (for 50-year old patients). **Conclusion** Conservative model-based projections suggest that stoma care leads to sizable follow-up costs. Efforts to reduce the need for diverting ostomy, for example based on novel device-based interventions, could lead to meaningful cost savings. These findings can be expected to directionally also apply in other healthcare system contexts.

THIERSCH PROCEDURE

Sarah El-Zahab, Lawrence Toquero

Peterborough City Hospital

Background/Aim Analysis of the efficacy and post-operative complications experienced in patients who underwent Thiersch procedure between 2013 and 2018 at Peterborough City Hospital. **Methods** Retrospective review of clinical records of patients who received Thiersch procedure between 2013 and 2018. Patient characteristics, ASA score, comorbidities, anticoagulant use, anaesthesia, and the admission type, were considered. Post-operative complications and length of inpatient stay was also reviewed. **Results** The review included 7 patients, 6 female and 1 male, with mean age of 79 (71–86), and mean BMI of 22.8 (16.4–40.6), with ASA scores of 3 or 4. Majority of patients (57%) had the procedure performed electively and 43% had it as an emergency. In terms of anaesthesia; majority of patients 4 (57%) had the procedure performed under local anaesthetic, 2 (29%) of patients had general anaesthesia, and 1 (14%) had spinal.

All patients experienced symptom improvement post-surgery. 3 (43%) of patients required laxative use. Inpatient hospital stay ranged from 1 to 25 days, with 4 (57%) remaining in hospital for less than 5 days. In median follow up of 106 days, 1 patient (i.e. 14%) experienced anal pain and faecal impaction. 1 patient (14%) experienced recurrence of rectal prolapse at 9 months, whereas 3 (43%) of patients died within 3 month period of surgical procedure. **Conclusion** Thiersch procedure is considered a simple and safe surgical management of rectal prolapse in high risk patients with multiple comorbidities. These include patients with an ASA score of 3–4, short life expectancy, and those who are not candidates for general anaesthesia. Main complications of this procedure include faecal impaction and wound infection. In cases of recurrences, this can be treated with a re-do of Thiersch.

INCISIONAL HERNIA RATE AT STOMA CLOSURE SITE CAN BE REDUCED BY USING SMALL BITE CLOSURE TECHNIQUE

Rosie McDonald¹, Alastair Brookes², Andrew Miller¹

¹Leicester Royal Infirmary; ²Walsall Manor Hospital

Background/Aim A small bite technique for fascial closure of midline abdominal wounds has been associated with a reduction in the incidence of incisional hernias (IH). IH is associated with a high morbidity and decreased quality of life for patients. In addition, they place an increased financial burden on the healthcare system, with recurrence rates after incisional hernia repair being as high as 30% in some series. Analysis of data collected from 11 Colorectal Surgeons in our unit over the 2 year period 2012–2013 revealed that the incisional hernia rate at stoma closure site was 17.1%. In 2014 a single surgeon in the unit (ASM) adopted the small bite wound closure technique and employed this for all abdominal wound fascial closures. The aim of this study was to explore whether a similar reduction in incisional hernia rates could be demonstrated when the principles of the small bite closure technique were applied to stoma site closure following either restoration of continuity or re-siting of stoma. **Methods** Prospectively collated demographic data on patients undergoing closure of stoma site by ASM between August 2014 and August 2019 were analysed. All patients had the fascial layer of the stoma site closed using a small bite technique (single layer, continuous 2/0 PDS, stitch: wound length ratio of $> 4:1$, short stitch length) having clearly demonstrated the fascial layer by excision of overlying tissue and any parastomal hernia sac. Evidence of incisional hernia was gathered, either from clinical review or cross sectional imaging. **Results** During the 5 year period 19 stoma sites were closed (14 ileostomy, 5 colostomy). Male to female ratio was 10:9. Mean age was 63.1 years (range 45–87 yrs). Median suture: wound length ratio was 8.1 (range 4.75–16.73). Mean BMI was 27.7 (range 20–36.8). Median P-Possum mortality was 2.13 (0.56–16%). Median ASA was 3 (range 1–4). Follow up data was available for 1.2 and 3 years in 13, 13 and 11 patients, respectively. There was no evidence of incisional hernia in any of the patients followed up. **Conclusion** The incidence of incisional hernia at stoma closure sites was minimised with the introduction of the small bite fascial closure technique. In addition to use in midline fascial closure, this technique can be safely and successfully used for closure of other abdominal wall wounds, without the need for mesh. The resultant reduction in incisional hernia rates will be of benefit both to patients and the healthcare systems serving them.

FEMALE MEDICAL STUDENTS ARE BETTER ADVOCATES FOR COLON CANCER SCREENING THAN THEIR MALE COUNTERPARTS

Ali Farsi, Sondos Alshammakh, Maria Abuhadi, Abdulaziz Saleem, Nadim Malibary, Nouf Akeel, Leena Merdad, Mohammed Basendowah

King Abdulaziz University

Background/Aim Colorectal cancer (CRC) is the 2nd and 3rd most common cancer among women and men, respectively. It can be prevented by screening and several screening modalities are available, with colonoscopy considered the gold standard. Population compliance to screening could be better. Previous studies have focused on barriers to screening among physicians and the general population. The role of medical students as advocates for CRC screening has not been studied yet. We aimed to evaluate the role of medical students as advocates for CRC screening among their families and to determine the obstacles they face as screening advocates. **Methods** The study was cross-sectional and conducted at KAUH in Jeddah, Saudi Arabia from September 2018 to April 2019. A paper-based questionnaire was distributed to all 1270 medical students in the 3 clinical years. The response rate was 74% (938 students). The associations between predictors and recommending screening were tested. The study was approved by the biomedical ethics research committee at King Abdulaziz University Hospital (KAUH). **Results** A total of 938 medical students responded to the questionnaire. Among all study participants, 22.3% recommended screening to their families and among these, 29% reported that their family member underwent screening. Knowledge related barriers were the most frequently reported barriers (75.5%). Predictors of recommending screening were being a 6th (final) year student (39% with p -value < 0.001), being female (55%, p -value = 0.039) and believing that CRC is a curable disease (76.2%, p -value < 0.001). Knowledge related barriers were the only significant type of barrier that impacted students' attitudes ($p < 0.001$). **Conclusion** We found most medical students had not discussed CRC with their families. Female and final year medical students were the most likely to recommend screening. The most common two barriers to discussing CRC screening were knowledge and social barriers. Addressing these barriers in medical school may help to increase the rate of screening among their family members

TUMOUR LIPID METABOLISM DISTINGUISHES MUCINOUS AND NON-MUCINOUS COLORECTAL ADENOCARCINOMAS

Sam Mason, James Alexander, Eftychios Manoli, Liam Poynter, Rob Goldin, Ara Darzi, Zoltan Takats, James Kinross

Imperial College London

Background/Aim Mucinous colorectal adenocarcinomas are more likely to present at an advanced stage and have poorer outcome than tumours that do not produce mucin. They demonstrate hallmark genetic, transcriptomic and metabolic changes; however the composition of cellular lipids (the lipidome) have yet to be described. Rapid Evaporative Ionization Mass Spectrometry (REIMS) analyses tissue chemistry in near real time. The aim of this study is to assess the ability of REIMS to identify mucinous tumours based on lipid chemistry. **Methods** A prospective observational cohort study was conducted in patients undergoing surgical resection for colorectal

cancer at two West London hospitals. Surgical specimens were analyzed ex vivo using an electrosurgical hand piece with the aerosol aspirated into a Xevo G2-S ToF mass spectrometer (Waters Corporation). The relative abundance of lipid metabolites was compared between mucinous (defined as extracellular mucin of greater than 50% of the tumour volume) and non-mucinous tumours. Predictive modelling was conducted using orthogonal partial least squares discriminant analysis and leave-one-patient-out cross validation. The primary outcome was the accuracy of REIMS in predicting mucinous status. The secondary outcome was to identify the lipids which differentiate tumour types. **Results** 63 patients (62% male, mean age 71) underwent resection of a colorectal adenocarcinoma, of which 10 were mucinous. 202 spectra were generated from REIMS analyses of tumour tissue. REIMS was able to predict the mucinous nature of tumours with 87.1% accuracy, 80% sensitivity, 88.6% specificity and 95.5% negative predictive value. The masses of multiple lipid metabolites were identified, with chemical structures elucidated using tandem mass-spectrometry or putatively from the exact mass. Phosphatidylethanolamine (16:0/18:0) and phosphatidylcholine (14:0/18:1) were of statistically significantly lower abundance in mucinous tumours, whereas phosphatidylethanolamine (18:2/18:1) and phosphatidylglycerol ($p = 20:0/16:0$) were of significantly higher abundance. **Conclusion** Mucinous colorectal adenocarcinomas appear to have a distinct lipid composition which can be used to accurately differentiate them from non-mucinous cancers using REIMS. We are gaining further metabolic insight by identifying the lipids which are differentially abundant in mucinous cancers and now need to understand how these metabolic phenotypes correlate with clinical outcome.

THE INNOVATIVE USE OF A HAEMOSTATIC GEL TO REDUCE THE INCIDENCE OF PELVIC COLLECTION AFTER RECTAL CANCER SURGERY: CAN WE ENHANCE THE ENHANCED RECOVERY PROGRAM?

Samuel Stefan¹, Najaf Siddiqi¹, Syed Naqvi¹, Emma Rawlinson¹, Jim Khan²

¹Portsmouth Hospitals NHS Trust; ²Portsmouth Hospitals NHS Trust & Anglia Ruskin University Cambridge

Background/Aim Precision rectal cancer surgery leads to minimal blood loss intraoperatively, however drains are still used in the postoperative period and it's not very infrequent to see a descent output from these drains on postoperative day 1–3. Pelvic resections have the potential to leave behind a large raw surface which can cause capillary bleeding and oozing postoperatively. These fluids are either absorbed by the peritoneum, or drained via a surgical drain, or can form a postoperative collection. The last 2 possibilities can lead to a delay in discharging the patient home due to increased postoperative drainage output or formation of pelvic sepsis—hence a reduced rate of compliance with the enhanced recovery program (ERP) in colorectal surgery. **Methods** Previous studies in resectional endoscopy and cardiothoracic surgery have revealed a significant reduction of the post-procedural complications with use of a haemostatic gel that reduces the oozing from capillaries and prevents secondary haemorrhage. The product used in this study is PuraStat[®] gel, 3-D Matrix Europe SAS. This prospective cohort study has compared the results of 10 consecutive cases of pelvic operations with use of PuraStat[®] gel and 10 consecutive cases without PuraStat[®] gel. The groups were compared for postoperative drain output and recovery, complications and length of hospital stay (LOS). Statistical analysis used SPSS paired samples t-test. **Results** 20 patients with laparoscopic or robotic

bowel resection procedures were enrolled into this study. The mean age was 62 and 64 years in group 1 and 2 respectively. Median BMI was 26.9 and 27.4. Median drain outputs on day 1, day 2 and day 3 were 70:103 ml, 37:59 ml, 14:48 ml. The median LOS was 5 days in both groups. Postoperative septic complications were seen in 1:4 cases. Postoperative ileus was noted in 2:5 patients. R0 resection was achieved in all patients. The results for lymph node count were similar in both groups. **Conclusion** PuraStat® gel is a haemostatic agent that has the capability to significantly reduce the pelvic oozing and bleeding after rectal cancer surgery. A controlled randomised trial to assess further the effects of this intervention is required.

LAPAROSCOPIC SURGERY FOR COLORECTAL CANCER: A RETROSPECTIVE STUDY FROM A RURAL SINGLE-CENTER OF SOUTHERN ITALY

Agata Ardizzone¹, Marco Vacante², Francesco Basile², Antonio Biondi², Gianluca Di Mauro¹

¹Hospital of Ragusa; ²University of Catania

Background/Aim This retrospective study aimed to evaluate the outcomes of laparoscopic surgery for colorectal cancer in a small rural hospital. **Methods** Data from a general surgery department in a small hospital in Ragusa, Italy, was collected between October 2016 to September 2019. All elective procedures were carried out by a single colorectal surgeon. The following parameters were evaluated: age and gender, tumor location and type of procedure (right or left hemicolectomy, anterior resection, low anterior resection with total mesorectal excision (TME), Hartmann's procedure), histology, lymph nodes removed, operative time, length of stay, American Society of Anesthesiologists (ASA) score, complications and mortality. **Results** Ninety-seven patients (57 males and 40 females) with colorectal cancer, median age 71 (range 48–93), were enrolled in the study. Right hemicolectomy was performed in 42%, left hemicolectomy in 22%, anterior resection in 27%, low anterior resection with TME in 7%, and Hartmann's procedure in 2% of cases. No patient underwent subtotal or total colectomy. In our series, CRC were classified after surgery as stage I in 27%, stage IIA in 33%, stage IIB in 1%, stage IIC in 1%, stage IIIA in 6%, stage IIIB in 20%, stage IIIC in 6%, stage IVA in 3%, and stage IVB in 3% of patients. Median duration of surgery was 184 min (range 120–555). Complications included wound dehiscence in 2 cases (2%), anastomotic dehiscence in 1 case (1%), bladder perforation in 1 case (1%), bowel obstruction in 1 case (1%), right ureteral injury in 1 case (1%), post-operative infection in 3 cases (3%). The average number of lymph nodes harvested was 17.8. Well differentiated adenocarcinomas were 24%, moderately differentiated 71%, and poorly differentiated 5% of cases. Mucinous and neuroendocrine subtypes were observed in 6% and in 2% of patients, respectively. ASA score was 2 in 11%, 3 in 83% and 4 in 3% of patients. Mean length of hospital stay was 7.8 days. We did not record any death during the study. **Conclusion** Our study suggested that major laparoscopic surgery procedures for colorectal cancer could be carried out safely and successfully also in low-volume centers. Our results were in accordance with other retrospective studies and showed that general surgeons with high experience in minimally invasive surgery may perform laparoscopic colorectal resection safely, even in a low-volume setting.

TaTME FOR RECTAL CANCER, MEDIUM-TERM ONCOLOGICAL OUTCOMES

Lorena Sancho Fructuoso, Carlos Javier Gomez Diaz, Javier Curto Lopez, Joan Altet Torne, Manel Bardaji Bofill, Merixell Labro Ciurans, Cristina Soto Montesinos, PABLO COLLERA ORMAZABAL

Xarxa Assistencial Universitaria de Manresa - Fundació Althaia

Background/Aim Total mesorectal excision (TME) is the gold standard for surgical treatment of rectal cancer, but the approach is still a reason for debate. Some studies, such as COLOR II, had reported that the laparoscopic approach is not inferior to the open when performing TME, however laparoscopic approach may present technical limitations in male and obese patients with narrow pelvis, also in those with low rectal tumours. The use of the transanal approach for TME would allow a minimally invasive surgery, with a better approach in these patients with surgical results comparable to laparoscopy or open surgery. However, there is controversy with the use of transanal approach due to the lack of medium and long-term oncological and functional outcomes. We present our series of rectal cancer treated with transanal Total Mesorectal Excision (TaTME), with at least 3 years follow-up. **Methods** In our centre, 72 patients of the 195 cases of rectal cancer treated by TaTME approach had an oncologic follow-up of minimum 3 years. 21 were women and 51 men. Aged between 46 and 91 years old (mean of 65.46). Surgeries were performed between August 2013 to September 2016. Mortality, recurrence and disease-free time data were analysed. **Results** The average follow-up was 3.33 years (2–5.5). Global survival was 82% at 5 years. In our series, 10 cases of recurrence has been reported (2.7% of local recurrence) with a mean time of disease-free 37.82 months. The 5-year survival was 81.9% and the mortality caused by disease progression was 11%. **Conclusion** We consider that TaTME surgical approach for treatment of rectal cancer is safe and feasible, with med-term oncological results comparable to the laparoscopic and open approach. Longer follow-up is necessary with a larger series to validate TaTME for surgical treatment of rectal cancer.

CAECAI VOLVULUS

Richard Reis, Vladimir Kostka, Boris Hrbaty, Ivan Satko, Peter Labaš

University Hospital Bratislava

Background/Aim Caecal volvulus is less frequent clinical condition and an uncommon cause of intestinal obstruction. Patients with this condition may present with variable clinical presentations ranging from intermittent abdominal pain to acute abdominal pain associated with intestinal strangulation. Lack of familiarity with this condition is a factor contributing to diagnostic and treatment delays. **Methods** Case report. **Results** A 81 year old woman was admitted to the hospital with diffuse, persistent abdominal pain of about 16 h duration. The patient reported cramping pain, vomiting of gastric content without relieving, without dietary mistake. In the history she reported appendectomy, hysterectomy, right upper lung lobe resection for TB in the past. On physical examination, the vital signs and cardiopulmonary examinations were within normal limits. On the physical examination the abdomen was distended, sensitive, without signs of

peritoneal irritation. The plain radiograph of the abdomen showed distended bowel loop in left mesogastrum. The cCT showed high suspicion on caecal volvulus and some free fluid in all compartments of the abdominal cavity. The urgent laparotomy was indicated, but informed consent was not acquired from the patient initially. After repeated discussion with patient and her family we finally got it. The patient underwent laparotomy (after another 16 h) with findings of caecal volvulus already associated with necrosis of caecum and ascending colon. Right colectomy and ileotransversostoma end-to-end was performed. The postoperative course was complicated with pneumonia, acute renal failure and patient died at postoperative day 15. **Conclusion** The occurrence of caecal volvulus is predisposed by excessive caecal mobility that is often associated with incomplete intestinal rotation. Bowel necrosis may occur as the sequelae of untreated and unresolved acute volvulus. Optimal management consists of metabolic support, early diagnosis, and operative therapy. The reported operative mortality has ranged from 0 to 40% with recurrence rates reported between 0 and 40% for those undergoing non-resectional treatment. Patient outcome is adversely affected by the presence of intestinal gangrenous changes and perforation, which are complications associated with delayed treatment of the condition.

THE EARLY COLONOSCOPIC IRRIGATION CAN BE A SAFE AND FEASIBLE TREATMENT IN UNCOMPLICATED RIGHT-SIDED COLONIC DIVERTICULITIS : A RETROSPECTIVE PILOT STUDY

HYUN HO KIM¹, Bong-hyeon Kye¹, Yoon Suk Lee², In Kyu Lee²

¹St. Vincent's Hospital, The Catholic University of Korea; ²Seoul St. Mary's Hospital, The Catholic University of Korea

Background/Aim Traditionally, the colonoscopy has not been performed in acute phase colonic diverticulitis to avoid worsening of the disease. One of the causes of diverticulitis symptoms is repetitive mechanical damages by fecal fragments, so the elimination of the fecal materials, which is the most common cause of inflammation, can relieve the symptom and reduce its duration, the probability of recurrence and use of antibiotics. This study is intended to identify the safety and efficiency of the early colonoscopic irrigation (CI) for the removal of fecal materials comparing outcomes between CI group and conservative care (CC) group. **Methods** This study was conducted as a retrospective cohort study of patients who were diagnosed as uncomplicated right-sided colonic diverticulitis at Seoul St. Mary's hospital, The Catholic University of Korea. The CI group consisted of 20 patients who underwent the early colonoscopic irrigation during the hospitalization from October, 2017 to May, 2018. And 40 patients who underwent the conservative care from August, 2016 to June, 2017 were included in the CC group. The right-sided colonic diverticulitis was defined as a diverticulitis in the range from cecum to hepatic flexure colon. The diagnosis was confirmed by CT finding, and enrolled patients had no other complications and comorbidity. **Results** In the CI group, there were 9 females (45.0%) and 11 males (55.0%), and the mean age was 37.9 ± 13.8 years old. The CC group consisted of 40 patients (19 females, 47.5% and 21 males, 52.5%), and the mean age was 41.1 ± 10.6 years old. There was no complication or the deterioration of the disease during or after CI in the CI group. The duration of IV antibiotics was 3.2 days in the CI group, 4.1 days in the CC group ($p = 0.024$) and the duration of PO antibiotics was 6.9 days in the CI group and 8.8 days in the CC group ($p = 0.001$). The frequency of pain killer was 0.9 in the CI group, 1.5 in the CC group ($p = 0.039$). The duration until performing colonoscopy was 1.5 ± 0.9 days and most common colonoscopic finding

was erythematous and edematous changes (14/20, 70%). **Conclusion** The early colonoscopic irrigation is a safe and feasible option to treat uncomplicated right-sided colonic diverticulitis. The early colonoscopic irrigation for uncomplicated right-sided colonic diverticulitis may be very useful for relieving symptoms, reducing use of antibiotics, and accurate diagnosis to differentiate other colonic disease in the early period of symptom.

DESIGN AND USAGE OF A SELF-CONSTRUCTED ENTERAL STENT IN PATIENTS WITH MALIGNANT COLORECTAL OBSTRUCTION

Tomasz Mitek

Warsaw Medical University

Background/Aim The work was aimed to manufacture an enteral stent with such a delivery system that would allow to implant the stent precisely in a tumour mass and to build an effective anti-migration system. **Methods** This study was performed prospectively, and both study group (60) and the control group (58) were patients diagnosed with malignant colorectal obstruction in the left half of the colon and rectum, and age ≥ 70 years. A double blind procedure was the method of choice used to determine the type of stent patients received. 48 patients in the study group underwent surgery after 10–14 days by an appropriate resection of the colon. In the control group 40 patients underwent surgery after obstruction regressed. 12 patients in the study group and 18 patients in the control group were treated with neoadjuvant chemoradiotherapy after surgery. **Results** In the subgroup which underwent neoadjuvant chemoradiotherapy, we observed 4 cases of stent migration when conventional stents were implanted in the sigmoid colon and rectum. Pain after implantation was observed in 28 patients in the control group, and in 5 patients in the study group. The presence of conventional stent distal to the tumor mass due to migration, forces excess healthy intestine to be resected which is significantly important in the functioning of the sigmoid colon and rectum. **Conclusion** The advantage of the new stent over the conventional stent is the ability to precisely implant the stent on to the tumor mass, which is of a particular important in protecting healthy mucosa in the rectosigmoid junction before elective surgery and primary colorectal anastomosis. The use of hooks is a safe and secure anti-migration stent system.

LEFT-SIDED TUMORS AND LOW EXPRESSION OF Mdm2 ARE INDEPENDENT FAVORABLE PROGNOSTIC INDICATORS OF OS FOR STAGE II AND III COLORECTAL CANCER

Alexandros Mekras¹, Matthaios Bobos², Alexandra Vasilakou¹, Dimosthenis Mekras³, George Mpasdanis³, Cem Atamer¹, Antonios Michalopoulos³

¹Verbundkrankenhaus Bernkastel/Wittlich; ²ARISTOTLE UNIVERSITY OF THESSALONIKI; ³Aristotle University, General Hospital AHEPA

Background/Aim The aim of our study was to investigate, in tumors of patients who underwent surgery for colorectal cancer (CRC) stage II and III, the immunohistochemical (IHC) expression of Mdm2, and correlated the results with clinicopathological characteristics and prognosis. **Methods** The study included 130 patients with AJCC stage

II and III. Paraffin tissue blocks containing tumor, normal tissue and metastatic lymph node used for the creation of TMA blocks. Specific antibodies involved in apoptotic PUMA/p53 pathway studied by IHC. **Results** 40% of the cases (n = 52) presented with left-sided tumor (LCRC), 30% (n = 39) right-sided (RCRC) and 30% with rectal tumor (n = 39). The median follow up period was 54 months (range 1–81), and the 3-year OS survival was 70.8%. Nodal metastases detected in 50% of the cases, while lymphatic invasion only in 30%. 88 patients (67.7%) received postoperative chemotherapy. Statistically significant correlations emerged between p53/Mdm2 (p = 0.033). Mdm2 was overexpressed only in tumor core compared to normal tissue core. The clinicopathological correlations showed statistically significant association between Mdm2 and maximal tumor diameter (p = 0.015). In multivariate analysis as independent favorable prognostic indicator for OS highlighted the left-sided location of the primary tumor (HR 2.63), postoperative chemotherapy treatment (HR 7.36) and low-expression of Mdm2 (HR 2). As independent adverse predictor for both Disease Free Survival (DFS) and Cancer Specific Survival (CSS) highlighted the infiltration of 4 or more lymph nodes (HR 1.39 and 1.79) and the lymphovascular invasion (HR 4.17 and 2.72). **Conclusion** Our results underline the reported in the literature difference in prognosis of RCRC and LCRC patients, while the observed Mdm2 overexpression in CRC denote the role of Mdm2 as potentially valuable target for molecular anti-cancer therapy. Larger studies are required to investigate the role of Mdm2 amplification and overexpression in therapeutic strategy for cancer treatment.

NEOADJUVANT CHEMORADIO THERAPY AND TUMOR RECURRENCE IN PATIENTS WITH EARLY T-STAGE LOWER RECTAL CANCER

Jeanette Reece¹, Elasma Milanzi¹, Peter Gibbs², Ian Hayes³

¹The University of Melbourne; ²The Walter and Eliza Hall Institute of Medical Research; ³Royal Melbourne Hospital

Background/Aim Major resection surgery is the recommended treatment for early T-stage rectal cancer. However, neoadjuvant chemoradiotherapy (nCRT) prior to surgery is widely used for early T-stage rectal cancer in Europe, the States and Australia, despite these recommended guidelines. Studies examining the role of nCRT in oncological outcomes for early T-stage rectal cancer are also limited. We aimed to clarify prognostic outcomes associated with nCRT by estimating tumor recurrence in patients with early T-stage lower rectal cancer that had nCRT prior to major surgery compared with recurrence outcomes in patients that had major surgery alone. **Methods** A retrospective analysis of prospectively collected data from all patients diagnosed with a localised rectal adenocarcinoma ≤ 8 cm from the anal verge that were $\leq T2$ by MRI and $\leq ypT2$ or $\leq pT2$ on final histopathology from private and public hospitals within regional Melbourne, Australia, between 1990 and 2017 was performed. We estimated the hazards of recurrence (local or distant) in 189 patients that had long course nCRT prior to major surgery ($\leq ypT2$) compared with 136 patients that had major surgery alone ($\leq pT2$) using a multivariate Cox proportional hazard (PH) model, after adjusting for any potential confounders. **Results** We found 58% of early T-stage lower rectal cancer patients in Melbourne had nCRT prior to major surgery, despite recommended guidelines. We found no differences in tumor recurrence hazards between patients that had nCRT prior to major surgery ($\leq ypT2$) compared with patients that had major surgery alone ($\leq pT2$) using a multivariate Cox PH model, after adjusting for any potential confounding effects of surgical procedure, proximity to the anal verge,

lymph node status and surgical complications (hazard ratio 0.76; 95% CI 0.22–2.58; p value = 0.9). Further, the effect of nCRT on recurrence hazards did not vary over time, confirming that the PH assumption of the Cox model was not violated. **Conclusion** We found no evidence to suggest long course nCRT prior to major surgery improved oncological outcomes for early T-stage lower rectal cancer compared with surgery alone. That is, nCRT did not reduce tumor recurrence outcomes compared with surgery alone. This study supports the current recommended guidelines of major surgery alone for the treatment of early T-stage lower rectal cancer.

PROPHYLACTIC NEGATIVE-PRESSURE WOUND THERAPY FOR PREVENTION OF SURGICAL SITE INFECTION IN OPEN ABDOMINAL SURGERY: A SYSTEMATIC REVIEW AND META-ANALYSIS

Jeremy Meyer¹, Elin Roos², Nicolas Buchs¹, Frédéric Ris¹, Christian Toso¹

¹Hôpitaux Universitaire de Genève (HUG); ²Karolinska Institutet

Background/Aim Our objective was to determine the effect of prophylactic negative-pressure wound therapy (pNPWT) on the prevention of surgical site infection (SSI) in open abdominal surgery. **Methods** MEDLINE, Embase and Web of Science were searched from inception to the 6th of October 2019. Original studies reporting the incidences of SSI in patients undergoing open abdominal surgery with and without pNPWT (those with conventional wound dressing) were identified according to a protocol registered in PROSPERO. The systematic review was carried on in accordance with the PRISMA guidelines. Odds ratios (OR) for SSI for patients with pNPWT were obtained using random effects models. Heterogeneity was assessed using the Q-test and quantified using the I2 value. **Results** Twenty studies accounting for 2880 patients were retained for the analysis. pNPWT was protective against the incidence of SSI with an OR of 0.46 (95% CI 0.32–0.65, p < 0.0001, I2: 54%). When pooling only studies including patients at high risk of SSI (4 studies, 690 patients), the protective effect was stronger (OR 0.22, 95% CI 0.10–0.47, p < 0.0001, I2: 21%). In patients undergoing colorectal surgery (1084 patients), abdominal wall reconstruction (400 patients) or pancreaticoduodenectomy (578 patients), the OR were of, respectively, 0.32 (95% CI 0.13–0.78, p < 0.05, I2: 72%), 0.59 (95% CI 0.36–0.96, p < 0.05, I2: 7%) and 0.35 (95% CI 0.21–0.58, p < 0.0001, I2: 0%). When pooling only randomized controlled trials (5 studies, 792 patients), the protective effect was conserved (OR 0.47, 95% CI 0.22–1.00, I2 67%) but lost significance (p = 0.05). **Conclusion** The present systematic review and meta-analysis shows that pNPWT allows reducing the incidence of SSI after open abdominal surgery, especially in patients at high risk for SSI. More studies are required to reach similar conclusion with randomized controlled trial.

ROBOTIC RIGHT HEMICOLECTOMIES LEAD TO FASTER RECOVERY AND ARE COST EFFECTIVE

Nima Ahmadi, Isabella Mor, Ross Warner

The Tweed Hospital

Background/Aim To compare the outcomes of patients undergoing right hemicolectomy using laparoscopic or robotic approaches and assess the cost effectiveness of the two operative methods. **Methods**

Retrospective review of all patients undergoing elective laparoscopic and robotic right hemicolectomies at a public and private hospital in NSW from January 2015 to June 2018. Cost analysis was calculated using actual and estimated costs. **Results** A total of 101 patients were identified. 59 (58%) had Robotic resection, of which 44 (75%) had an intra-corporeal anastomosis. There were no demographic or oncological differences between the two groups. The Robotic group had a significantly earlier time to bowels opening (2 vs 4 days, $p < 0.001$) and shorter length of stay (3 vs 5 days, $p < 0.001$). The robotic group had a lower rate of ileus (2% vs 14%, $p = 0.02$) and complications (5% vs 22%, $p = 0.006$). The mean lymph node harvest was higher in the robotic group (18 vs 14, $p = 0.001$). The operative time was longer in the Robotic group (110 vs 97 min, $p = 0.021$). The total instrument costs of Robotic surgery were \$2565.37 compared with \$1507.50 for laparoscopic surgery. The cost of bed days was \$1167.00/day. The average difference in cost of care was calculated as \$1276.13 and \$464.43 less in the robotic with intra-corporeal and extra-corporeal anastomosis, respectively. **Conclusion** Patients have significantly faster return to bowel function and shorter length of stay after Robotic vs laparoscopic right hemicolectomy and experience fewer complications. This difference in length of stay may make Robotic hemicolectomies more cost effective.

ADJUVANT CHEMOTHERAPY FOR STAGE II COLON CANCER IN ELDERLY PATIENTS

Jae-Im Lee

The Catholic University of Korea, College of Medicine

Background/Aim The efficiency of adjuvant chemotherapy for patients with stage II colon cancer is still controversial. In elderly patients, the benefits and risks of chemotherapy should be considered prior to the administration of chemotherapy considering the toxicity of chemotherapy. In particular, the evidence of benefit from adjuvant chemotherapy in elderly patients with stage II colon cancer is scarce. Therefore, this study aimed to evaluate whether adjuvant chemotherapy affects recurrence-free survival and overall survival in elderly patients with stage II colon cancer. **Methods** Patients older than 70 years who underwent curative resection of stage II primary colon cancer from 2004 to 2010 were included in six hospitals. Medical records were collected and reviewed retrospectively. Patients were classified into no adjuvant chemotherapy (NO) and adjuvant chemotherapy (AC) groups. The endpoints were recurrence-free (RFS) and overall survival (OS). **Results** A total of 314 patients were analyzed, of whom 197 (62.7%) patients received adjuvant chemotherapy. The mean ages of NO and AC groups were 79.0 (± 5.4) and 74.4 (± 3.9) years ($p < 0.001$), respectively. There was no statistically significant difference in 5-year RFS [90% versus (vs) 83.7%, log-rank $p = 0.986$]. However, 5-year OS was higher in the AC group than in the NO group. (79.0% vs 92.2%, log-rank p value < 0.001). In a Cox regression analysis for RFS, adjuvant chemotherapy was not found to be an independent factor. [Hazard ratio (HR) 1.01, 95% confidence interval (CI) 0.51–1.98, $p = 0.986$.] In univariable analysis with Cox regression analysis, adjuvant chemotherapy was a factor affecting OS (HR 0.30, 95% CI 0.15–0.60, $p = 0.001$). However, no significant benefits of adjuvant chemotherapy were observed in multivariable analysis. (HR 0.43, 95% CI 0.17–1.07, $p = 0.070$). **Conclusion** Adjuvant chemotherapy confers no significant survival benefit in patients older than 70 years with stage II colon cancer.

USE OF THE TST STAPLER IN THE SURGICAL TREATMENT OF PSEUDOObSTRUCTIVE DEFECATION SYNDROME

Pavel Zbořil, Pavel Skalický, Katherine Vomackova, Tomáš Řezáč, Michal Gregořík

University Hospital Olomouc

Background/Aim Defecation problems affect up to 20% of the adult population. Women are affected 3x more often than men. Diagnosis of defecation problems is complex and is performed in cooperation with other medical specialties, such as urology, gynecology, and neurology. Nonetheless, the first specialist patients with defecation problems most often seek out is a proctologist. **Methods** Treatment of defecation problems includes dietary measures, rehabilitation techniques, and surgical procedures. The most common causes of defecation problems include ventral rectocele, anorectal prolapse, and rectorectal intussusception. In the majority of cases, III and IV degree hemorrhoids are also present. A number of surgical techniques have been developed to treat static and dynamic disorders of the small pelvis. The new resection technique using the TST high capacity stapler seems promising. This method is based on segmental resection of the rectal wall. Between January 2016 and October 2018, 54 patients were operated on using the TST stapler. **Results** Surgery using the TST stapler led to the treatment of the underlying disease in all patients. Stapler failure did not occur in any of the cases. **Conclusion** The introduction of high capacity circular staplers (TST 36) creates new possibilities for treating anorectal prolapse and rectocele. Based on our experience, this method is able to treat rectal prolapse protruding 3 cm past the anus. The surgery is always performed using only one stapler.

CLINICAL SIGNIFICANCE OF DETECTING MINIMAL RESIDUAL DISEASE IN PERIPHERAL AND TUMOR-DRAINING BLOOD OR BONE MARROW IN PATIENTS WITH COLORECTAL CANCER

Pavel Skalický¹, Josef Srovnal², Pavel Zbořil¹, Ivo Klementa¹, Martin Loveček¹, Dušan Klos¹, Marian Hajdúch², Čestmír Neoral¹

¹University Hospital Olomouc; ²Palacky University Olomouc, Faculty of Medicine and Dentistry

Background/Aim Minimal residual disease (MRD) is defined as the presence of isolated or circulating tumor cells in the blood, bone marrow, lymph nodes and body cavities, such as the peritoneal cavity. These cells are considered precursors for the development of distant metastases. Aim of this study is to determine whether the presence of circulating tumor cells (CTCs) in the blood and bone marrow of colorectal cancer (CRC) patients with localized disease is a negative prognostic factor, and to study correlations with clinical/pathological disease characteristics. **Methods** The presence of CTCs in peripheral blood, tumor-draining blood, and bone marrow of 179 colorectal cancer patients was assessed before, immediately after, and 1 month after surgery. Sample analysis is performed using the RT-RQ-PCR method, where MRD detection is based on detecting expression of specific genes. In addition to examining for minimal residual disease, standard histopathological tumor and lymph node examination is performed to determine staging and grading of the disease. All patients are continuously dispensarized according to protocol estab-

lished by our coloproctology team. The laboratory results obtained are analyzed and correlated with the clinical course (disease-free interval, liver metastasis-free interval and overall survival). **Results** We observed no statistically significant association between MRD positivity and clinical stage, grading, lymph node affection, primary tumour volume and serum oncomarkers value. In relationship with these results the MRD positivity in CRC patients seems to be an indicator with no association with routinely used prognostic factors. In patients with clinical stage I–III the MRD positivity of marker CEA in the systemic blood at the time of operation was found as a prognostic factor for identification of patients with higher risk of recurrence. Similarly the MRD positivity in samples 1 month after the operation (marker CK20 in systemic blood, CEA and CK20 in bone marrow) was observed even more significant for the prognosis of the patient. **Conclusion** Presence of CTCs in blood and bone marrow after surgery is an independent negative prognostic factor for cancer-specific survival in stage I–III colorectal cancer patients.

ILEOTRANSVERSE LAPAROSCOPIC MANUAL INTRACORPOREAL ANASTOMOSIS: VIDEO TECHNIQUE

Christian König¹, Misael Ocares¹, Gino Caselli¹, Claudio Benavides², José Manuel Vivanco², Marcos Carvajal¹

¹Universidad de Concepción; ²Hospital Guillermo Grant Benavente de Concepción

Background/Aim To present a completely laparoscopic intracorporeal manual ileotransverse anastomosis technique in right colectomy for ascending colon cancer. **Methods** We present a video of ileotransverse manual intracorporeal laparoscopic anastomosis technique in right colectomy for ascending colon cancer. **Results** Female patient, 71 years old with 2 cm adenocarcinoma in ascending colon. Laparoscopic right colectomy was performed and intracorporeal manual anastomoses with poliglecaprone 25 suture. Operating time: 175 min. No postoperative complications. Discharged on the fourth day. **Conclusion** We present an option to mechanical intracorporeal anastomosis in patients with right colon cancer.

3D PRINT PATIENT-SPECIFIC MODEL FOR TaTME PROCEDURE

Alberto Biondi¹, Fabiano Bini², Laura Lorenzon¹, Michele Grieco¹, Simone Novelli², Andrada Pica², Franco Marinozzi², Roberto Persiani¹

¹Fondazione Policlinico Universitario A. Gemelli IRCCS, Roma; ²Department of Mechanical and Aerospace Engineering - “Sapienza” University of Rome

Background/Aim Trans-anal TME (TaTME) procedures for rectal cancer treatment has the advantage of reducing conversion rate and providing a longer distal resection margin comparing laparoscopic trans-abdominal low rectal resection (1). However, the surgical field is demanding and performing a mesorectal dissection could be difficult in relation to the challenging anatomy. Also, new adverse events such as such as nerve, vessel and urethral injuries have been described (2). 2D and 3D pelvimetry reconstructions, both using CT scans or

MRI, may be helpful in predicting surgical difficulties, or achieving a complete mesorectal plane, negative circumferential margins or a sphincter-saving procedures. **Methods** A 77 years old woman underwent clinical staging for a locally advanced rectal cancer located at 6.3 cm from the anal verge and assessed using MRI as a cT4b cN1, with a suspected infiltration of the uterus. CT scan was negative for distant metastases. The patient was treated with neoadjuvant chemotherapy and an MRI used for restaging was consistent with a cT4a cN0 tumor. Accordingly the patient was scheduled for a TaTME procedure 15 weeks following the neoadjuvant treatment, as previously described (1). Pre-operative CT scans were acquired and Digital Imaging and Communications in Medicine (DICOM) images were post-processed by means of 3D Slicer v. 4.11 (open source software platform for medical image—Harvard University). From the axial plane view, a set of reference-standard algorithms and graphical tools has filled all the space enclosed by the boundaries of the segmented ROI (Region of Interest) with the supervision of the Surgeon. Once all the CT DICOM images were segmented (3.4), a 3D model was generated and was imported into another open-source system, Meshmixer v. 3.5, and saved as stereolithography (STL) files for 3D print. **Results** The 3D model provided a clear representation of the pelvis and of pelvic organs and was used for 3D printing for an educational purpose. The use of 3D images could be helpful in providing an insight of the pelvic anatomy and could be a reliable and useful tool in patients selected for TaTME treatment. **Conclusion** The 3D Print model can also be used during consultation with patients in order to explain management strategies. Future models will aim to provide interactive elements such as augmented or virtual reality, importantly, with haptic feedback.

APPLICATION OF THE ELECTRONIC FRAILTY INDEX IN A COHORT OF ELDERLY EMERGENCY LAPAROTOMY PATIENTS WITH SMALL BOWEL OBSTRUCTION. A SINGLE CENTRE EXPERIENCE

Kristof Nemeth¹, Laura Falvey², Cesar Brito Ramirez², Buket Ertansel², Ioannis Nikolopoulos²

¹Queen Elizabeth Hospital, London/On behalf of the Queen Elizabeth Hospital NELA Multidisciplinary Team; ²Queen Elizabeth Hospital, London

Background/Aim Patients over the age of 65 years are considered to be at higher risk during surgery and this is especially true for emergencies. Older people represent almost half of patients undergoing emergency laparotomy every year in the United Kingdom. The British Geriatrics Society recommends that a multidisciplinary team (MDT) approach should be applied involving senior geriatricians, anaesthetists and surgeons. **Methods** Data were collected from the National Emergency Laparotomy Audit (NELA) on all patients aged 65 years or older who underwent emergency laparotomy/laparoscopy for all forms of SBO between December 2018 and June 2019 at our hospital. The primary outcome measures were length of stay and 30-day mortality. The prevalence of frailty was calculated by application of the electronic Frailty Index (eFI), a 36-point-measure utilising electronic data from primary care. Data Analysis was performed with R Statistic Programming calculating T-Test and odds ratios. **Results** 26 elderly patients underwent emergency laparotomy/laparoscopy. 17 females and 9 males with a median age of 78 years with no difference between the two groups ($p = 0.43$). 20 patients had a default

laparotomy, 5 cases were converted from initial laparoscopy and 1 case was completed as an emergency laparoscopic adhesiolysis. 7 patients did not meet the criteria of frailty according to the eFI. 19 patients demonstrated different stages of frailty. (10 mild, 5 moderate and 4 severe frailty). The moderate and severe frailty groups stayed significantly longer (median 21 days, $p = 0.002$) than the no frailty and mild frailty groups (median 10 days). There was no difference in 30 days mortality between the none frail and frail groups. OR 1.75 95% CI 0.21–91.87. **Conclusion** 73% of our patients over 65 years undergoing laparotomy for small bowel obstruction were diagnosed as frail. These individuals had an extended length of stay in hospital. In our experience early application of the electronic Frailty Index can accurately identify frail patients and timely referral to intensive care and geriatric services can be accomplished in order to minimise mortality.

EFFECT OF MICROBIOTA TRANSPLANTATION ON ACTIVE ULCERATIVE COLITIS AND GUTMICROBIOTA

Yunsheng Yang¹, Ren Rongrong¹, Shi Yichao¹, Gao Xuefeng², Li Jianfeng¹, Wang Zikai¹, Peng Lihua¹

¹Chinese PLA General Hospital, Beijing, China; ²Shenzhen University General Hospital

Background/Aim To assess the efficacy of fecal microbiota transplantation (FMT) treating active ulcerative colitis (UC), and to identify the microbial features associated with different therapeutic outcomes. **Methods** Thirty-one patients with active UC (Mayo scores ≥ 3) were recruited. The patients received FMT via colonoscopy from a same eligible donor. Patients received each FMT procedure and repeated endoscopy in 2 months. The primary end points were clinical remission, endoscopic remission and clinical response after each FMT treatment. The second end point was the relapse rate which patients received two FMT procedures and relapsed during 1–5 years. Fecal samples were collected from patients and the donor during FMT. The fecal microbiome profiles were studied via 16S rRNA sequencing. **Results** Thirty-one patients received two FMT procedures and 20 patients underwent three times of endoscopy. After the first FMT, 22.58% (7/31) of patents achieved clinical remission and endoscopy remission, while the clinical response rate was 67.74% (21/31). When the second FMT completed, both the clinical and endoscopy remission rate increased to 55% (11/20), while the clinical response rate was up to 80% (16/20). The time of clinical remission ranged from 3 to 48 months (average 21.09 ± 15.99 months). No serious adverse events occurred in all patients. The overall microbial composition of patients changed to the donor's profile after FMT, and the abundance of *Bacteroides plebeius*, *Bacteroides coprocola* and *Bifidobacterium adolescentis* is increased significantly, closing to the donor level. Increased levels of *Fusobacterium varium* and Proteobacteria Sulfurovum were associated with poor outcomes. The phylum Firmicutes, especially the genera Roseburia and Ruminococcus, were particularly more abundant in the responders. **Conclusion** FMT induces clinical and endoscopic remissions in active UC, with a high level of safety. The gut microbial composition of UC with different FMT outcomes were distinguishable. The enrichment of *Bifidobacterium breve*, *Bacteroides* and *Blautia* might be indices of sustained remission.

CURRARINO SYNDROME: A RARE CLINICAL ENTITY

Sara Castanheira Rodrigues¹, Catarina Pestana Muller², Pedro Mendes², Alexandre Duarte², Pedro Correia da Silva², Elisabete Barbosa

¹CENTRO HOSPITALAR SAO JOAO - CIRURGIA GERAL; ²Centro Hospitalar Universitario Sao Joao, Porto, Portugal

Background/Aim Currarino Syndrome (CS) is a rare congenital disorder characterized by a triad of presacral mass, anorectal malformation, and sacral bone defect. This triad is rarely observed together in children or adults. It results from an incomplete separation of endoderm from ectoderm during embryonic development. Most cases are inherited with an autosomal dominant pattern, but the syndrome can also be sporadic, with variable phenotypic expression. It is caused by mutation on the homeobox gene HLXB9 in chromosome 7q36, present in 50% of cases. Malignancy is very rare in CS and it can involve the malignant transformation of a benign mass. **Methods** A 49 year-old male with symptoms of severe constipation and incomplete fecal elimination with over 1 year of evolution, and a past history of congenital anal imperforation. Abdomino-pelvic MRI showed a bulky, heterogeneous, expansive mass in the presacral region. A CT scan was performed showing a hypervascular mass with multiple calcification foci and areas of necrosis, a partial agenesis of the body of sacrum and multiple iliac adenopathy. **Results** The patient was proposed for surgical resection of the presacral tumor. The histopathological exam revealed a well-differentiated neuroendocrine tumor, locally invasive, associated with a malformative cystic lesion, a very rare presentation of CS. There were no major post-operative complications and patient was discharged at 10th post-operative day. **Conclusion** There are few reports of CS in literature. About one-third of patients are asymptomatic, underestimating its incidence. It is usually missed and underdiagnosed. The diagnosis requires a high grade of suspicion. Evaluating correctly an adult with a prolonged history of constipation, especially if intractable, is the first step. Most presacral masses are benign but can undergo malignant transformation. De novo malignancy is very rare. MRI or CT scan are the best imaging modalities to identify and characterize the presacral mass. The histopathological exam is essential to determine tumor nature. Genetic diagnosis is important for screening and counseling. The treatment is frequently surgery. For malignancy, complete tumor characterization and appropriate staging are mandatory, and systemic therapy might be needed. Due to the rarity and missed recognition of CS, tumor recurrence should be considered a possibility. Follow-up with MRI or CT scan is recommended.

MECKEL'S DIVERTICULITIS: A RARE CASE OF ABDOMINAL PAIN

Catarina Pestana Muller¹, Sara Castanheira Rodrigues², Vitor Neves Lopes¹, Rui Mendes Costa¹, Tiago Pimenta¹, Elisabete Barbosa

¹Centro Hospitalar Universitario Sao Joao, Porto, Portugal; ²Centro Hospitalar Sao Joao - Cirurgia Geral

Background/Aim Meckel's diverticulum (MD) is an infrequent embryonic trace with an estimated prevalence of 2–4% in general population. It affects equally both male and female, but its complications are 2–3 times more frequent in male patients. Complications

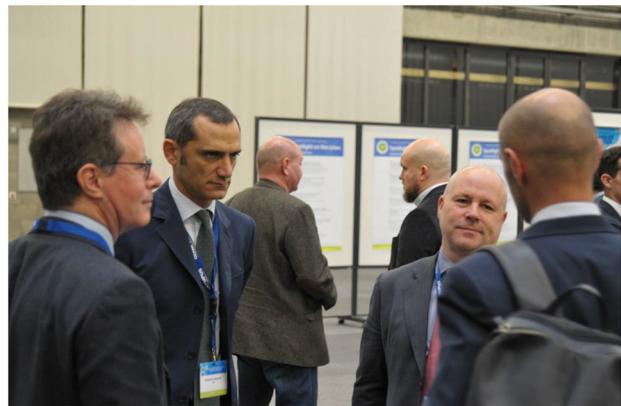
associated with MD include diverticulitis, hemorrhage and intestinal obstruction, ulceration and/or perforation. The development of any complication during life occurs in 4–6% of patients, and the mortality rate associated to it is approximately 6%. **Methods** A 23 year-old female with symptoms of abdominal pain, nausea and vomiting attended to the emergency room department. Abdominal pain was initially located in the epigastric region, later migrating to the right iliac fossae. At physical examination, abdomen was tender to palpation in the inferior quadrants, without signs of peritoneal irritation. Patient had no fever. No past history of disease was known. Blood chemistry showed elevation of the inflammatory markers. An abdominopelvic ultrasound was performed showing a focal distention of an intestinal segment in the hypogastric region. The abdominopelvic CT scan revealed a tubular structure on the hypogastric region, slightly to the left of the median line, with about $7 \times 3 \times 6 \times 3.5$ cm, with air in the small bowel loop wall and an liquid–air level next to it. A complicated MD was assumed as the most probable diagnosis. **Results** Patient was proposed for exploratory laparoscopy and intraoperatively a MD was identified. It was performed a laparoscopic diverticulectomy. There were no major post-operative complications and patient was discharged at the 5th post-operative day. **Conclusion** Diverticulitis occurs in about 10–20% of patients with a symptomatic MD, most frequently in older and male patients. Clinical presentation with abdominal pain, frequently associated with nausea, vomiting and fever might be mistaken with an episode of acute appendicitis. The definitive diagnosis can only be established after surgical exploration. Despite of the advances on diagnostic exams, the pre-operative diagnosis of MD is extremely difficult to establish and a high level of suspicion is required. The early diagnosis of this rare entity is essential to prevent the development of more serious complications such as small bowel ischemia, necrosis and perforation.

SURGICAL PROCEDURE FOR SUPER ELDERLY PATIENTS WITH COLORECTAL CANCER

Ryo Miyazaki, Shuichiro Matoba, Hiroya Kuroyanagi

Background/Aim Short-term and midterm outcomes of surgery remain unclear in very elderly patients (≥ 85 years) with colorectal cancer. This study was designed to clarify the safety and therapeutic usefulness of surgery for colorectal cancer in this subgroup of patients. We compared postoperative short-term and midterm outcomes between laparoscopic surgery and open surgery to evaluate the feasibility of laparoscopic surgery in very elderly patients. **Methods** The study group comprised 80 patients [38 men (48%) and 42 women (52%)] aged 85 years or older who had colorectal cancer and were treated in our department from 1987 to 2010. The mean age was 87.3 ± 2.3 years, and the median follow-up was 45 months (range 4–252 months). Sixty-nine patients (86%) were 85–89 years old, and 11 (14%) were aged 90 years or older. The American Society of Anesthesiologists' (ASA) risk class was I in 2 patients (2%), II in 44 (55%), and III in 34 (43%). Open surgery was performed in 46 patients (58%), and laparoscopic surgery was performed in 34 patients (42%). **Results** The ASA risk class was II or III in 78 patients (98%). Postoperative complications occurred in 21 patients (26%), including ileus in 8 patients (10%), wound infection in 7 (9%), and anastomotic leakage in 3 (4%). As compared with open surgery, laparoscopic surgery had significantly lower intraoperative blood loss ($p < 0.0001$) and a significantly shorter

postoperative hospital stay ($p = 0.0001$) but required a significantly longer operation time ($p = 0.0017$). Clinicopathologically, laparoscopic surgery was associated with a significantly smaller tumor size ($p = 0.0371$), significantly fewer dissected lymph nodes ($p = 0.0181$), and significantly fewer patients with stage II or III disease ($p = 0.0090$). Postoperative complications occurred in 14 patients (30%) in the open surgery group and 6 (18%) in the laparoscopic surgery group, but this difference was not significant. As for midterm outcomes, the disease-free survival rate and the overall survival rate were, respectively, 90.9% and 100% in stage I disease, 89.7% and 100% in stage II disease, and 68.4% and 75.9% in stage III disease. **Conclusion** Colorectal surgery was safe, therapeutically useful, and had good short-term and midterm outcomes in very elderly patients with colorectal cancer. As compared with open surgery, laparoscopic surgery was associated with lower intraoperative blood loss and a shorter postoperative hospital stay. These results suggest that laparoscopic surgery is suitable for very elderly patients with colorectal cancer because it is less invasive than open surgery.



The president of the international abstract jury Justin Davies discusses the merits of the presented abstracts with friends and colleagues Antonino Spinelli, Andrea Pietrabissa, and Luigi Boni.



Dr. Min Jung Kim from Seoul, Republic of Korea was presented the Best Poster Award for her work on Oncological Impact of Lateral Lymph Node Dissection After Preoperative Chemoradiotherapy in Patients with Rectal Cancer

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