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Book of abstracts

**Faculty lectures & Oral presentations**

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## Surgical anatomy in pancreatic Head resection

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In recent years there has been an increase in the indications for pancreatic resection of benign or low-grade malignant lesions, especially in young patients with long life expectancy. We present about vascular anatomy of the pancreas when performing pancreatic head resection. When DPPHR (duodenum preserving pancreatic head resection) applies to patients with benign or low-grade malignancy, it is important to remove completely the pancreatic head to avoid tumor remnant and pancreatic fistula, because the majority of the patients with these tumors have the normal pancreatic exocrine gland, and variation of the branch duct of the head of the pancreas. On the other hand, if complete resection of the head of the pancreas is performed, there is danger of ischemia and perforation of the bile duct or duodenum. During resection of the head of the pancreas, therefore, it is absolutely essential to maintain the blood supply to the bile duct and the duodenum in order to prevent early postoperative complication. DPPHR is technically difficult and time-consuming due to reconcile these antinomic techniques, namely, complete resection in the pancreatic head and preservation of both the bile duct and the pancreaticoduodenal vessels. The posterior superior duodenal artery crosses the distal bile duct anteriorly and descends along the right border of the bile duct and crosses again posteriorly at the level of the papilla. The posterior superior pancreaticoduodenal vein has to be preserved to avoid the congestion of the duodenum.

For patients, it would be beneficial for their QOL if PD could be avoided. Oncologic radicality and organ preserving operation is important. DPPHR is just enough operation.

# Technical challenges in pancreatic surgery

Henne-Bruns Doris

## **When to perform a pancreaticoduodenectomy in the absence of a positive histology for pancreatic cancer**

Freiss Helmut

# Surgery for advanced PDAC

Hackert Thilo

## **Conversion Surgery for Initially Unresectable Locally Advanced Pancreatic Cancer Following Multidisciplinary Treatment**

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In the treatment of pancreatic cancer, the most innovative recent change is the introduction of FOLFIRINOX and nab-paclitaxel as an effective protocol. By multidisciplinary treatment using them, there are increasing cases in which resection is possible in pancreatic cancer which was unresectable at the time of initial diagnosis. In Japan, this is called "Conversion Surgery", implying strategy-conversion. There is no clear evidence on the validity and usefulness of this option; however, good prognosis has been reported little by little. I will review previous reports of conversion surgery for initially unresectable locally advanced pancreatic cancer following multidisciplinary treatment and state the experience and results of our institution.

## Effectiveness of multimodality treatment for pancreatic cancer

**M. Sho**, M. Nagai, T. Akahori, S. Nishiwada, K. Nakagawa, K. Nakamura, N. Ikeda, T. Tanaka, H. Nishiofuku, T. Tamamoto, M. Hasegawa, K. Kichikawa.

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### Objectives:

The aim of this study was to retrospectively evaluate the impact of neoadjuvant chemoradiotherapy (NACRT) on perioperative and long-term clinical outcome in pancreatic cancer (PC).

### Methods:

One hundred sixty patients who preoperatively received full-dose gemcitabine (1000 mg/m<sup>2</sup>) with concurrent radiation of 54 Gy between 2006 and 2016 were analyzed. One hundred thirty patients who underwent upfront surgery were served as control.

### Results:

Among the 160 patients treated with NACRT, 153 patients (96%) completed the protocol treatment. The reasons of failure to complete NACRT were drug-induced pneumonia, acute mucosal injury, severe cholangitis and poor performance status (PS). Furthermore 21 (13%) couldn't undergo pancreatic resection after NACRT because of distant metastasis in 9 patients, tumor progression in 7 and poor PS in 5. The rate of pancreatic fistula was lower and hospital stay was shorter in the NACRT group compared to the control group ( $P=0.033$ ,  $P=0.002$ ). Furthermore, the rate of lymph node metastasis, R0 resection and pathological stage were favorable in the NACRT group ( $P < 0.0001$ ,  $P=0.006$ ,  $P < 0.0001$ ). The completion rate of adjuvant chemotherapy was also higher in the NACRT group ( $P=0.015$ ). Importantly, patients treated with NACRT had a better prognosis than those without (median survival time: 60.2 vs. 28.5M,  $P=0.008$ ). In addition, according to tumor resectability status, patients were classified as R (resectable), BR-P (borderline resectable with venous involvement) and BR-A (borderline resectable with arterial involvement) groups. As a result, patients treated with NACRT had a better prognosis than those without in the R and BR-P groups (58.6 vs. 34.2M,  $P=0.013$ , 62.4 vs. 18.8M,  $P=0.015$ ), while NACRT had no significant impact on prognosis in the BR-A group.

### Conclusions:

Neoadjuvant chemoradiotherapy may have a variety of favorable impact in pancreatic cancer treatment. Furthermore, NACRT may improve the prognosis especially in resectable and borderline resectable pancreatic cancer with venous involvement.

## Neoadjuvant treatment and aggressive surgical resection for BR and UR pancreatic cancer. Is R0 resection the key for better prognosis?

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### Backgrounds:

The optimal treatment for borderline resectable pancreatic cancer (BR) is still controversial.

### Aim:

To estimate the roles of neoadjuvant treatment and surgical resection for pancreatic head BR with arterial involvement (BR-A) by retrospective analysis of patients who underwent surgical resection and pursue the optimal treatment.

### Methods:

Medical records of 105 patients with BR located in pancreatic head who underwent surgical resection between 2002-2014 in Chiba University Hospital were analysed retrospectively. BR-PV and -A were defined according to 7th JPS classification.

### Results:

Patients characteristics; M/F: 68/37, Median age: 65 y.o. (35-82), BR-A/-PV: 44/61, Operation methods PD/TP: 102/3. Thirty patients were treated with neoadjuvant therapy (NAT) (GEM+S-1 (n=21), GEM (n=2), GEM or S-1+radiation (n=5), radiation (n=2)). The median duration between initiation of NAT and surgery was 2.6m (range: 1.0-36.1m). Patients treated with NAT survived significantly longer in BR-A (MST: NAT +/- (n=22/22): 51.5/15.2m p=0.0002), but not in BR-PV (MST: NAT +/- (n=8/53): 20.5/22.9m).

There were no statistical differences in OS between patients with R0 and R1 resection in both BR-A and BR-PV. In contrast, R2 resection resulted in poor prognosis in both groups (MST of R0/1/2; BR-A (n=21/14/9): 28.2/22.7/6.7m, BR-PV (n=41/16/4): 26.8/22.9/4.6m). In BR-A patients, there was no statistical difference in local recurrence rate between R0 and R1 resection. Multivariate analysis of BR-A patients showed NAT (+ vs. - p=0.0003) was an independent prognostic factor for OS along with R (R0, 1 vs. R2 p=0.0003), operation time ( $\leq 494$  vs.  $>494$ min p=0.005), post-operative CA19-9 level ( $\leq$  vs.  $>37$  U/ml p=0.02) and nodal involvement (N0 vs. N1 p=0.045).

### Conclusion:

The combination of NAT and surgical resection improves survival of patients with BR-A pancreatic head cancer. The prophylactic extended resection should not be performed for those patients.

## **Management of postoperative complications after pancreatoduodenectomy**

Zerbi Alessandro

## Impact of sleeve gastrectomy and gastric bypass on obesity comorbidities in comparison to conservative therapy after 5 years.

N.A. Gad El Hak, Stefan Post, M.A. El Refai.

### Objectives:

Obesity represents nowadays a global. Obesity is not only a burden per se, but is also tightly connected to large number of diseases e.g. diabetes mellitus type 2, hypertension, and dyslipidemia.

This clinical study was planned to examine the impact of bariatric surgery procedures (LRYGB and LSG) on obesity related comorbidities in comparison to conventional medical therapy of morbidly obese patients after 5 years.

### Methods:

Patients were recruited from the outpatient clinic for obesity care. 30 operated patients were matched and compared to 30 patients in the conventional group who received medical therapy of obesity. Measured outcomes were weight loss, changes in retinal Arteriovenous ratio (AVR), diabetes, dyslipidemia, quality of life

### Results:

%EWL and % TWL were 59.7% and 29.4% after bariatric surgery versus 3.3 % and 0.5% respectively among medical patients ( $P < 0.001$ ).

Bariatric surgery resulted in improvement of patients' lipid profile. Total plasma cholesterol dropped by  $-37.2$  mg/dl after surgery versus only  $-4.2$  mg/dl in conventional therapy group ( $P < 0.001$ ). Triglycerides and LDL dropped postoperatively by  $-48.8$  mg/dl and  $-37.9$  mg/dl respectively.

Baseline fasting blood sugar decreased significantly from  $106.1$  mg/dl to  $92.1$  mg/dl after surgery. After mean of 5 years, 66.2% of our operated patients with DM at baseline examination were in remission at follow up versus 25% in control group.

Our results show that bariatric surgery resulted in an amelioration of endothelial function. AVR increased significantly in interventional patients ( $+0.03$ ,  $P = 0.05$ ). In control group, AVR deteriorated and decreased with time by ( $-0.03$ ) reflecting metabolic aggravation of endothelial dysfunction.

### Conclusion:

Bariatric surgery is more effective than conventional medical therapy of obesity in terms of sustained weight loss, improved dyslipidemia and remission of diabetes mellitus. Beneficial metabolic impact of bariatric surgery on obesity related comorbidities can be witnessed on long term follow up after 5 years

## **Sleeve gastrectomy for morbid obesity in a western african country. First steps in Senegal**

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### Objectives:

In Senegal, the practice of obesity surgery is very recent. The objective of this study is to report the results of our first experience of bariatric surgery in Senegal.

### Methods:

We did at the Clinique de la Madeleine in Dakar, during one year, a prospective study in 21 patients undergoing surgery for obesity. The study included patients who had sleeve gastrectomy by laparoscopy. A total of 19 patients were included. We evaluated at one year, weight loss, diabetes control, high blood pressure, dyslipidemia and patient satisfaction.

### Results:

They were 2 men and 17 women (sex ratio: 0.1). The mean age was 35.5 years (range: 27 years-52 years). Body mass index, BMI, was 43.27 kg / m<sup>2</sup> (range: 40.2 kg / m<sup>2</sup> - 50.6 kg / m<sup>2</sup>). Four patients were treated for arterial hypertension), 19 for knees arthrosis, 8 for low back pain and 2 for primary infertility. Four (4) patients had type II diabetes and were treated with oral antidiabetics. Hypercholesterolemia was found in 5 patients, hypertriglyceridemia in 3 patients and metabolic syndrome in 4 patients. Abdominal ultrasound had eliminated biliary lithiasis in all patients and had recovered hepatic steatosis in all patients. In peroperative time, one patient presented barotrauma to intubation with a left pneumothorax requiring exsufflation and postponement of the procedure. One patient presented an early stenosis of the gastric sleeve. The mean weight loss was 48.5 kg (39 kg-65 kg), type II diabetes and high blood pressure were controlled in 4 patients by the diet alone; Dyslipidemia was corrected in 8 patients. 18 patients were satisfied. Morbidity was 2/19 and mortality was zero.

### Conclusions:

The preliminary results of our study are encouraging and motivate us to develop bariatric surgery in Senegal.

## Chronic Gastric leaks after sleeve gastrectomy : risk factors of radical surgical treatment.

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### Introduction:

2% of the sleeve gastrectomy (SG) lead to gastric leak (GL). Surgical treatment (total gastrectomy) is the treatment of chronic GL. The aim of this study is to determine the risk factors (RF) of chronic GL.

### Material and methods:

This retrospective monocentric study compares the patients of our service specialized in bariatric surgery, who had a GL after SG. We realized 264 SG between december 2008 and december 2016, and 4 patients had a GL. 18 patients with a GL went from other hospitals, 22 patients were included in the study. We compared the datas of 10 patients who had a gastrectomy and 12 patients who have not been operated.

### Results:

The RF of chronic GL are a gastro-cutaneous fistula, an intra-peritoneal abscess and a large fistula (more than 1cm) (respectively 16 % vs 80%,  $p = 0.003$ , 25% vs 70%,  $p = 0.035$ , 25% vs 70%,  $p = 0.035$ ). A previous gastric surgery (16% vs 60%,  $p = 0.074$ ), aged patients (average of 39.6 years vs 48 years  $p = 0.073$ ), high BMI (45.5 vs 50.7kg/m<sup>2</sup>,  $p = 0.213$ ) and denutrition (prealbumine rate 0.21 vs 0.16g/L,  $p = 0.076$ ) seems to be RF of total gastrectomy.

### Conclusion:

The RF of chronic GL are gastro-cutaneous fistula, intra-peritoneal abscess and large fistula. Others studies are required to have better knowledges about the RF of chronic GL and the necessity to execute a gastrectomy for GL after SG.

### Keywords:

Gastric leak, sleeve gastrectomy, chronic

## Endoscopic vacuum-assisted closure system for the treatment of upper gastro-intestinal anastomotic leakages: report of two cases.

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### Background:

Treatment of digestive anastomotic leakages remains challenging and there are no specific recommendations of care. Recently, endoscopic vacuum-assisted closure system (E-VAC) was developed and used to treat intestinal leakage not responding to standard treatment. This technique provides wound drainage, promotes tissue granulation and closure of the fistula. Data come from cases reports or small series suggesting that (E-VAC) is a safe and effective procedure.

### Methods:

We report here two cases of upper gastro-intestinal anastomotic leakages treated by E-VAC. The endoscopic procedures were performed under general anesthesia with intubation. After an endoscopic assessment of the leak and the cavity, the size of the polyurethane sponge was adjusted. The sponge was introduced into the cavity through the luminal defect with a gastroscope. A negative pressure was applied constantly to the sponge and the E-VAC was changed every week.

### Results:

We treated with E-VAC, leakage of one esophago-jejunal and one gastroduodenal anastomosis. Both were complicated by liquid collections. Sponges were changed two and three times respectively and time interval between each change of sponge was between 5 and 7 days. No complications were observed during the treatment with E-VAC. This procedure closed both leaks after three weeks of treatment. No reopening of the fistulas was observed after more than 6 months of follow-up.

### Conclusion:

E-VAC should be considered as an effective and safe treatment of upper gastro-intestinal anastomotic leakages. This procedure requires a multidisciplinary approach and has to be compared to standard care in larger and controlled studies.

## Positive fungal culture in patients of peptic ulcer perforation – A significant risk factor for adverse outcome.

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### Background:

Although the incidence of peptic ulcer disease has reduced, the peptic ulcer perforation rates remain constant. Till recently the emphasis has been given on identification of microbial flora associated with peritonitis caused by perforated peptic ulcer. The aim of this study was to determine the incidence and significance of intraoperative peritoneal fluid culture of fungus in patients with perforated peptic ulcers.

### Materials and method:

In this study, we included 53 patients of perforated gastroduodenal ulcers (confirmed intraoperatively) admitted in our hospital. Patients were evaluated pre-operatively; intra-operative peritoneal fluid specimen was sent for culture & sensitivity; post-operative records of various parameters were studied; patients morbidity & mortality were evaluated with reference to their culture outcome.

### Results:

Out of the total 53 patients studied, 35 patients (66%) had gastric ulcer perforation and 18 patients (34%) had pyloroduodenal ulcer perforation. Fungal cultures of peritoneal fluid were positive in 24 out of 53 patients (45.2%), Candida being the most common isolated species in 22 patients (91.6%) followed by *Aspergillus*. Fungal cultures were found positive more commonly in patients above 50 years of age and in females. Age, preoperative organ failure, delay in operation, high Mannheim Peritonitis Index (MPI) and Acute Physiology And Chronic Health Evaluation (APACHE) II scores, smoking, alcohol abuse, steroid use, H2 blockers and preoperative antibiotic therapy were risk factors for a positive fungal culture. Increased morbidity was observed in fungal peritonitis patients in comparison to non-fungal peritonitis cases. 18.18% mortality was observed in Candida peritonitis group and 3.44% mortality in non-Candida peritonitis group.

### Conclusion:

Fungal positivity was a significant risk factor for adverse outcome in patients with a PPU. Patients having associated risk factors and a MPI score >24 and APACHE II score of >12 with positive intra-operative peritoneal fluid fungal culture can be considered for early antifungal treatment.

## Nutritional and dietary intervention to lessen gastric cancer risk

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Inflammatory mediators alter the local environment of tumors, known as the tumor microenvironment. Mechanistically, chronic inflammation induces DNA damage, but understanding this hazard may help in the search for new chemopreventive agents for gastric cancer which attenuate *Helicobacter pylori*-associated inflammation. In the clinic, gastric cancer still remains a major cause of cancer-associated mortality in spite of advances in screening and non-invasive treatment, chemoprevention with anti-inflammatory agents to mitigate *H. pylori*-associated mutagenic inflammation is thought to be a realistic approach to reduce gastric cancer. In this lecture, I will provide insights to explain the mechanistic connection between inflammation and gastric cancer, as well as describe a feasible cancer prevention strategy based on anti-inflammatory treatments. Especially, I will introduce kimchi intake as nutritional and dietary intervention to prevent gastric cancer. To prove whether dietary intervention can prevent *Helicobacter pylori*-induced atrophic gastritis and gastric cancer, we developed cancer preventive kimchi (cpKimchi) through special recipe and administered to chronic *H. pylori*-initiated, high salt diet-promoted, gastric tumorigenesis mice model. *H. pylori*-infected C57BL/6 mice were administered with cpKimchi mixed in drinking water up to 36 weeks. Gross and pathological gastric lesions were evaluated after 24 and 36 weeks, respectively and explored underlying molecular changes to explain efficacies. Cancer preventive actions of anti-inflammation and anti-mutagenesis were compared between standard recipe kimchi (sKimchi) and special recipe cpKimchi in *in vitro* *H. pylori*-infected cell model. The erythematous and nodular changes, mucosal ulcerative and erosive lesions in the stomach were noted at 24th weeks, but cpKimchi administration significantly ameliorated. After 36th weeks, scattered nodular masses, some ulcers, and thin nodular gastric mucosa were noted in *H. pylori*-infected mice, whereas these gross lesions were significantly attenuated in cpKimchi group. On molecular analysis, significant expressions of COX-2 and IL-6, activated NF- $\kappa$ B and STAT3, increased apoptosis, and marked oxidative stresses were noted in *H. pylori*-infected group relevant to tumorigenesis, but these were all significantly attenuated in cpKimchi group. cpKimchi extracts imparted significant selective induction of apoptosis only in cancer cells, led to inhibition of *H. pylori*-induced proliferation, while no cytotoxicity through significant HO-1 induction in non-transformed gastric cells. In conclusion, daily dietary intake of cpKimchi can be an effective way either to rejuvenate *H. pylori*-atrophic gastritis or to prevent tumorigenesis supported with the concerted actions of anti-oxidative, anti-inflammatory, and anti-mutagenic mechanisms.

## Laparoscopic surgery for gastric cancer-How to avoid undersired events?

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### Objectives:

Gastric cancer is second most common cause of death among all malignancies. Several meta-analyses have show better short-term results after laparoscopic gastrectomy compere to open procedure, with similar oncological outcomes. In this study patients with resectable gastric cancer was included.

### Metods:

Patients with histologically proven, surgically resectable gastric cancer (T1-4a,N1-3b, M0) and European Oncology Study Group performance status 0,1,2 are eligible to participate in this study. Primary endpoint is operative time and morbidity rate. From 01.03.2014-30.12.2016 52 patients underwent laparoscopic gastric resection for gastric cancer. We performed 21 total D2 gastrectomy with intracorporal esophagojejunal anastomosis and 31 subtotal gastrectomy with gastrojeunoanastomosis. We performed 64 open gastrectomy (36 total and 32 subtotal gastrectomy) for this period.

### Results:

The mean duration of the laparoscopic procedure was 210 min. versus 150 min in open group. There was 1 conversion due to mesenterial lipoma as a reason for short jejunal loop. Mean hospital stay was 5,6 days in laparoscopic group and 9,4 days in open group. Fore postoperative complication (7,6%) after laparoscopic procedure (internal pancreatic fistula, leakage of oesophagojejunal anastomosis, ileus, wound infection) was reported. Six postoperative complication (9,3%) after open surgery (duodenal stump leakage, external pancreatic fistula with bleeding, leakage from oesophagojejunal anastomosis) was founded. All of patients with postoperative complication were in advanced stage gastric cancer disease (T3-4aN1-3bM0).

### Conclusion:

The implementation of laparoscopy to clinical practice in patients with gastric cancer can result in improved postoperative care quality, shortening of hospital stay, and quicker return to normal activity. We did not found significant differences in morbidity rate between laparoscopic and open operated patients.

## **Skin perforator (LICAP) flap pedicled by intercostal muscle for repair of a tracheobronchoesophageal fistula.**

**Bertheuil N., Rayar M., Gaignard E., Watier E., Meunier B.**

### **Background/aim:**

A tracheobronchial fistula (TBF) is a rare complication when surgery is performed to treat esophageal carcinoma; no consensus treatment strategy has emerged over past years.

### **Materials and methods:**

Here, we describe a surgical interposition strategy, using a new flap, to repair a TBF arising when esophageal squamous cell carcinoma was treated via neoadjuvant chemoradiation. This intervention is ideal after minimally invasive esophagectomy by thoracoscopy but is also feasible after thoracotomy. We performed a skin perforator propeller (lateral intercostal artery perforator) flap pedicled by the intercostal muscle 1. Here, we describe the surgical technique and our result on our four patients.

### **Result:**

We performed this flap in four patients in emergency for this life threatening complication. Two patients were saved and were alive by this technique. In the post-operative, 1 patient was re-operated on 11 months later to treat a residual tracheal fistula. Two patients were died, one of mesenteric ischemia and one of massive digestive hemorrhage but without complication on the treated fistula. The last patient was alive without complication.

### **Conclusion:**

This treatment allows survival in the acute phase; if there is a residual fistula or recurrence, resection and anastomosis can be performed when the patient is stabilized. We believe that this perforator flap using the lateral intercostal perforator pedicled with an intercostal muscle flap is safe and simple. The very long pedicle can reach deeper sites and opens new doors when there are complications during esophageal surgery. In conclusion, this strategy is a valuable option and may be the optimal first-line treatment, especially in the context of neoadjuvant radiation therapy. We are convinced that this flap affords new options for intrathoracic reconstruction.

### **Reference:**

1 - Bertheuil N, Cusumano C, Meal C, Harnoy Y, Watier E, Meunier B. Skin Perforator Flap Pedicled by Intercostal Muscle for Repair of a Tracheobronchoesophageal Fistula. *Ann Thorac Surg.* 2017 Jun;103(6):e571-e573.

## Laparoscopic intragastric resection of submucosal tumors near the EGJ

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There are many types of submucosal tumors of the stomach. The most common submucosal tumor of the stomach is Gastrointestinal stromal tumor (GIST). Because of the low risk of lymphatic spread, surgery remains the main curative treatment. Laparoscopic wedge resection is used as the standard treatment for small submucosal tumors of the stomach including GIST. By the way, resection of tumors located near the esophagogastric junction (EGJ) remains challenging. Extensive resection can compromise function, cause significant morbidity, and technically difficult laparoscopically.

Laparoscopic intra-gastric resection allows for resection of small submucosal tumors near the EGJ while minimizing the extent, invasiveness and morbidity of the procedure.

In this video, we describe a technique for laparoscopic intragastric resection of a submucosal tumor located close to the EGJ in a 64-year-old male in BMA General hospital Bangkok, Thailand. This video demonstrates the technique for operative field setup, port placement, and step of the operation.

## Intragastric single-incision laparoscopic surgery for gastric leiomyoma: a stepwise approach

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### Background:

Laparoscopic wedge resection without lymph node dissection is commonly used as the standard treatment for small gastric subepithelial lesions suspect of gastrointestinal stromal tumor (GIST). Esophagogastric Junction (EGJ) represents a difficult location for surgical resection. We report a successful single-incision laparoscopic and endoscopic cooperative surgery (LECS) for a suspected GIST of the EGJ.

### Patient:

A 51-year-old man with bleeding and dysphagia symptoms was diagnosed with tumor near the EGJ. Preoperative CT scan and endoscopic ultrasonography showed a 35mm hypo echoic sub mucosal tumor at the smaller curvature of the EGJ, suspect of GIST.

The lesion was only visible in retrograde vision, which made the endoscopic resection not feasible.

### Technique:

The patient was placed in the supine position, and both arms in abduction (French position). First laparoscopy allowed an abdominal cavity exploration, the release of the vessels at risk of bleeding after stapling. After a short gastrotomy in the antrum and skin fixation, the single-incision device was placed in the gastric cavity. The suspected GIST was definitively identified and the stapler was placed under laparoscopic vision and gastoscopic retrovision control, insuring the absence of EGJ stenosis. The resection was performed, using 2 ranges of staples while removing the tumor and the muscular layer.

### Conclusion:

LECS provide a better control for stapling and prevent for post-operative EGJ stenosis. Transgastric single-incision allows single gastrotomy, ergonomic laparoscopy, while protecting the gastric wall from peroperative tearing.

## **Small liver met: radiofrequency versus resection: a comparative study**

Demartines Nicolas

## Repeat laparoscopic liver resection for tumour recurrence

Belli Giulio

## "Associating Liver Partition with Portal vein ligation for Staged Hepatectomy" (ALPPS) does not promote colorectal tumor growth

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### Objectives:

The effect of ALPPS on tumor proliferation, remains a concern. This study investigated the impact of ALPPS on growth of colorectal metastases in mice and human.

### Methods:

The effect of ALPPS and 90% portal vein ligation (PVL) on colorectal liver and lung metastases was investigated in mice. In vivo tumor progression was assessed by magnetic resonance imaging (MRI), histology and survival experiments. The effects of ALPPS, PVL and control sera on colorectal cancer cells (MC38 and CT26) were tested in vitro. Additionally, the international ALPPS registry enabled to identify patients with remaining tumor in the future liver remnant (FLR) after ALPPS stage 1.

### Results:

Two and three weeks after ALPPS stage 1, PVL or sham surgery, liver MRI showed similar intrahepatic tumor numbers ( $p=0.14/0.82$ ), sizes ( $p=0.45/0.98$ ) and growth kinetics ( $p=0.58/0.68$ ). Tumor growth was not different between ALPPS and PVL groups after completion of stage 2. Survival after tumor cell injection was similar after sham surgery and completion of ALPPS and PVL (36 days (IQR 32-40) vs. 42 days (IQR 36-48) vs. 39 days (IQR 35-42),  $p=0.237$ ). Pulmonary metastases progression and in vitro cell proliferation were comparable among groups. Observations in humans failed to identify accelerated tumor growth in the FLR within the regenerative phase after ALPPS stage 1.

### Conclusion:

The accelerated regeneration process associated to ALPPS does not enhance the growth of residual colorectal liver metastases.

## Regeneration of the FLR, <sup>99m</sup>Tc-mebrofenin hepatobiliary scintigraphy and hemodynamic stress in ALPPS: A prospective study.

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### Objective:

To prospectively assess hemodynamic changes and their relationships with regeneration and function in Associating Liver Partition and Portal vein ligation for Staged hepatectomy (ALPPS).

### Summary Background Data:

Regeneration of future liver remnant (FLR) and function are two processes that not always coincide.

### Methods:

Twenty-one patients underwent ALPPS between June 2013 and November 2016. Total liver volume (TLV) were evaluated. FLR function was assessed by <sup>99m</sup>Tc-Mebrofenin (MEBRO) scintigraphy. Liver hemodynamics were assessed by transit time flow and pressure measurements.

### Results:

ALPPS was completed after a median time of 12 days. At ALPPS-2, baseline FLR/TLV and FLR/BW showed significant negative correlation with volume gain ( $p=0.002$  and  $p=0.02$  respectively). A significant positive correlation was found between final indexed portal vein flow (iPVF) and volume gain ( $p=0.002$ ). In patients with portal vein pressure (PVP)  $<20$  mmHg and portal gradients (HVPG)  $<15$  mmHg a significantly higher volume gain was recorded: 76.7% vs. 30.6% ( $p=0.04$ ). Similarly, the median increase of the MEBRO<sub>FLR</sub> uptake was significantly higher: 26.7% vs. -0.13% ( $p=0.02$ ). A decreased MEBRO<sub>FLR</sub> uptake before ALPPS-2 was observed in 2 patients, the first despite a 50% FLR volume gain. Perioperative mortality was seen in 2 (9.5%) patients, both displaying low regeneration rates and a PVP $>20$  mmHg and HVPG $>15$  mmHg following ALPPS-1.

### Conclusions:

The volume increase in ALPPS procedure is partially correlated to the MEBRO uptake, being higher in patients exhibiting a moderate hemodynamic stress. Patients with HVPG  $<15$  mmHg or PVP  $<20$  mmHg showed a higher increase of functional growth and a higher volume gain.

## Extended liver venous deprivation before major hepatectomy. A safe alternative to ALPPS?

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### Objective:

Extended liver venous deprivation (eLVD) was previously defined by our group as the combination of right portal vein embolisation and right and middle hepatic vein embolisation in the premises of major hepatic surgery in order to achieve a future liver remnant (FRL) functional increase. The aim of the present study is to investigate the surgical outcome of these patients.

### Methods:

All consecutive patients treated in our center between October 2015 and May 2017 that were referred to eLVD were included in the present study. eLVD was only proposed to non-cirrhotic patients with a FRL volume <25% of the total liver or a small FRL function assessed by <sup>99m</sup>Tc-mebrofenin hepatobiliary scintigraphy (HBS). Morbidity and mortality were recorded alongside with disease related variables.

### Results:

Nine patients out of 10 included underwent post eLVD major hepatectomy for colorectal liver metastases (n=7), breast cancer liver metastases (n=1) and intrahepatic cholangiocarcinoma (n=1). The sex ratio of operated patients was M:F=5:4. The average age was 57.33 years. FRL function increased by 81.86% (range 19.65-225%) and the maximum FRL function was at day 7. The FRL volume increased by +44.44% at 21 days. Six extended right hepatectomies were performed out of which five were extended to segment IV and one was extended to both segments I and IV. The rest of the surgical operations were standard right hepatectomies. Mean hospital time was 15 days. Two Clavien Dindo grade IIIA complications were observed. The rest of the cases did not present any major complication. One patient had a PT<70 at postoperative day 5 but no post-hepatectomy liver failure was reported. No patient died in the 90 days following surgery.

### Conclusion:

Post eLVD major hepatectomy is feasible and safe. If those early results are confirmed by larger studies, eLVD could constitute a safe and effective alternative to ALPPS.

## ALPPS possibilities in the treatment of the focal hepatic neoplasms

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### Aim:

Immediate results of the Associated Liver Partition and Portal Vein Ligation for Staged Hepatectomy (ALPPS) at the focal liver lesions at the Small Liver Remnant after liver resection have been studied.

### Materials and methods:

22 ALPPS have been performed in our clinic from December 2011 to June 2017. Multiple metastases of colorectal cancer (9 patients), hepatocellular carcinoma (3 patients), advanced alveolar disease of the liver (6 patients), cholangiocellular carcinoma (1 patients), Klatskin tumor (1 patient), metastatic neuroendocrine cancer of the liver (1 patient) and metastases of the adrenocortical cancer in the liver (1 patient) with Small Liver Remnant (<25%) after liver resection according data of the CT-volumetry have been indications for surgery.

### Results:

At the first stage of the surgery duration of the surgery was 240 (210-290) minutes; the average blood loss was 1000 (800-1500) ml. At the second stage of the surgery duration of the surgery was 90 (70-100) minutes; the average blood loss was 300 (200-400) ml. Morbidity was 40.9%. 6 patients (27.3%) had the bile leakage from the liver stump with biloma formation (drainage of the bilomas through ultrasound). One patient (4.5%) had intraabdominal bleeding with hematoma formation (drainage of the hematoma through ultrasound). One patient (4.5%) had acute renal failure developed (completely interrupted after the second stage of the surgery). Postoperative liver failure (ISGLS, 2011) was not among all patients. Hospital mortality was 4.5% (1 patient with massive pulmonary embolism). Postoperative hospital-stay was 22 (18-29) days.

### Conclusion:

ALPPS at extensive liver damage by the primary and secondary focal lesions and at the small liver remnant after liver resection allows achieve the desired growth of the liver remnant and perform the resection of the affected liver.

## Multiple bilobar colorectal liver metastases with main vascular contact: survival analysis and prognostic factors

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### Objectives:

Multiple colorectal liver metastases (CRLM) is one of the most challenging disease for a hepatobiliary team. Complete clearance of the disease is often not possible due to the small volume of the future remnant liver. Several strategies have been proposed to overcome this problem (es. Staged procedures, intraoperative radiofrequency ablation). We proposed the complete removal of all lesions in a single stage (one stage hepatectomy, OSH) thank to the extensive use of intraoperative ultrasonography. The aim of the study is to analyze the outcome of patients with bilobar CRLM treated with chemotherapy and surgery.

### Methods:

597 consecutive patients undergoing first liver resection (LR) for CLM between 2002 and 2015 were considered. Patients carrier of multiple ( $\geq 4$ ) CLM with intrahepatic major vascular contact were included.

### Results:

210 patients were analyzed. OSH was performed in 195 (93%), 28 patients received new devised surgical intervention (SERPS, transversal hepatectomy, mini-mesohepatectomies, liver tunnels). Thirty-one patients received vascular reconstruction. Fifteen patients underwent two stage hepatectomy (TSH). 14 patients of the OSH group underwent major hepatectomy associated to limited resection.

The median number of resected CRLMs was 8 (4-48) and 77 (37%) patients had  $>10$  nodules. Twenty-seven patients were R0, 36 R1 vascular only, 75 R1vascular+R1parenchymal, 64 parenchymal only.

Mortality and morbidity rates were 1,4% and 37%. Five-year survival was 28% (median overall survival 30 months). At univariate analysis extrahepatic disease, radiological response, vascular reconstruction, RAS mutation and re hepatectomy were all independent factor affecting survival. At multivariate analysis only RAS mutation HR 2.230285 CI 1.019159-4.880663  $p= 0.045$ , re-hepatectomy HR .2643287 CI 0.0924081 - 0.756099  $p= 0.013$  and early recurrence HR 4.822064 CI 2.26014-10.28799  $p=0.000$  were independently associated with survival.

### Conclusions:

OSH for CRLMs is safe and effective. TSH must be reserved for a selected number of patients. Parenchymal spare resections must be attempted whenever possible to allow re resection.

## Liver procurement on swine: a pilot study on a simulation-based program for advanced surgical training

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### Objectives:

Liver procurement (LP) from deceased donor is a challenging procedure often performed by junior surgeons. The current modalities for teaching LP to surgical trainees (STs) rely on theoretical lectures and patient-based apprenticeship. Porcine LP may represent an alternative for teaching LP without putting patients at risk, but its effectiveness is ill-defined. Herein, we assessed the feasibility and utility of a porcine simulation model of LP.

### Methods:

A pilot course for STs combining theoretical lectures and a hands-on simulation of LP on swine was organized. An anonymous survey was conducted before and after the course to assess STs' background knowledge and feedback.

### Results:

Among the 30 attending STs, 21 (70%) had previously performed at least one step of LP on patient as first operator, but 27 (90%) expressed lack of confidence for performing the procedure on patient without senior assistance. All porcine LPs were conducted successfully, except for one animal that died from hemorrhage during cannulation. Twenty-six (87%) STs considered that the proposed training program should be mandatory before performing LP on patients.

### Conclusions:

The porcine simulation model of LP is feasible and greatly valued by STs, allowing them to learn a complex procedure without putting patients at risk.

## Postoperative liver dysfunction after right lobe hepatectomy in LDLTX

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### Objectives:

Evaluation of the incidence of postoperative liver dysfunction after right lobe donation and searching for risk factors:

### Methods:

In the period between may 2004 and may 2016,440 cases of living donor liver transplantation were done in Mansoura gastroenterology surgical center in Egypt, 434 right lobe. Age 27 (18-47). Males 310 females 124.bmi 26.3.almost all are related donors. Residual liver volume 38.4 (28.9-52.7). GRWAR 1,1 (0.53-2.46). double HA was found in 3% trifurcated portal in 4.1% and double portal in 0.5%.dominant MHV in 9%.makuchi in 24%.seg V in36%segment VIII in 42%.parenchymal transaction was kellyclasia in6%,harmonic in 74%spray diathermy in 10.8%.operative time 410min.parenchymal transaction time 77min,blood loss average 500cc:

### Results:

Hospital stay 10 days.biliary complications 9.4%,internal haemorrhage 2.3%.serum bilirubin day 0 1.7mg, day3 2.2,day 6 1.1.inr day 0 1.3, day 3 1.5 and day 6 1.3.postoperative liver dysfunction in 11.5%.grade A 10.8%,B 0.5%andC 0.2% .PREDICTIVE FACTORS of liver dysfunction were residual liver volume less than 35%and blood transfusion. Age, Sex, BMI. Operative time labouratory, steatosis are not significant.

### Conclusions:

Postoperative liver dysfunction occurred in 11.5% of cases and residual liver volume less than 35% and blood transfusion are the only significant risk factor in univariant and multivariant analysis. So, residual liver volume of 35% at least should be insisted.

## Proximal or distal portosystemic shunts during liver transplantation have similar hemodynamic and metabolic efficiency

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### Introduction:

Cirrhotic patients undergoing liver transplantation often develop spontaneous portosystemic collaterals that may render surgical decompression unnecessary. On the other hand, spontaneous pedicle collaterals and/or portal thrombosis make the pedicle dissection difficult. In this latter situation, an alternative to the classical portacaval anastomosis may be proposed to decrease blood loss. The goal of this study was to compare the hemodynamic and metabolic efficiency of spontaneous and surgical proximal versus distal shunts.

### Material and method:

Patients transplanted between January 2014 and January 2016 who underwent a portal decompression during the anhepatic phase were included. Patients were compared according to 2 types of surgical decompression techniques: classical portacaval shunt (PCS) (n=44) and passive mesenterico-saphenous shunt (MSS) (n=77). MSS consisted of a passive shunt between inferior mesenteric vein and saphenous vein. The type of shunt was at the surgeon's discretion. Intraoperative and in-hospital course were compared between the 2 groups to validate the feasibility of MSS. An analysis of the hemodynamic and metabolic efficiency of spontaneous shunts using staged lactate measurements was realized to validate the observation.

### Results:

MSS and PCS showed a comparable hemodynamic and metabolic efficiency with no significant difference in terms of portal pressure variation and gut lactate production. Moreover there was no significant difference in terms of short-term outcomes.

### Conclusion:

The anatomy of spontaneous portosystemic collaterals should be analyzed before transplantation as they can guide the need for portal decompression. When a portal decompression is needed, classical portacaval anastomosis may be realized but passive mesenterico-saphenous shunt could be particularly helpful in cases of portal thrombosis and/or pedicle collaterals to avoid a difficult dissection. In this setting, it seems feasible and sure and exerts comparable short-term outcome to classical portacaval shunt.

## Liver Cystadenoma

**Treska V.**, Ferda J., Daum O., Liska V., Skalicky T., Bruha J.

### Objectives:

Liver cystadenomas are rare conditions representing approximately 5% of all cystic lesions of the liver. The aim of this study was to establish an optimal diagnostic and therapeutic approach and to emphasize a danger of their malignant transformation.

### Methods:

In a retrospective study, 15 female patients primarily diagnosed as having cystadenoma of the liver were evaluated between 2000 - 2016. In 6 patients, serum CA 19-9 and CEA levels were determined pre-operatively. Enucleation of the cystadenoma was performed in 7 (46.7 %) and liver resection in 6 (40 %) patients. Due to the localization, complete enucleation or radical liver resection could not be performed in two patients (13.3 %).

### Results:

Tumor marker levels were normal. In 3 patients, grade III-a complications (Clavien – Dindo) were recorded after surgery. No patient died within 30 days of surgery. The average length of hospitalization was 26 (5–52) days. Malignant transformation occurred in 2 patients with incomplete removal of the cystadenoma. In both cases, CA 19-9 serum levels were elevated during the follow-up period. In the first patient, a R1 resection reoperation was performed with subsequent oncological treatment. The patient died 28 months after primary surgery. The second patient failed to undergo the recommended liver transplantation. The remaining patients are all well, with no signs of recurrence.

### Conclusions:

The only possible treatment of cystadenomas involves their radical surgical removal. Any other incomplete surgical treatment is insufficient and associated with a high risk of malignant transformation. In patients where for technical reasons R0 resection or complete enucleation cannot be performed, liver transplantation should be considered.

## Tailored approach for very low rectal cancer

Panis Yves

## **New technique for sutured laparoscopic ileocolic anastomosis enterotomy closure**

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### Introduction/Objective:

Intracorporeal anastomosis after right laparoscopic hemicolectomy is associated with lower complications and shorter length of stay. However, the closure of the enterotomy made for the stapling device requires advanced laparoscopic skills and is time consuming. We report a new technique of sutured enterotomy closure

### Methods:

We use a slowly absorbing surgical suture cut to roughly 25 cm. On the free end, we create a loop by first placing a double knot and then looping the thread 4 times. We begin the suture on the posterior edge of the defect, and after the first stitch is passed the needle is passed through the loop made previously making a self-locking knot. We make a full thickness running suture and on the other end of the defect we tie a Cushieri knot, we continue back using the same thread to make a running seromuscular suture. Finally, we tie a knot using the needle edge and the free edge left in the beginning of the suture.

### Results:

Using the standard technique of double layer suture the surgeon must tie four knots. This technique requires the surgeon to tie only one standard knot intracorporeally and to throw one Cushieri knot.

### Conclusion:

By using self-locking knots and a single suture this technique has the potential to decrease the complexity and time spent on enterotomy closure in intracorporeal ileocolic anastomosis.

**CRIAL (colorectal intracorporeal anastomosis by laparoscopy).  
- A safe way to avoid an derivative stoma in the low anterior  
resection of rectum after neoadjuvant radiotherapy.**

Costa Pereira Joaquim

## Colorectal cancer in patients younger than 50 years: a retrospective multicenter study on behalf y-sico –preliminary results.

**Patrizia Marsanic**, Andrea Muratore, Alfredo Mellano, Donatella Marino, Annamaria Squicciarino, Marco Veltri, Dario Parini, Maximilian Scheiterle, Sara Pollesel, Laura Lorenzon, Genoveffa Balducci, Roberta Tutino, Giuseppe Salamone, Rega Daniela, Delrio Paolo, Matteo Frasson, Carmen Muniesa Gallardo, Gaetano Gallo, Mario Trompetto, Raffaele De Luca.

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### Background:

In the last ten years, the incidence and mortality rates of colorectal cancer (CRC) have been decreasing in adults over 50 years and increasing in adults under 50 years<sup>1,2</sup>. CRC in patients under 50 yrs can be distinguished in hereditary and sporadic forms. Regardless of age at diagnosis, the vast majority of patients with CRC have sporadic disease and are “average risk” patients without a family or personal history of colorectal neoplasm, inflammatory bowel disease, polyposis syndromes, or other risk factors<sup>3</sup>.

### Objectives:

A growing number of studies, which examine the rising incidence of CRC among patients under 50 years age, have been published, but they are small cohort studies with some bias like the inclusion of hereditary forms. Aim of the present study is to analyze the data of a large cohort of <50 years and ≥50 years old CRC patients to understand if young patients (<50 years old), when matched for stage, have different prognosis and prognostic factors compared with old ones (≥50 years old) and if young patients need a different approach in terms of follow up or perioperative chemotherapy.

### Methods:

Multicenter international retrospective study comparing patients <50 years with patients >50 years stratified by TNM classification. We have enrolled patients <50 years with sporadic cancers radically operated in 9 centers in the last 10 years. We have used as control group patients >50 years from the same centers

### Results:

Nowadays we have enrolled 2925 patients with colorectal cancer operated in the last 10 years. 338 (11%) are young patients: 233 with colon cancer and 105 with rectal cancer. Mean follow up is 42 months. In the present series, we didn't notice an increasing incidence of colorectal cancer in young patients between period 2006-2010 and 2011-2016 (49,8% vs 50,2%, p=0.009). We have noticed a higher rate of T4 in patient <50 years than in ones >50 years (27% vs 12.4% p=0.000). Furthermore we have noticed a higher rate of lympho node metastases (N+ 59.4% vs 39.5 %, p 0.03) and distant metastases (M+20.2% vs 17.7%, p0.000). However, the recurrence free survival and the overall survival were significantly better in group under 50 years. (respectively 25.94 months old vs 41.22 months young, p 0.03 and 14,76 months old vs 21.98 months young, p 0.01). Mortality rate was 20,2% in young patients and 13,8% in old patients, p 0.000. We have studied the correlation between stage and age stratifying the patients in 5 groups for age. We observed higher rates of T3-T4 (88.9% vs 75,8% p 0.09), N+ (61% vs 51% p 0.05), M+(28% vs 20.6% p 0.47), and undifferentiated tumors (38.9% vs 27.3%, p 0.18) in patient between 20-40 years than between 41-50 years. However, the recurrence free survival was similar among the groups whereas the overall survival was significantly better in group between 41-50 years. (33.9 months vs 50.8 vs 42.9, p 0.03).

### Conclusion:

In our serie young patients with sporadic colorectal cancer seem to have more advanced disease, especially patients with age between 20 and 40 years.

## Neoadjuvant therapy and surgery in rectal adenocarcinoma. Analysis of patients with complete pathological response

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### Abstract:

**Objectives:** Neoadjuvant chemoradiotherapy and total mesorectal excision are considered the standard treatment for locally advanced rectal cancer. Various studies have reported a complete pathological response rate of 15%–27% following neoadjuvant chemoradiotherapy which has translated into improved survival. Our objective is to determine the incidence and outcome of complete pathological response in our African setting with younger patients and aggressive tumour biology.

### Methods:

Between 2011 and 2016, one hundred and ten patients of locally advanced rectal cancer underwent surgical resection at Soba university hospital following preoperative chemotherapy and short course radiotherapy. 33 patients (30%) underwent APR and 77 patients underwent anterior and low anterior resections.

### Results:

Eleven patients (10%) showed complete pathological response. The median age of presentation was 49 years and 63.6% were males. The median interval between completion of preoperative chemoradiotherapy and surgery was 72 days (range 42-120 days). Four patients (36.4%) underwent abdominoperineal resection and 7 patients (63.6%) had anterior and low anterior resection. The median nodes dissected at surgery were 8 (range 1–16). After a median follow-up of 39.3 months (range 10–70 months), the 3-year overall survival (OS) was 90.9% and the 3-year disease-free survival (DFS) was 100%. The locoregional and systemic recurrence rates were 0%.

### Conclusion:

In the African scenario, despite younger age, aggressive disease and late presentation, outcome in complete responders is good and is in concordance with world literature. Efforts need to be made to increase complete response rates in order to get the maximum benefits in terms of survival and local control.

## Colorectal Carcinoma associated with Schistosomiasis: a possible causal relationship

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### Abstract

The association between schistosomiasis and colorectal malignancy has long been suggested in the literature, but it is not uniformly accepted. In the Far East, considerable evidence supports an etiological link between schistosoma *japonicum* and colorectal cancer. However, the available data regarding the role of schistosoma *mansoni* in colorectal carcinogenesis are conflicting and most often do not show causality. We report on a patient with sigmoid colonic cancer associated with schistosomiasis *mansoni*, and we provide a review of the literature with regard to this relationship.

### Background

Schistosomiasis is a fairly prevalent communicable disease in tropics and subtropics caused by a trematode of the genus schistosoma. It affects more than 200 million people worldwide, with over 700 million living under conditions favouring transmission. <sup>[1]</sup> Human schistosomiasis is generally caused by three major species: *Schistosoma mansoni* (*S. mansoni*) endemic in Africa, the Middle East, and South America, *Schistosoma japonicum* (*S. japonicum*) common in Southeast Asia, and *Schistosoma haematobium* (*S. haematobium*) prevails in Africa and the Middle East. <sup>[1]</sup>

In endemic areas, schistosomal infestation has been implicated in the aetiology of several human malignancies including bladder, liver, and colorectal cancer. <sup>[2]</sup> However, while sufficient evidence supports a causal relationship between *S. haematobium* infection and bladder cancer, the association between schistosomal infestation and colorectal cancer has apparently low status within the canons of medicine and reports from the publishing world. <sup>[3]</sup> Furthermore, most of the published data refer to *S. japonicum* species, whilst the evidence linking *S. mansoni* to colorectal cancer occurrence is meagre.

We herein present three cases of sigmoid colonic adenocarcinoma associated with deposited schistosoma *mansoni* eggs, and we discuss the probable etiological role of chronic schistosomal infestation in colorectal cancer. We also describe the a new endoscopic finding.

## **Intramural Spread and Lymph Node Metastases Detected in the Mesorectum Distal to Carcinoma of the Rectum by the Clearing Method**

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### Objectives:

Total mesorectal excision (TME) effectively reduces the local recurrence rate of carcinoma of the rectum. This study was undertaken to clarify the rationale for TME.

### Methods:

We retrospectively reviewed the records of 198 patients who underwent resection of a carcinoma of the rectum. The presence of nodal metastases in the mesorectum distal to the primary tumor was examined by the clearing method.

### Results:

Twenty-one patients (10.6%) were positive with distal intramural spread. Patients with a higher pT number showed a higher positive rate. The distal spread was 2cm at maximum. The maximum distal spread in carcinomas of the rectosigmoid and carcinomas of the upper rectum was 2cm, and in carcinoma of the lower rectum the distal spread was 1cm. The metastatic rate in the distal mesorectum was 20.2%. The metastatic rates according to the extent and site of the tumor were as follows: pT1, 0%; pT2, 0%; pT3, 21.9%; pT4, 50%; rectosigmoid, 10%; upper rectum, 26.3%; and lower rectum, 19.2%. The longest distal spread from the primary tumor to the metastatic node was 2 cm in carcinoma of the rectosigmoid, 4 cm in carcinoma of the upper rectum, and 3 cm in carcinoma of the lower rectum.

### Conclusions:

Distal mural resection of at least 3cm is required for patients with carcinoma of the rectosigmoid and carcinoma of the upper rectum, a 2cm distal mural resection is required for patients with carcinoma of the lower rectum, and a 1cm distal mural resection is required for patients with T1 and T2 tumors. In addition, TME is required for patients with T3 and T4 tumors in the lower rectum, and excision of all mesorectal tissue down to at least 5 cm below the tumor is required for patients with T3 and T4 tumors in the upper rectum.

## Surgical management of rectum tumors in consideration of modified neoadjuvant therapy

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### Introduction:

Nowadays the therapeutic treatment for advanced, T3-T4 staged rectum cancer and rectum cancers adjacent to the anal sphincter is neoadjuvant radio-chemotherapy and subsequent surgical intervention.

### Method:

Neoadjuvant oncological treatment for rectum cancer consisted of a standard-dose (50.4 Gy) radiotherapy and the intravenous administration of leucovorin and 5-fluorouracil. In the course of the new protocol, patients receive the same dosage of radiotherapy with the oral administration of capecitabine. We analyzed retrospectively the effect of these two oncological protocols to the surgical outcomes in case of T3-T4 rectum tumors between 29<sup>th</sup> of September 2012 and 20<sup>th</sup> of May 2016 (n=94). We assessed the clinical data of 87 patients since 7 case proved to be technically inoperable. The effectiveness of oncological therapy is best characterized by the Tumor Regression Grade (TGR1 means total regression, whilst TGR5 indicates progression). We evaluated the type of operations, the surgical technique of the operation, the number of removed regional lymph nodes and the proximity of resection margins.

### Results:

Comparing the two groups we found that in case of per os neoadjuvant chemotherapy (Group 1, n=44) we could achieve complete regression in 13 cases (29.5%), while in case of intravenous administration (Group 2, n=43) complete regression occurred in 4 cases (9.3%) only. Comparing the surgical techniques we found, that the sparing of the anal sphincter was significantly higher with modified treatment as opposed to the old neoadjuvant therapy. Furthermore, in case of laparoscopic resection after the modified neoadjuvant therapy the number of removed lymph nodes increased from 7,7 to 10,7 pcs/pts. In the safety resection margins (distal, circumferential) weren't significant different between the groups.

### Conclusions:

As a result of the modification of oncological protocol in case of advanced rectum cancer, the number of cases with complete tumor regression is significantly increased. The results strongly suggest that the modified neoadjuvant treatment following laparoscopic surgery has several advantages over the previous methods in the surgical solution for advanced (T3-T4) rectum cancers.

## Surgical treatments for patients with Familial Adenomatous Polyposis (FAP); A Single-Institute Experience

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### Objectives:

Familial adenomatous polyposis (FAP) is an autosomal dominant disorder caused by a germline mutation in the adenomatous polyposis coli (APC) gene. These patients have innumerable adenomatous polyps in their colorectum and develop colorectal cancer (CRC) unless polyps are adequately removed. The aim of this study is to reveal clinicopathological features of FAP patients with surgical treatments.

### Methods:

Clinicopathological factors of fifty-seven patients (male: 32, female: 25), who underwent surgical treatment for FAP in Tohoku University Hospital between 1984 and 2017, were retrospectively analyzed.

### Results:

The median age at surgical treatment was 31 years old (12-64). Total proctocolectomy with ileal pouch-anal anastomosis (IAA), Subtotal colectomy with ileo-rectal anastomosis (IRA), total proctocolectomy with permanent ileostomy, and low anterior resection were performed in 44, 10, 2, and 1 patients, respectively. Nineteen patients (33.3%) had CRC at initial surgical treatments, and all CRC occurred in patients age twenty and older (6 patients, 11%). Pathological stage of those 19 patients with CRC was Stage 0: 3, Stage I: 4, Stage II: 5, Stage III: 7, respectively. Patients with CRC were significantly older than patients without CRC (38.2 vs 30.1,  $p = 0.019$ ). Four patients died from distant metastases. Although total proctocolectomy with IAA is considered to be standard procedure, subtotal colectomy with IRA was also performed in several patients, such as older patients and advanced CRC patients. Out of 10 patients with IRA, 2 patients required additional surgeries for an occurrence of rectal cancer or an increased number of polyps.

### Conclusions:

The standard procedure for FAP is total proctocolectomy with IAA. Careful surveillance of the rectal remnant is needed in patients who had subtotal colectomy with IRA.

## Low rectal cancer – Evaluation of survival in anterior rectal resection versus abdomino-perineal amputation

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### Objectives:

In low rectal cancer the long term results of abdomino-perineal amputation (APA) usually are worst than the low anterior rectal resection (LAR). The goal of this study was to compare the impact of two surgical techniques for low rectal cancer on overall-survival and disease-free survival.

### Methods:

We analysed a retrospective cohort of patients submitted to low rectal cancer surgery - both LAR and APA - with curative intent from January 2012 to December 2014. Exclusion criteria were: non-curative resection, stage IV disease, Hartmann's procedure and benign pathology. We used the log rank test for comparison of the Kaplan-Meier curves. P values < 0.05 were considered statistically significant.

### Results:

We identified 32 patients – 34.4% of which were submitted to APA (n=11) and 65.6% underwent LAR (n=21). Neoadjuvant radiotherapy was given to 46.9% of the patients (n=15). Half of the patients were between 50 and 70 years old and 43.8% of the patients were older than 70 years old. Stage I/II was found in 46.9% of the patients (n=15) and stage III in the remaining 53.1% (n=17).

We did not identify a statistical significance between both surgical techniques on overall survival and disease-free survival. However, in patients submitted to LAR there was a tendency for shorter overall survival (p= 0.06).

### Conclusion:

The results of this study do not favour one of the techniques over the other, so in selected cases a sphincter preserving technique can be offered to patients.

## **LDLT in patient with HCV 540 cases single center experience**

Abdel-Wahab Mohamed

# **New technologies for difficult living donor liver transplantation**

Voskanyan Sergey

## Liver transplantation for HCC: Optimal selection criteria

Takada Yasutsugu

## Impact of sarcopenia in hepato-biliary-pancreatic and transplant surgery

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### Objectives:

We investigated the impact of sarcopenia on outcomes in hepato-biliary-pancreatic (HBP) and liver transplantation (LT).

### Methods:

Patients who underwent living donor LT (LDLT, n=250), liver resection for hepatocellular carcinoma (HCC, n=465) or intrahepatic cholangiocarcinoma (ICC, n=109), and resection for pancreatic cancer (n=301) were enrolled. The impact of preoperative skeletal muscle mass [standard muscle mass (SMM), psoas muscle mass index (PMI) or skeletal muscle mass index (SMI)], muscle quality [intramuscular adipose tissue content (IMAC) or muscle attenuation (MA)], and visceral adiposity [visceral to subcutaneous adipose tissue area ratio (VSR)] on outcomes was examined.

### Results:

- LDLT: The overall survival (OS) rate in patients with low SMM was significantly lower than those with normal SMM. Perioperative nutritional therapy significantly increased OS in patients with low SMM. The OS rate was significantly lower in patients with low PMI or SMI, high IMAC (muscle steatosis) and high VSR (visceral adiposity) than each respective normal group. Based on these results, we have revised our inclusion criteria for LDLT since January 2013. After revision of the criteria, the OS rate has dramatically improved.
- HCC: Preoperative low SMI, high IMAC and high VSR were independent risk factors for death after hepatectomy.
- ICC: Multivariate analysis revealed that low SMI and low MA were independent predictors of survival.
- Pancreatic cancer: Multivariate analysis showed that high VSR was an independent risk factor for mortality and recurrence together with low SMI and low MA.

### Conclusions:

Pretransplant sarcopenia was closely involved with outcomes after HBP surgery and LDLT.

## Biliary duct-to-duct reconstruction with or without a tunneled retroperitoneal t-tube in orthotopic liver transplantation

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### Objectives:

The interest of T-tube for biliary reconstruction during OLT remains controversial because of frequent T-tube inherent biliary complications (BC). The use of a tunneled retroperitoneal T-tube (TRT) may decrease such complications. The aim of this study was to assess the impact of TRT on biliary outcome following OLT.

### Methods:

We retrospectively compared the biliary outcome of OLT with duct-to-duct biliary reconstruction with or without a TRT performed from 2005 to 2015. A propensity score-matching was performed to adjust for potential confounders.

### Results:

Of the 571 OLT performed over the study period, 457 had a duct-to-duct biliary reconstruction, including 358 with a TRT and 99 without splintage. Of these, 97 recipients in each group were matched. Patient median follow-up was 36 (IQR: 14-70) months. The rate of bile leak was similar in both groups (7.2% in the non-TRT group, 4.1% in the TRT group,  $p=0.55$ ). There were 4 TRT inherent BC in the TRT group: 2 cholangitis managed conservatively, and 2 leakages occurring at TRT removal, which required invasive treatment. Patients in the TRT group had a lower rate of overall BC (10.3% versus 25.8%,  $p=0.009$ ), severe (Clavien grade  $\geq 3$ ) BC (9.3% versus 21.6%,  $p=0.02$ ), anastomotic biliary stricture (7.2% versus 19.6%,  $p=0.02$ ), and a better BC-free survival (HR=0.38 [95% CI: 0.18-0.79],  $p=0.01$ ). There was no difference in patient and graft survival between the 2 groups.

### Conclusions:

The use of TRT during OLT reduces the incidence of overall BC and anastomotic biliary strictures, without influencing the risk of leakage. Duct-to-duct biliary anastomosis with TRT may represent a new standard for biliary reconstruction after OLT.

## Cost of metabolic adaptation in liver transplantation: guiding donor-recipient matching through real-time metabolomics

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The purpose of this study was to evaluate the potential value of high-resolution magic-angle-spinning nuclear magnetic resonance (HR-MAS-NMR) metabolomic analysis of native liver and back-table biopsies for the prediction of early allograft dysfunction and donor-recipient matching. Indeed there is an emerging need to assess the metabolic state of liver allograft especially in the novel setting of machine perfusion preservation. HR-MAS-NMR could be a useful tool in this setting as it can extemporaneously provide untargeted metabolic profile. In order to validate this method, the metabolic profiles obtained by HR-MAS-NMR of back-table biopsies were compared according to the presence of early allograft dysfunction. The identification and quantification of differentially expressed metabolites showed that intragraft lactate level  $>8\text{mmol/g}$  and phosphocholine content  $>0.646\text{ mmol/g}$  were significantly associated with graft dysfunction with an excellent accuracy ( $\text{AUROC}_{\text{lactates}}=0.906$ ;  $\text{IC95\% } 0.813\text{-}0.999$ ) and  $\text{AUROC}_{\text{phosphocholine}}=0.816$  ( $\text{IC95\% } 0.679\text{-}0.954$ ). A graft metabolic score was designed to predict early graft function. Metabolic profiles from native livers from sarcopenic patients, who experience higher morbidity, showed opposite content in lactate and glycerophosphocholine. In sarcopenic patients, the risk of EAD was significantly higher when transplanting a graft exerting high risk graft metabolic score.

This study underlines the cost of metabolic adaptation identifying lactate and choline-derived metabolites as predictors of poor graft function in both native livers and liver grafts. Moreover HR-MAS-NMR seems a valid technique to evaluate the quality of a graft and the consequences of cold ischemia on the graft and could thus be used to assess the efficiency of graft resuscitation on machine perfusion in future studies.

## Outcomes of ABO compatible and DSA positive living donor liver transplantation.

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### Background:

We analyzed the outcomes of ABO compatible and DSA positive living donor liver transplantation (LDLT) focusing on preformed or de novo donor specific anti-HLA antibody (DSA).

### Patients and Methods:

- I) Twenty-five recipients whose anti-HLA antibody test (screening test, PRA) was examined were divided into 4 groups depending on the result of (PRA and ABO incompatibility (ABOI))=(-, -), (+, -), (-, +), (+, +), and 6-month survival was assessed in each group. In the group of (+, -), anti-HLA antibody test (single antigen test, Luminex) was performed and preformed DSA positive recipients were identified.
- II) In the 257 LDLTs, recipients who developed antibody mediated rejection (AMR) were retrospectively identified and the outcomes were assessed.

### Results:

- I) Six-month survivals were 62, 81, 100, 100% in (-, -), (+, -), (-, +), and (+, +), respectively. Out of the 9 patients in (+, -), 4 recipients were strongly positive for preformed DSA (>10,000MFI). All 4 recipients postoperatively received immunosuppression including portal infusion therapy and their postoperative courses were uneventful. None of them developed AMR.
- II) Four recipients were identified to have developed AMR postoperatively. Their pre and postoperative examinations suggested that de novo DSA appeared. Three died of AMR and 1 survived after re-transplantation. Three did not receive portal infusion therapy because of individual reasons.

### Conclusion:

Outcomes of recipients who had preformed DSA was satisfactory but those of recipients who developed de novo DSA was poor. Our immunosuppression protocol including portal infusion therapy may be associated with the outcomes.

## Liver resection versus living donor liver transplantation for hepatocellular carcinoma in cirrhotic patients

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### Objectives:

Liver resection and liver transplantation are well known modalities of management of hepatocellular carcinoma (HCC). Limitations and complications exist for both of them. This study aims to evaluate both methods in the management of HCC in cirrhotic patients.

### Methods:

Retrospective analysis of the files and electronic data of Child A or B cirrhotic patients who underwent liver resection (LR) or living donor liver transplantation (LDLT). Those within tumours proven to be within UCSF criteria were identified. The early postoperative, recurrence and survival data were compared.

### Results:

120 patients were included in this study. 84 (60%) patients were treated by liver resection (LR group) and 36 (40%) underwent LDLT (LT group).

In LR group, 60 (71.4%) patients underwent non-anatomical resections. Anatomical resections were done in 24 (28.6%) patients. All LT group underwent right lobe-LDLT not including the middle hepatic vein.

There was no operative mortality in both groups. Blood loss and blood transfusion were significantly more in the LT group.  $p < 0.001$ .

Patients with early complications in LR group were 33 (61.1%) versus 21 (58.3%) in LT group with no significant statistical difference, ( $p = 0.829$ ).

Tumor recurrence was observed in 43/76 (56.6%) cases in the LR group and 3/31 (9.7%) cases in the LT group,  $p = < 0.001$ .

Disease-free survival was significantly better in LT group with mean of  $127.7 \pm 7.3$  months compared to  $43.2 \pm 3.5$  in LR group,  $p = < 0.0001$ .

Survival was better in LT group with mean survival of  $91.4 \pm 10.4$  months compared to  $48.3 \pm 3.4$  months in LR group but not statistically significant,  $p = 0.085$ .

### Conclusion:

LR and LDLT are viable options for HCC in early cirrhotic patients. Recurrence is significantly less with LDLT but this has not been yet translated into better survival. Improvement of early outcome of LDLT can lead to better overall survival and make the choice more clear.

## **Liver transplantation and Whipple surgery combined with chemo-radiotherapy for treatment of hilar cholangiocarcinoma in the context of primary sclerosing cholangitis**

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### Objectives:

Hilar cholangiocarcinoma (CC) is a fatal malignant tumor that is often diagnosed in advanced stages leading to very short-term survival despite surgical intervention. Here in, we described our experience of liver transplantation and Whipple surgery combined with chemo-radiotherapy in patients with primary sclerosing cholangitis (PSC) diagnosed with hilar CC.

### Methods and Materials:

A descriptive analysis of patients who underwent liver transplantation at Shiraz organ transplant center, Iran, was performed in March 2016.. Data and outcomes of patients with PSC patients and hilar CC that underwent with liver transplantation and Whipple surgery combined with peri-operative chemo-radiotherapy were extracted and reviewed.

### Results:

Among more than 2500 liver transplant patients at Shiraz Transplant Center, 4 patients (2 males and 2 females) with PSC underwent liver transplantation with Whipple surgery and peri-operative chemo-radiation. Patients received mycophenolate mofetil, prednisolone and sirolimus as immunosuppressive regimens. One of our patients survived 36 months after surgery but died due to tumor recurrence, metastasis and other complications of transplantation. The other three patients survived 21, 9 and 17 months after transplantation without tumor recurrence. There were one episode of portal vein thrombosis treating with anti-coagulation and acute rejection treating with methylprednisolone pulse.

### Conclusion:

Liver transplantation and Whipple surgery combined with peri-operative chemo-radiotherapy can be considered as a modality of treatment in patients with hilar cholangiocarcinoma in the context of PSC.

## **Liver transplantation using liver graft from Hepatitis B Core Antibody-Positive donors for Hepatitis B Surface Antigen Negative recipients:**

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### **Objectives:**

Using liver from donors who are positive for hepatitis B core antibody (anti-HBc) to hepatitis B surface antigen (HBsAg) positive recipient is routinely practiced. But using this kind of donor for HBsAg negative is still controversial. To overcome the problem of organ shortage and to save life of recipient who are on waiting list for liver transplantation, it is necessary in our center to use this strategy. This retrospective study present our experience in using liver graft from anti-HBc positive but HBsAg-negative donor for HBsAg negative recipient.

### **Methods:**

Between January 2007 and May 2017, 181 liver transplantations procedures were performed at our center. We evaluated using HBcAb-positive liver graft in HBsAg-negative recipient. All our patient receives nucleos(t)ide analogue (Lamivudine 100mg/day) for prophylaxis against de novo HBV infection

### **Results:**

The prevalence of anti-HBc positive liver donors is 43.65% (79/181). There are 53 HBsAg-negative recipients whom received anti-HBc positive liver. Twenty-nine of these (54.7%) were antiHBs positive. With a median follow up of 42 months (range 1-112 month), only one of 53 (1.8%) patients who receiving a graft from anti-HBc positive donors developed de novo hepatitis B.

### **Conclusions:**

From our small transplant series, we found that liver grafts from anti-HBc positive donors can be safely used and HBsAg negative recipients should receive nucleos(t)ide analogue for prophylaxis against de novo HBV infection.

## **Surgical and oncological problems of borderline resectable pancreatic cancer**

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We have been performing aggressive surgery combined with vascular resection for pancreatic cancer. The patients who had undergone resection of pancreatic cancer in our institution were reviewed and the survival differences among the resectable (R), borderline resectable (BR), unresectable (UR) group and subgroups of BR disease were analyzed. BR were further classified into 3 subgroups: portal invasion (PV (+)), common hepatic artery invasion (CHA (+)) and superior mesenteric artery invasion (SMA (+)). PV (+) was subdivided into types B, C, and D according to the degree of portal invasion.

Patients in the R group had significantly better survival than those in the PV(+) group, who in turn survived significantly longer than those classified as SMA(+). Type B patients survived significantly longer than did types C and D patients. The compliance with postoperative chemotherapy of patients with BR group was inferior to patients with R group. The optimal treatment strategy may differ among various subgroups within the BR category.

## **Customized preoperative management of patients with bile duct tumors.**

Van Gulik Thomas

## **Surgery for chronic pancreatitis**

Conlon Kevin

## **Importance of real ERAS compared to ERAS-like in liver surgery for outcome**

Demartines Nicolas

## The place of the pelvic exenteration in the treatment of extended pelvic cancers

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### Background:

Pelvic cancers are extended primary or relapse rectal, genital and urological malignancies. Pelvic exenterations (PE) are the operations, performed to remove these tumors. What is the place of PE in the complex treatment of extended pelvic cancers? The place of radio-chemotherapy? Lecture defines the multidisciplinary team for PE – does it need surgeon, urologist and gynecologist to remove a pelvic cancer. Lecture assesses postoperative complications, mortality; survival.

### Patients:

The lecture is based on 289 PE patients for 1992-2011 - total 88, posterior 116, anterior 85 - advanced primary or relapse rectal (54), genital (223) and urological (12) carcinomas. Radical PE–197; palliative-92. Primary–107; secondary PE-124 relapse and 58 persisting tumors.

### Results:

Duration 3-5 hours. Mortality – intraoperative – 0%; postoperative – 6%. Complications: early and late - Gastrointestinal–18%; urinary – 48%; pelvic floor – 44%. Survival - radical PE: 5-years – 22%. Palliative PE– up to 18-30 months. Palliations –6-9 months. Postoperative treatment, analysed in –primary PE - RT – 17; RT&CT – 15; CT – 23; no – 10; secondary – RT – 14; RT&CT – 13; CT – 46; no – 26.

### Discussion:

Most PE were secondary. For persisting tumors preexenterative radio-chemotherapy was like preoperative; persisting after operation means that PE was already indicated at the time of the primary surgery. Most common complications - urinary, especially infections. Palliative PE patients have significantly higher morbidity and lower survival than radical.

### Conclusions:

Since PE is the only more radical method for treatment of the extended pelvic tumor, it takes the main place in the complex therapy. Complex treatment is important for improvement of postoperative results and especially survival after PE. We prefer to perform PE before RT or very close after RT because complications increase after RT. We aim at simple reconstructive procedures that result in significantly shortened operative time and less complications.

## Totally laparoscopic right hemicolectomy for colon cancer: a comparative study

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### Objectives:

The totally laparoscopic right hemicolectomy has gained popularity in recent years while requiring greater expertise of laparoscopic technique.

Aim of this study was to evaluate short and medium term results of the methodology and comparing it with extracorporeal anastomosis.

### Methods:

A retrospective chart review of consecutive patients who underwent laparoscopic right hemicolectomy, from January 2014 to December 2016, was performed.

Multivariate regression analysis was used to compare postoperative outcomes.

### Results:

Between January 2004 and December 2016 at our Institution, 215 right hemicolectomy were performed for right colon cancer.

In the last three years a total of 93 consecutive patients were identified. The extracorporeal group (EA) included 47 patients and the intracorporeal group (IA) 46 patients.

There were no statistically significant differences in demographics and disease-related characteristics between the two groups.

Conversion to open surgery was not required. Mean operative time was longer in the extracorporeal group (94±22 min vs 80±25 min  $p<0.05$ ).

Major morbidity was recorded only in EA: 2 cases (4.3%) of wound infection, 2(4.3%) anastomotic leakage that required re-intervention (Clavien-Dindo III 4.3 % vs 0%  $p= 0.015$ ).

Mean time of return of bowel function (3.1 ±0.7 vs 4.1 ±0.8 days  $p <0.0001$ ) and mean length of hospital stay (4.2 ± 1.2 vs 6.3 ±1.9 days  $p<0.0001$ ) were significantly shorter in IA. Similarly, minilaparotomy was smaller in IA (3.8 ± 0.9 vs 6.2±0.9 cm  $p <0.00001$ ).

There was no significant difference in the median number of lymph nodes harvested while length of operative stump was superior in IA (29.54±11.09 vs 25.03±4.32).

### Conclusions:

The rationale of totally laparoscopic right hemicolectomy is based on technical factors, such as unnecessary mobilization of the transverse colon and the absence of manipulation and traction of the small bowel. Shorter hospital stay and optimal cosmetics results have contributed to the spread of this surgical option.

## Colorectal surgical management: looking back, leaping forward

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### Objectives:

The aim of this study was to compare the outcomes for colorectal cancer (CRC) patients who underwent conventional (C-CRS) or laparoscopic colorectal surgery (L-CRS). In the laparoscopic group we compared two distinct periods: the early and the advanced experience.

### Methods:

We conducted a retrospective analysis of 556 colorectal patients who underwent conventional or laparoscopic colorectal surgery for CRC. Data was categorized into 3 groups: patients operated by laparotomy, the C-CRS cohort (n = 317, from January 1993 to December 2002); the first hundred patients operated by laparoscopy, the EL -CRS cohort (n = 101, from January 2008 to December 2012); and those operated by laparoscopy with more advanced experience, the AL -CRS cohort (n = 138, from January 2013 to December 2016).

### Results:

The patients in the C-CRS cohort had a significantly higher rate of overall complications ( $P < 0.001$ ), more wound related complications ( $P < 0.0001$ ), respiratory infections ( $P < 0.001$ ), and higher length of hospital stay ( $P < 0.001$ ). A higher operative time and proportion of harvested lymph nodes occurred in the C-CRS and EL-CRS cohorts, when compared to the AL -CRS cohort ( $P < 0.001$ ). We found no statistically significant differences in conversion rate, intraoperative adverse events, anastomotic related complications or mortality.

### Conclusions:

Laparoscopic colorectal surgery presents as a feasible and safe technique for CRC patients, with better short term outcomes than the conventional approach. Additionally, we can state that best postoperative outcomes come with higher experience. Therefore, a solid and well-defined learning and training model in laparoscopy should be adopted towards proficiency.

## Safety of Laparoscopic Surgery in Colorectal Cancer Patients with Severe Systemic Complications.

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### Objectives:

In colorectal cancer surgery, the indication for laparoscopic surgery in patients with severe systemic complications has not been established. We investigated the safety of laparoscopic surgery in colorectal cancer patients with severe systemic complications.

### Methods:

The subjects were colorectal cancer patients who underwent surgical treatment in our hospital from January 2006 to May 2017. Patients were classified into 3 groups according to the severity of systemic condition based on the American Society of Anesthesiologists (ASA) physical status: 31 patients in class 3 who underwent laparoscopic surgery (LAP 3 group), 377 patients in class 2 or lower who underwent laparoscopic surgery (LAP 1/2 group), and 97 patients in class 3 who underwent open surgery (OP 3 group). We compared the clinical data among 3 groups.

### Results:

In the LAP 1/2 group and the LAP 3 group, there was no significant difference in operation time (225min vs 205min,  $p=0.099$ ) and intraoperative bleeding amount (16ml vs 14ml,  $p=0.500$ ). Postoperative complications were observed in 156 patients (41%) in the LAP 1/2 group and 14 patients (45%) in the LAP 3 group, which also showed no significant difference. Also, between the LAP 3 group and the OP 3 group, there was no significant difference in operative time (205min vs 192min,  $p=0.483$ ), but intraoperative bleeding amount (14ml vs 238ml,  $p=0.500$ ) was larger in the OP 3 group. Postoperative complications were observed in 14 patients (45%) in the LAP 3 group and 57 patients (58%) in the OP 3 group, which showed no significant difference ( $p=0.185$ ).

### Conclusions:

Laparoscopic surgery can be performed safely in colorectal cancer patients with severe systemic complications. In addition, laparoscopic surgery had advantages including less bleeding and shorter hospital stay compared with open surgery in patients with the same degree of severe complications.

## Laparoscopic total excision of the right mesocolon

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### Introduction:

The concept of total excision of the mesocolon encompasses the intact removal of the mesocolon by its embryological plane and central vascular ligation. Its impact on patient survival and morbidity and mortality is not yet established.

### Objective:

Demonstration of the technique of total excision of the right mesocolon by laparoscopy.

### Methods:

Video demonstrating the technique of total excision of mesocolon in patients with right colon neoplasia.

### Technique:

Identification and ligation of ileocolic vessels at their origin, with exposure of the superior mesentery vein. Following the mobilization of the right colon, separating the mesocolon from the retroperitoneum allowing visualization of the retroperitoneal organs: duodenum, pancreas and Gerota's fascia. Subsequently the section of the distal ileum and the transverse colon with endostapler is made. Finally, intracorporal ileocolic anastomosis is performed.

### Conclusion:

This approach allows a complete resection of the right mesocolon through embryologic planes, allowing an excellent recovery in postoperative period.

## Rectal prolapse: Is laparoscopic posterior mesh rectopexy the procedure of choice?

Vinay Kumar Shaw

### Introduction:

Rectal prolapse present a dilemma in management as there is no single treatment which can be set as gold standard. Surgery is the only option for cure and variety of options exist. The common goal of any type of surgery is to control the prolapse, restore continence and prevent constipation or impaired evacuation [1]. Therapeutic procedures are broadly divided between abdominal and perineal procedures and an abdominal procedure are usually considered for younger and fitter patients. With refinements in surgical and anaesthetist technique and also great strides in minimal invasive surgery present literature is more in favour of abdominal procedures even in elderly group. [2,3,4]The aim of our study was to analyse the efficacy and safety of laparoscopy posterior mesh rectopexy in all age group and review with existing literature to plan an algorithm in management.

### Material and methods:

Retrospective data of 9 patients operated for full rectal prolapse in the period from April 2014 to Jan 2017 was taken. All underwent laparoscopic posterior mesh rectopexy in our hospital. The surgical procedure comprised of complete mobilisation of rectum and sigmoid and a 6X6' polypropylene mesh was fixed to the presacral fascia with absorbable tacks. The mesh was customised so as to wrap 4/5 of the rectum and fixed with 3-0 absorbable suture.

Operative time, blood loss, length of hospital stay, mortality, morbidity and recurrence rate were evaluated. Review of literature was done to further analyse the efficacy of the procedure.

### Results:

Patients consisted of 6 women and 3 men with a mean age of 60.3years. Mean operative time was 128min. The blood loss was minimal and average length of hospital stay was 5.1 days. In follow up three patients had some degree of constipation and could be managed with laxatives. There was no mortality or any significant perioperative complications. In short follow up results, there is no recurrence.

### Conclusion:

Abdominal approach is preferred modality of treatment for rectal prolapse. In abdominal procedure, mesh rectopexy has fewer complications and mortality compared to suture fixation, resection rectopexy and other intervention.

Laparoscopic posterior mesh rectopexy is a safe and effective procedure for full rectal prolapse and possibly be considered as first choice procedure in feasible candidates.

### References:

- 1) Eung Jin Shin: Surgical Treatment of Rectal Prolapse: J Korean Soc Coloproctology. 2011 Feb; 27(1): 5–12.
- 2) Jean-Luc Faucheron et al: Anterior rectopexy for full-thickness rectal prolapse: Technical and functional results: World J Gastroenterol. 2015 Apr 28; 21(16): 5049–5055
- 3) Manash Ranjan Sahoo et al: A single centre comparative study of laparoscopic mesh rectopexy versus suture rectopexy: J Minim Access Surg. 2014 Jan-Mar; 10(1): 18–22.
- 4) Deepraj S. Bhandarkar: Laparoscopic rectopexy for complete rectal prolapse: mesh, no mesh or a ventral mesh? J Minim Access Surg. 2014 Jan-Mar; 10(1): 1–3.

## **Novel approaches to reduce surgical difficulty in laparoscopic pancreaticoduodenectomy.**

Nagakawa Yuichi

## **Pros and cons of laparoscopic distal pancreatectomy for pancreatic ductal adenocarcinoma.**

Nagakawa Yuichi

## What can we do to obtain long-term survivors of pancreatic cancer?

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### Objectives:

To obtain long-term survivors of pancreatic cancer (pancreatic ductal adenocarcinoma; PDAC) is not easy. Although such tough situation, the number of survivors from PDAC is increasing, even at the city hospital level. Here we review our long-term survivors and discuss what we can do now.

### Methods:

Patients with PDAC, who underwent surgical resection in our institute between January 2000 and August 2012, and have survived more than 5 years, were extracted. Characteristics of these patients, including contents of medical treatments and histopathological characteristics, were retrospectively reviewed. Patients with invasive carcinoma derived from intraductal papillary-mucinous neoplasm were excluded.

### Results:

Sixteen out of 115 patients (13.9%, Male/Female: 9/7, average age 67.0) were eligible. Median survival was 108 months (62-132). Most patients resulted in Stage IIA or B (UICC), 3 of which had lymph node metastasis. We had only one Stage IA patient. Histopathological examination revealed that no tumor tissue was diagnosed as poorly differentiated ductal adenocarcinoma (all belonged to G1 or G2). Portal vein resection was performed in 3 out of 12 patients who underwent pancreaticoduodenectomy (PD). One patient underwent total pancreatectomy. Radical (R0) resection was achieved in all cases. Gemcitabine and/or S-1 were administered to the patients as adjuvant chemotherapy. Four patients died of recurrent malignancy (liver, lung or brain mets), whereas 7 cases survived without recurrent diseases.

### Discussion:

Cases who underwent neo-adjuvant chemotherapy (NAC) were not included in this study. NAC study is now under clinical studies, which may yield more long-term survivors. In addition, precision therapy should be considered in the near future.

### Conclusion:

What we can do to obtain long-term survivors of PDAC at the city hospital level are achieving R0 resection and adequate chemotherapy.

## **Pancreatectomies with arterial resection for malignancy : which results and who are best candidates?"**

Bachelier Philippe

## Early removal of intraperitoneal drainage after pancreatoduodenectomy in selected patients: a randomized clinical trial

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### Objectives:

To determine whether the timing of removal of abdominal drainage (AD) after pancreatoduodenectomy (PD) influences the 30-day surgical site infection (30-day SSI) rate.

### Methods:

A multicenter randomized, intention-to-treat trial with two parallel arms (superiority of early vs. standard AD removal on SSI) was performed between 2011 and 2015 in patients with no pancreatic fistula (PF) on POD3 after PD (NCT01368094). The primary endpoint was the 30-day SSI rate. The secondary endpoints were specific post-PD complications (grade BC PF), postoperative morbidity, reoperation rate, 30-day mortality, postoperative infectious complications and length of stay.

### Results:

One hundred and forty-one patients were randomized: 71 in the early arm, 70 in the standard arm (70.2% of pancreatic adenocarcinomas; 91.5% of pancreatojejunostomies; 66.0% of bilateral drainages; feasibility: 39.9%). Early removal of drains was not associated with a significant decrease of 30-day SSI (14.1% vs. 24.3%,  $p = 0.12$ ). A lower rate of deep SSI was observed in the early arm (2.8% vs. 17.1%,  $p = 0.03$ ), leading to a shorter length of stay ( $17.8 \pm 6.8$  vs.  $21.0 \pm 6.1$ ,  $p = 0.01$ ). Grade BC PF rate (5.6%), severe morbidity (17.7%), reoperation rate (7.8%), 30-day mortality (1.4%) and wound-SSI rate (7.8%) were similar between arms. After multivariate analysis, the timing of AD removal was not associated with an increase of 30-day SSI (OR = 0.74 (95%CI 0.35 – 1.13,  $p = 0.38$ )).

### Conclusion:

In selected patients with no PF on POD3, early removal of abdominal drainage does not seem to increase or decrease surgical site infection's occurrence.

## The criteria of early drain removal reduced pancreatic fistula after pancreatoduodenectomy

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### Objectives:

Since 2012, we introduced own criteria of early drain removal after pancreatectomy. In this study, we retrospectively verified a usefulness of our recent criteria concerning to postoperative complications after pancreatoduodenectomy by comparing with former criteria.

### Methods:

The perioperative data of consecutive 522 patients who underwent pancreatoduodenectomy during recent 10 years were compared between 255 patients with recent criteria and 267 patients with former criteria. A detail of our recent criteria is both drained fluid amylase value (DFA) under 5000 U/L on postoperative day (POD) 1 and DFA under 3000 U/L on POD3. If criteria was satisfied, drain was removed on POD3. On the other hand, our former criteria was DFA under 375 U/L on POD3.

### Results:

There were no significant differences in primary disease, patient's backgrounds and fistula risk score between two groups. After introducing recent criteria, intra-abdominal abscess development was statistically decreased (12.2 vs 24.3%). Clinically relevant postoperative pancreatic fistula (CR-POPF) was also statistically decreased (12.6 vs 19.1%), while biochemical leak was increased (31.0 vs 19.5%). A median duration of postoperative hospital stays was statistically shortened (12 vs 14 days). To detect an independent predictive factor of CR-POPF, patient's factor, operative factors and drain removal criteria were analysed by logistic regression analysis. As a result, both recent criteria and soft pancreatic texture were revealed as predictive factors (Odds: 0.45 and 6.6,  $P < 0.01$ ).

### Conclusions:

These results indicated that implementation of the recent criteria could realize appropriate patient selection for early drain removal on POD3, resulting in a decreased incidence of CR-POPF.

## Visceral obesity and open drainage are independent risk factors of pancreatic fistula after distal pancreatectomy.

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### Objective:

To identify predictive risk factors of clinically relevant pancreatic fistula (CR-PF) following open and laparoscopic distal pancreatectomy (DP).

### Background data:

Predictive risk factors of CR-PF after DP have not been consensually identified.

### Methods:

Analysis of a prospectively maintained database of elective DP. Preoperative and intraoperative clinical data were collected. Radiologic analysis on preoperative CT-scan included measure of Visceral Fat Area (VFA), Total Fat Area (TFA), Subcutaneous Fat Area (SFA), pancreas density, retro renal fat thickness and Total Muscle Area (TMA: parietal+paraspinal+psoas). Sarcopenia was defined according to Prado et al. (Lancet Oncol 2008) with a Surface Muscle Index  $<38,9\text{cm}^2/\text{m}^2$  in female and  $52,4\text{cm}^2/\text{m}^2$  in male. Occurrence of a CR-PF as defined by ISGPF (grade B or C) was the main end point. All variables associated with a p value  $<0.1$  in univariate analysis were included in a logistic regression model for multivariate analysis.

### Results:

From 2012 to June 2016, 208 patients have been included. CR-PF occurred in 31(15%). In univariate analysis, risk factors of CR-PF were: BMI  $>25\text{kg}/\text{m}^2$  ( $p=0.023$ ), a dilated main pancreatic duct ( $>3\text{mm}$ ;  $p=0.035$ ), laparotomy ( $p=0.008$ ), ligation of the main pancreatic duct ( $p=0.027$ ), venous resection ( $p=0.02$ ), blood loss  $>150\text{ml}$  ( $p=0.007$ ) and a passive drainage using a multichannel drain ( $p<0.001$ ) while a suction drainage decreased this risk ( $p<0,001$ ). A VFA  $>92\text{cm}^2$  ( $p=0.052$ ), a TFA  $>245\text{cm}^2$  ( $p=0.080$ ) and a soft pancreas ( $p=0.072$ ) trend to increase the risk of CR-PF.

In sub-group analysis, obese sarcopenic patients had a higher risk to develop a CR-PF ( $p=0.009$ ).

In multivariate analysis, a VFA  $>92\text{cm}^2$  (OR: 3.057 [1.06-8.8];  $p=0.038$ ) and a multichannel passive drainage (OR: 7.120 [1.7-29.3],  $p=0.007$ ) were two independent predictive factors of CR-PF. Sarcopenia did not increase this risk ( $p=0.128$ ).

### Conclusions:

Both visceral obesity and passive drainage increase the risk of CR-PF. Sarcopenia did not influence this risk except in obese patients.

## Laparoscopic versus Distal Pancreatectomy: A single-institution comparative 10-year experience.

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### Background:

Distal pancreatectomy is the standard curative treatment for symptomatic benign, pre-malignant and malignant diseases of the pancreatic body and tail. This study was designed to compare clinical outcomes for laparoscopic distal pancreatectomy (LDP) and open distal pancreatectomy (ODP) performed over a 10-year period at a single specialist tertiary referral centre.

### Methods:

This retrospective study included 127 patients that underwent distal pancreatectomy between 2006 and 2017. The patient data was divided into two groups based on surgical approach: LDP (n=50; 39.4%) and ODP (n=77; 60.6%). Data was collected on pre-operative patient characteristics, intra-operative details, post-operative outcomes and pathological results. All statistical analyses were carried out on SPSS software for Windows.

### Results:

Intra-operative blood loss (500mls vs 1620mls), rate of splenectomy (28% vs 74%), new post-operative diabetes (10% vs 28.6%) and length of hospital stay (7 days vs 8 days) were significantly less in LDP compared to ODP. There were no significant differences in operative time, major complications, post-operative pancreatic fistula and haemorrhage, day of drain removal, 30 day re-admission rate, further procedures, perineural and venous invasion. 26% were converted from LDP to ODP. There was no 30-day patient mortality in either procedure.

### Key statement:

LDP is as safe a surgical approach as is ODP. Still, LDP has the advantages of shorter hospital stays, less intra-operative blood loss, lower splenectomy rates and reduced rate of post-operative diabetes.

### Keywords:

Distal pancreatectomy; Laparoscopic distal pancreatectomy; Open distal pancreatectomy

## Role of Somatostatin in Pancreaticoduodenectomy: A prospective controlled randomized trial.

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### Background:

Somatostatin have well-recognized inhibitory effects on pancreatic exocrine secretion. But its efficacy to prevent postoperative pancreatic fistula (POPF) after pancreaticoduodenectomy (PD) still controversial. This study was conducted to evaluate the effect of postoperative use of octreotide on the postoperative outcomes, POPF, after PD.

### Patients and methods:

This is a prospective randomized controlled trial for post-operative use of somatostatin in patients after PD during the period from June 2015 till December 2016. Patients enrolled in the study were randomized to 2 groups. Group I include patients who did not receive postoperative somatostatin. Group II include patients who did not receive postoperative somatostatin. The primary outcome of the study is the rate of development of POPF.

### Results:

104 patients included in the study and divided into two randomized groups. No significant difference in median output between both groups. There were no significant difference in overall complications and its severity. POPF occurred in 11 patients (21.2%) in group I, and in 10 patients (19.2%) in group II, and this was statistically non-significant ( $p = 0.807$ ). Also, there was no significant differences between both groups regarding the incidence of biliary leakage ( $p = 0.083$ ), delayed gastric emptying ( $p = 0.472$ ), and early postoperative mortality ( $p = 0.727$ ).

### Conclusion:

Somatostatin did not reduce postoperative morbidities, reoperation and mortality rate. Also, it did not affect the incidence of post-operative pancreatic fistula and its clinically relevant variant. Based on these results, the routine use of octreotide after PD is not recommended.

## **A new simple and safe pancreaticojejunal anastomosis. Three grade b pancreatic leaks after 100 consecutive peocedures**

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### Background:

Postoperative pancreatic fistula (POPF) is the main cause of fatal complications after pancreatoduodenectomy. There is still no universally accepted technique for pancreaticojejunal anastomosis (PJA), especially in patients with soft and fragile pancreas.

### Method:

Pull-through M- with locking U-sutures and internal STent one-layer invaginated end-to-end PJA (MUST) has become a main anastomotic technique in our department Postoperative morbidity and 90- days mortality were registered in 100 consecutive patients who underwent PJA with MUST technique between November 2014 to September 2016.

### Results:

Retrospectively assessed rate of clinically relevant POPF was significantly lower for MUST (3% Grade B and no Grade C) as well as rate of fistula-related mortality in MUST group compared to modified Cattell – Warren method (6%-Grade B and 4% Grade C POPF) which we used during the last 9 years. The length of postoperative hospital stay was significantly shorter in MUST group.

### Conclusion:

A retrospective analysis confirmed the efficacy of MUST technique for any pancreatic parenchyma type and any duct size. To finally prove this method as a standard for PJA it must be the subject of prospective randomized trials.

# Japanese Practice Guidelines for Hepatocellular carcinoma 2017

Kokudo Norihiro

## Re-evaluation of clinical importance of intraductal papillary neoplasm of the bile duct

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### Objectives:

Intraductal papillary neoplasm of the bile duct (IPNB) is characterized by dilated intrahepatic bile ducts filled with a noninvasive papillary or villous biliary neoplasm covering delicate fibrovascular stalks. About one third of IPNB secrete mucin in the duct lumen. However, there are several problems. First, neoplasms diagnosed as IPNB are different according to institutes. Second, tumor location and the incidence of associated invasive malignancy are different according to reports. This discrepancy may be, at least in part, due to different diagnostic criteria.

### Methods:

The clinicopathological characteristics of 21 IPNBs were re-evaluated.

### Results:

The median age was 66 years. The symptoms included abdominal pain, jaundice and cholangitis. 11 IPNBs were located in the intrahepatic bile duct, 10 were in the extrahepatic bile duct. There were significant differences between intrahepatic and extrahepatic IPNBs in CA19-9 levels (10 vs 257 (IU/dl)) and presence of gross mucin (82% vs 20%). Intrahepatic IPNB showed low- or intermediate-, or high-grade neoplasia, while extrahepatic IPNB showed IPNB with an associated invasive carcinoma. 5-year relapse free survival rates were 82% and 16%, respectively. Univariate and multivariate analyses showed that tumor location and tumor grade were significant factors for 5-year relapse free survival.

### Conclusions:

Location of the tumor was one of the independent risk factors for postoperative relapse-free survival.

### Proposal:

This study demonstrated that there are two types of IPNB.

- **Type 1 IPNB (classical IPNB)** is histologically similar to IPMN of the pancreas, typically develops in the intrahepatic bile ducts and contains macroscopic mucin.
- **Type 2 IPNB (so-called papillary carcinoma or cholangiocarcinoma)**, has a more complex histological architecture with irregular papillary branching or with foci of solid-tubular components, typically involves the extrahepatic bile ducts and is mostly associated with invasive cancers. We should re-evaluate IPNBs by classifying them into two types.

# Genomic profiling of cholangiocarcinoma

Borad Mitesh

## **Hilar cholangiocarcinoma: A new national strategy**

Launois Bernard

# **The role of telomere dysfunction during liver cirrhosis development and hepatocarcinogenesis**

Hartmann Daniel

## Prognostic impact of intrahepatic cholangiocarcinoma: a multi-institutional study by Hiroshima surgical study group of clinical oncology (Hisco).

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### Objectives:

While surgical resection is the main treatment for intrahepatic cholangiocarcinoma (ICC), the indication of lymph node dissection (LND) has been still controversial. The aim of this study is to identify the prognostic factor and the impact on the LND in patients with ICC with the database from the multi-institutional study.

### Methods:

This retrospective study included 97 patients who underwent hepatectomy for ICC in Hiroshima Surgical study group of Clinical Oncology (HiSCO) from 2005 to 2015. The prognostic factors for cancer-specific survival were analyzed using the Kaplan-Meier method and Cox proportional hazards regression models.

### Results:

Five-year overall survival (OS) and disease free survival (DFS) were 48.2% and 40.4%, respectively. While CA19-9 elevation (hazard ratio [HR] 2.74 ( $p = 0.004$ )) and hepatic venous invasion ([HR] 2.56 ( $p = 0.023$ )) were identified as prognostic factors for OS, hepatitis B viral infection ([HR] 2.66 ( $p = 0.046$ )), portal invasion ([HR] 2.27 ( $p = 0.018$ )) and intrahepatic metastases ([HR] 2.31 ( $p = 0.043$ )) were identified as those for DFS. The strategy of LND depended on operators and hospitals' policies. Lymph node metastases (LNMs) were found in 10 of 25 cases undergoing LND and 9 of 72 cases not undergoing LND. Portal invasion ([HR] 4.41 ( $p = 0.015$ )), intrahepatic metastases ([HR] 5.44 ( $p = 0.014$ )) and the hilar location of the tumor ([HR] 4.64 ( $p = 0.012$ )) were identified as predictive factors for LNM. Moreover, the patients with recurrence were analyzed. CA19-9 elevation at recurrence (hazard ratio [HR] 17.61 ( $p = 0.005$ )), the surgical treatment for recurrence (hazard ratio [HR] 13.90 ( $p = 0.007$ )) and biliary invasion ([HR] 4.36 ( $p = 0.018$ )) were identified as prognostic factors after recurrent ICC.

### Conclusions:

Multidisciplinary therapy should be applied for the patient with a high level of CA19-9 and/or vascular invasion. LND might be necessary in patients with portal invasion, intrahepatic metastases and/or the tumor located in the hilar region. Recurrent sites should be resected if possible when the patient would have recurrence.

## Assessment of Preoperative Liver Function in Patients with Hepatocellular Carcinoma – The ALICE Grade

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### Objective:

Most patients with hepatocellular carcinoma (HCC) have underlying liver disease, therefore, precise preoperative evaluation of the patient's liver function is essential for surgical decision making. The aim of the study is to develop a preoperative liver function evaluation system that is useful for predicting the postoperative outcomes after liver resection.

### Methods:

We developed a grading system incorporating only two variables, namely, the serum albumin level and the indocyanine green retention rate at 15 minutes (ICG R15), to assess the preoperative liver function, based on the overall survival of 1868 patients with HCC who underwent liver resection. We then analyzed the predictive power for the postoperative short-term outcome after liver resection in 1488 Child-Pugh A patients with HCC, in 343 patients with colorectal liver metastasis, and in 166 patients with biliary tract cancer.

### Results:

The Albumin-Indocyanine Green Evaluation (ALICE) grading system was developed in a randomly assigned training cohort: linear predictor =  $0.663 \times \log_{10} \text{ICG R15 (\%)} - 0.0718 \times \text{albumin (g/L)}$  (cut-off value: -2.20 and -1.39). This new grading system showed a predictive power for the overall survival similar to the Child-Pugh grading system in the validation cohort. Determination of the ALICE grade in Child-Pugh A patients allowed further stratification of the postoperative prognosis. Determination of the ALICE grade allowed better prediction of the risk of postoperative liver failure and mortality (ascites: grade 1, 2.1%; grade 2, 6.5%; grade 3, 16.0%; mortality: grade 1, 0%; grade 2, 1.3%; grade 3, 5.3%) than the previously reported model based on the presence/absence of portal hypertension. Determination of the ALICE grade also allowed prediction of the risk of postoperative liver failure in patients with colorectal liver metastasis and biliary tract cancer.

### Conclusions:

This new grading system is a simple method for prediction of the postoperative long-term and short-term outcomes.

## **Selection of hepatic resection rather than transplantation for cirrhotic patients with hepatocellular carcinoma.**

Yanaga Katsuhiko

## Surgical resection for HCC with macroscopic vascular invasion

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### Objectives:

The presence of macroscopic vascular invasion in patients with hepatocellular carcinoma (HCC) is regarded as indicating an advanced stage, and surgical resection is not recommended in the Western guidelines.

### Methods:

Between October 1994 and December 2011, we performed surgical resection in 84 cases with portal vein tumor thrombus (PVTT), 34 cases with hepatic vein tumor thrombus (HVTT), and 19 cases with bile duct tumor thrombus (BDTT). The surgical outcomes were analyzed.

### Results:

The median survival time (MST) of patients with PVTT was 2.19 years for PVTT limited to the second order branch and 2.37 years for PVTT invading the first order branch. The MST of patients with HVTT was 3.95 years for HVTT limited to the major hepatic veins and 1.39 years for inferior vena cava invasion. Since the only recommended treatment option for advanced stage is palliative Sorafenib treatment with an expected median survival of 0.89 years, the survival benefit of surgical resection certainly exists in advanced stage.

### Conclusions:

Surgical resection for advanced HCC even with macroscopic vascular invasion can be identified in some selected cases.

# Vascular liver diseases and liver transplantation

Lerut Jan

## Customized Patient Care for Gastric Cancer

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Despite of the decreasing incidence, gastric cancer remains one of the common neoplasms and results in the 3<sup>rd</sup> leading cause of cancer-related death worldwide. Surgical resection is the most effective and potentially curative treatment for gastric cancer. In addition to the discipline of the radical eradication of gastric malignancy, our team devoted for years in developing the innovative surgical devices and techniques of minimal invasive surgery to minimize the operative stress and to reduce the post-operative complications.

Moreover, it has been realized that only a multidisciplinary team provides the best treatment strategy for the cancer patients. New modalities, including chemotherapy, radiation therapy, immunotherapy with target agents, and hormone therapy, have been documented to be proper adjuvant treatments along with the surgery, or even considered as alternatives for patients without feasible operation. In our institute, an integrated expertise team provides detail discussions and full-fledged plans during pre-operative assessments and postoperative adjuvant treatment and follow-up.

In more depth, we emphasize the importance of nutritional support and early rehabilitation program to accelerate the postoperative recovery. The para-medical supports not only stand for perioperative recovery, but also long-term postoperative care. The newly developed telecare system is organized with multidisciplinary teams for different types of cancers in our institute. To fit different postoperative requirements, a personalized plan of treatment will be established on the agreement of expertise. In fact, nutrition specialists are in companion with surgeons for adjusting treatment plans in out-patient-clinic. In addition, a new National Taiwan University Cancer Center, a new Radiation Science, and a proton therapy center are under construction, which would facilitate the most modern service for cancer treatment.

Certainly, the early detection of cancer may ensure an early and most successful treatment of the disease. In our society, several public health programs regarding cancer screening have been conducted in recent 20 years. The programs mainly cover most prevalent cancers, including those from gastrointestinal tract, breast, oral, and cervical origins. Our hospital provides a friendly way for those in need to access the health program. In addition, a separated health management center in National Taiwan University Hospital helps provide the high quality protocol though early cancer screenings to accomplish cancer treatments.

Taking together, the best treatment strategy for gastric cancer should be personalized. Along with the improvement of disease prognosis, a more delicate plan including early diagnosis, sharpened surgical skill, and effective adjuvant therapy should be arranged to accomplish the modern medicine for gastric cancer patients.

# **Optimal surgical approach for adenocarcinoma of the esophagogastric junction**

Yamashita Hiroharu

## Current clinical trials of laparoscopic gastrectomy for gastric cancer patients in Korea

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In the era of minimally invasive surgery, there are presently several trials underway in Korea, especially related to laparoscopic surgery for gastric cancer. These trials can be classified in two major categories; the trials related with the feasibility and oncologic safety of laparoscopic gastrectomy and the trials related with function-preserving gastrectomy.

Regarding the trials related with the feasibility and oncologic safety, KLASS-01 study is a first large-scale multicenter randomized controlled trial to compare laparoscopic distal gastrectomy (LDG) and open distal gastrectomy (ODG) in clinical stage I gastric cancer. Its long-term outcomes are expected to be published soon. KLASS-02 study is a phase III study to evaluate the efficacy of LDG with D2 lymph node dissection for advanced gastric cancer. The short-term outcomes of postoperative morbidity and quality control study were recently opened and the 3 year relapse-free survival will be analyzed in next year. KLASS-03 study is a phase II study to evaluate the safety of laparoscopic total gastrectomy (LTG) in patients with early stage gastric cancer.

Regarding the trials related with function-preserving surgery, SENORITA is a multicenter phase III trial to validate the clinical role of laparoscopy sentinel node biopsy. KLSS-04 and KLASS-5 are multicenter phase III trials to compare laparoscopic pylorus-preserving gastrectomy with LDG or laparoscopic proximal gastrectomy with double tract reconstruction with LTG in patients with middle third or upper third located early gastric cancers. These trials focus on not only reducing postgastrectomy syndrome but also improving nutritional outcomes and quality of life after surgery.

Recently, two KLASS trial series are preparing for the launch within this year. KLASS-06 trial is a multicenter study to compare laparoscopic spleen-preserving total gastrectomy with open total spleen-preserving gastrectomy for upper third advanced gastric cancer. KLASS-07 trial is a multicenter study to compare laparoscopy-assisted distal gastrectomy with totally laparoscopic distal gastrectomy.

## **Current status of robotic surgery in gastric cancer**

Kakiashvili Eli

## Treatment of gastric cancer in a low volume center

Valsangiacomo Pablo

## Billroth II with Braun reconstruction in the era of totally laparoscopic distal gastrectomy

Sang-Uk Han.

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### Objectives:

Theoretically, Braun anastomosis can divert a substantial amount of bile from the remnant stomach to the efferent loop, thereby it may reduce the afferent loop syndrome compared with Billroth II without Braun anastomosis. This simple and easy method may be used as a good alternative to Roux-en-Y reconstruction for patients undergoing totally laparoscopic distal gastrectomy (TLDG). However, it is unclear whether Billroth II Braun anastomosis results in superior perioperative outcomes when compared with Roux-en-Y reconstruction, or *vice versa*, after TLDG. (Methods) From Jan 2013 to Dec 2015, 56 patients who underwent TLDG for gastric cancer at Ajou University Hospital, followed by Billroth II Braun or Roux-en-Y reconstruction, were retrospectively analyzed. Surgical outcomes, including length of operation, quantity of blood loss, and postoperative complications, were compared in the two groups.

### Results:

Mean length of operation was significantly longer in the Roux-en-Y group than the Billroth II Braun group (157.3 min vs. 134.6 min,  $p < 0.010$ ), but length of hospital stay, blood loss, and complication rate did not differ between the two groups. Ileus occurred in three patients (10.0%) in the Roux-en-Y group. Endoscopic findings 6 months after surgery showed bile reflux in seven (28%) patients in the Billroth II Braun group and five (17.2%) in the Roux-en-Y group ( $p = 0.343$ ), but no significant differences in rate of gastric residue or degree of gastritis in the remnant stomach in the two groups. Regarding gastrointestinal symptoms during postoperative 6 months, Roux-en-Y groups showed various symptoms such as gas bloating, diarrhea, and dyspepsia, however there was no significant difference in occurrence rate between two groups (11.5% in the Billroth II Braun group vs. 30.0% in the Roux-en-Y group,  $p=0.114$ ).

### Conclusions:

These findings indicate that Billroth II Braun anastomosis may be a good alternative to Roux-en-Y reconstruction in treating bile reflux.

## **Treatment of difficult bile duct stones: Endoscopy & Surgery**

Akaraviputh Thawatchai

## Short term outcomes of billliary enteric anastomosis for different indications in a teaching tertiary hospital over two years.

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### Objective:

There are different types billiary enteric anastomosis done with literatures preferring one over the other for different reasons. This study is conducted to compare and see the outcomes of the commonly done billiary enteric bypass surgeries namely choledochoduodenostomy, choledocojejunostomy, hepaticojejunostomy, and cholecystojejunostomy

### Methods:

All patients admitted and operated in the duration of January 1 2013 up to December 31 2014 are included and chart review done retrospectively to fill out a preformed questionnaire and the data analyzed using 10.1 SPSS data processor.

### Results:

39 patients were operated in the duration Out of these 28(71.8%) were females and 11(28.2) were males. 18(46,2%) were in the age group 50 – 70 years and 14 patients age between 30 – 50 years. Over all 12 (30.7%) patient had postoperative complication 8 (20.5%) wound infections, three (7.7%) billiary leaks and one sepsis of pulmonary origin. All 19 cases Of choledochoduodenostomies, had no billiary leak but 3 (15.8%) had wound infection. 7 cases of choledocojejunostomies complicated with 2 (28.5%) wound infection. Seven cholecystojejunostomies done and there were two (28.8%) cases of wound infection and two cases (28.8%) of temporary billiary leak. Six patients had hepaticojejunostomy. of which one patient (16.7% ) had wound infection, one patient (16.7% )had transient billiary leak

### Conclusion:

Though the number of patients are small to induce deduction according to this study there is no statistically significant different in the immediate outcome of patients operated with all four types of billiary enteric anastomosis.

## Rediscovering the surgical bile duct exploration

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The treatment of gallstone disease has evolved since the upcoming of laparoscopic cholecystectomy. While improving the recovery of the patient and becoming one of the most common procedures in abdominal surgery, the subsequent exploration of the common bile duct in case of choledocholithiasis has not met an equal dissemination in the surgical community dominated by laparoscopy, maybe because of the high technicity required. In contrast, gastroenterologists are becoming more aggressive in the endoscopic procedures but they do not have an answer to all situations such as the growing population with a gastric bypass. On the hand of some clinical cases and video's, the importance of the surgical bile duct exploration is illustrated.

## The evolution of laparoscopic liver surgery: from innovation, through implementation, to mastery

*Perioperative and Oncological Outcomes of 2238 Patients from Four European Specialized Centers.*

### Objective:

To evaluate a large cohort undergoing laparoscopic liver resection (LLR) from 2000 to 2015, focusing on the technical approaches, perioperative and oncological outcomes, and evolution of practice over time.

### Methods:

The demographics and indications, intraoperative, perioperative and oncological outcomes of 2238 patients were evaluated. The trends in practice and outcomes over time were assessed.

### Results:

LLR has increased from 5% to 43%. Pure laparoscopy was used in 98.3% of cases. Wedge resections were the most common operation; they were predominant at the beginning of LLR and then decreased and reached a steady percentage at approximately 53%. Major hepatectomies were initially uncommon and then increased and reached a stable percentage at approximately 16%. Overall, 410 patients underwent resection in the posterosuperior segments; these were more frequent with time, and the highest percentage was in 2015 (26%). The blood loss, operative time and conversion rate significantly improved with time. The 5-year overall survival rates were 73% and 54% for hepatocellular carcinoma (HCC) and colorectal liver metastases (CRLM), respectively. The 5-year recurrence-free survival rates were 50% and 37% for HCC and CRLM, respectively.

### Conclusions:

Since laparoscopy was introduced, a long implementation process was necessary to allow for standardization and improvement in surgical care, mastery of the technique and the ability to obtain good perioperative results with safe oncological outcomes.

## My first twenty robotic right hepatectomy: our initial experience

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### Objective:

Firstly described in 2002, the robotic liver surgery didn't gain a wide acceptance due to its high cost and the lack of a standardized training program. Still considered a "development in progress" technique, we decided to evaluate the potential advantages of the robotic over laparoscopic approach for a complex liver procedure also in hands of a young surgeon during his initial experience.

### Methods:

We analyzed the postoperative outcomes of 20 patients undergoing to robotic right hepatectomy since March 2015 to September 2016.

### Results:

The overall mean operative time was 430 min (range 290,550) and the estimated blood loss was 325 ml (range 120,720), no blood transfusion was required. Only 2 patients (10%) underwent to conversion to open surgery both for oncologic reason; the overall morbidity was 3/20 (15%) and all complications occurred (two biliary fistula and one transient liver failure) were classified like minor according to Clavien-Dindo score. The histological characteristics showed a mean surgical margin of 25 mm and we achieved a R0 resection rate of 95% (19/20). The reoperation and 90-days mortality rate were both null. The 1-year overall and disease free-survival rate were 92.3% and 84.6% respectively.

### Conclusions:

Nevertheless some concerns regarding the cost-effectiveness and the absence of liver-specific robotic tools, the robotic right hepatectomy is a safe and feasible technique, providing interesting short-term outcomes and oncological results also in the initial phase of learning curve.

# Aberrant activation of placental growth factor/Neuropilin 1 pathway in intrahepatic cholangiocarcinoma: Therapeutic potential

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## Objectives:

To determine the role of placental growth factor (PIGF)/Neuropilin 1 (Nrp1) pathway in progression of intrahepatic cholangiocarcinoma (ICC).

Methods: We evaluated the expression of PIGF/Nrp1 in resected human ICC specimens, ICC patient-derived xenografts and genetically engineered mouse models. We also examined the downstream signaling in ICC, hepatic stellate cells (HSCs) and cancer-associated myofibroblasts (CAFs) upon PIGF stimulation or blockade and evaluated their interaction in *in vitro* co-culture systems. Finally, we tested *in vivo* the effect of anti-PIGF antibody in orthotopic (intrahepatic) mouse models.

## Results:

PIGF and Nrp1 were expressed in 87.8% and 100% of the resected specimens, respectively, and Nrp1 was expressed also in endothelial cells and CAFs. HSCs secreted more PIGF than ICC cells and PIGF expression was stimulated under hypoxic condition. PIGF or Nrp1 knockdown in ICC cells significantly inhibited proliferation though down-regulated Akt pathway. In CAFs, PIGF blockade down-regulated Akt signals and decreased the expression of profibrotic/activation markers ( $\alpha$ SMA/collagen I). PIGF stimulation or co-culture with CAFs led to significantly larger tumor spheroids and increased invasion. *In vivo*, PIGF knockdown (sh-PIGF) significantly inhibited orthotopic tumor growth and improved prognosis compared with control. Moreover, compared with sh-PIGF alone, combination with anti-PIGF treatment significantly showed potent anti-tumor effects, including low frequency of bloody ascites and reduced lung and lymph node metastasis. In tumor specimens, anti-PIGF treatment decreased the number of proliferating (Ki67+) cancer cells. In tumor microenvironment, treatment inhibited angiogenesis (number of CD31+ vessels) and increased pericyte coverage (CD31+/ $\alpha$ SMA+), indicative of vascular normalization, and also reduced desmoplasia (the number of myofibroblasts and content of extracellular matrix components). As a result, anti-PIGF treatment reduced intratumor hypoxia (evaluated by qPCR by *HIF1a*).

## Conclusion:

PIGF/Nrp1 blockade showed potent antitumor effects. Treatment effects on tumor stroma indicated normalization of tumor vessels and microenvironment, which holds promise for combinations with other therapies (cytotoxics, immunotherapy) in this intractable disease.

## Preliminary report of percutaneous cholecystostomy as diagnosis and treatment of biliary tract trauma

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### Objective:

Biliary leak following severe blunt liver injuries (BLI) is a complex problem becoming more frequent with improvements of non-operative management (NOM). Standard treatment requires main bile duct drainage usually performed by endoscopic sphincterotomy and stent placement. We report our experience with cholecystostomy as a first minimally invasive diagnostic and therapeutic approach.

### Methods:

We performed a retrospective analysis of consecutive patients with post-traumatic biliary leak between 2006 and 2015. In the first period (2006-2010), biliary fistula was managed using perihepatic drainage and endoscopic, percutaneous or surgical main bile-duct drainage. After 2010, cholecystostomy as an initial minimally invasive approach was performed.

### Results:

Of 341 patients with BLI, 21 had a post-traumatic biliary leak. Ten patients received standard treatment and eight patients underwent cholecystostomy. The cholecystostomy (75%) and the standard treatment (80%) groups presented similar success rates as first biliary drainage procedure ( $p=0.80$ ). Cholecystostomy presented no severe complication and resulted when successful in a bile flow rate inversion between the perihepatic drains and the gallbladder drain within a median [IQR] 4 days [1-7]. The median time for bile leak resolution was 26 days in the cholecystostomy group and 39 days in the standard-treatment group ( $p=0.09$ ). No significant difference was found considering median duration of hospital stay (54 and 74 days respectively,  $p=0.37$ ) or resuscitation stay (17.5 and 19.5 days,  $p=0.59$ ).

### Conclusion:

Cholecystostomy in NOM of biliary fistula after BLI is an effective, simple, and safe first-line procedure in the diagnostic and therapeutic approach of post-traumatic biliary tract injuries.

## Pathologic Grade and Multiphase Contrast-enhanced Computed Tomography Attenuation Level in Pancreatic Neuroendocrine Tumor

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### Objectives:

We aimed to investigate whether computed tomography (CT) enhancement pattern is associated with the pathologic tumor grade and can predict that of pancreatic neuroendocrine tumor (PNET).

### Methods:

Ninety PNET patients who underwent multi-phase enhanced CT before pathologic diagnosis between 2011 and 2015 were retrospectively reviewed. CT enhancement values at each phase were measured and its relation with pathologic grade was assessed.

### Results:

Ninety pancreatic NETs included sixty-two G1 (68.9%), twenty-one G2 (23.3%), seven G3 (7.8%). The enhancement values of the early arterial phase were significantly different among three groups (G1 vs. G2;  $p=0.043$ , G1 vs. G3;  $p=0.001$ , G2 vs. G3;  $p=0.027$ ). In the late arterial phase, there was a difference between grade 1/2 and 3 but no significant difference between grade 1 and grade 2 (G1 vs. G2;  $p=0.804$ , G1 vs. G3;  $p=0.016$ , G2 vs. G3;  $p=0.022$ ). The enhancement value of the portal phase did not differ significantly among the three groups. Diagnostic ability of the early arterial enhancement value for the differentiation of the grade 1 (cutoff value 109.5HU; sensitivity 73.3%; specificity 62.5%) was comparable to that of the tumor size (cut-off value 20.5mm; sensitivity 68.9%; specificity 66.7%)

### Conclusions:

CT enhancement value at early arterial phase and its changing pattern can be a useful predictor for the differentiation of pathologic grade of pancreatic neuroendocrine tumors.

# **Small non-functioning pancreatic Neuroendocrine Tumors (PNET): observation or resection ?**

Sauvanet Alain

## Analysis of Long-term Outcome and Risk Factors of Recurrence in Patients with Resectable Pancreatic Neuroendocrine Tumors

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### Objectives:

The incidence of pancreatic neuroendocrine tumors (PNET) is increasing in past 30 years. However, the experience of each hospital, esp. in Asia country, is rare. Several studies from western countries suggested small PNET ( $\leq 2$ cm) could be followed up with no need of resection. The optimal management about this issue is still controversial. This study analyzed the parameters to predict recurrence of PNET and re-appraised whether the policy of "non-operative management for small PNET" is optimal.

### Methods:

The clinicopathologic profile, surgical findings, and postoperative follow-up were retrospectively collected for patients with resectable PNET from 1995 to 2012. The end of follow-up was Oct. 2017. We statistically analyzed recurrence pattern and identified the independent predictors.

### Results:

There were totally 126 PNET patients with mean age 52.7 years old. Only 19.8% of patients have functional PNET symptoms. The median size of tumor was 2.55 cm. Most of tumors (73%) located at neck, body or tail. The no. of each grading is G1 86, G2 37, and G3 3. The no. of AJCC staging is IA:52 IB:19 IIA:20 IIB:14 III:1 IV: 20. We found 8.8% of small PNET ( $\leq 2$ cm) was G2 lesion, and 5.3% of small PNET has LN mets. G1 PNET has 8.1% with regional LN mets. The median recurrence free survival has not reached. 17.14% of patients has recurrence. The presence of symptoms, duration, age, and operative methods do not correlate with earlier recurrence. By Kaplan-Meier estimates, AJCC(7<sup>th</sup>) staging predicted recurrence well. The independent predictors of recurrence are G grade, regional LN mets, and positive margin.

### Conclusions:

G grade, regional LN mets, and positive margin are the independent predictors of earlier recurrence. Small PNET or G1 PNET has non-negligible proportion of regional LN mets. We recommend all PNET including small PNET should be resected and regional LN dissection should be performed.

**Neuroendocrine liver metastases – current surgical perspectives**

Cerwenka Herwig

## Vascularity and Tumor Size are Significant Predictors for Recurrence after Resection of Pancreatic Neuroendocrine Tumor

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### Objectives:

It is difficult to identify the high risk patients of recurrence after pancreatectomy for pancreatic neuroendocrine tumor (PNET) only using grading classification, especially in the G2 category which includes both benign and low- and high-grade malignant tumors.

### Methods:

Forty-one patients with PNET who underwent pancreatectomy were enrolled. We defined the CT-ratio as the CT value of the tumor divided by that of non-tumorous pancreatic parenchyma using the late arterial phase dynamic CT. The optimal cut-off values for the CT-ratio and tumor size were determined using p-values that were calculated using the log-rank test.

### Results:

The optimal cut-off values of the CT-ratio and tumor size for dividing patients according to the greatest difference in the disease-free survival (DFS) were 0.85 ( $p < 0.001$ ) and 3.0 cm ( $p < 0.001$ ). The CT-ratio ( $p = 0.007$ ) and tumor size ( $p = 0.003$ ) were individually associated with the Ki-67 proliferative index in analysis by Spearman's correlation coefficient. Cox proportional hazard analysis identified that CT-ratio  $< 0.85$  ( $n = 10$ ,  $p = 0.006$ ) and tumor size  $> 3.0$  cm ( $n = 13$ ,  $p = 0.023$ ) to be independent prognostic factors associated with the DFS. All patients in the CT-ratio  $> 0.85$  and tumor size  $< 3.0$  cm group ( $n = 23$ , including 7 patients with G2) did not develop recurrence after surgery. On the other hand, the 5-year DFS in the CT-ratio  $< 0.85$  and tumor size  $> 3.0$  cm group ( $n = 5$ , including 3 patients with G2) was zero.

### Conclusions:

PNETs with a CT-ratio  $< 0.85$  and tumor size  $> 3.0$  cm should be considered to have high risk of recurrence after pancreatectomy.

## Upfront resection of pancreatic neuroendocrine tumors: analysis of prognostic factors of survival

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### Background:

Pancreatic neuroendocrine tumors (pNET) remain rare, with few large series evaluating prognostic factors of survival after resection. The present study aimed to evaluate short and long-term outcomes after resection of pNET in a large cohort.

### Methods:

This study retrospectively evaluated 131 consecutive pancreatic resections performed for PNET between January 1995 and December 2016. The 2010 World Health Organization grading system was used for classifying all specimens. Univariate and multivariate Cox analysis were performed to assess survival prognostic factors.

### Results:

Median age was 56 (range, 18-80, years) and there were 106 non-functioning tumors (81.5%) and 11 tumors in the context of an inherited syndrome. There were 32 pancreaticoduodenectomies, 51 splenopancreatectomies, 27 distal pancreatectomies, 5 total pancreatectomy and 16 various parenchymal-sparing resections. Forty-three patients (32.8%) had synchronous metastatic disease. Forty-five patients required extended resections including: synchronous liver resection (27), portal vein resection (10) or resection of adjacent invaded organs (11). Overall mortality and morbidity were 0.7% and 38%. The 1-,3-,5-, and 10-year overall survival rates were 96%,87%,76% and 56%, respectively. In presence of synchronous liver metastases, the 1-,3-,5-, and 10-year overall survival rates were 92%,78%,61% and 34%, respectively. In multivariate analysis, tumor grade ( $P<0.0001$ ) and synchronous metastatic disease ( $P=0.006$ ) were identified as independent poor prognostic factors.

### Conclusions:

Tumor grade and presence of synchronous metastatic disease were identified as prognostic factors of overall survival in resected pNET. Even in presence of synchronous liver metastases, long term survival can be achieved.

## The evaluation of soft pancreas during operation using elastography

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### Introduction:

Postoperative pancreatic fistula (POPF) is still regarded as a most serious and important complication. It has been reported a rate of occurrence of the POPF is due to the stiffness of the pancreas. However, pancreatic stiffness is judged subjectively by surgeons, without objective criteria.

### Aims:

In the present study, pancreatic stiffness was quantified using intraoperative ultrasound elastography, and its relevance to was investigated.

### Materials and Methods:

62 patients underwent elastography during PD at our department from June 2012 to December 2016.

### Methods:

Measured Velocity of shear wave ( $V_s$  value, m/s) by Acoustic Radiation Force Impulse (ARFI). Velocity of shear wave of the 10 locations of pancreatic stump. The average value of the 8 points expect for the upper and lower measured value. The definition of POPF used that proposed by the ISGPF. In this study, we classified No-POPF Group (no fistula, and Group A) and POPF Group (Group B and C). and also the examination of the stiffness of the pancreas take effect pathologically.

### Results:

The final diagnosis were pancreatic carcinoma ( $n=31$ ), intraductal mucinous neoplasm ( $n=15$ ), bile duct carcinoma ( $n=8$ ), papilla ampulla carcinoma ( $n=3$ ), pancreatic neuroendocrine tumor ( $n=1$ ), serous cyst adenoma ( $n=1$ ), chronic pancreatitis ( $n=1$ ), duodenum carcinoma ( $n=1$ ), Ewing sarcoma ( $n=1$ ). Multivariate analysis showed that pancreatic carcinoma or not and  $V_s$  ( $1.885\text{m/s} <$ ) value are associated with pancreatic fistula. It was proved pathologically.

### Conclusions:

Pancreatic stiffness can be quantified using intraoperative elastography. Elastography can be used to diagnose stiffness of pancreas and may be thus be useful in predicting the occurrence of POPF. In the future, if the change of the operative method and drainage method could select by this intraoperative evaluation, it was thought to prevent POPF.

# **Neoadjuvant chemotherapy for patients with resectable pancreatic cancer**

Unno Michiaki

## Updates on management of locally advanced pancreatic cancer

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The definition of locally advanced pancreatic cancer and its resectability have been changed during the last decades. However many issues remain to be unclear.

The aim is to highlight the current state of resectability for locally advanced pancreatic cancer.

The literature data as well as our institution experience were analysed in order to evaluate the main challenges and advances of venous and arterial resection for locally advanced pancreatic cancer.

Recent consensus review of the guidelines for treatment of pancreatic cancer showed agreement on work-up methods despite the lack of evidence. However there exists a disagreement with insufficient evidence on the point of definition of borderline resectable pancreatic cancer and portal vein resection. We proposed the own combination of computed tomography with angiography for detection of vascular involvement. The results of treatment of patients underwent vascular resection in our study are reported to be beneficial comparing to those of standard resection given more advanced adjuvant therapy of former ones.

Literature data and our experience demonstrated the role of radiological work-up and need for advanced chemotherapeutic approach. Minimally invasive approach for extended pancreatectomy with vascular resection remains an extremely rare procedure and so far is not justified as beneficial.

## **Central pancreatectomy - the Dagradi-Serio-Iacono operation: past, present and future.**

Iacono Calogero

## Recent Advance of palliative chemotherapy of advanced pancreatic cancer

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Pancreatic adenocarcinoma (PC) is one of the fatalist malignancies. A large proportion of patients are diagnosed with unresectable stage at the time of presentation. Gemcitabine is a standard chemotherapeutic agent since 1997, but survival benefit is not satisfactory. Recent clinical study proved that several new combination chemotherapy regimens (FOLFIRINOX, gemcitabine with nab-paclitaxel (Gnp)) are superior to gemcitabine single chemotherapy, and extended overall survival. The current standard therapy for metastatic PC patients with good performance status is either FOLFIRINOX or Gnp. However, no head-to-head clinical trials comparing these two new regimens have been published and inter-study comparisons are limited. FOLFIRINOX significantly increased grade 3 neutropenia compared with gemcitabine (45.7% vs 21%), as well as febrile neutropenia (5.4 vs 1.2%), thrombocytopenia, diarrhea, and neuropathy. Gemcitabine is an appropriate treatment option for patients who choose to receive less-toxic therapy, and those who have either poor PS or comorbidity profiles.

In NAPOLI-1 phase III randomized trial, the effects of nanoliposomal irinotecan were examined in patients with metastatic PC who previously received gemcitabine-based therapy. Median progression free survival (PFS) was 3.1 months vs. 1.5 months, which was statistically significantly greater for patients who received nanoliposomal irinotecan with 5-FU/leucovorin compared with patients who did not receive irinotecan ( $P < .001$ ). Irinotecan liposomal injection, combined with 5-FU/leucovorin, was approved by the US FDA as second-line treatment following gemcitabine-based therapy. Retrospective study showed that GnP can extend PFS survival with an acceptable toxicity as second-line treatment following FOLFIRINOX. Recently, more attention has been paid to immunotherapy to abolish immune bypass mechanisms. However, current evidence strongly suggests critical limiting challenges ahead for evolvement of immunotherapy in PC treatment, due to the poorly immunogenic nature of PC.

## Intra-arterial (IA) chemotherapy of locally advanced pancreatic cancer

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### Aim:

To study the results of IA-chemotherapy in unresectable, locally advanced pancreatic cancer.

### Materials and methods:

Between 2002 and 2016, IA-chemotherapy was performed in 220 pts (109 men, 111 women, mean age 60 years) with morphologically proven pancreatic adenocarcinoma of TNM stages T<sub>3-4</sub> N<sub>0-1</sub> M<sub>0</sub> located in the pancreatic head (76%), body (20%) or tail (4%). Obstructive jaundice (68% of patients) was treated by surgery or PTBD before IA-chemotherapy.

Celiac artery infusion (340 CAI, 1 to 6, mean 2) of gemcitabine 1000 mg/m<sup>2</sup> (since 2012 plus oxaliplatin 75 mg/m<sup>2</sup>) every 4 wks was performed in 168 pts. Oily chemoembolization (109 OCE, 1 to 7, mean 2; gemcitabine 600-1000 mg/m<sup>2</sup> with 3-5 ml Lipiodol in the feeding arteries; every 4 wks) was made in 52 pts. Combined treatment (OCE + CAI, gemcitabine 500+500 mg/m<sup>2</sup>) was used in 44 pts (143 procedures, 1 to 6, mean 3.2).

Only pts who received  $\geq 3$  courses of IA-therapy were considered and stratified according sex, gender, tumor stage, and dose of chemotherapy.

### Results:

60 pts (20+20+20) were stratified, all had pancreatic head adenocarcinoma. The first treatment course of CAI resulted in partial response in 6 (30%), stable disease in 7 (35%), and tumor progression in 7 pts (35%). The rates of PR, SD, and PD were 40%, 25%, and 35% after OCE and 30%, 40%, 30% after OCE+CAI. All 60 pts died; the mean survival was 15.0 $\pm$ 4.8, 14.1 $\pm$ 3.9, and 17.9 $\pm$ 3.3 mo, respectively (P>0.05).

### Conclusion:

Regular courses of IA-therapy (CAI, OCE, CAI+OCE) cause tumor control in 2/3 of pts with locally advanced pancreatic head adenocarcinoma. Improvement of survival in these patients can be expected. Following studies including individualization of IA-methods of treatment are necessary.

## Radiologic predictive features of hepatic metastasis in patients with pancreatic adenocarcinoma

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### Objectives:

To evaluate the imaging predictive findings of hepatic metastasis in patients with pancreatic adenocarcinoma.

### Methods:

This retrospective study included 590 patients with pathologically confirmed pancreatic adenocarcinoma between January 2012 and December 2013 who underwent initial multi-phase CT and pertinent follow-up images. We evaluated the relationship between hepatic metastasis within six months of initial work-up studies and the radiologic findings of intrahepatic arterioportal (AP) shunt, invasion of portal/superior mesenteric/splenic veins (PV/SMV/SV), thrombus in PV/SMV/SV, and bile ductal dilatation shown on initial dynamic CT scan.

### Results:

The invasion of PV/SMV/SV and thrombus in PV/SMV/SV shown on initial dynamic CT were significantly associated with the manifestation of hepatic metastasis within six months (relative risk 2.74; 95% CI 2.07-3.62;  $p < 0.0001$ , relative risk 2.15; 95% CI 1.57-2.93;  $p < 0.0001$ , respectively). The presence of intrahepatic AP shunt or bile ductal dilatation on initial CT had no significant relationship with the manifestation of hepatic metastasis within six months ( $p = 0.9165$  and  $p = 0.1055$ , respectively)

### Conclusions:

The invasion of PV/SMV/SV and thrombus in PV/SMV/SV on initial CT scans were the predictive findings of hepatic metastasis in patients with pancreatic adenocarcinoma.

## Tailored Pancreatic Reconstruction after Pancreaticoduodenectomy: A Single Center Experience of 892 Cases

Waleed Askar, Ayman El Nakeeb.

### Background:

Pancreatic reconstruction following pancreaticoduodenectomy (PD) is still debatable even for pancreatic surgeons. Ideally, pancreatic reconstruction after PD should reduce the risk of POPF and its severity if developed with preservation of both exocrine and endocrine pancreatic functions. It must be tailored to control the morbidity linked to the type of reconstruction. This study was planned to show the best type of pancreatic reconstruction according to the characters of pancreatic stump.

### Patients and method:

We studied all patients who underwent PD in Gastroenterology Surgical Center from January 1993 to December 2015. Patients were categorized into three groups depending on the presence of risk factors of postoperative complications. Low risk group (absent risk factor, G1), moderate risk group (presence of one risk factor, G11) and high risk group (presence of two or more risk factors, G111).

### Results:

892 patients underwent PD for resection of periampullary tumor. BMI > 25, liver cirrhosis, soft pancreas, pancreatic duct <3mm, and pancreatic duct location from posterior edge < 3mm are risk variables for development of postoperative complications. Postoperative pancreatic fistula (POPF) developed in 128 (14.3%) patients. Delayed gastric emptying occurred in 164 (18.4%) patients, biliary leakage developed in 65 (7.2%) and pancreatitis presented in 20 (2.2%) patients. POPF in G1, G11 and G111 were 26 (8.3%), 65 (15.7%), and 37 (22.7%) patients respectively. Postoperative morbidities and mortality were significantly lower with pancreaticogastrostomy (PG) in G111 while pancreaticojejunostomy (PJ) decreases incidence of postoperative steatorrhea in all groups.

### Conclusion:

Selection of proper pancreatic reconstruction according to the risk of patients may reduce POPF and postoperative complications and mortality. PG is superior to PJ as regards short term outcomes in high risk group but PJ provides better pancreatic function in all groups. So, PJ is superior in low and moderate risk groups.

## **Current status of laparoscopic liver resection**

Han Ho Seong

## Current and future perspectives in primary liver tumors

Polak Wojciech

## **"The X-Y classification : An easy way to define resectability of perihilar cholangiocarcinoma »**

Boudjema Karim

## **Skulpturing the liver for more and safer hepatectomies**

Torzilli Guido

**Personalized medicine for hepato-biliary-pancreatic malignancies**

Do brila-Dintinjana Renata

# **Common practice and controversies in the the surgical treatment of pancreas cancer**

Dervenis Christos

## Multidisciplinary therapy for hepatic metastases from gastric carcinoma

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### Objectives:

The indication for surgery in hepatic metastases seems to depend on which type of cancer they originate from. Unlike the case with colorectal cancer, gastric cancer hepatic metastases have rarely been considered as oncologically resectable. Methods: In order to prepare for a clinical question on hepatic metastasis in the Japanese Guidelines for the Treatment of Gastric Cancer Ver. 4, literature research was conducted using the PubMed. Consequently, solitary metastasis was found to be the prognostic factor in several case series, and the indication for surgical treatment was found not to be deniable for a limited population of patients with this disease (Kodera et al. Gastric Cancer 2014;17:206-12, presented also at the IASGO in Bucharest,). Further literature search was conducted as a follow up.

### Results:

After the initial literature search, a largest single-institution study was reported from Yonsei University, Korea, and the largest multi-institution series from Kinoshita et al., Japan. In several latest series including these two reports, 5-year survival rates in carefully selected case series exceeded 30%, justifying surgical intervention even in this challenging disease. Although the number of metastatic nodules is one of important criteria for proceeding to surgery, the methodology to evaluate the number had been varied due to the chronological progress in the diagnostic imaging modalities. The most recent report featured a case-series selected based on the contrast-mediated MRI, in which 28 patients with  $\leq 3$  metastatic nodules benefited with a 5-year survival rate of 32% (Tatsubayashi et al. Gastric Cancer 2017; 20: 387-393).

### Conclusions:

Gastric cancer hepatic metastases in carefully selected patients based on the number of metastatic nodules could be indicated for hepatectomy with long-term outcomes that cannot be denied. Prospective clinical trials to further explore the treatment strategy for this disease is warranted.

## **The multicenter comprehensive methodological and technical analysis of 832 pressurized intraperitoneal aerosol chemotherapy (PIPAC) interventions performed in 349 patients for peritoneal carcinomatosis treatment. An international survey study.**

**M. Nowacki**, M Alyami, L. Villeneuve, M. Hubner, W. Willaert, W Ceelen, M. Reymond, D. Pezet, C. Arvieux, V. Khomyakov, L. Lay, S. Gianni, W. Zegarski, N. Bakrin, O. Glehen.

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### Introduction:

The Pressurized intraperitoneal aerosol chemotherapy (PIPAC) is a new drug delivery method offered for selected patients suffering from peritoneal carcinomatosis (PC). There are still a lack number of publications analyzing in details the multicenter PIPAC programs. That is why we distributed a survey among 15 PIPAC centers actively reporting their clinical findings in scientific literature.

### Methods:

The established and fully prepared by author's survey has been sent electronically to the all most relevant and active PIPAC centers on the world. The survey was proposed on a voluntary basis. The questionnaire was reviewed beforehand by 2 surgeons (MN, MA), and consisted of a 34 questions. The survey was conducted over a period of 3 months starting from March 2017.

### Results:

From the total number of 15 prepared and distributed questionnaires we have received answer from 12 centers (80%) but only 9 responds were proved to be fully and accurately completed and finally accepted to study (60%) in order to preserve the full scientific and meritorious purity. Respondents represented centers from six countries: Argentina, Belgium, France, Germany, Russia and Switzerland. In this study we have obtained data related to the practical and technical aspects of PIPAC procedures performed in each center.

### Conclusion:

This data can confirm that the execution of the PIPAC procedure, while preserving all general conditions to be safe for patients. We are also confident that the high standardization of the procedure will allow it to be properly verified in the future in different clinical trials and multicenter evaluation projects.

## **Cytoreductive surgery and hyperthermic intraperitoneal chemotherapy for peritoneal carcinomatosis in the elderly – A case-controlled, multicenter study**

**M. Alyami**, P. Lundberg, V. Kepenekian, D. Goéré, J.M. Bereder, S. Msika, G. Lorimier, F. Quenet, G. Ferron, E. Thibaudeau, K. Abboud, R. Lo Dico, D. Delroeux, C. Brigand, MD, C Arvieux, F. Marchal, J.J. Tuech, J.M. Guilloit, F. Guyon, P. Peyrat, D. Pezet, P. Ortega-Deballon, F. Zinzindohoue, C. de Chaisemartin, R. Kianmanesh, O. Glehen, G. Passot.

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### Objective:

To identify factors associated with morbidity and mortality in patients over 70 years who underwent cytoreductive surgery (CRS) and hyperthermic intraperitoneal chemotherapy (HIPEC) for peritoneal carcinomatosis (PC).

### Background:

Major surgery is associated with higher morbidity and mortality in elderly patients. For PC, CRS and HIPEC is the only current potential curative therapy, but the risks inherent to this patient population have called its benefits into question.

### Methods:

We retrospectively analyzed a prospectively maintained, multi-center database from 1989 to 2015. All patients who underwent CRS and HIPEC for PC were selected and patients older than 70 were matched 1:4 with a younger cohort according to cancer origin, peritoneal cancer index (PCI), and completeness of cytoreduction. Major morbidity and mortality were analyzed.

### Results:

Out of 2328 patients, 188 patients over 70 were matched with 704 younger patients. Patients over 70 demonstrated a higher American Society of Anesthesiologist score ( $\geq$  ASA III 10.8% vs. 6.6%,  $p=0.008$ ). There was no difference in overall 90-day morbidity ( $\geq 70$ : 45.7% vs.  $<70$ : 44.5%;  $p=0.171$ ), however patients over 70 had significantly more cardiovascular complications (13.8% vs 9.2%,  $p=0.044$ ). Differences between the older and younger cohorts failed to reach significance for 90-day mortality (5.4% and 2.7%, respectively;  $p=0.052$ ), and failure-to-rescue (11.6% and 6.1%, respectively;  $p=0.078$ ). In multivariate analysis,  $PCI > 7$  (95%CI: 1.051-5.798,  $p=0.038$ ) and HIPEC duration (95%CI: 1.106-6.235,  $p=0.028$ ) were independent factors associated with morbidity.

### Conclusion:

CRS and HIPEC appear feasible for selected patients over 70, albeit with a higher risk of medical complications associated with increased mortality.

## **Ninety-day postoperative morbidity and mortality using the national cancer institute's common terminology criteria for adverse events better describe post-operative outcome after CRS and HIPEC**

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### Background:

The postoperative morbidity and mortality after CRS-HIPEC has been widely evaluated. However, there is a major discrepancy between rates reported due to different metrics used.

### Objective:

To evaluate the legitimacy of 90-day morbidity and mortality based on the (NCI-CTCAE) v4.0 classification as criteria of quality for CRS-HIPEC.

### Methods:

A prospective database of all patients undergoing CRS-HIPEC for peritoneal carcinomatosis between 2004 and 2015 was queried for 90-day morbidity and mortality, and survival.

### Results:

Among 881 patients, the 90-day major complication rate based on NCI-CTCAE classification and Clavien-Dindo's classification were 51% (n=447 patients) and 25% (n=222 patients), respectively. Among patients who presented with a 90-day complication based on the NCI-CTCAE classification, 50% (n=225 patients) presented a medical complication not reported by Clavien-Dindo's classification. After surgery, 24 patients (2.7%) died of postoperative complications, for only 10 (42%) of them the death occurred within 30-day after surgery.

### Conclusion:

Among commonly reported morbidity's classification, 90-day morbidity based on NCI-CTCAE classification represents a legitimate metric of CRS-HIPEC quality. Postoperative morbidity after CRS-HIPEC should be reported using 90-day NCI-CTCAE.

## PIPAC procedure for non-resectable peritoneal carcinomatosis (with video)

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### Background:

Peritoneal carcinomatosis (PC) is a common evolution of abdominal cancers and is associated with poor prognosis in the absence of aggressive multimodal therapy (1). Pressurized intraperitoneal aerosol chemotherapy (PIPAC) is a safe and innovative approach, which enhances the effect of chemotherapy (2) without reported renal/hepatic toxicity (3,4). It requires mastery of technical aspects to reduce postoperative morbidity, increase effectiveness, and prevent caregiver chemotherapy exposure. We therefore report herein the surgical protocol after two years of implementation in our university center specialized in PC management, accompanied by a short video, to share our experience.

### Methods:

The procedure was performed under general anesthesia and capnoperitoneum (12mmHg, 37°C) using two balloon trocars placed on the midline, in accordance with the open laparoscopic technique. Explorative laparoscopy allowed Sugarbaker peritoneal cancer index to be determined. Parietal biopsies were taken and ascites was removed for peritoneal cytology. The nebulizer was inserted and connected to a high-pressure injector. A pressurized aerosol containing chemotherapy agents was then administered; cisplatin (7.5mg/m<sup>2</sup> in 150ml 0.9%NaCl) immediately followed by doxorubicin (1.5mg/m<sup>2</sup> in 50ml 0.9%NaCl), or oxaliplatin alone (92mg/m<sup>2</sup> in 150ml 0.9%NaCl), based on PC origin and chemotherapy history. Aerosol was kept in a steady-state for 30 min then exhausted through a closed filter system and trocars were retracted. Each step is illustrated in the video.

### Conclusion:

This video protocol provides a better understanding of the PIPAC procedure and the safety measures essential for this method of chemotherapy administration. It should help all teams wishing to implement a PIPAC therapy program.

## Predictive utility of preoperative prognostic nutritional index in patients with early-stage gastric cancer

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Masayuki Urabe.

### Objectives:

Postoperative relapse are rare events in patients with early-stage gastric cancer, and causes of deaths among such a population are thus mainly comprised of other diseases. However, tools to prognosticate mortality from non-primary diseases are limited before surgery. Prognostic nutritional index (PNI) has been frequently proposed as a predictive indicator in various solid tumours including gastric cancer. We retrospectively assessed the relationship between preoperative PNI and long-term outcome in early gastric cancer, especially focusing on mortality from other diseases.

### Methods:

Preoperative PNI were retrospectively examined in 903 consecutive patients who underwent curative surgical resection for T1 (mucosal/submucosal) gastric adenocarcinoma from 1999 to 2014. Patients with synchronous malignancies, liver cirrhosis, collagen diseases, or inflammatory diseases were excluded. The survival time was evaluated with log-rank test and Cox regression analysis.

### Results:

Of 903 enrolled patients, 9 died of recurrence, whereas 29 died of other malignancies and 47 died of non-tumorous diseases (e.g. pneumonia) during the follow-up period (median 69.8 months). Preoperative PNI, as a continuous variable, was significantly correlated with overall survival (OS) and disease-specific survival (DSS) in univariate Cox regression analysis (both  $P < 0.001$ ). In multivariate analysis adjusted with clinicopathological factors (age, gender, location, histology, submucosal invasion, nodal metastasis, and lymphatic/venous involvement), preoperative PNI still showed independent correlation with OS (HR per 10-unit increase 0.65, 95% CI 0.52-0.81;  $P < 0.001$ ) but not with DSS ( $P = 0.43$ ). Preoperative PNI (mean  $\pm$  SD) was  $47.1 \pm 4.7$  in 9 patients dying of recurrence,  $48.8 \pm 6.0$  in 29 patients dying of other malignancies,  $45.9 \pm 6.7$  in 47 patients dying of other non-tumorous diseases, and  $49.8 \pm 6.0$  in censored population ( $n = 818$ ), indicating significant differences among them ( $P < 0.001$ , ANOVA).

### Conclusions:

Preoperative PNI is of value to prognosticate long-term outcome in early-stage gastric cancer, especially mortality from other diseases.

## Challenges of setting up dedicated peritoneal surface malignancy centre in resource limited settings

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A newly established surgical oncology service in Pakistan has started management of peritoneal surface malignancies (PSM) almost a year ago. Looking back at the process of development, the problems and challenges faced were identified.

The challenges of dealing with management of PSM were multifaceted. These include lack of awareness of physicians and patients, lack of organized multidisciplinary teams for PSM management, appropriate perioperative management including anaesthesia, theatre staff and intensivists, and availability of equipment for delivery of HIPEC.

These challenges are looked at from the standpoint of resource-limited settings. We describe how each of these challenges were dealt by our team. Possible solutions in view of our experience in setting up a peritoneal surface oncology service in a developing country are put forward. This will serve as a guide to centres interested in developing programs especially in resource limited settings.

## Correlation between the immunohistochemical expression of c-MET, IGF-1R y VEGFR-2 and the recurrence of gastric adenocarcinoma.

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### Introduction:

Gastric adenocarcinoma has a poor prognosis, with a 5-year survival of 30%. This has led to the research of complementary treatments including molecular targeted.

### Objectives:

To determine the expression of c-MET, IGF-1R and VEGFR-2 markers in gastric adenocarcinoma cells in the gastrectomy specimen biopsy and to correlate clinical, anatomopathological and immunohistochemical data with tumor recurrence.

### Method:

This retrospective study was performed on 245 patients who underwent gastrectomy for adenocarcinoma between 2000 and 2012. The immunohistochemical analysis was made using the tissue microarray technique. A Cox uni and multivariate proportional hazards model was constructed to evaluate the effect of T and N stage, histological grade, Lauren histological type and the 3 biomarkers in the relation to recurrence.

### Results:

The expression of the tumor markers was 27.3% for c-MET, 19.2% for IGF-1R and 1.6% for VEGFR-2. The absence of c-MET expression was associated with an increased nodal involvement, higher histological grade and diffuse Lauren type. The absence of IGF-1R expression was correlated with greater nodal involvement and diffuse type. The median time to recurrence was 24 months (95% IC, 15-36) with 46% recurrences. In the univariate analysis, stage T3/4, diffuse type and differentiation grade 2/3 were associated with an increased risk of recurrence. In multivariate analysis only T and N stages had prognostic value.

### Conclusions:

None of the 3 biomarkers studied influenced directly the recurrence of the gastric adenocarcinoma, having only T and N parameters prognostic value.

## Multicentric initial experience with the use of the Pressurized Intraperitoneal Aerosol Chemotherapy (PIPAC) in the management of unresectable peritoneal carcinomatosis.

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### Background:

PIPAC is a recent approach for intraperitoneal chemotherapy with promising results for patients with PC. We aimed to evaluate the postoperative outcome of pressurized intraperitoneal aerosol chemotherapy (PIPAC) in patients with non-resectable peritoneal carcinomatosis (PC) during our initial experience of the technique.

### Methods:

All patients who underwent PIPAC for non-resectable PC in three centers experienced in the management of peritoneal carcinomatosis (PC), were analyzed regarding postoperative outcomes.

### Results:

From December 2015 to December 2016, 73 patients underwent 164 PIPAC. PC was from colorectal, gastric, ovarian, malignant mesothelioma, pseudomyxoma peritonei or other origins in 20, 26, 13, 8, 1 and 5 patients, respectively. At the time of the first PIPAC, the median PCI was 19 (1-39), and 57 patients presented with symptomatic PC (pain: 33; ascites: 35; transit disorder: 11). Forty-five (62%), 31 (42%), 8 (11%), 6 (8%), 1 (1%) patients underwent a second, third, fourth, fifth, and sixth PIPAC, respectively. Major complications occurred for 16 PIPAC (9.7%). For 64 (88%) patients, systemic chemotherapy was associated with PIPAC and could be administered after PIPAC with a median delay of 14 days (2-28). Among 57 patients with preoperative symptoms related to PC, 31 (63.5%) patients presented with complete disappearance of symptoms. PCI improved in 64.5% of patients.

### Conclusions:

Implementing a PIPAC program in association with systemic chemotherapy is feasible and is associated with a risk of postoperative morbidity, even in teams highly experienced in PC management. International consensus is mandatory to determine a standardized PIPAC protocol.

## Survival of 456 esophagel cancer patients after surgical and non-surgical treatment

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Esophageal cancer (EC) remains a major challenge in oncology due to significant mortality and morbidity. Depending on the tumor stage and histological subtype, different therapeutic strategies including surgical resection, chemotherapy (CT), radiotherapy (RT), radio-chemotherapy (RCT) or multimodal concepts, are pursued in EC. Here, we analyzed the survival in an unbiased cohort of 456 patients diagnosed with EC between 1996 and 2011 in our clinic, focusing on different therapeutic concepts as well as clinical and histopathological factors.

Majority of patients was diagnosed with squamous cell carcinomas (336 patients, 74%). Of all 456 patients 238 patients (52%) received curative treatment. Of these curatively treated patients, 97 patients (41%) were treated by surgical resection. 5-year overall survival rate (5y-OSR) of curatively treated patients amounted 32% and was significantly superior to palliatively treated patients (5y-OSR: 1%). Within the curatively treated cohort, patient that received surgical resection demonstrated the best outcome (5y-OSR: 46%) compared to patients that were treated by RT, CT or RCT (5y-OSR: 20%). Perioperative mortality was 5% and perioperative morbidity 63%. Analyzing clinical and pathological factors revealed age, tumor localization, histological subtype, grading, tumor stage and surgical procedure as important prognostic factors for survival.

Surgical resection in combination with multimodal treatment concepts achieves the longest survival rates compared to non-surgical therapies and provided the highest chance for cure. However, it should be considered that surgical resection is often pursued in patients with less advanced tumor stages and without severe comorbidity. Nevertheless, future attempts will aim to increase the number of patients suitable for surgical therapy. To accomplish this, optimization of neoadjuvant therapeutic concepts to effectively achieve down-staging of the tumor will be required. Moreover, perioperative morbidity and mortality needs to be diminished by novel minimal invasive surgical techniques and perioperative minimization of potential risk factors such as pulmonary function and nutritional status.

## **Italian experience of surgical treatments for cholangiocarcinoma**

Guglielmi Alfredo

## **Novel targets for bile duct cancer**

Song Si Young

**The role of the Pathologist in the management of Chronic hepatitis Or Important case studies in GI and liver: My experience**

Duduyemi Babatunde

## Isolated hepatic perfusion chemotherapy for unresectable malignant hepatic tumors. Preliminary results

**Emilio Vicente MD, PhD, FACS.**

In patients with hepatic metastases from solid-organ malignancies, surgical resection may be a potentially curative option, but it is not possible in most cases. Chemosaturation with percutaneous hepatic perfusion was developed for the management of unresectable metastases to the liver.

In Europe, chemosaturation with percutaneous hepatic perfusion was commercially launched in 2012, and a second-generation, high-efficiency filter was approved for use in conjunction with a proprietary hepatic delivery system that same year.

Chemosaturation with percutaneous hepatic perfusion is a minimally invasive, repeatable, regional therapy in which a high dose of melphalan is directly infused into the liver via the hepatic artery using a percutaneous approach.<sup>3,9,10</sup> The liver is isolated from the systemic circulation by a double-balloon catheter inserted through the femoral vein. Chemotherapy-infused blood is then diverted through the arterial catheter via an extracorporeal pump circulation and is then filtered and returned to the patient via venovenous bypass and the jugular vein.

Study patients in different trials had a variety of primary tumor types, including ocular melanoma, cutaneous melanoma, cholangiocarcinoma, leiomyosarcoma, and colorectal, breast, and gastric cancers. In these studies, rates of overall hepatic response ranged from 50% to 75%. Hepatic responses were seen in those with cholangiocarcinoma, colorectal cancer, ocular melanoma, cutaneous melanoma, and leiomyosarcoma. Complete responses were observed in patients with cholangiocarcinoma and ocular melanoma. The experience is very limited. Until now, no more than 200 cases have been published.

The aim of this lecture is to present the technical aspects and our experience with this approach.

## **Novel technique of right hepatic artery reconstruction for the treatment of hilar cholangiocarcinoma with arterial invasion by transposition of common hepatic artery.**

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### Background:

In hilar cholangiocarcinoma(CC) Bismuth type IIIB, the expansion of the tumor can lead to involvement of the RHA and/or the portal vein (PV) or its branches. Arterial reconstruction may be difficult in case of tumor invasion to hepatic artery propria(HAP). Authors describe a novel technique that allowed an oncological resection in patient with hilar CC Bismuth type IIIB and contralateral arterial invasion using transposition of common hepatic artery(CHA).

A 48-year-old man presented with jaundice. The pre-operative computed tomography scan and magnetic resonance imaging confirmed hilar CC type IIIB with contralateral vascular invasion. During the surgical procedure, reconstruction of the RHA was performed: after transection of the CHA at the origin from celiac trunk and transposition of it to the distal portion of RHA, anastomosis was done between CHA and RHA just before anterior and posterior branches of RHA was divided. Arterial clamping time was 15 min. Patient underwent a left hepatectomy with caudate lobe resection. The tumor was resected en-bloc with the liver parenchyma, the involved PV and the extrahepatic bile duct. PV reconstruction was accomplished by end-to-end anastomosis. The portal clamping time was 15 min. Doppler ultrasonography confirmed a patent HA and PV with an adequate blood flow. Patient made a full recovery and was discharged 10 days after surgery. Pathological examination confirmed hilar CC with disease-free vascular and surgical margins. At 7s month patient remain disease free.

The novel technique that include of using CHA transposition for RHA reconstruction was clinically and technically feasible allowing an oncological resection to be performed in patient with tumor invasion of RHA and extension to HAP.

## Prognostic impact of distribution of hepatic nodules (single, satellites or multifocal) after resection for intrahepatic cholangiocarcinoma

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### Background and aims:

The aims of the study were to compare the clinicopathological features and survival after surgery of patients with intrahepatic cholangiocarcinoma (ICC) according to the pattern of presentation

### Methods:

A retrospective analysis of a multi-institutional series of 282 patients with ICC was carried out. Patients were further classified according to the pattern in single tumor (type I), single tumor with satellites in the same liver segment (type II) or multifocal scattered tumors (type III)

### Results:

173 (61.3%) patients were type I, 61 (21.6%) type II and 48 (17%) type III. Curative liver surgery was performed in 259 (91.8%) patients with a significant difference according to the pattern: 94.8%, 96.7% and 75% in type I, II and III, respectively ( $p < 0.001$ ). The 5-years overall survival for the entire cohort was 38.2% and 48.9%, 26.4% and 7.3%, in type I, II and III, respectively ( $p < 0.001$ ). On multivariate analysis factors related with survival were pattern type II and type III (OR 3.499,  $p < 0.001$ , and OR 4.394,  $p < 0.001$ , respectively), Ca 19-9  $> 55$  U/mL (OR 2.105,  $p = 0.021$ ), LN metastases (OR 2.254,  $p = 0.007$ ), R1 resection (OR 1.929,  $p = 0.023$ ) and size  $> 5$ cm (OR 1.900,  $p = 0.046$ ), respectively

### Conclusion:

ICC could have three distinct pattern of presentation with different prognosis that should be considered in the therapeutic decision. In type III patient's surgery should be reserved only for selected cases and after a multidisciplinary discussion

## Role of lymph-node dissection in small ( $\leq 3$ cm) intrahepatic cholangiocarcinoma

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### Background and aims:

The role of lymph-node dissection (LD) in patients with small intrahepatic cholangiocarcinoma (ICC) is still under debate.

The aims of the study were to compare the lymph-node (LN) status and its correlation with survival in patients with ICC after surgery according the tumor size

### Methods:

A retrospective analysis of a multi-institutional series of 259 patients submitted to curative surgery was carried out. Patients were further classified according to the tumor size in small-ICC ( $\leq 3$ cm) and large-ICC ( $> 3$ cm)

### Results:

Fifty-three patients had small-ICC and 206 had large-ICC. LD was performed in 194 (74.9%) patients, with a significant difference between small-ICC and large-ICC, 62% and 78%, respectively ( $p=0.016$ ). LN metastases were identified in 38% of the entire cohort, in 30% and 39% of small-ICC and large-ICC, respectively ( $p=0.216$ ). No differences in the number of LN retrieved, number of LN metastases and LN ratio were identified between small and large-ICC who underwent LD. The 5-years overall survival (OS) was 52% for small-ICC and 34% for large-ICC ( $p=0.019$ ). Regarding small-ICC, the 5-years OS according to the LN status was 85% in the N0 and 36% in the N+ ( $p=0.035$ ).

### Conclusion:

Despite the lower rate of LD in small-ICC group, one third of the patients had LN metastases with important prognostic implications. LD should be performed, also in small-ICC, for a correct staging and for the allocation to adjuvant therapy

## **Liver resection in hilar cholangiocarcinoma using parenchymal first approach with modified glissonian approach- technically easier technique even in frozen porta hepatis. Case series of 5 patients.**

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### **Background:**

Liver resection for hilar cholangiocarcinoma is technically demanding surgery .we describe our technique of anterior approach of parenchyma first approach for resection of hilar cholangiocarcinoma which can be easily applied to even difficult porta hepatis with repeated metal stenting.

### **Our technique:**

After opening abdomen, we routinely look for metastasis, if no metastasis is seen. After portal hepatis is looped, we start parenchyma transection first.

### **Right trisegmentectomy:**

After looping portal hepatis for pringle maneuver if needed, we start Liver transection just right to umbilical fissure, and reach to left hepatic duct and left portal vein intrahepatically and loop them. After that left hepatic duct is cut and margin is sent for frozen section. Then we dissect left hepatic duct and right hepatic duct and common hepatic duct and tumor mass from underlying portal vein if possible and then cut bile duct just above pancreas and sent for frozen section. If separating from portal vein is not possible left portal vein is cut and then main portal vein is dissected and then portal vein reconstruction is carried out. Mass with right-sided glissonian pedicals are cut, ligated and over sutured with prolene4-0 enmass. In the end hepaticojejunostomy is done in left hepatic duct.

### **Left trisegmentectomy with caudate lobectomy:**

After looping the porta hepatis, liver transection line is marked by marking right hepatic vein ultrasonographic guided or some times we mark along the line between Rouviere sulcus and right hepatic vein and then we isolate and loop right posterior pedical intrahepatically and loops, rest of the bile duct is looped enmass with the cancer and ligated and cut. Margins are sent for frozen section. If portal vein involved then main and left portal vein is looped and portal vein reconstruction is done.

### **Right and left hepatectomy:**

Transection plane is marked via marking the middlehepatic vein ultrasonographically or line from plane between hepatic vein confluences. Pedical looping technique is same as above.

### **Results:**

Five patients were operated using above technique. 3 patient underwent right trisegmentectomy, one left hepatectomy with caudate lobectomy and one left trisegmentectomy with caudate lobectomy. One patient required 5 units of transfusion due to severe cholestatic liver, other wise mean transfusion requirement was 2 units of PCV. One patient died due to sudden cardiac arrest at 4<sup>th</sup> post -operative day after he was shifted out of ICU, One patient developed small for size syndrome after right trisegmentectomy, which was settled down with conservative management. One patient had frozen portal due to multiple metal stenting which could also be operated easily.

### **Conclusion:**

Anterior approach and parenchymal first technique using modified glissonian approach is feasible and applied every - where and learning curve for the same is less.

## Our strategy in hepatopancreatoduodenectomy for cholangiocarcinoma to reduce invasiveness of the procedure

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### Objectives:

Hepatopancreatoduodenectomy (HPD) is technically demanding and is usually associated with high mortality and morbidity rates. Therefore, it has been yearned to decreasing the operative invasiveness by improving the results of the procedure. For this occasion, we have begun to utilize brand new devise (water jet dissector) in hepatic transection so as to reduce the operative time, blood loss, and vascular occlusion time. Additionally, the pancreas was transected in the final stage of the resection, and reconstructed using modified Blumgart technique.

We herein present operative procedures in which the new strategies were employed.

### Methods (Case presentation):

An early 60's gentleman were presented with jaundice and diagnosed as having extrahepatic bile duct cancer spreading towards hilar and intrahepatic ducts. Preoperative biliary decompression was successfully performed with biliary drainage. Estimated hepatic reserve after portal embolization was sufficient for right hemihepatectomy. Then, right HPD was scheduled.

The surgical procedure was performed in order as follows: (1) Mobilization of the pancreas and the duodenum with jejunal and gastric division, (2) Dissection of hepatoduodenal ligament, (4) Mobilization of the right hemiliver and caudate lobe, (5) Wedge resection of the left portal vein at bifurcation after transection of ventral and caudal part of the liver, (5) Transection of the liver along to the middle hepatic vein followed by division of the right hepatic vein, (6) Division of the left hepatic duct, (7) Transection of the pancreas and retrieve of the specimen, (7) Reconstruction in the modified Child's fashion.

### Results:

Hepatic transection was completed without any vessels occlusion to the remnant liver. The operative time was 13 hours and 39 minutes and blood loss was 1600 ml. Postoperative maximum serum bilirubin value was 1.8 mg/ dL.

### Conclusions:

Right HPD could be performed with the strategies including new hepatic transection procedure which might contribute to reducing the invasiveness of the procedure.

## Near-infrared fluorescent cholangiography as a new tool for a safer dissection during elective laparoscopic cholecystectomy.

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### Objectives:

The primary aim was to evaluate, in this preliminary experience, the efficacy of near-infrared fluorescent cholangiography (FC) in real-time visualization of the biliary tree during elective laparoscopic cholecystectomy. The second aim was to analyze the possible factors influencing the visualization rates of the biliary system by FC.

### Methods:

Fifty consecutive elective laparoscopic cholecystectomies were performed with fluorescent cholangiography. FC was performed at three time point during laparoscopic cholecystectomy: (1) following exposure of Calot's triangle, prior to any dissection; (2) after partial dissection of Calot's triangle; (3) after complete dissection of Calot's triangle, according to the "Critical View of Safety"(CVS) technique.

### Results:

Fluorescent cholangiography was successfully performed in all 50 patients undergoing elective laparoscopic cholecystectomy. The mean age was 55.4 years-old (range 24-80 ys) with 13 males and 37 females. The mean body mass index (BMI) was 26.8 (range 17.7-44.0). The cystic duct (CD) was successfully identified by FC in 43 of 50 patients (86%) and in 45 of 50 patients (90%) before and after Calot's dissection respectively ( $p>0.05$ ). The common hepatic duct (CHD) and the common bile duct (CBD) were successfully identified in 12 of 50 patients (24%) and in 33 of 50 patients (66%) before Calot's dissection respectively ( $p=0.007$ ) and in 26 of 50 patients (52%) and in 47 of 50 patients (94%) after complete Calot's dissection respectively ( $p=0.001$ ). No statistically significant differences were observed between frequencies of CD, CHD and CBD visualization by BMI (25 as cut-off value), by age (median value 57.5 years as cut-off) and by a history of cholecystitis, except for the CBD visualization rate that was increased in patients without previous cholecystitis ( $p=0.017$ ). No major and/or minor bile duct injuries were reported.

### Conclusions:

ICG fluorescent cholangiography could be considered a valid and useful tool for a safer dissection during elective laparoscopic cholecystectomies.

## **Management of colorectal cancer with synchronous liver metastases**

Siriwardena Ajith

## Surgery for advanced colorectal cancer

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### Background:

The recent more effective chemotherapy and the development of surgical procedures have expanded the possibilities of treatment patients with advanced colorectal cancer – locally and metastatic as well. Multiorgan resection in the case of invasion of cancer to the adjacent organs or structures, two-stage hepatectomy, associated liver partition and portal vein ligation (ALPPS) or repeated hepatectomies for liver metastases, lung resection for lung metastases, cytoreductive surgery + HIPEC in peritoneal dissemination - are the surgical solutions proposed for these patients.

### Material and methods:

There were 72 total pelvic exenterations, 210 liver resection including repeated hepatectomies for locally advanced and metastatic colorectal cancer provided in last 15 years, 12 HIPEC procedures with or without peritonectomy in last 2 years for peritoneal dissemination at single institution provided. Totally there were more than 1800 patients with colorectal cancer from 2001 to 2016 operated on at Surgical Department, Thomayer Hospital Prague, Czech Republic.

### Results:

With multidisciplinary approach we have in advanced stages of colorectal cancer the 5 - year survival in TNM stage III 69% (group of total pelvic exenteration 5-year survival 49%), in TNM IV stage 38%. In colorectal liver metastases the 5-year survival is 40%, including repeated and multiple-staged resections.

### Conclusion:

All patients having gastrointestinal malignancy should be assessed by a multidisciplinary team in a cancer centre. The benefits of multidisciplinary disease management include reducing recurrent disease, optimizing timing of surgery and organ preservation, prolonging survival for the patient and enhancing the surgical possibilities and response to targeted therapies as well.

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## Significance of multidisciplinary approach for advanced colorectal liver metastases: a single institutional experience

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### Objectives:

Multidisciplinary team (MDT) approach has reportedly been a keyword for the treatment of Stage IV cancers in the era of modern chemotherapy. However, actual impact of MDT approach on the treatment outcomes of colorectal liver metastases has not yet been discussed so well. The objective of this study was to clarify the significance of MDT approach in clinical decision making process for advanced colorectal liver metastases.

### Methods:

Based on the retrospective review of a prospectively collected clinical database in a single high-volume hepatobiliary center, impact of MDT approach including hepatobiliary surgeon on the treatment outcomes of synchronous liver metastases was investigated by comparing the estimated clinical results based on the initial treatment plans offered by colorectal surgeons and the actual clinical results based on the treatment plans modified by hepatobiliary surgeons.

### Results:

Among 689 patients who underwent curative resections for primary colorectal lesions between April 2014 and October 2015, 42 (6.1%) patients presented synchronous liver metastases with (n=14) or without (n=28) extrahepatic disease. Proportion of patients who were diagnosed with resectable or potentially resectable disease at initial assessment was 40.5% (17/42) by colorectal surgeons and 61.9% (26/42) by hepatobiliary surgeons (P=0.049). With adequate combination of preoperative chemotherapy and advanced hepatobiliary surgical approach, 54.7% (23/42) patients eventually underwent curative surgical resection including 4 conversion cases. Based on the outcome-based estimation, approximately 20% of patients would have benefit from curative surgical options with 10% of conversion rate among initially unresectable population by including hepatobiliary surgeons in MDT.

### Conclusion:

MDT approach including hepatobiliary surgeons significantly improves resection rate and may offer potential survival benefit even for patients with initially unresectable disease.

## **Laparoscopic combined colorectal and liver resections for primary colorectal cancer with synchronous liver metastases.**

Vladov Nikola

## Management of the synchronous colo-rectal tumors (benign and malignant)

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### Background:

The advance and wide-spread of bowel endoscopy resulted in early diagnostics of colo-rectal tumors (SCRT)-benign and malignant; as well as encountering synchronous tumors.

### Aims:

We discuss the diagnostics of the found synchronous colo-rectal tumors regarding histopathology (benign and malignant); treatment tactics – performed procedures; follow-up.

### Patients:

We retrospectively analyze 148 patients with SCRT treated in the Surgical Departments and Gastroenterology of our hospital for 2010-2015. Colonoscopies are performed in First Surgical Department by surgeon; in Gastroenterology by gastroenterologist. Assessed are: number of synchronous tumors per patient; localization; histopathology; TNM stage of malignant; performed procedures – endoscopic and/or surgery.

### Results:

Histopathology of synchronous tumors: Benign–12; Benign and malignant–19; Malignant–8 cases.

Number of SCRT per patient: 2 tumors-94; 3 tumors-32; 4 tumors-20; 10 and more tumors-2 patient.

Localization of polyps: rectum–68; sigmoid–175; descendens–23; transversum–36; ascendens–27; cecum-9.

Performed procedures: Biopsy–5%; Biopsy and endoscopic polypectomy–48%; Endoscopic polypectomy–26%; Surgery and endoscopic polypectomy–3%; Surgery–9%.

The tactics for diagnostics and treatment of SCRT comprises:

- Total colonoscopy is performed in all cases
- If synchronous polyps are found small and not proper to be removed, biopsy of every tumor is performed; and patient is included in follow-up.
- Pediculated polyps are removed during colonoscopy. If not possible - subjected to open surgery – laparotomy, colotomy, polypectomy and suture.
- When synchronous benign and malignant tumors are found –is possible to:
  - 1) Remove the benign during colonoscopy and surgery for the malignant to follow
  - 2) Remove one of benign during colonoscopy and surgery for the malignant and the remaining benign (if close) to follow
  - 3) Surgery

### Conclusions:

We aim to remove the benign colo-rectal tumors endoscopically. Colo-rectal cancers are submitted to surgery after endoscopic diagnosis.

## Treatment Standard of Rectal Cancer for Organ Preservation

Watanabe Toshiaki « In Memorium »

## Long-term survival for colorectal cancer with liver metastases

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### Background:

Despite the introduction into clinical practice calculating the volume of future liver remnant as well as application of portal vein embolization (PVE) or associating of liver partition and portal vein ligation, ALF remains to be the leading cause of complications and mortality after liver resection.

### Method:

Researches are based on retrospective analysis of (406 patients) colorectal cancer patients with synchronous and metachronous liver metastases (mCRC), (pT<sub>1-4</sub>N<sub>0-2</sub>M<sub>0-1</sub> cancer of the colon and pT<sub>1-3</sub>N<sub>0-2</sub>M<sub>0-1</sub> rectal cancer) period from 2007 to 2017 in National Cancer Institute (Ukraine).

### Results:

Ten-year overall survival rate of mCRC was 23% and 38% for rectal and colon cancer primary respectively. Total level of complications registered for 30 days post-operative period was 17.9%. Most serious complications registered in patients who underwent "major" liver resection (12.5%). ALF was the second lead reason of complication in patients with simultaneous and combined surgical tactic.

### Conclusions:

And new principles of ALF diagnosis and management should develop.

## **Simultaneous laparoscopic right hepatectomy and extensive right colectomy for crc with synchronous liver metastases**

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### **Objectives:**

Nowadays laparoscopic liver and colorectal resections as separate procedures are accepted as feasible, safe and oncological equivalent to open ones in the treatment of colorectal cancer. However, there is still no consensus, regarding its applicability as simultaneous procedures in cases with synchronous liver metastases from colorectal cancer. A case of a 65-year-old male patient with cancer of transverse colon and two synchronous metastatic lesions (8 and 7 cm) in the right liver is presented. The disease was confirmed by colonoscopy and CT scan.

### **Methods:**

After a laparoscopic exploration of the abdomen, a simultaneous right hepatectomy and extensive right colectomy were performed, using six trocars for the entire procedure. The specimens were extracted through an upper midline mini-laparotomy.

### **Results:**

Total operative time was 320 minutes, with minimal intraoperative blood loss. Blood transfusions after the procedure were not performed. Per oral feeding was started on the third day after surgery. The postoperative hospital stay was 6 days without any complications.

### **Conclusions:**

In this case we can see the feasibility of the laparoscopic approach to simultaneous liver and colorectal resections for colorectal cancer with synchronous liver metastases. The well known advantages of the mini-invasive surgery make such complex procedures more reliable. They must be performed when the surgical team has enough experience and in properly selected cases.

## Pure laparoscopic right hepatectomy using anterior approach for metastatic breast cancer

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### Objectives:

Pure laparoscopic hepatectomy is a minimally invasive procedure that leads to fast recovery. This still can be a challenging procedure, especially if anterior approach is required. A case of a 58 years old female in a good general condition, suffering from metastatic lesion (7 cm) in the right part of the liver is presented. She has had left radical mastectomy for breast cancer combined with adjuvant chemotherapy. On follow-up PET/CT scan, 21 months after the breast operation, a metastatic lesion was detected.

### Methods:

After open-laparoscopy and exploration of the abdomen we focused on the liver, which presented with heavy steatosis and a huge solitary metastatic lesion. This is the reason why we have chosen anterior approach. We started with dissection of the hepatoduodenal ligament, then divided the right hepatic artery and right hepatic vein. The parenchyma was transected with minimal blood loss and the right hepatic pedicle and the right vein were transected with linear endoscopic stapler (45 mm). The specimen was extracted through a mini-Pfannenstiel laparotomy.

### Results:

The operative time was 210 minutes and the blood loss was under 100 ml. No additional blood transfusion was required. The entire procedure was totally laparoscopic. The postoperative hospital stay was 5 days without any complications.

### Conclusions:

Laparoscopic liver resection enable the patient to have early discharge from the hospital with minimal percent of postoperative complications. Performed by experienced surgeon, laparoscopic liver resections using anterior approach show excellent short- and long-term outcomes.

## Advanced Laparoscopic Pancreatectomy

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LDP becomes one of the common surgical methods in the field of pancreatic surgery. However, splenic-vessels preservation is still challenging. Preservation of spleen was performed in 32% of patients who underwent laparoscopic distal pancreatectomy (LDP) in Japan, and 85.9% of spleen preserving LDP was performed by preserving splenic vessels. Our anatomical findings concerning splenic vein contributed to the dissemination of vessel-preservation method.

Recognition of portal-vein system is also important in the field of laparoscopic pancreatoduodenectomy (LPD). LPD comprise several other GI surgeries, i.e., gastrectomy, colectomy and distal pancreatectomy. However, resection of uncinate process is unique process required exclusively for LPD. IPDVs are linker of uncinate process and SMV, and also one of major sources of bleeding during resection. The early recognition of IPDVs and their resection broaden the operation field between uncinate process, SMV and SMA in a safe way. Addition to the recognition of IPDVs, anatomy of Treitz's ligament is also important to make LPD more feasible. These anatomical findings and laparoscopic techniques will be discussed.

## Short-term Outcome of Laparoscopic distal pancreatectomy; comparison between spleen-preserving and en-bloc splenectomy

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### Introduction:

Laparoscopic distal pancreatectomy is now the standard treatment for low-malignant tumor in the pancreas body or tail. Although many institutes perform laparoscopic spleen-preserving distal pancreatectomy (LSPDP), its benefit is still controversial. The aim of this study is to compare LSPDP with laparoscopic distal pancreatectomy with splenectomy (LDP) in the light of safety.

### Methods:

We evaluated the characteristics and the operative outcomes of all patients who underwent LSPDP or LDP at our institution from July 2009 to January 2017.

### Results:

We performed 55 LDPs (LSPDP, n = 12; LDP, n = 43) during the study period. There was no significant difference in the characteristics such as age, sex, body mass index and ASA score. The operation time of LSPDP was significantly longer than LDP (LSPDP, 470 ± 43 minutes; LDP, 352 ± 22 minutes, p=0.018), meanwhile blood loss of each group was similar (LSPDP, 203 ± 74 ml; LDP, 207 ± 39 ml, p=0.96). Only 1 patient who received LDP was converted to open surgery because of strong adhesion. The rate of postoperative complications, including pancreatic fistula were not significantly different between the 2 groups. Splenic infarction was not observed in all patients at the time of discharge. The length of hospital stay was not different significantly (LSPDP, 19.3 ± 3.8 days; LDP, 17.5 ± 2.0 days, p=0.69). Ten of 12 patients who were treated by LSPDP, were histologically diagnosed as NET.

### Conclusion:

According to our data, LSPDP is feasible and almost has similar outcomes to LDP.

## How to reduce POPF after PPPD?

Yoon Dong Sup

## Learning curve of minimally invasive pancreatic resection

Richard Schulick

## Laparoscopic Surgery for Pancreatic cancer

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Laparoscopic surgery is associated with less blood loss and shorter hospital stay compared with open surgery. In case of laparoscopic distal pancreatectomy, these results have been recently reproduced by higher quality studies such as large-scale multicenter or propensity score matching studies. In comparison, laparoscopic pancreaticoduodenectomy for pancreatic cancer still has a very low level of evidence.

The current evidence on the safety and effectiveness of laparoscopic surgery for pancreatic cancer is limited in well-selected patients by experienced surgeons. To support the extended application and generalization of laparoscopic surgery in the treatment of pancreatic cancer, well-designed studies with good quality of evidence are necessary. However, considering the aggressive biology of this cancer and the inherent technical challenge of minimally invasive pancreatectomy, there is a long way to go until laparoscopic surgery for pancreatic cancer is accepted as a safe alternative treatment to open surgery.

## **Risk factors for survival in PDAC patients following pancreatoduodenectomy**

Barauskas Giedrius

## Ten years of Post-Operative Pancreatic Fistula (POPF) definition (2005-2016). Does the new classification really change something?

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### Introduction:

In 2005 International Study Group of Pancreatic Surgery (ISGPS) classified POPF into 3 different grades of severity (A, B, C) and it has been universally adopted. Recently, ISGPS updated this classification.

The aim of this study was to compare the incidence and severity of POPF in our series of Pancreatico-Duodenectomies (PDs) using the two classifications.

### Material and methods:

All consecutive PDs performed from 2010 to 2016 were retrospectively evaluated from a prospective database. Incidence and grade of POPF strictly adopting the two classifications were recorded.

### Results:

A total of 502 patients were included in the study. The overall incidence of POPF was 35.2% and 30.7% in the old and new classification, respectively ( $p < 0.01$ ). POPF was classified as grade A, B and C in 4.6%, 26.1% and 4.6%, respectively, according to the old classification, while was classified as grade B and C in 26.1% and 4.6%, respectively, according to the new one (biochemical leak was observed in 4.6% of cases). Reasons of grade B POPF were extremely heterogeneous: antibiotic administration (10.7%), drain > 3 weeks (67.9%) and radiological procedures (drainage/embolization) (21.4%).

### Discussion:

The updated classification deletes grade A POPF, introducing the concept of biochemical leak. Consequently, it reduces significantly the overall rate of POPF. However, this classification doesn't change the criteria of grade B POPF, that continue to be too much dependent to the post-operative management policy (antibiotics administration, timing of drain removal) and to group cases with different clinical severity.

## Unjustified and potentially avoidable preoperative biliary drainage: impact on perioperative outcomes of resectable periampullary tumors

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### Objective:

Preoperative endoscopic biliary drainage (PEBD) should not be performed systematically for malignant periampullary tumors (MPT) with uncomplicated obstructive cholestasis, yet many patients still receive routine PEBD. Herein were assessed perioperative outcomes of routine PEBD in resectable MPT with uncomplicated biliary obstruction.

### Methods:

Avoidable-PEBD (despite recommendations), Necessary-PEBD (following recommendations), and Upfront-Surgery groups were identified among patients undergoing surgery for resectable MPT (2008-2014). The first two groups were compared on referral patterns, drainage procedure, and post-PEBD complications; Avoidable-PEBD and Upfront-Surgery groups were compared on perioperative outcomes.

### Results:

A total 140 patients underwent surgery for resectable MPT; 34 had cholestasis with clear PEBD indication (Necessary-PEBD). A further 70 presented uncomplicated obstructive cholestasis with total bilirubin < 300 μmol/l, of whom 30 had Avoidable PEBD and 40 underwent upfront surgery. In total 46.9% of PEBD were avoidable and 64.1% were performed before surgical consultation. Time-to-surgery was significantly increased in the Avoidable-PEBD group by a mean ± SD 33 ± 5.2 days as compared to Upfront-Surgery group (95% CI [22.9-43.6]; p < 0.001). The Avoidable-PEBD group had a complication rate of 43.3%, and 10.0% were unresectable due to severe fibrosis following PEBD-induced acute pancreatitis. Perioperative severe complication rate was higher in the Avoidable-PEBD (73.3%) than in the Upfront-Surgery group (37.5%, p = 0.003), as was Clavien-Dindo grade > II postoperative complication rate (63.3% and 37.5%; p = 0.03).

### Conclusion:

Routine preoperative biliary drainage is deleterious and persists despite recommendations against its use, and most stenting is performed before surgical consultation. Early multidisciplinary team discussions could be implemented with an aim to reduce unnecessary stenting and improve patient outcomes.

## Laparoscopic doudenopancreatectomy(LPD)-our approach. How to do it?

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### Introduction:

Laparoscopic procedures have advanced to represent the new gold standard in many surgical fields. Laparoscopic pancreatoduodenectomy and laparoscopic distal pancreatectomy(LDP) are advocated to improved perioperative outcomes, including decreased blood loss, shorter length of stay, reduced postoperative pain and expedited time to functional recovery. However, the indication to minimally invasive approach for pancreatic surgery is often benign or low grade malignances.

### Material and Method:

The steps of LDP procedures are similar to the open procedure. We perform destructive part of procedure totally laparoscopically and we prefer to do reconstructive part of procedure using hand-assisted techniques. For the period 2014-2016, we have been perform 46 PD, 14(30%) we have done with laparoscopic approach. 4(28,5%) of patients were operated totally laparoscopic and 10(71%) of patients were operated by hand-assisted techniques.

### Results:

We found longer operative time in laparoscopic group, 385min. vs 210 min in open group. Mean blood loss was 260ml in laparoscopic operated patients and 430 ml in open group. Mean length of stay was 8 days in laparoscopic group vs 14 days in open group. Overall morbidity in laparoscopic group was 21%. One patient with superior vein thrombosis(Clavien-Dindo-II), One patient with postoperative acute necrotizing pancreatitis(Clavien-Dindo-IVa), a patient with low debit pancreatic fistula(Clavien-Dindo-II). Mortality rate was 7%(1 patient was died in early postoperative period from venous mesenterial thrombosis and multiorgan dysfunction.

### Conclusion:

LPD can be done laparoscopically in selected patients by experienced surgeons (in laparoscopic and open surgery too), but clear advantages remain to be defined.