

# **Abstract**

## Scalpel Please: Becoming of a Surgeon

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Dr. Vigneswaran, is an internationally recognized thoracic surgeon dedicated to improving the quantity and quality of life for his patients. He has been a leader in Academic Cardiothoracic Practice in renowned institutions in Chicago, USA such as University of Illinois, Loyola University and University of Chicago.

Dr. Vigneswaran completed basic medical education at the University of Peradeniya in Sri Lanka. He underwent residency training in Surgery and Cardiothoracic surgery in the United Kingdom and in the United States working in institutions including University of Glasgow, University of Edinburgh, Imperial College London, Harefield Hospital, University of Colorado School of Medicine and Mayo Clinic.

Dr. Vigneswaran is a Fellow of the American College of Surgeons, Royal College of Physicians and Surgeons of Canada, Royal College of Surgeons of Edinburgh and a past president of the International College of Surgeons-US Section. He also served as Trustee for the Chest Foundation of the American College of Chest Physicians.

During the past 4 decades Dr. Vigneswaran has authored over 175 original articles and book chapters, edited 4 books, and 10 movies on surgical procedure. His book 'Lung Transplantation, Principles and Practice is also published in Chinese language. Dr. Vigneswaran is often invited to speak on topics as robotic thoracic surgery, lung transplantation, pleural mesothelioma, lung cancer and surgical education. He is named as top surgeon in the US News and World Report, Castle Connolly's Americas Top Doctors and The Chicago Magazine's Top Doctor, during the past fifteen years. He is also named in Who is Who and awarded Albert Nelson Marquis Lifetime Achievement Award, and named Leading Health Professionals of the World, by International Biographical Center, Cambridge, England.

## A-1-1 A case of laparoscopic hernia repair for esophageal hiatal hernia with upside down stomach

○Yusuke Akimoto, Junji Maehara, Nobue Futawaytari, Manabu Watanabe, Yoshihisa Saida  
(Department of Surgery, Toho University Ohashi Medical Center)

A 92-year-old woman was admitted to the hospital for type B acute aortic dissection. An esophageal hiatal hernia with an upside-down stomach was detected on the chest and abdominal CT. Therefore, the patient was referred to our department for further examination. The CT showed that the stomach and pancreas had migrated into the mediastinum with an upside-down stomach. Upper gastrointestinal imaging showed that the stomach was inverted, and that the entire stomach had prolapsed into the mediastinum. She was diagnosed with an esophageal hiatal hernia with an upside-down stomach, and laparoscopic hernia repair was performed. The herniated stomach and pancreas are reduced in the abdominal cavity. The hernial orifice measured 5 cm in size. The hiatal hernia defect was closed using non-absorbable sutures. The esophageal hiatus was reinforced using a mesh. Additionally, Toupet fundoplication was performed. The postoperative course was uneventful, and the patient was discharged 10 days after the surgery. As esophageal hiatal hernia with an upside-down stomach can be treated laparoscopically, laparoscopic surgery is useful in such cases.

## A-1-2 Prognostic value of T cell phenotypes and PD-L1 expression in esophageal squamous cell carcinoma

○Jie Hu, Takeshi Toyozumi, Kentaro Murakami, Masaya Uesato, Ryuma Urahama, Akira Nakano, Koichi Hayano, Yasunori Matsumoto, Yoshihiro Kurata, Ryota Otsuka, Hisahiro Matsubara  
(Department of Frontier Surgery, Chiba University)

**Background:** The activation of effector immune cells is one of the most important parts of anti-tumor immunity, however, their functions could be hindered by inhibitory signals or immunosuppressive cells. The purpose of this study is to investigate the function of PD-L1 and distinct T cells and their clinical prognostic significance in esophageal squamous cell carcinoma (ESCC).

**Methods:** T cells (CD4, CD8, CD25, FOXP3) and PD-L1 expression in the center of tumor were examined by immunohistochemistry and immunofluorescence in resected specimens from 126 patients with ESCC who underwent surgery before received preoperative therapy and to compare among various clinicopathological features.

**Results:** T cells (CD4, CD8 and FOXP3) were associated with prolonged overall survival ( $p=0.0473$ ,  $p=0.0028$ ,  $p=0.0324$ ). PD-L1, CD25, and Tregs were associated with poor prognosis ( $p=0.0402$ ,  $p=0.0279$ ,  $p=0.0349$ ). A significantly positive correlation was found between PD-L1 and CD8+ TILs ( $p=0.0086$ ). Positive PD-L1, high CD4 and low FOXP3 expression were associated with greater depth of tumor invasion ( $p=0.006$ ,  $p=0.020$ ,  $p=0.003$ ). PD-L1 and Tregs were positively associated with pathological TNM staging ( $p=0.049$ ,  $p=0.017$ ). FOXP3 expression was associated with venous invasion ( $p=0.039$ ). Tregs correlated with lymph node metastasis ( $p=0.047$ ) and lymphatic invasion ( $p=0.004$ ).

**Conclusion:** T cells status and PD-L1 are associated with disease outcome in ESCC and may be prognostic indicators of overall survival. FOXP3 expression is an independent event required for Tregs development and function, not an exclusive marker for Tregs.

### A-1-3 The proliferation of cancer stem cells in esophageal adenocarcinoma are suppressed by Tranilast and furosemide

○Naosuke Nakamichi, Atsushi Shiozaki, Hiroyuki Inoue, Toshiyuki Kosuga, Hiroki Shimizu, Michihiro Kudou, Takuma Ohashi, Tomohiro Arita, Hirotaka Konishi, Ryo Morimura, Yoshiaki Kuriu, Hisashi Ikoma, Takeshi Kubota, Hitoshi Fujiwara, Eigo Otsuji  
(Department of Surgery, Kyoto Prefectural University of Medicine)

**Background:** Recent studies suggest that the targeting of membrane proteins specifically activated in cancer stem cells (CSCs) is an important strategy for Esophageal adenocarcinoma (EA). The objectives of the present study were to investigate the expression and activity of ion channel in EACSCs.

**Methods:** Cells exhibiting strong ALDH1A1 activity (CSCs marker) were isolated from OE33 cells, a human Barrett's EA cell line, by fluorescence-activated cell sorting. EACSCs were identified based on formation of sphere. Gene expression profiles in EACSCs were examined by a microarray analysis.

**Results:** The ALDH1A1 expression was higher in CSCs than in non-CSCs. The CSCs also exhibited resistance to cisplatin and redifferentiation potential. The microarray analysis revealed that the expression of several genes related to ion channels/transporters, such as transient receptor potential vanilloid 2 (TRPV2) and solute carrier family 12 member 2 (SLC12A2), were upregulated in CSCs. We also assessed the expression levels of ALDH1A1, TRPV2, and SLC12A2 in primary tumor samples of human Barrett's EA by immunohistochemical analysis. The expression of ALDH1A1 correlated with that of TRPV2 and SLC12A2 (TRPV2:  $r=0.4286$ , SLC12A2:  $r=0.5187$ ). The cytotoxicities of the TRPV2 inhibitor tranilast and the SLC12A2 inhibitor furosemide were greater at lower concentrations in CSCs than in non-CSCs, and reduced tumor-sphere numbers. Moreover, both drugs added cytotoxicity to cisplatin.

**Conclusions:** We revealed that TRPV2 and SLC12A2 are highly expressed in EACSCs and have potential as therapeutic targets for EA.

### A-1-4 Role of Whole Body Dynamic PET/CT in esophageal cancer

○Moe Iwata, Yoshihiro Kurata, Koichi Hayano, Hisashi Mamiya, Yumiko Takahashi, Toru Tochigi, Shunsuke Imanishi, Gaku Ohira, Hisahiro Matsubara  
(Department of Frontier Surgery, Graduate School of Medicine, Chiba University.)

#### **[Introduction]**

Whole-Body Dynamic PET/CT is an image obtained by repeating whole-body imaging in a short time span in 18F-fluorodeoxyglucose positron emission tomography (FDG-PET), which enables measurement of the uptake rate and metabolic rate of FDG in tissue. In this study, we investigated the relationship between FDG kinetics and stage of cancer using measurements obtained from dynamic PET images of esophageal squamous cell carcinoma taken before treatment.

#### **[Method]**

A retrospective analysis of 13 patients with esophageal cancer who had undergone preoperative Dynamic PET imaging at our department since August 2021 was performed, to compare measurements (SUV; total amount of FDG, Slope; metabolic rate, and Intercept; primarily reflects perfusion) obtained from Dynamic PET images and the clinical stage of the disease.

#### **[Result]**

The median age of the patients was 70 (52-83) years, and the male to female ratio was 10:3. pT1 group showed a higher SUV max ( $4.04 \pm 1.79$  v.s.  $14.73 \pm 5.67$ ,  $p < 0.01$ ), SUV peak ( $2.93 \pm 1.16$  v.s.  $7.99 \pm 1.91$ ,  $p < 0.01$ ), and Slope max ( $1.81 \pm 1.03$  v.s.  $7.78 \pm 3.79$ ,  $p < 0.01$ ) and Slope peak ( $1.29 \pm 0.57$  v.s.  $4.11 \pm 1.28$ ,  $p < 0.01$ ) were lower than T2 + T3 group. Compared to the pStage0,1, in pStage2 + pStage3 groups, SUV max ( $3.95 \pm 1.81$  v.s.  $11.75 \pm 6.95$ ,  $p = 0.03$ ), SUV peak ( $2.94 \pm 1.24$  v.s.  $6.54 \pm 2.98$ ,  $p = 0.05$ ) and Slope max ( $1.53 \pm 0.54$  v.s.  $6.31 \pm 4.07$ ,  $p = 0.01$ ) and Slope peak ( $1.17 \pm 0.54$  v.s.  $3.41 \pm 1.64$ ,  $p < 0.01$ ) were lower.

#### **[Conclusion]**

The metabolic rate in the tumor may also be related to tumor depth and progression.

## A-1-5 Preoperative BNP and Nt-proBNP levels predict the onset of postoperative tachyarrhythmia in esophagectomy

○Yuuko Tohmatsu, Tomoyuki Okumura, Yoshihisa Numata, Takeshi Miwa, Toru Watanabe, Katsuhisa Hirano, Takamichi Igarashi, Haruyoshi Tanaka, Isaya Hashimoto, Kazuto Shibuya, Shozo Hojo, Koshi Matsui, Isaku Yoshioka, Tsutomu Fujii

(Department of Surgery and Science, Faculty of Medicine, Academic Assembly, University of Toyama)

**Introduction:** Postoperative tachyarrhythmia, such as atrial fibrillation, is often experienced in patients who received subtotal esophagectomy. BNP and Nt-proBNP are biomarkers used as indicators of heart failure. In this study, we investigated the usefulness of preoperative BNP and Nt-proBNP levels as predictors of postoperative tachyarrhythmia.

**Methods:** Consecutive 124 patients who underwent subtotal esophagectomy for esophageal cancer from 2011 to 2022 were retrospectively analyzed. The relationship between preoperative BNP and Nt-proBNP levels and postoperative tachyarrhythmia which required anti-arrhythmic drugs was investigated.

**Results:** Postoperative tachyarrhythmia was present in 20 patients (16%). In the group with (n=20) and without (n=104) postoperative tachyarrhythmia, gender (M/F) was 20/0 and 79/25 (p=0.014), median age (years) was 75 and 69 (p<0.001), Brinkman Index was 1080 and 565 (p<0.001), blood loss (ml) was 275 and 130 (p=0.041), respectively. Preoperative median BNP (pg/mL) level was 34.6 and 15.2 (p=0.006), while Nt-proBNP (pg/mL) level was 126 and 75.5 (p=0.02). Cut-off values based on ROC curves for BNP and Nt-proBNP were 25.3 and 119, respectively. The number of patients with both BNP and Nt-proBNP higher than the cut-off value in the group with and without tachyarrhythmia was 11 (55%) and 22 (21.2%), respectively (p=0.002). Multivariable analysis showed that high BNP and high Nt-proBNP (p=0.014), as well as age (p=0.006), male gender (p=0.049), and Brinkman Index (p=0.002) were independent predictive factors for the onset of postoperative tachyarrhythmia.

**Conclusion:** Preoperative BNP and Nt-proBNP levels were suggested to be useful for predicting the onset of postoperative tachyarrhythmia in patients who receive subtotal esophagectomy.

## A-2-1 A case of Y-Anastomotic Site re-anastomosis due to repeated intussusception of the jejunal pouch after total gastrectomy for gastric cancer

○Koyo Fujitsuka, Yoshitsugu Tsukamoto, Shinya Mikami, Masaki Hiwatari, Jin Shimada, Takehito Otsubo  
(Department of Gastroenterological and General Surgery, St. Marianna University School of Medicine)

### Background

Postgastrectomy intussusception is a relatively rare disease, accounting for about 1~4% of adult patients with intussusception and occurring in 0.1~2% of patients after gastrectomy. We have experienced a case of intussusception with Roux-en-Y anastomosis after total gastrectomy and will report its clinical course with some literature review.

### Case

The patient is a 47-year-old male. He underwent total gastrectomy and Roux-en-Y reconstruction in 2016 for gastric cancer. In 2017, he had recurrence of peritoneal metastasis and started chemotherapy. In 2019, he came to our hospital with a chief complaint of sudden abdominal pain. Contrast-enhanced CT scan of the abdomen showed intussusception at Roux-en-Y anastomosis, and emergency surgery was performed for manipulation. In 2020, he had another recurrence of intussusception and underwent laparotomy for manipulation and fixation. Nevertheless, the patient continued to develop intussusception 8 more times and underwent repeated endoscopic repair. In April 2022, Roux-en-Y anastomosis was re-created due to increased frequency of intussusception. The patient's postoperative course was good, and he was discharged from the hospital. Since then, he has not had a recurrence of intussusception.

### Conclusion

One of the factors that led to repeated intussusception in this case is suspected as the Roux-en-Y reconstruction in which a jejunal pouch was created. However, since pouch formation also improves the patient's quality of life, we believe it is important to accumulate cases with similar symptoms in the future.

## A-2-2 Acute mental disorder caused by vitamin B12 deficiency eight years after total gastrectomy

○Takayoshi Tsubaki<sup>1,2)</sup>, Mitsuhiro Morikawa<sup>2)</sup>, Michiaki Shimada<sup>2)</sup>, Noriyuki Tagai<sup>2)</sup>, Hidetaka Kurebayashi<sup>2)</sup>, Katsuji Sawai<sup>2)</sup>, Masato Tamaki<sup>2)</sup>, Kenji Koneri<sup>2)</sup>, Makoto Murakami<sup>2)</sup>, Hiroyuki Maeda<sup>2)</sup>, Takanori Goi<sup>2)</sup>, Yasuo Hirono<sup>1,2)</sup>

(<sup>1</sup>Cancer Care Promotion Center, University of Fukui Hospital, <sup>2</sup>Department of First Surgery, Faculty of Medicine, University of Fukui)

### Background

Vitamin B12 deficiency can cause a variety of diseases. The most common disease is macrocytic anemia, but it is also known to cause psychiatric disorders. The causes of deficiency are varied and diagnosis is difficult. We report a patient who developed mental disorders due to vitamin B12 deficiency after total gastrectomy.

### Case presentation

A 37-year-old woman, eight years after total gastrectomy, became withdrawn at her workplace, talking and acting abnormally. The family had seen unusual behavior for three days and she was referred to our hospital. There were no specific findings in the head on imaging examination. Spinal fluid cytology and electroencephalography showed no specific findings, and herpes DNA was negative. Metabolic factors were considered and intravenous vitamin replacement therapy was started. The psychiatric symptoms improved rapidly after vitamin B12 supplementation was started. On the fifth day, it was discovered that vitamin B12 level at the time of admission was extremely low. Typically, vitamin B12 deficiency is associated with macrocytic anemia, but in this patient, serum iron was also decreased, indicating a mixed anemia, making the diagnosis difficult. The patient had undergone a total gastrectomy eight years ago and the psychiatric symptoms were thought to be due to impaired vitamin B12 absorption caused by intrinsic factor deficiency. Since then, oral replacement therapy and intramuscular injection have been continued without recurrence of symptoms.

### Conclusion

Disturbances of consciousness have many causes. When there is a history of gastrectomy, we should also consider vitamin B12 deficiency.

### **A-2-3 A case of gastric syphilis requiring differentiation from gastric cancer**

○Sae Kimura<sup>1)</sup>, Yasuhito Hisatune<sup>1)</sup>, Masaki Hiwatari<sup>1)</sup>, Yoshitugu Tukamoko<sup>1)</sup>, Jin Shimada<sup>1)</sup>,  
Saeko Naruki<sup>2)</sup>, Shinya Mikami<sup>1)</sup>, Takehito Otubo<sup>1)</sup>

(<sup>1)</sup>Division of Gastroenterological and General Surgery, St. Marianna University School of Medicine, <sup>2)</sup>Department of Diagnostic Pathology, St. Marianna University School of Medicine)

**[Case]** A man in his 30s was referred to our hospital after an upper gastrointestinal endoscopy was performed and he was diagnosed with gastric cancer. Upper gastrointestinal endoscopy revealed a Type3-Type4 lesion centered on the lesser curvature of the angle of stomach. Computed tomography (CT) showed wall thickening around the lesser curvature of the angle of stomach. Based on the above, gastric cancer was suspected, but the biopsy was Group 2. Blood tests at admission showed TP antibody qualitative (+), syphilis RPR qualitative (+), TP antibody quantification: 13280, and RPR quantification: 310, which were high. A large number of bacteria were confirmed. He had a history of sexual intercourse at a sex shop several months ago, and was diagnosed with gastric syphilis. Sawacillin 1500mg/day was administered orally for 12 weeks, and the symptoms improved. Upper gastrointestinal endoscopy performed 2 months later showed marked improvement of the ulcers mainly at the angle of stomach. In Japan, more than 10,000 cases of syphilis infection were reported in the 1960s, but the number decreased due to infection control measures and the spread of antibacterial drugs. However, in recent years it has been on the rise again. The frequency of gastric syphilis is said to be about 0.1% of patients with syphilis, but as the number of people infected with syphilis increases, the chances of seeing gastric syphilis patients may increase. We report a case of gastric syphilis that required differentiation from gastric cancer.

### **A-2-4 Short-term results of Non-opened clean end-to-end anastomosis method in pylorus preserving gastrectomy**

○Yuhei Hakozaiki, Takashi Mitsui, Kazuyuki Saito, Takashi Okuyama, Hideyuki Yoshitomi  
(Department of Surgery, Dokkyo Medical University Saitama Medical Center)

Surgery to limited gastrectomy in early-stage gastric cancer is attracting attention, and pylorus-preserving gastrectomy is one of the most popular methods. However, postoperative complications of pylorus-preserving gastrectomy include intra-abdominal infection and gastric stasis. In particular, intra-abdominal infection is reported to cause gastric stasis and worsen the long-term prognosis. No useful method has been developed to reduce intra-abdominal infection.

To reduce the complications of intra-abdominal infection, we developed a new technique called the non-opened clean end-to-end anastomosis method (NoCEAM) to prevent gastric contents from leaking into the intraperitoneal without opening the stomach lumen during reconstruction. In this technique, after lymph node dissection is completed, a temporary suture closure is performed around the entire circumference of the cutting line on the oral and anorectal sides, and the specimen is resected with an automatic suture machine after the specimen is circumferentially externalized. NoCEAM is a new concept of anastomosis that allows simultaneous completion of resection and reconstruction without opening the digestive tract.

NoCEAM was performed in 38 patients from December 2018 to December 2022. The median operative time was 234 minutes and blood loss was 7.5 ml. Postoperative complications included poor peristalsis in one patient, pneumonia in one patient, and suture failure in one patient. Postoperative hospital stay was 8 days.

NoCEAM reduced intra-abdominal infection and gastric retention.

NoCEAM was considered to be a new option for reconstruction in pylorus-preserving gastrectomy.

## A-2-5 Safe implementation of robotic distal gastrectomy performed by non-endoscopic surgical skill qualification system-qualified surgeons

○Yusuke Umeki<sup>1)</sup>, Susumu Shibasaki<sup>1)</sup>, Seiji Inoue<sup>1)</sup>, Masahiro Fujita<sup>1)</sup>, Ai Goto<sup>1)</sup>, Kazumitsu Suzuki<sup>1)</sup>, Akiko Serizawa<sup>1)</sup>, Shingo Akimoto<sup>1)</sup>, Masaya Nakauchi<sup>2)</sup>, Tsuyoshi Tanaka<sup>1)</sup>, Kazuki Inaba<sup>2)</sup>, Ichiro Uyama<sup>2,3)</sup>, Koichi Suda<sup>1,4)</sup>

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**Purpose** Robotic gastrectomy (RG) for gastric cancer (GC) was approved for national medical insurance coverage in April, 2018, since when its use has increased dramatically throughout Japan. However, the safety of RG performed by surgeons who are not Endoscopic Surgical Skill Qualification System (ESSQS)-qualified has yet to be established. We conducted this study to verify the short-term outcomes of the initial series of RG procedures performed by non-ESSQS-qualified surgeons.

**Methods** Between January, 2020 and December, 2021, 30 patients with clinical Stage I and II GC underwent RG performed by four non-ESSQS-qualified surgeons according to the Japan Society for Endoscopic Surgery guideline. We evaluated, retrospectively, the morbidity rates according to Clavien-Dindo (CD) classification grade II or higher.

**Results** Each operating surgeon completed all procedures without any serious intraoperative adverse events. The median operative time, console time, and estimated blood loss were 413 (308-547) min, 361 (264-482) min, and 25.5 (4-167) mL, respectively. No patient required conversion to laparoscopic or open surgery. Three (10%) patients suffered CD grade II complications postoperatively. The median postoperative hospitalization was 11 (8-51) days.

**Conclusion** Non-ESSQS-qualified surgeons trained by expert RG surgeons could perform robotic distal gastrectomy safely for initial cases.



### **A-3-1 A case of emergency surgery for a patient with COVID-19 positive gastric perforation**

○Hiro Nishizawa, Taro Hamabe, Shinpei Takagi, Asako Fukuoka, Natsuko Kamei, Takayuki Asano, Ryoji Makisumi, Shinya Mikami, Takehito Otsubo  
(Division of Gastroenterological and General Surgery, Department of Surgery, St. Marianna University School of Medicine)

The patient was a 51-year-old male. He was transferred to our hospital because he had COVID-19 infection at the same time, which was difficult to treat at his previous hospital. The patient was transferred to our hospital because it was difficult for the previous doctor to treat the patient. The physical examination revealed tenderness in the upper abdomen, but there were no other findings of note. However, on the second day of the hospital, the patient's abdominal symptoms worsened, and he was judged to be suffering from generalized peritonitis, and emergency surgery was performed. This was the first case of surgery for a patient with COVID-19 infection at our hospital. The necessary examinations from the time the decision was made to perform surgery, the patient flow line from the admission room to the operating room, and the procedures for preventing the spread of infection including full intraoperative PPE, as well as the procedure for removing the machine and securing the line of medical personnel were handled according to the flow chart in the hospital. The case of a patient with COVID-19 infection, in which infection prevention and spread control are required, will be discussed in this case study.

### **A-3-2 Short-term results of combined laparoscopic-endoscopic surgery (D-LECS) for superficial non-papillary duodenum tumors**

○Seiyo Kobayashi, Yukinori Yube, Takashi Hashimoto, Hajime Orita, Shinji Mine, Tetsu Fukunaga  
(Department of Esophageal and Gastroenterological Surgery, Juntendo Univ)

**[Introduction]** Superficial non-papillary duodenal tumors are relatively rare. Combined laparoscopic-endoscopic surgery is minimally invasive and excellent in terms of preserving function. Adaptation expanded.

**[Subjects and methods]** At our hospital, joint laparoscopic endoscopic surgery is indicated for superficial non-papillary duodenal tumors that are more than 10 mm away from Vater's papilla and whose circumference is less than semicircular. From July 2018 to the present, 12 patients who underwent treatment at our hospital were devised for the procedure, and the short-term results were retrospectively examined.

**[result]** The patient background was 10 men, 2 women, and 15 lesions. The median age was 67 years (44-77 years), and the median BMI was 23.7 (21.4-34.4). The lesion sites were the duodenal bulb in 4 cases, the descending leg in 5 cases, and the horizontal leg in 6 cases. Median operative time was 262 minutes (124-652 minutes), median blood loss was 10 mL (2-150 mL), and median postoperative hospital stay was 8.0 days (6-15 days). We found one case of laparotomy for the tumor on the pancreatic side. As for complications, pancreatic fistula was observed in 1 case, but it resolved conservatively. No postoperative suture failure or postoperative bleeding was observed.

**[Conclusion]** Combined laparoscopic-endoscopic surgery for duodenal tumors can be performed safely with appropriate indications and techniques.

### A-3-3 Introduction of Laparoscopic and endoscopic cooperative surgery for duodenal tumors and Short-term Surgical Outcomes at Our Hospital

○Takashi Ono, Akira Matsushita, Masato Yoshioka, Tetsuya Shimizu, Junji Ueda, Hiroshi Yoshida  
(Department of Surgery, Nippon Medical School Hospital)

The Laparoscopic and endoscopic cooperative surgery (LECS) for duodenal tumors is becoming increasingly popular as a minimally invasive surgery, but its indications and techniques have not yet been standardized. Since the introduction of LECS for local resection of duodenal tumors in our hospital in April 2022, we have performed LECS in 5 cases (3 males and 2 females).

We evaluated tumor size, operative time, intraoperative blood loss, open conversion rate, postoperative obstruction to passage, other complications, and the days of postoperative hospital stay in these patients.

The median maximum tumor diameter was 47 mm (26-50 mm), median operative time was 310 minutes (263-405 minutes), median intraoperative blood loss was 0 mL (0-37 mL), and there was one case of open conversion. Postoperative pathology results included one case of early duodenal cancer, three cases of duodenal adenoma, and one case of GIST. The median hospital stay was 8 days (7-41 days), and no patient showed postoperative obstruction of duodenum. Complications of Clavien-Dindo classification IIIa or higher were gastrointestinal bleeding and residual abscess in one case.

We introduced LECS surgery for duodenal tumors; LECS surgery may be useful in the treatment of early duodenal cancer and benign low-grade duodenal tumors.

### A-3-4 A case of angiosarcoma of the small intestine

○Hiroaki Shuto, Emiko Takeshita, Haruka Oi, Shunya Miyazaki, Takashi Okuyama, Hideyuki Yoshitomi  
(Department of Surgery, Dokkyo Medical University Saitama Medical Center)

**Introduction:** Angiosarcoma is a rare high-grade neoplasm that frequently involves the skin and subcutaneous tissues. Even among them, angiosarcomas of the gastrointestinal tract are exceedingly rare.

**Case:** A 77-year-old male patient presented with melena. He had no history of intraabdominal radiation or exposure to industry carcinogens. On enteroscopy, he was found to have a bleeding lesion in the small intestine. The lesion of histopathology review was consistent with angiosarcoma. The patient continued to have melena and needed frequent blood transfusions. He underwent resection of the three lesions in the small intestine, of which two were found intraoperatively. Ten days post-surgery, the patient developed abdominal pain and melena. Multiple nodules were found in the duodenum on upper gastrointestinal endoscopy. The patient's status was very poor and further treatment was not available. He was treated in his home and needed a repeated blood transfusion. He died within four months of the diagnosis.

**Conclusion:** We report a case of a 77-year-old male patient with small intestine angiosarcoma. Surgical resection of the lesions is a standard treatment for angiosarcoma. However, it is often difficult to completely remove all tumor tissue. In general, the survival of patients with small bowel angiosarcoma is poor. Therefore, the development of early diagnosis and effective treatment are required.

## Keynote Lecture

### Woundless HIFU (high intensity focused ultrasound) Ablation for Uterine fibroid and adenomyosis

○Cherng-Jye Jeng<sup>1)</sup>, Kae-Ying Ou<sup>1)</sup>, Cheng-Yu Long<sup>1)</sup>, Linus Chuang<sup>2)</sup>, Chin-Ru Ker<sup>1)</sup>

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**Objective:** Clinical outcomes of 500 high-intensity focused ultrasound (HIFU)-treated uterine fibroids and adenomyosis are analyzed and presented.

**Materials and methods:** This is a retrospective cross-sectional analysis from a single tertiary medical center. From April 2015 to October 2018, 546 cases were enrolled for the study. After excluding 46 patients with less than 3 months of follow-up period, there were 404 fibroids, 149 adenomyosis and 53 mixed conditions entered for analysis.

**Results:** Three months after HIFU-treated uterine fibroids and adenomyosis, the lesion size reduced 40.2% and 46.3%, respectively. Symptoms all improved with better quality of life for the fibroid group, while those with adenomyosis or combined diseases benefit the most from pain control.

**Conclusion:** HIFU is safe and effective in treating uterine fibroids and adenomyosis. The results are reproducible if standardized treatment schedules are followed. It is a promising treatment alternative with the advantages of precision, non-invasiveness, rapid recovery and readiness for pregnancy.

#### A-4-1 Contralateral risk-reduction mastectomy and patient background factors in patients with BRCA pathological variant-positive breast cancer in our hospital

○Runa Sugiyama, Ai Motoyoshi, Kazuki Ito, Sayoko Kakimoto, Miki Sasaki, Kaori Sakamaki, Mina Kitajima, Mika Matsuo, Mizuho Tazou, Takako Kuroda, Tomoko Tsuruga, Arata Shimo, Yasuyuki Kojima, Toru Nishikawa, Koichiro Tsugawa  
(Division of Breast and Endocrine Surgery, Department of Surgery.)

**Background:** Risk-reduction mastectomy (RRM) is the most powerful surgical strategy for breast cancer risk reduction in women with *BRCA1* and *BRCA2* (*BRCA1/2*) mutations. Moreover, contralateral risk-reduction mastectomy (CRRM) has been shown to significantly reduce risk for contralateral breast cancer, improving survival. We conducted a retrospective survey of CRRM implementation after starting insurance coverage in our hospital.

**Methods:** Of 1,090 primary breast cancer cases operated on at our hospital between April 2020 and October 2021, those who underwent preoperative BRCA genetic testing were included. We compared background factors in terms of morbid variant positivity rate, CRRM status, and CRRM implementation. The background factors examined were age, *BRCA1/2*, marital status, existences of children, family history of breast and ovarian cancers, preoperative genetic counseling, and cT, cN or NAC.

**Results:** Preoperative BRCA genetic testing was performed in 190 (17.4%) patients. Pathological variants were found in 15 cases (7.9%), including *BRCA1* in 8 cases and *BRCA2* in 7 cases. CRRM was performed in 9 cases (60%), with Bt in 2 cases, SSM in 2 cases, NSM in 6 cases, and simultaneous reconstruction in 5 cases (56%). The mean age of patients who underwent CRRM was 45.8 years, and 42.8 years for those who did not ( $p=0.4027$ ). No significant difference was detected in the other background factors between the two groups.

**Conclusion:** The CRRM implementation rate for BRCA pathological variant-positive breast cancer patients was as high as 60% in our hospital. No characteristic trend for CRRM implementation was observed in the examination of background factors.

## A-4-2 Adolescent & Young Adult patients with breast cancer has worse outcome and specific biological features compared to other age groups

○Masanori Oshi<sup>1,2</sup>, Akimitsu Yamada<sup>1</sup>, Mahato Sasamoto<sup>1</sup>, Shinya Yamamoto<sup>3</sup>, Kazutaka Narui<sup>3</sup>, Takashi Ishikawa<sup>4</sup>, Kazuaki Takabe<sup>2</sup>, Itaru Endo<sup>1</sup>

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**Aim:** This study aimed to clarify the difference in the clinicopathological and biological features of breast cancer (BC) patients between Adolescent & Young Adult (AYA) and other generations.

**Methods:** BC patients were categorized into four age groups; AYA (15-39 years), perimenopausal (40-55), menopausal (55-65), and older (65+). 1) Clinicopathological analysis was performed using cohorts from two Yokohama city university hospitals (YCU;  $n=4,562$ ), and large public databases (METABRIC;  $n=1,903$ , GSE96058;  $n=3,273$ ). 2) Biological features were analyzed using gene set variation analysis and the xCell algorithm with mRNA expression in public databases.

**Results:** AYA had significantly poorer disease-specific survival than other groups consistently in two cohorts ( $p=0.010$  and  $p=0.002$ , respectively). The survival difference was more pronounced in Luminal BC patients. AYA BC group had larger tumor size, higher rates of node metastasis and PgR positivity (all  $p<0.001$ ) while it did not observe among the other groups. In Luminal subtype, AYA BC significantly had higher enhancement in cell proliferation-related gene sets (G2M checkpoint, E2F targets, and MYC target v1) as well as in MTORC1, unfolded protein response, and PI3K/ACT/MTOR signaling when compared to the other age groups. In HER2-subtypes, AYA BC showed significantly high activated BRCAness ( $p\leq 0.002$  and  $p\leq 0.023$ , respectively) compared to other groups.

**Conclusion:** Biological difference was found in BC between AYA group and the others. This could play a pertinent role in the difference of outcome in each age group. It is necessary to elucidate these differences and develop the treatment strategies which are specific to the AYA BC.

## A-4-3 Predictive Factors of Pathologically Node Negative in cN+ Breast Cancer Patients Following Neoadjuvant Chemotherapy

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**Background:** We performed axillary lymph node dissection (ALND) for clinical node positive (cN+) breast cancer patients if they became pathological node negative (ypN0) after neoadjuvant chemotherapy (NAC). We hypothesized that we could omit ALND if we accurately predicted ypN0. Then, we explored useful clinicopathological factors to predict ypN0 in cN+ breast cancer patients.

**Methods:** A total of 278 cN+ primary breast cancer patients who received NAC and ALND from 2013 to 2017 in St. Marianna University School of Medicine were included in this study. Using retrospective chart review, we assessed clinicopathological factors, accuracy of ypN0, and recurrence rate.

**Results:** Among the 278 patients, 196 (70.5%) were diagnosed with ycN0, and the correct diagnostic rate was 69.9%. The results of multivariate analysis showed that PgR-negative (OR 3.230,  $p=0.0189$ ), HER2-positive (OR 3.323,  $p=0.0046$ ), and clinical complete response (cCR) (OR 5.569,  $p=0.0032$ ) were independently associated with ypN0. Although 21 (10.7%) of the 196 ycN0 patients had recurrence of breast cancer, there was no significant difference between the ypN+ (8.5%) and ypN0 (11.7%) groups ( $p=0.620$ ).

**Conclusion:** In cN+ primary breast cancer patients who underwent NAC, PgR-negative, HER2-positive and cCR could be helpful predictive factors of ypN0 for omitting ALND.

#### A-4-4 A cohort study investigating age and cancer treatment in elderly women with breast cancer

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**Background:** In 2019, 999,000 individuals were newly diagnosed with cancer(s) in Japan, of whom 75% were elderly (≥65 years of age). Elderly patients may experience more serious adverse events than the non-elderly due to the presence of comorbidities and reduced organ function and, as such, may not be adequately treated. Although subsequent life expectancy for Japanese women at 75 years of age is 16 years, inadequate cancer treatment can worsen patient prognosis. Elderly patients are often excluded from clinical trials, and optimal treatment remains unclear. The present study aimed to clarify patient characteristics and treatment using data from an elderly cohort study currently in progress.

**Method:** A total of 532 patients ≥70 years of age, diagnosed with breast cancer at the authors' hospital between 2016 and 2022, were enrolled. The relationship between clinicopathological factors and treatment were analyzed.

**Result:** The mastectomy rate did not differ significantly between the semi-elderly (≤74 years of age) and elderly (75-89 years of age); however, the rate of axillary surgery was significantly higher among the elderly ( $p < 0.001$ ). Semi-elderly patients (24%) had a significantly higher radiotherapy rate than the elderly (8%) and super-elderly (>90 years of age [0%]). Endocrine therapy and chemotherapy groups were significantly younger and exhibited higher risk (stage, lymph node metastasis) than the non-treatment group.

**Conclusion:** The choice of treatment method(s) differed according to age group. Prognosis and quality of life will be examined in future studies.

#### A-4-5 Surgical management of unilateral oophorectomy for ovarian tissue cryopreservation in pediatric patients

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**Purpose:** Fertility preservation for children is still challenging due to an information gap. In particular, there is little information about the surgical aspects of ovarian tissue cryopreservation (OTC) for children. In the present study, the appropriateness of preoperative management and the criteria of our cases were investigated with the aim of establishing a safe OTC procedure.

**Methods:** A total of 69 girls who underwent OTC from November 2015 through February 2023 were retrospectively analyzed with IRB approval.

**Results:** The average age of the patients was  $10.1 \pm 4.7$  years. The medical indications were varied (e.g., leukemia, lymphoma, brain tumor), and included rare diseases. The patient with the poorest preoperative hematology data had a white blood cell count (WBC) of  $100/\mu\text{l}$ . Most cases underwent OTC during chemotherapy or radiotherapy, and they had comorbidities. All cases underwent ovarian tissue retrieval with laparoscopy, and the operating time was around 1 hour, with little bleeding. Although one had complications, all patients started treatment on schedule. Patients who had a normal postoperative course had only mildly elevated WBC and CRP on the first postoperative day.

**Conclusion:** As long as the preoperative criteria are met, OTC could be possible even for children with a severe blood condition. In such cases, the degrees of the WBC and CRP elevations are useful to assess surgical infection.



## A-5-1 Artificial intelligence three-dimensional imaging analysis predicts pathologically noninvasive adenocarcinoma in patients with small-sized lung adenocarcinoma

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**Introduction** Consolidation tumor ratio (CTR) is often used by surgeons to determine the limited surgical procedure for small-sized lung cancer. In this study, we aimed to objectively evaluate small-sized lung adenocarcinomas using 3-dimensional (3D) imaging analysis with artificial intelligence (AI) technology.

**Subjects and methods** A total of 324 patients with clinical N0 lung adenocarcinoma  $\leq 2$  cm who underwent complete resection between 2017 and 2020 were enrolled. The association between radiological findings obtained by AI software and pathological factors was analyzed. The AI software automatically calculated each confidence score of GGN. Noninvasive tumors were defined to have no pathological invasive factors.

**Results** We compared tumor sizes measured by radiologists (rTS) and those measured by the AI software (aiTS), using pathologic tumor sizes as the reference. The difference in rTS was  $-0.29 \pm 0.69$ cm, and the difference in aiTS was  $-0.01 \pm 0.70$ cm ( $p < 0.001$ ). Next, we analyzed 234 patients (72.5%) with tumors  $\leq 2$  cm of aiTS. The patients' characteristics showed that the median CTR was 0.67 (range 0-1.0). Noninvasive adenocarcinomas were found in 176 patients (75%). In the clustering method, the AI software score of GGN  $\geq 0.85$  was assigned as GGN (AI-GGN). Tumors with CTR  $\leq 0.25$  and AI-GGN were compared for sensitivity, specificity, and negative likelihood ratio for noninvasiveness (31.8% vs. 33.9%, 98.2% vs. 98.5%, and 0.69 vs. 0.67, respectively).

**Conclusion** Our results suggest that AI-3D analysis enables the evaluation of objective radiological findings of small-sized lung adenocarcinoma and the prediction of noninvasiveness.

## A-5-2 EGFR Mutation Impacts Recurrence in Patients with High-Risk Early-Stage Lung Adenocarcinoma in the Novel IASLC Grading System

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**Introduction:** The prognostic value of the new grading system proposed by the International Association for the Study of Lung Cancer (IASLC) has been reported. This study aimed to identify patients with early-stage lung adenocarcinoma at high risk for recurrence based on pathological indicators of poor prognosis, including the IASLC grade, and elucidate the prognostic impact of epidermal growth factor receptor mutation (EGFRm) status.

**Methods:** The study included 494 consecutive patients who underwent complete resection for pathological stage I lung adenocarcinoma between 2011 and 2016. All eligible patients were evaluated for EGFRm and IASLC grade. Multivariable analysis was used to identify pathological factors for poor prognosis associated with recurrence-free survival (RFS) and overall survival (OS). Patients with any one of these factors were classified into the high-risk group. The prognostic impact of EGFRm was evaluated using RFS, OS, and cumulative recurrence proportion.

**Results:** Multivariable analysis revealed that the IASLC grade 3, pathological invasion size  $>2$  cm, and presence of lymphovascular invasion were indicators of poor prognosis. The incidence of all types of recurrence, central nervous system (CNS) metastasis, and distant metastasis was significantly higher in EGFRm-positive patients in the high-risk group. Recurrence occurring five years after surgery was observed in EGFRm-positive patients in the high-risk group.

**Conclusions:** The incidence of recurrence, including CNS metastasis in the late postoperative period, was higher in patients with EGFRm-positive stage I lung adenocarcinoma in the high-risk group. Further studies are needed to devise strategies for postoperative surveillance and adjuvant treatment in this population.

### A-5-3 Perioperative outcome of segmentectomy using ICG for primary lung cancer

○Ryosuke Amemiya, Yujin Kudo, Tomokazu Omori, Hideyuki Furumoto, Satoshi Takahashi, Sachio Maehara, Masaru Hagiwara, Masatoshi Kakihana, Tatsuo Ohira, Norihiko Ikeda  
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**Background:** The number of segmentectomies for small-sized lung cancer is increasing. The identification of intersegmental planes is important for this surgical procedure, and ICG method is easily for this purpose. In this study, we evaluate the usefulness of the ICG methods compared with the other methods.

**Methods:** The consecutive 215 patients who received segmentectomy for primary lung cancer in our hospital between 2017 and 2022 were enrolled in this study. Clinicopathological and perioperative factors were retrospectively investigated.

**Results:** Segmentectomy using the ICG method (ICG group) was performed in 97 cases and other than the ICG method (non-ICG group) in 118 cases, respectively. Complex segmentectomy was performed in 37 (38%) and 20 patients (17%), respectively ( $p<0.01$ ). There were no significant differences in clinical factors (clinical Stage, emphysema, etc.), perioperative outcomes (using fibrin glue, operation time, etc.), and postoperative complications between the two groups. In the ICG group, 18 patients (19%) had postoperative air leak, including prolonged air leak (PAL) in 5 patients (5%) and Grade 3a or higher air leak (G3a-air leak) in 3 patients (3%). In the non-ICG group, 28 patients (24%) experienced postoperative air leak, including PAL in 10 patients (9%) and G3a-air leak in 8 patients (7%). Regarding complex segmentectomy, G3a-air leak was found in no patients of the ICG group and 2 patients (10%) of the non-ICG group ( $p=0.05$ ), which indicated that the ICG group tended to have a low incidence of postoperative air leak.

**Conclusion:** Our results suggested that segmentectomy using the ICG method can reduce postoperative complications compared to the conventional technique.

### A-5-4 Utility of simulated surgery for congenital tracheal stenosis using three-dimensional Printed models

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**Purpose:** Congenital tracheal stenosis (CTS) is rare but often life-threatening. The slide tracheoplasty (STP) is the standard treatment for CTS. Understanding the features of the tracheal stenosis in each case and choosing an appropriate incision design are very important for successfully executing the procedure. The present study aimed to evaluate the advantages of three-dimensional (3D) printed models of the trachea for improving CTS.

**Methods:** Twenty consecutive patients undergoing STP for CTS at Tokyo Metropolitan Children's Medical Center were included. The patients were divided evenly into two groups with or without 3D simulation. The former group underwent STP without a 3D simulation, and the latter group underwent a pre-operative STP simulation. Clinical outcomes, including patient survival, postoperative surgical interventions, and time required for STP, were compared between the groups. The utilities and limitations of the simulated surgery were discussed.

**Results:** All ten patients for whom simulated surgery using a 3D tracheal model were conducted achieved good airway patency after their STP. The surgeons reported feeling that the 3D model simulations were highly effective although there was no significant difference in the clinical outcomes in the two groups. The models were useful not only for surgical planning but also for sharing important information among the multidisciplinary team and the patients' family. Regarding the 3D models, fragility, and cost-effectiveness were challenges for the future.

**Conclusion:** Our experience using 3D tracheal models demonstrated several features enabling improvement in the surgical treatment of CTS.

## A-5-5 Lung segmentectomy using mixed reality (MR) technology

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**【Background】** The number of segmentectomies has increased as there are more screening detected cancers than before. However, segmentectomy is difficult procedure in terms of difficulty in identification of the accurate intersegmental planes and keeping resection margin. In this study, we used mixed reality (MR) technology, which combines virtual reality (VR) and augmented reality (AR), for tumor localization and intersegmental planes identification.

**【Methods】** This study enrolled 23 patients (9 male patients and 14 female) who received lung segmentectomy between October 2021 and August 2022. The median tumor diameter was 2.0 cm (range: 0.5 - 3.1 cm). We created MR lung models using software (Holoeyes XR) from preoperative CT images, and we used MR goggles (Hololens: Microsoft) during operation. The actual image of the lung on the thoracoscopic monitor and the MR lung model were superimposed on the thoracoscopic monitor to identify the tumor location and intersegmental planes. Accuracy of intersegmental planes identification was evaluated by the ICG method.

**【Results】** The median time from thoracic observation to intersegmental planes identification was 8 minutes (range : 3-16). and the median distance of the resection margin from the tumor was 1.5 cm (range: 0.8 - 3.8), and safety distance was obtained in all cases. In addition, there was general agreement between the MR and ICG method.

**【Conclusion】** The MR-assisted resection may be safe and comparable to conventional methods such as ICG. In this report, we show the specific identification method.



## A-6-1 A case of ciliated muconodular papillary tumor/bronchiolar adenoma accompanied with interstitial pneumonia in an 82-year-old woman

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An 82-year-old woman had an 8-mm solid pulmonary nodule in the right lower lobe that had slowly grown. A computed tomography (CT) images of the background lung showed usual interstitial pneumonia (UIP). Her blood test showed high pro-gastrin releasing peptide (pro-GRP), high Krebs von den Lungen-6 (KL-6), and high surfactant protein A (SP-A). The patient underwent thoracoscopic right lower lobe wedge resection safely and there was no complication in the postoperative course. The tumor was confirmed ciliated muconodular papillary tumor/bronchiolar adenoma (CMPT/BA). A CMPT/BA is a rare benign tumor with a slow growth rate which is often observed in middle-aged and elderly individuals. Approximately half of the patients had a history of smoking, but the association between the tumor and interstitial pneumonia is unclear. In this study, we report our experience of CMPT/BA accompanied with interstitial pneumonia in an 82-year-old woman following thoracoscopic right lower lobe wedge resection, with some literature review.

## A-6-2 A case of pneumothorax after acupuncture

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**[Introduction]** We report a case of pneumothorax after acupuncture and moxibustion.

**[Case]** A 51-year-old woman. There were no special notes in the medical history. After receiving acupuncture and moxibustion on X-1 day, right chest pain appeared on the way home. She also had a cough and difficulty breathing, and could not sleep that day. When she visited a nearby doctor on X day, she was diagnosed with right pneumothorax, and was referred to our department on the same day. At the time of our outpatient, there were many acupuncture and moxibustion marks on the anterior chest and back, and SpO<sub>2</sub> was 99% (room), but dyspnea and shortness of breath worsened over time. We immediately inserted chest tube. CT showed no lesions that could cause pneumothorax, so we judged the pneumothorax by acupuncture. Air leakage continued for X+1 days, and the lung was not full expansion, so VATS is being considered.

**[Discussion]** In addition to this case, we have also experienced a case of bilateral pneumothorax and air embolism after acupuncture and moxibustion who was transported by ambulance for CPA(cardiopulmonary arrest). We will report our experience and the literature review.

### A-6-3 Initial Management of Open Pneumothorax: A Case Report

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**Introduction:** Pneumothorax is an accumulation of air within the pleural cavity, leading to mechanical disruption of respiratory cycles and in some circumstances, hemodynamic instability. Open pneumothorax is called a ‘sucking’ wound, since air can move inward and/or outward. The previous TCCC guideline, initial management of open pneumothorax relies on the application of a three-sided dressing that functions as a one-way valve that allows air to leave but not enter the pleural cavity. Open pneumothorax is rarely reported.

**Case Presentation:** We present a case of a 47-year old male with open left pneumothorax and multiple rib fractures due to traffic accident. Primary survey showed a wide open wound at the left 4<sup>th</sup>-8<sup>th</sup> ribs. Patient underwent exploratory thoracotomy, debridement, rib cage wiring & clipping and chest tube insertion. There was no significant morbidity nor complication recorded post-operatively; vital signs were unremarkable.

**Discussion:** The latest ATLS and TCCC guideline stated that sufficient three-sided dressing could prevent respiratory deterioration seen in open pneumothorax cases, followed by chest tube insertion and definitive surgical repair. Initial management of open pneumothorax in general are primary survey, adequate chest dressing, analgetics, and they all must be individualized with the patients’ condition.

**Conclusion:** Open pneumothorax can be life threatening since it interrupts effective respiration. Primary survey, hemodynamic stabilisation, adequate chest dressing - if available and chest tube insertion followed by definitive repair can prevent the development of tension pneumothorax and mortality.

**Keywords:** guideline; initial management; open pneumothorax

### A-6-4 The Actual Frequency of Asymptomatic Cerebral Infarction after TEVAR is High

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**Objective.** The actual incidence of embolic brain infarction after Thoracic endovascular aortic repair (TEVAR) has rarely reported. The aim of this study is to evaluate the rate of asymptomatic cerebral infarction after TEVAR by MRI scan.

**Methods.** We investigated 70 patients undergoing TEVAR from 2017 April. Perioperative cerebral infarction was diagnosed by serial cerebral diffusion-weighted MRI at before and after the procedure.

**Results.** The procedure was successful in all patients. No patient died in hospital and there was 1 symptomatic neurologic deficit. Preoperative MRI scans showed no signs of prior acute ischemia in any patients, however, postoperative MRI detected a total of 48 new lesions of cerebral infarction in 25 patients (35.7%). These patients included 4 out of 32 cases of ‘zone 4’ (12.5%), 16 out of 22 cases treated with debranching arch vessels (72.7%), and 12 out of 17 cases treated with left subclavian artery occlusion by vascular plug (70.6%). More than moderate atherosclerotic change (thickness of intima in aortic arch > 4 mm) may have a potential risk of asymptomatic cerebral infarction.

**Conclusions.** TEVAR was associated with a high incidence of asymptomatic cerebral infarctions by MRI scan. Debranching and LSA occlusion with TEVAR in ‘zone 1-2’ cases might increase the risk of perioperative stroke.

## **A-6-5 A case of lung metastasis from gastric cancer presenting as ground-glass opacity dominant nodules**

○Takahiro Niimi, Joji Samejima, Yutaro Koike, Tomohiro Miyoshi, Kenta Tane, Keiju Aokage, Tetsuro Taki, Genichiro Ishii, Masahiro Tsuboi

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**Backgrounds:** Most metastatic lung tumors present as pure solid nodule on chest computed tomography. On the other hand, ground-glass opacity on chest computed tomography usually suggests low-grade malignant lesions such as adenocarcinoma in situ or atypical adenomatous hyperplasia of the lung.

**Case presentation:** A 75-year-old woman with a history of gastric cancer surgery about 5 years ago was referred to department of thoracic surgery in our hospital due to a newly-appearing two pulmonary ground-glass opacity dominant nodules on chest computed tomography. She had two ground-glass opacities in the right lower lobe, the one in the S6 segment was 12 mm and the one in the S10 segment was 8 mm. On chest computed tomography 15 months prior to referral, the one in the S6 segment was 8 mm and the one in the S10 segment could not be pointed out. She was suspected of having primary lung cancer and underwent a wide wedge resection for the nodule in S6 segment. In resected specimen, polygonal tumor cells infiltrated into the alveolar septa with some tumor cells taking signet-ring cell morphology. With morphological similarities to tumor cells of previous gastric cancers and the results of immunostaining, she was diagnosed as lung metastasis of gastric cancer.

**Conclusions:** Pulmonary nodules in patients with a history of cancer of other organs, even if ground-glass opacity predominant, should also be considered a possibility of metastatic pulmonary tumors if they are growing fast.

## A-7-1 The usefulness of liver scintigraphy as the evaluation of liver function in patients scheduled for hepatectomy

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**Aim:** Post-hepatectomy liver failure (PHLF) remains a severe complication after liver resection. This retrospective study aimed to predict the risk of PHLF using liver scintigraphy, 99mTc- galactosyl human serum albumin scintigraphy (99mTc-GSAS), in addition to the indocyanine green clearance (ICG) test.

**Methods:** A total of 334 consecutive patients who underwent various type of hepatectomies between January 2018 and December 2020 at our institution were enrolled. Both the ICG test (ICGR15) and the 99mTc-GSAS (LHL15) were routinely examined before scheduled hepatectomy to evaluate preoperative the hepatic reserve. Based on the retrospective chart review, a multivariate analysis was performed to identify the potential predictors for PHLF. In addition, the predictive model of PHLF using both the ICGR15 and LHL15 was proposed to clarify the clinical efficacy of LHL15.

**Results:** Of 334 patients, 64 patients (19.2%) developed PHLF (Grade A: n=18, Grade B: n=38, Grade C: n=8). On multivariable analyses, preoperative prothrombin time (P=.006), ICGR15 (P=<.001), intraoperative blood loss (P=.001), and operation time (P=.005) were significant independent predictors for PHLF. In the predicted probability for PHLF in combination with ICGR15 and LHL15, each value of the ICGR15 and LHL15 were parallel impact on the probability for PHLF when the ICGR15 was ≤13. However, when the ICGR15 >13, the predictive probability for PHLF was increased dependent on the value of LHL15 (P=.093).

**Conclusion:** The preoperative LHL15 value in addition to ICGR15 could predict more accurately PHLF, especially in patients with the value of ICGR15>13.

## A-7-2 Predictive factors for recurrence of Hepatocellular carcinoma

○Hiroataka Ishido, Musashi Takada, Tepei Tatsuoka, Keishi Kawasaki, Takuji Noro, Hidehiro Tajima, Hideyuki Yoshitomi

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### [Backgrounds]

With advances in chemotherapy for hepatocellular carcinoma (HCC), we should reconsider the indication of surgical resection. Therefore, we investigated the predictive factors for recurrent cases of HCC.

### [Method]

We included 100 consecutive cases who underwent hepatectomy for HCC in our department between 2015 to 2021.

We performed univariate and multivariate analysis by Cox regression analysis for recurrence-free survival and determined the independent prognostic factors. We chose the cut-off value for continuous variables by comparing the early recurrence group (recurrence within one year after surgery) and the long-term recurrence-free group (recurrence-free for more than two years) by ROC analysis. We include the following factors: age, sex, Child-Pugh, background (alcohol, HBV, HCV), single or multiple, preoperative vascular invasion (PVI) or not, non-anatomical resection or anatomical resection, preoperative laboratory data (AST, ALT,  $\gamma$ -GTP, total bilirubin, LDH, Albumin, PT%, CRP, Plt, ICG, AFP, PIVKA-II), and preoperative tumor size.

### [Results]

The univariate analysis revealed that multiple tumors, PVI, preoperative AST, ALT,  $\gamma$ -GTP, and preoperative tumor size were the significant predictive factors.

The multivariate analysis showed PVI, high AST, and big tumor size were independent prognostic factors.

The two-year recurrent free survival rate was 85.9% in the patients without any of these factors, 50.1% in the patient with one factor, 21.4% in the patient with two factors, and 22.5% in the patients with all three factors, and the recurrent free survival was significantly shorter depending on the number of elements (p< 0,001).

### [Discussion]

For cases with those multiple factors, the indication of surgical resection should be reconsidered. Neoadjuvant therapy might improve survival.

### A-7-3 A case of laparoscopic extended left medial sectionectomy for a hepatocellular carcinoma patient with right ligamentum teres

○Jun Shibamoto, Yoshihisa Matsumoto, Yusuke Yamamoto, Ryo Morimura, Hisashi Ikoma, Takuma Ohashi, Hiroki Shimizu, Tomohiro Arita, Hirotaka Konishi, Atsushi Shiozaki, Yoshiaki Kuriu, Takeshi Kubota, Hitoshi Fujiwara, Eigo Otsuji  
(Department of Surgery, Kyoto Prefectural University of Medicine)

**Background:** Right-sided ligamentum teres (RSLT) is a rare anatomical variant. In cases with RSLT, the balance of the liver sector is different, and there are deviations of vasculobiliary architecture. We report a case of laparoscopic liver resection for a hepatocellular carcinoma patient with RSLT.

**Case:** A 72-year-old man with a past history of chronic hepatitis C presented for the treatment of hepatocellular carcinoma. The tumor was 40.8 mm in diameter and located in the S4/8. Laparoscopic expanded left medial sectionectomy including the resection of MHV and a part of S4/8 ventral area was performed. Intraoperative ultrasonography (IOUS) detected the antero-ventral section (ventral P8), left paramedian segment (P4), middle hepatic vein (MHV), fissural vein, and V8. The transection of liver parenchyma was carried out as follows. On the left border, the root of P4 was isolated, while the fissural vein was preserved. While the V8 and the MHV were exposed on the transection plane, the cranial part of the falciform ligament was resected with the tumor, and the caudal part of the falciform ligament was preserved. The duration of the procedure was 280 min, and the blood loss was 75 ml. The postoperative CT scan showed that any ischemic areas were not observed and that resection had been completed as preoperatively planned. The patient was discharged on the eighth postoperative day without any complications.

**Conclusions:** Meticulous preoperative simulations and IOUS are crucial for secure anatomical liver resection, and it will bring uneventful postoperative course in patients with RSLT.

### A-7-4 A case study performing intensive care before liver transplantation in our hospital

○Itaru Chinen, Shinichiro Ono, Yasunori Uesato, Tokuro Baba, Masaaki Kuda, Yoshihiro Miyagi, Yoji Nakamura, Tatsuya Kinjyo, Hiroyuki Karimata, Mitsuhsa Takatsuki  
(Department of Digestive and General Surgery, Graduate School of Medicine, University of the Ryukyus, Okinawa)

#### **[Background]**

Acute-on-chronic liver failure (ACLF) often leads to multi-organ failure (MOF) and is associated with a very poor prognosis. The survival rate after liver transplantation is good; however, the timing of transplantation and perioperative management are often difficult because of severe infections and the development of MOF.

#### **[Subjects and methods]**

Six of 21 patients who underwent living donor liver transplantation were diagnosed with ACLF. This retrospective study analyzed and considered these cases.

#### **[Results]**

The causes of chronic liver failure included alcoholism (n=4), autoimmune disease (n=1), and Wilson's disease (n=1) in a pediatric patient. The causes of the progression of ACLF were thyrotoxic crisis (n=1), infection (n=1), bleeding (n=1), unknown (n=3). Five of six patients could not be taken off dialysis until liver transplantation. Five of the six patients were unable to be weaned from dialysis prior to transplantation. A patient whose BMI:13 with severe sarcopenia had difficulty in controlling the infection and deciding the timing of transplantation. In addition, one patient suffered thyroid crisis which triggered the onset of ACLF and therefore underwent a total thyroidectomy prior to transplantation. The median time from hospitalization to liver transplantation was 21 (2-55) day, and the median of MELD score was 33 (16-38). Two of six patients died of MOF at 107 and 183 days after liver transplantation, respectively. The breakdown included cases of severe sarcopenia and thyroid crisis, in whom it was difficult to control post-transplant biliary fistulas and infection control.

#### **[Conclusion]**

Intensive care and liver transplantation were salvageable in 66% of ACLF cases in our hospital.

## A-7-5 A resected case of chest wall metastasis from hepatocellular carcinoma successfully treated with ICG fluorescence

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**[Introduction]** Chest wall metastases after RFA for hepatocellular carcinoma are occasionally encountered and may be an indication for resection. On the other hand, hepatocellular carcinoma (HCC) has been clinically treated with ICG, which fluoresces in the near-infrared light, and has been reported to be useful in the treatment of peritoneal dissemination. In this report, we describe a case in which ICG fluorescence was useful in the resection of a chest wall metastasis of hepatocellular carcinoma.

**[Case]** A 69-year-old man was diagnosed with hepatitis B 30 years ago and underwent TACE for hepatocellular carcinoma 11 years ago. One year ago, RFA was performed for S6 hepatocellular carcinoma recurrence. This time, CT scan revealed metastasis in the right chest wall, and the patient was referred to our hospital. At the same time, peritoneal dissemination was also noted, but because the chest wall metastasis was painful and symptomatic, palliative surgery for the tumor was planned before chemotherapy. Considering the ICG fluorescence method, 2.5 mg of ICG was injected intravenously the day before surgery.

**[Result]** A skin incision was made just above the ninth intercostal tumor, and the subcutaneous tissue was dissected to identify the tumor. Tumors were easily identified by the ICG camera as they fluoresced. Furthermore, ICG fluorescence showed two small tumors near the main tumor. The main tumor and two smaller tumors nearby could be removed in one lump. After resection, ICG fluorescence confirmed the absence of local remnants.

**[Conclusion]** ICG fluorescence was also useful in resection of chest wall metastases of hepatocellular carcinoma.

## A-7-6 A patient with post Fontan operation underwent laparoscopic partial resection of the liver for liver tumors

○Kisara Tada<sup>1,2)</sup>, Shunichi Ariizumi<sup>1)</sup>, Yusuke Oime<sup>1)</sup>, Yutaro Matsunaga<sup>1)</sup>, Yusuke Kawamoto<sup>1)</sup>, Chikae Ubukata<sup>1)</sup>, Goro Honda<sup>1)</sup>

(<sup>1)</sup>Dept. of Surgery, Tokyo Women's Medical Univ., <sup>2)</sup>Tokyo Women's Medical Univ.)

### Background

The Fontan procedure has been widely accepted for children with single ventricle physiology and guarantees survival rates of approximately 80% at age 20 years. However, there have been cases of Fontan-associated liver disease (FALD) caused due to congestion, along with recent reports of the development of liver tumor, focal nodular hyperplasia (FNH) or hepatocellular carcinoma in younger patients with FALD. Laparoscopic liver resection is controversial since pneumopressure is dangerous for patient with post Fontan operation.

### Case presentation:

The patient was a 21-year-old man who was diagnosed with multiple liver tumors two years ago. Contrast enhanced computed tomography (CECT) revealed two hypervascular tumors, 3 cm in diameter in the segment No2 and 1 cm in diameter in the segment No4. His liver function test, Child-Pugh class was A with an indocyanine green retention rate of 15% at 15 min. The levels of alpha-fetoprotein (AFP) and protein induced by vitamin K antagonists-II (PIVKA-II) were 5 ng/ml (normal <10 ng/ml) and 24 mAU/ml (normal <40 mAU/ml), respectively. Central venous pressure was (CVP) 13 mmHg. To maintain the blood pressure, laparoscopic partial resection was successfully performed without the head-up position (reverse Trendelenburg position) and lower pneumopressure (8 mmHg). During surgery, CVP maintained 13~15 mmHg, and the total operation time was 161 min with a total blood loss of 50 ml. The patient's postoperative course was uneventful.

### Conclusions:

Laparoscopic partial resection was performed safely while maintaining CVP in a patient with post Fontan operation.



## A-8-1 Dorsal Pancreatic Artery—A Study of its Detailed Anatomy for Safe Pancreaticoduodenectomy

○Teppei Tatsuoka, Hirotaka Ishido, Musashi Takada, Keisi Kawasaki, Takashi Mitsui, Emiko Takeshita, Hidehiro Tajima, Takashi Okuyama, Hideyuki Yoshitomi  
(Dokkyo Medical University Saitama Medical Center Department of Surgery)

### **【backgrounds and purpose】**

In pancreaticoduodenectomy (PD), reducing the amount of blood loss without causing venous congestion at the resection site is one of the main purposes of performing arterial pretreatment. In addition to the gastroduodenal and inferior pancreaticoduodenal arteries, the dissection of the dorsal pancreatic artery should also be preceded to avoid venous congestion in PD resection. We examine the anatomy of the pancreatic artery using computed tomography (CT).

**【Subject and method】** We analyzed the preoperative dynamic CT of 160 patients who underwent hepatobiliary-pancreatic surgery from January 2016 to December 2017. We also analyzed the presence or absence of the dorsal pancreatic artery, its root position, and the bifurcation morphology and running of the dorsal pancreatic artery.

**【result】** Of the 160 included patients, the dorsal pancreatic artery was found in 103 (64%), branched from the celiac artery or its branches in 70 (68%), and intersected the superior intestine in 34 (33%). The dorsal pancreatic artery roots derived from the celiac artery system included 28 common hepatic arteries, 27 splenic arteries, and 15 celiac trunks. Eight cases of replacement right hepatic artery, 1 case of the anterior inferior pancreaticoduodenal artery, 1 case of the middle colic artery.

**【Discussion】** An understanding of the anatomy of the dorsal pancreatic artery is essential for a complete arterial pretreatment.

## A-8-2 Association Between Preoperative Chemoradiotherapy for Pancreatic Cancer and Postoperative Vertebral Compression Fracture

○Masakazu Fujii, Toru Nakamura, Toshimichi Asano, Shintaro Takeuchi, Kimitaka Tanaka, Aya Matsui, Yoshitsugu Nakanishi, Takehiro Noji, Takahiro Tsuchikawa, Satoshi Hirano  
(Department of Gastroenterological Surgery II, Hokkaido University Faculty of Medicine)

**Introduction:** Preoperative chemoradiotherapy is a standard treatment for locally advanced pancreatic ductal adenocarcinoma (PDAC), but its impact on bone health is not well understood. This study aimed to investigate whether preoperative treatment of PDAC could lead to postoperative vertebral compression fractures (VCF).

**Methods:** This retrospective study reviewed the data of patients who underwent pancreatectomy for PDAC at our hospital between 2014 and 2021. Patients who had 1-year and more of follow-up were eligible. Demographic information, tumor characteristics, and prognosis were collected. VCF was defined as a height reduction of more than 4 mm in the vertebral body between the cranial and caudal edges.

**Results:** Of the 108 patients, 67 (62%) had resectable tumors (R) and 41 (38%) had borderline or unresectable tumors (BR/UR). Preoperative treatment included upfront surgery (28%), neoadjuvant chemotherapy (NAC:52%), and neoadjuvant chemoradiotherapy (NACRT:20%). The postoperative vertebral compression fracture rates for upfront, NAC, and NACRT were 10%, 16%, and 36%, respectively ( $P=0.042$ ). Multivariate analysis revealed that NACRT was an independent risk factor for new fractures ( $P=0.015$ ). Older age ( $\geq 65$ -year-old), female sex, and past compression fractures did not significantly increase the risk. The numbers of VCF in the NACRT and upfront/NAC groups were 10 and 16, respectively. All VCF in NACRT were around the thoracolumbar transition (Th11-L2) and coincided with the irradiated area; however, 25% of VCF were found in areas other than the thoracolumbar transition in upfront/NAC.

**Conclusions:** Preoperative chemoradiotherapy may increase the risk of VCF. Further studies are required to better understand the potential long-term effects of chemoradiotherapy.

### A-8-3 Utility of PNA-directed PCR clamping for detecting KRAS mutation in peritoneal lavage of pancreatic ductal adenocarcinoma

○Gaku Shimane<sup>1</sup>, Yutaka Nakano<sup>1</sup>, Sachiko Matsuda<sup>1</sup>, Minoru Kitago<sup>1</sup>, Masugi Yohei<sup>2</sup>, Kohei Nakamura<sup>3</sup>, Yuki Nakamura<sup>1</sup>, Hiroshi Yagi<sup>1</sup>, Yuta Abe<sup>1</sup>, Yasushi Hasegawa<sup>1</sup>, Shutaro Hori<sup>1</sup>, Masayuki Tanaka<sup>1</sup>, Hiroshi Nishihara<sup>3</sup>, Yuko Kitagawa<sup>1</sup>

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**Background:** Peritoneal washing cytology (CY) is recognized as a poor prognostic factor in patients with pancreatic ductal adenocarcinoma (PDAC). Despite CY0, peritoneal dissemination is one of the common recurrence patterns due to the low sensitivity of CY. Therefore, we aimed to compare the diagnostic performance of liquid biopsy by peptide nucleic acid (PNA) directed polymerase chain reaction (PCR) clamping with conventional cytology.

**Methods:** Peritoneal washing lavages obtained from patients with PDAC who underwent surgery at Keio University hospital between January 2020 and December 2021 were analyzed retrospectively. Genomic DNA was extracted from peritoneal washing lavage (peritoneal-floating cell DNA: pfDNA). KRAS mutations in pfDNA were confirmed by the Sanger sequence or next-generation sequence. The optimal cutoff value of PNA-directed PCR clamping to KRAS mutation in pfDNA was determined by Receiver Operating Characteristic (ROC) curve.

**Results:** Of 54 patients, nine were diagnosed with positive CY (CY1), and six had peritoneal dissemination at surgery (P1). The value of the threshold cycle (Ct) in pfDNA was significantly lower in patients with CY1 ( $P < 0.001$ ) and P1 ( $P < 0.001$ ). KRAS mutation in pfDNA was detected in 11 patients (20.4%). The optimal cutoff value of Ct was 36.42, and  $Ct \leq 36.42$  was determined as positive molecular cytology (MC1) and 15 patients (34.9%) were classified as MC1 in CY0P0. Patients with MC1 had significantly more peritoneal dissemination recurrences in resected PDAC (MC1:38.9% vs. MC0:12.0%,  $P = 0.040$ ).

**Conclusions:** PNA-directed PCR clamping for pfDNA demonstrated higher sensitivity than conventional cytology. The genomic approach might be clinically valuable for diagnosing tumor cells in peritoneal lavage.

### A-8-4 The pitfall for adopting KRAS droplet-digital PCR for peritoneal lavage tumor DNA as a clinical application in pancreatic ductal adenocarcinoma

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**Objective:** Recently tumor-derived DNA in peritoneal fluid of patients with pancreatic ductal adenocarcinoma (PDAC) has been expected as a novel surrogate marker, because of the worse prognosis related to the peritoneal washing cytology positive. We investigated the clinical utility of droplet digital PCR (ddPCR) for KRAS mutations in peritoneal lavage of PDAC patients.

**Methods:** The peritoneal lavage samples were prospectively collected from surgically treated 173 consecutive PDAC patients between 2018 and 2022. KRAS mutation allele frequencies were analyzed using ddPCR, and the thresholds of the amplitudes and the cutoff values of allele frequency were optimized. The patients were categorized into 3 groups: cytology positive/negative (Cy1/Cy0), and defined KRAS mutation-positive/negative (mu1/mu0) among Cy0. The primary outcome was disease-free survival (DFS), and the secondary outcome was overall survival (OS) and the cumulative incidence of peritoneal recurrence.

**Results:** Any definition of thresholds and cutoff values did not show a significant difference in DFS and OS between Cy0/mu0 and Cy0/mu1. On the other hand, peritoneal recurrence was significantly higher in the Cy0/mu1 than in the Cy0/mu0 setting as a threshold in 9,000 and cutoff values of 3 mutant droplets. We detected KRAS mutations completely in the Cy1 group and showed the worst prognosis in DFS, OS, and peritoneal recurrence in any patterns.

**Conclusion:** KRAS mutations in the peritoneal lavage of PDAC could not show prognostic impact but relate to peritoneal recurrence. Therefore, an appropriate definition of thresholds and cutoff values for ddPCR will be required for a clinical testing.



## **A-8-5 Portal vein white thrombus discovered during pancreaticoduodenectomy**

○Shuhei Ikejiri, Shimpei Takagi, Hiroshi Nakano, Toshihiro Nakayama, Sai Kimura, Takuma Otsubo, Yuya Tanaka, Takahiro Ozaki, Toshiyuki Miyahara, Tsunehisa Matsushita, Yasuhiro Sumi  
(National Hospital Organization Shizuoka Medical Center)

### **Introduction**

A hypercoagulable or prothrombotic state of malignancy occurs due to the coagulation system activation by tumor cells, which sometimes lead to portal vein thrombus.

### **Case**

A woman in her sixties was referred to our hospital for upper abdominal discomfort and black stool. Upon assessment, she was diagnosed as adenocarcinoma of the pancreatic head with portal vein and duodenal invasion. Contrast-enhanced computed tomography (CECT) conducted 16 days before surgery didn't show portal vein thrombus.

The patient underwent subtotal stomach-preserving pancreaticoduodenectomy with D2 dissection and portal vein reconstruction. Superior mesenteric vein (SMV) was invaded by the tumor, therefore portal vein reconstruction via end-to-end anastomosis was conducted. Doppler ultrasonography after reconstruction revealed insufficient portal venous flow. No improvement was seen after reanastomosis, either. Further examination with ultrasonography showed a large thrombus just proximal to the reconstruction site in the portal vein confluence. Therefore, 1cm venotomy was made, and the thrombus was removed using a Fogarty catheter. After this, portal venous flow on ultrasonography significantly improved. The operative time was 10 hours and 27 minutes with an estimated blood loss of 721 ml.

The pathological analysis of the thrombus revealed a fibrin thrombus. On postoperative day 2, an abdominal CECT showed patent portal venous flow. The postoperative course was uneventful. The patient was discharged on postoperative day 14.

### **Conclusion**

Preoperative CECT cannot rule out the presence of portal vein thrombus. Doppler ultrasonography after reconstruction is essential to confirm adequate blood flow.

## **A-8-6 A Case of AAST-OIS grade IV pancreatic injury who underwent pancreaticoduodenectomy after diagnosis of main pancreatic duct injury by ERP**

○Masaaki Inoue, Shigeta Kenta, Koji Asai, Hodaka Moriyama, Ryutaro Watanabe, Osahiko Hagiwara, Kiribayashi Takaharu, Enomoto Toshiyuki, Nobue Futawatari, Takuya Nagata, Manabu Watanabe, Yoshihisa Saida  
(Department of Surgery, Toho University Ohashi Medical Center)

### **Introduction**

The frequency of pancreatic injury is about 0.2-12% among abdominal traumas, especially pancreatic injury with main pancreatic duct is rare.

### **Case**

The patient was a 16-year-old man. In a basketball game, he lost his balance in the air and fell from his abdomen to the floor. Contrast-enhanced computed tomography revealed transection of the pancreatic head. Endoscopic retrograde pancreatography (ERP) showed injury of the main pancreatic duct and leakage of contrast medium. So, he was diagnosed with the Organ Injury Scale of the American Association for the Surgery of Trauma (AAST-OIS) grade IV pancreatic injury. As a stent could not be placed distal to the injured area, an endoscopic nasal pancreatic drainage (ENPD) tube was placed up to the proximal end of the injured area. Based on the results of the blood test, abdominal findings, and various imaging tests, we decided to perform a semi-emergency operation on the next day. Pancreaticoduodenectomy was performed because a pancreatic head injury and main pancreatic duct transection were found about 3 cm from the ampulla of Vater. He recovered successfully and was discharged on postoperative day 34.

### **Conclusion**

Surgery is commonly performed in cases of pancreatic injury with main pancreatic duct in Japan, but recently, there have been some reports of successful conservative treatment. There is no consensus on the exact surgery or non operative management (NOM) of grade IV pancreatic injury in the world. We report a case with a highly suggestive treatment strategy and surgical technique, with some discussion of the literature.

## B-1-1 Expression and role of glutaredoxin 2 in colon cancer

○Atsuki Ota, Hiroki Shimizu, Atsushi Shiozaki, Tomoyuki Fukami, Jun Kiuchi, Takuma Ohashi, Tomohiro Arita, Yusuke Yamamoto, Hirotaka Konishi, Ryo Morimura, Yoshiaki Kuriu, Hisashi Ikoma, Takeshi Kubota, Hitoshi Fujiwara, Eigo Otsuji

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**[Background]** Glutaredoxin 2 (GLRX2) is a member of the glutaredoxin family of proteins, which regulate through deglutathionylation the activity of several enzymes playing a role in the control of cell apoptosis. Previous studies have elucidated the roles of and the mechanisms by which GLRX2 is activated in various cancer type. However, the role of GLRX2 in colon cancer remains poorly understood. In the present study, we analyzed the relationship between GLRX2 expression and tumor progression in colon cancer.

**[Methods]** Knockdown (KD) experiments were performed by transfecting human colon cancer cell lines with GLRX2 siRNA. Samples from 141 patients with colon cancer were subjected to immunohistochemistry (IHC) for GLRX2, and its relationship with clinicopathological factors and prognosis were examined.

**[Results]** GLRX2-KD suppressed the cell proliferation, cell cycle progression, apoptosis, and cellular movement. Cell cycle analysis showed that GLRX2-KD suppressed the progression of G1-S phase. Wound healing assays revealed that GLRX2-KD suppressed the migration of cells. Survival analysis showed significantly poorer 5-year relapse-free survival (RFS) in the GLRX2 high expression group by IHC (high vs low; 65.7 vs 81.4%,  $p=0.0292$ ).

IHC multivariate analysis identified the high expression of GLRX2 as an independent prognostic factor for 5-year RFS in colon cancer patients ( $p=0.0287$ ).

**[Conclusion]** The present study may contribute to the identification of GLRX2 as a mediator in tumor progression, with it eventually being a promising prognostic biomarker or a novel therapeutic target of colon cancer.

## B-1-2 Detection of HER2 gene amplification in colorectal cancer by droplet digital PCR

○Shintaro Kanaka, Takeshi Yamada, Hiromichi Sonoda, Akihisa Matsuda, Seiichi Shinji, Kazuhide Yonaga, Takuma Iwai, Kohki Takeda, Sho Kuriyama, Toshimitsu Miyasaka

(Department of Gastrointestinal and Hepato-Biliary-Pancreatic Surgery, Nippon Medical School,)

**Background:** It has been reported that HER2-positive tumors were 2-3% in colorectal cancer (CRC). In general, HER2 amplification was detected in KRAS wild-type patients. It is also reported that CRC with HER2 amplification revealed resistance for anti-epidermal growth factor receptor (EGFR) antibody drugs. In this study, we analyze HER2 gene amplification in tumors and plasma with colorectal cancer using droplet digital PCR.

**Method and Patients:** We retrospectively collected and analyzed data of pathological Stage IV CRC patients who underwent primary tumor resection at our hospitals from October 2017 to September 2021. We also analyzed HER2 gene amplification in tumors and plasma with colorectal cancer using droplet digital PCR. Based on previous reports, RPPH1 was used for the reference gene.

**Results:** In total, 27 patients were enrolled in this study. Tissue HER2 copy number (median) and tissue HER2 ratio (HER2/RPPH1) were 249.57 (123.42 -2280.42)/ml and 1.16 (0.71 -13.57). Plasma HER2 copy number (median) and Plasma HER2 ratio (HER2/RPPH1) were 22.3 (3.3 -209)/ml and 1.81 (0.93 -8.94). Only one patient demonstrated both high tissue HER2 ratio 13.57 ( $p<0.001$ ) and high plasma HER2 ratio 8.94 ( $p<0.001$ ). 16 patients received anti-EGFR antibody drugs. In 9 patients who were resistant to anti-EGFR antibody drugs, the plasma HER2 ratio was increased ( $P = 0.02$ ), and in 5 patients who were responsive to anti-EGFR antibody drugs, the plasma HER2 ratio was not increased ( $P = 1.00$ ).

**Conclusion:** HER2 detection in plasma samples may use for monitoring of treatment and diagnosis of heterogeneity.

### **B-1-3 The prognosis factor in elderly CRC patients with high-risk based on preoperative inflammatory and nutritional marker**

○Koki Hayashi<sup>1)</sup>, Toshimitsu Miyasaka<sup>2)</sup>, Takeshi Yamada<sup>2)</sup>, Hiromichi Sonoda<sup>2)</sup>, Seiichi Shinji<sup>2)</sup>, Akihisa Matsuda<sup>2)</sup>, Kazuhide Yonaga<sup>2)</sup>, Takuma Iwai<sup>2)</sup>, Kohki Takeda<sup>2)</sup>, Sho Kuriyama<sup>2)</sup>, Shintaro Kanaka<sup>2)</sup>, Hiroshi Maruyama<sup>1)</sup>, Hiroshi Makino<sup>1)</sup>, Hiroshi Yoshida<sup>2)</sup>

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**[Introduction]** The number of elderly patients with colorectal cancer (CRC) is increasing every year in line with rising in the number of CRC patients and the super-aging society. Despite having multiple comorbidities, elderly patients are increasingly undergoing curative surgery and chemotherapy thanks to advances in medical treatment. However, it is important to consider both the potential for cure and the patient's safety when deciding on a treatment plan. In this study, we examined the short- and long-term postoperative outcomes of elderly CRC patients with severe comorbidities, based on preoperative factors.

**[Methods]** We included patients with stage II and III CRC who were treated in our hospital between Jan 2011 and Dec 2020 and were over 65 years old (except patients with neoadjuvant chemotherapy). We compared the patients in the high-risk group (ASA-PS 3 or higher) with those in the non-high-risk group (ASA-PS 2 or lower).

**[Results]** We analyzed 460 patients, with 83 in the high-risk group and 377 in the non-high-risk group. The high-risk group had a significantly higher frequency of postoperative complications with a Clavien-Dindo classification grade of 2 or higher ( $p=0.007$ ). In high-risk group, only modified Glasgow Prognostic Score (mGPS) 2 points were the risk factor for postoperative complications ( $p=0.021$ ). Postoperative complications were not the risk factor for poor long-term prognosis ( $p=0.70$ ). Conversely, only Prognostic Nutritional Index (PNI) was the poor predict marker for overall survival and relapse-free survival ( $p=0.037$ ,  $p=0.028$ ).

**[Conclusion]** Preoperative nutritional status may be an important marker for short- and long-term prognosis in elderly CRC patients with high-risk.

### **B-1-4 Predictors and histological effects of preoperative chemoradiotherapy for rectal cancer and control of lateral lymph node metastasis**

○Hiroshi Miyakita, Yutaro Kamei, Kazutake Okada, Hajime Kayano, Seiichiro Yamamoto  
(Tokai University department of surgery)

**[Introduction]** Standard treatment strategy for low rectal cancer in Japan is different from Western countries. Total mesorectum excision (TME) + lateral lymph node dissection (LLND) is mainly carried out in Japan, whereas neoadjuvant chemoradiotherapy (nCRT) + TME is selected in Western countries. There is no clear definition of preoperative diagnosis of lateral lymph node metastasis. If we can predict lateral lymph node swelling that can be managed by nCRT from lateral lymph node swelling that require surgical resection, clinical benefit is significant. In the current study we assessed characteristics of the lateral lymph node recurrence (LLNR) and LLND that can be managed by nCRT.

**[Patients and Methods]** Patients with low rectal cancer ( $n=168$ ) underwent nCRT between 2009 and 2016. We evaluated CEA, neutrophil/lymphocyte ratio (NLR), platelet/lymphocyte ratio (PLR), and lateral lymph node short axis pre and post nCRT, respectively, and also evaluated tumor shrinkage rate, tumor regression grade (TRG). We evaluated the relationship between each and LLNR.

**[Results]** LLND was not carried out all patients. Factors associated with LLNR were PLR and lymph node short axis pre and post nCRT. ( $p=0.0269$ ,  $0.0278$ ,  $p<0.0001$ ,  $p<0.0001$ , respectively). Positive recurrence cut-off values of lateral lymph node short-axis calculated were 11.6 mm pre nCRT and 5.5 mm post nCRT.

**[Conclusion]** Results suggest that PLR before and after CRT was associated with control of LLNR, and LLND should be performed on lateral lymph nodes with short-axis of 5 mm and 11 mm pre and post nCRT.

## **B-1-5 Evaluation of mesenteric resection range by ICG in transverse colon cancer**

○Tatsuya Kinjo, Yoshihiro Miyagi, Mitsuhsisa Takatsuki  
(University of the Ryukyus , Department of Digestive and General Surgery)

**(Introduction)** The surgical procedures of LN dissection for transverse colon cancer has not been standardized. This is because of technical difficulties in surgical procedures and uncertain region of lymphatic drainage in transverse colon cancer. Recently, the efficacy of lymphatic-flow assessment using near-infrared observation of ICG has been reported.

**(Aim)** We investigated the outcomes related to LN metastases in transverse colon cancer at our institution and reported the determination of the range of lymphadenectomy using ICG lymph-flow evaluation.

**(Patients and Methods)** Twenty-five patients with transverse colon cancer underwent surgery at our institution between 2010 and 2020. We evaluated short-term outcomes on basis of clinicopathological factors.

**(Results)** Stage I/IIa/IIb/IIIb/IIIc = 6/12/3/3/1. The median number of LNs dissected was 10, the maximum number of metastasis-positive LNs was 9, and the median was 0. There were no metastases in LNs other than #221 and #222. Of the 25 patients, 3 had LN metastasis, including poorly differentiated adenocarcinoma, large tumors, and extensive preoperative LN metastasis. Two patients recurred at #223 with extensive LN and liver metastasis.

**(Conclusion)** It was suggested that ICG lymphatic-flow evaluation can be useful for appropriate LN dissection in transverse colon cancer.

## **B-2-1 A case of robot-assisted laparoscopic resection of rectal Rb carcinoma with multiple enlarged HIV-positive lymph nodes**

○Yoshihisa Watanabe, Ryutaro Udo, Yu Kuboyama, Tomoya Tago, Kenta Kasahara, Tetsuo Ishizaki, Yuichi Nagakawa  
(Department of Gastrointestinal and Pediatric Surgery, Tokyo Medical University)

The patient was a 46-year-old man. He visited his local doctor with a chief complaint of bloody stools, and lower gastrointestinal endoscopy revealed a semi-peripheral type 2 tumor at 5 cm AV. Biopsy revealed a diagnosis of tub2. The patient had FDG-PET which showed multiple enlarged lymph nodes and 18F-FDG uptake. A left inguinal lymph node biopsy was performed and Kaposi's sarcoma was detected. The preoperative diagnosis was rectal cancer cT3N3M0 cStage IIIc. Because of concerns about exacerbation of HIV infection following induction of chemotherapy, the patient was decided not to undergo preoperative treatment. Robotic-assisted laparoscopic ultra-low anterior resection + upper D3 dissection + bilateral lateral dissection + temporary ileal colostomy was performed. Postoperatively, the patient had a Clavien-Dindo classification grade 2 neurogenic bladder and milk erosion, but his progress was good, and he was discharged on postoperative day 17. The pathological diagnosis was pT3N3M0 pStage IIIc. One month after surgery, the patient was alive without recurrence. We report this case because we realized that lower rectal cancer in an HIV patient with Kaposi's sarcoma can have a good course if appropriate treatment for HIV infection and rectal cancer surgery are performed.

## **B-2-2 A case of rectal cancer with abdominal aortic aneurysm undergoing robot-assisted rectal resection using a laparoscope**

○Kota Sugiura, Junpei Takashima, Ayaka Koizumi, Fumi Shigehara, Kenji Yamazaki, Daisuke Fujimoto, Hitoshi Sugimoto, Fumihiko Miura, Keizo Taniguchi, Noriyuki Matsutani, Hirotohi Kobayashi  
(Department of Surgery, Teikyo University School of Medicine, Mizonokuchi Hospital)

**[Introduction]** We report a case of rectal cancer with an abdominal aortic aneurysm treated by a robot-assisted anterior resection using a laparoscope.

**[Case]** A 86-year-old man who presented with bloody stool was found to have an advanced rectal cancer (RSRa, dT3 N1a M0: cStage IIIb). Preoperative computed tomography revealed a 39mm abdominal aortic aneurysm and a 25mm left iliac aneurysm. Robot-assisted anterior resection with D2 lymph nodes dissection was performed. We inserted a 5mm laparoscope during surgery to confirm no contact between the robotic forceps and the aneurysm. The operation was completed without any problems. The postoperative course was uneventful, and the patient was discharged on postoperative day 9.

**[Discussion]** Although precise manipulation is possible in a robotic surgery, there is a lack of tactile sensation. For this reason, in some institutions, robotic surgery is contraindicated for patients with abdominal aortic aneurysm or common iliac aneurysm. In this case, we successfully completed a robotic surgery in a patient with abdominal aortic aneurysm by using a 5mm laparoscope. A real-time monitoring using a laparoscope is useful to look down at operative field in a robotic surgery to prevent an accidental blood vessel injury. Robotic surgery for rectal cancer may be possible even in a patient with abdominal aortic aneurysm by adding ingenuity.

### **B-2-3 A case of endoscopic fistula closure with Over-The-Scope Clip (OTSC) for anastomotic leakage after low anterior resection**

○Jiro Sato, Tshoyuki Enomoto, Sayaka Nagao, Nanako Kakizaki, Nobue Hutawatari, Junji Maehara, Yusuke Akimoto, Koji Asai, Manabu Watanabe, Yoshihisa Saida  
(Department of Surgery, Toho University Ohashi Medical Center)

Anastomotic leakage after rectal cancer surgery is one of the most serious postoperative complications. In this study, we report a case, that an over-the-scope clip (OTSC) was successfully used to close the fistula of anastomotic leakage after laparoscopic low anterior resection for a rectal cancer.

The patient is a 86-year-old woman. She underwent laparoscopic low anterior resection for rectal cancer. She started eating on the 3rd postoperative day, and the drain in the Douglas fossa was removed on the 4th postoperative day. On the 5th postoperative day, she developed fever and had tenderness with muscular defense in the lower abdomen. Labo data showed no elevation of CRP and WBC. Abdominal CT showed increased CT value of panniculitis around the anastomosis and free air outside the intestinal tract, but there was no abscess cavity. So we just observed. On the 6th postoperative day, she had tenderness with muscular defense on the whole abdomen, and abdominal CT showed abscess with free air outside the intestine. We diagnosed panperitonitis, and performed a colostomy of ileum. On the 20th postoperative day, CRP elevated. On the 22nd postoperative day, we underwent colonoscopy which revealed a fistula on the dorsal rectum and abscess from the fistula. We performed OTSC on the 26 postoperative day. After the OTSC, the inflammatory findings improved. She was discharged from hospital on the 78th postoperative day.

OTSC is one option for the treatment of the anastomotic leakage after colorectal surgery. We would like to report with some literature review.

### **B-2-4 A case of locoregionally advanced mixed neuroendocrine-non-neuroendocrine neoplasm of the descending colon which underwent curative resection and adjuvant chemotherapy**

○Yuya Tanaka<sup>1</sup>, Toshihiro Nakayama<sup>1</sup>, Shimpei Takagi<sup>1</sup>, Takuma Otsubo<sup>1</sup>, Takahiro Ozaki<sup>1</sup>, Toshiyuki Miyahara<sup>1</sup>, Tsunehisa Matsushita<sup>1</sup>, Yasuhiro Sumi<sup>1</sup>, Masayuki Takagi<sup>2</sup>, Hiroshi Nakano<sup>1</sup>  
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**Introduction:** Neuroendocrine carcinomas (NECs) of the colon are rare, and when they present with a non-neuroendocrine component the diagnosis is categorized as mixed neuroendocrine-non-neuroendocrine neoplasms (MiNENs). Since the first description of a mixed neoplasm 99 years ago, the nomenclature has evolved, most recently with the 2022 WHO classification, yet we have still little understanding of the spectrum of diseases.

**Case:** The patient is a 72 year old woman who presented with hematochezia for 2 months. Colonoscopy revealed a type 2 tumor near the splenic flexure in the descending colon, which was initially diagnosed as poorly differentiated adenocarcinoma on biopsy. CT scan did not show any regional lymph node or distant metastasis. The clinical diagnosis was adenocarcinoma, cT2N0M0, cStage I. Laparoscopic partial colectomy with D3 lymph node dissection and intracorporeal overlap anastomosis was performed. The pathological diagnosis was mixed adenocarcinoma-NEC of the descending colon, pT4aN1bM0, pStage IIIB: 70% was NEC, while poorly differentiated mucinous carcinoma constituted 30% of the tumor. The postoperative course was uneventful, and the patient was discharged on postoperative day 10. She is currently recurrence-free undergoing cisplatin/irinotecan adjuvant chemotherapy for a duration of 4 courses.

**Conclusion:** We experienced a rare case of locoregionally advanced MiNEN of the descending colon which underwent curative laparoscopic resection with intracorporeal anastomosis and adjuvant chemotherapy. The clinical course of MiNENs depend on the biology of the two components, and both components must be pathologically characterized. Even quantitatively discrete components should be carefully subtyped as their prognostic relevance is undetermined.

## **B-2-5 A case of the internal hernia resulting from the defect in the bowel film after laparoscopic partial colon resection**

○Shimpei Takagi, Yasuhiro Sumi, Toshihiro Nakayama, Takuma Otsubo, Yuya Tanaka, Takahiro Ozaki, Toshiyuki Miyahara, Tsunehisa Matsushita, Hiroshi Nakano  
(National Hospital Organization Shizuoka Medical Center Surgery)

The case is an 87 year old man. Undercaroscopic lymphadenectomy was performed for stage II advanced large cell lymphoma of the colon and a D2 cavity overlap anastomosis was performed. He made good progress and was discharged on day 8. Four days after discharge, he developed abdominal pain and vomiting and consulted our hospital. On contrast CT scan, emergency surgery was performed as strangulated intestinal obstruction due to internal hernia. The nodal aromatic part was incarnate and necrotic, with the hynomatic defect, which had not been closed in the rampant colon anastomosomosomo during surgery, as the hernia gate. The necrotic small bowel was removed and sutured by hand. To close the intestinal membrane deficiency, the indulgence of the proximia was fixed to the deficiency and the surgery was terminated. Hernias of the intestinal membrane defect after colon surgery are rare, but they can occur with a certain probability. In particular, the internal hernia after splenic curvature excision is more likely to occur than other bowel resections due to the anatomical characteristics that the bowel film defect is close to a truth ligament. This time, after laparoscopic colonic surgery, we have experienced a case of internal hernia that occurred from the intestinal membrane defect, which will be reported, including literature considerations.



### **B-3-1 A case of hemolytic uremic syndrome undergoing subtotal colorectal resection**

○Peilin Li, Toshiyuki Adachi, Satomi Okada, Yusuke Inoue, Kazuma Kobayashi, Akihiko Soyama, Tomohiko Adachi, Masaaki Hidaka, Kengo Kanetaka, Susumu Eguchi  
(Department of Surgery, Nagasaki University Graduate School of Biomedical Sciences)

**Case:** A man in his 70s visited a hospital with the chief complaint of bloody stools. He was transported to our hospital for emergency care after a colonoscopy at the previous hospital revealed extensive colitis. When the patient came to the hospital, he was found to have a decreased level of consciousness, severe renal dysfunction, and colitis of the whole colon type, and ICU management was started. The next day, septic shock progressed, and the patient underwent emergency surgery with a diagnosis of colon necrosis or bacterial translocation. Based on the intraoperative findings, a subtotal colorectal resection was performed. Infectious disease screening revealed that the patient was positive for verotoxin, leading to the diagnosis of hemolytic uremic syndrome (HUS) associated with pathogenic *E. coli* infection. After 18 days of multidisciplinary treatment, including plasma exchange, he was transferred to a general ward and discharged on his own.

**Discussion:** Limited cases of intestinal resection for HUS have been reported. It is difficult to evaluate the efficacy of intestinal resection. However, some cases of intestinal necrosis have been observed during the course of the disease. In cases that do not respond to multimodality therapy, a surgical approach may be lifesaving in confirming necrosis and interrupting the source of persistent infection.

**Conclusion:** HUS that does not respond to multidisciplinary treatment should be treated with surgical intervention.

### **B-3-2 A case of renal metastasis from transverse colon cancer**

○Tatsufumi Kosuge, Tomoya Tago, Ryutarō Udo, Kenta Kasahara, Junichi Mazaki, Tetsuo Ishizaki, Yuichi Nagakawa  
(Department of Gastrointestinal and Pediatric Surgery, Tokyo Medical University)

**[Background]** Renal metastasis of colorectal cancer is reported to account for 3.5% of autopsy cases, and it is often seen in the advanced or late stage of clinical course, and is rarely diagnosed during surviving.

**[Case]** 74 year old female. Anemia was pointed out, and lower gastrointestinal endoscopy performed for the purpose of detailed examination revealed a tumor with circumferential stenosis in the right transverse colon, and biopsy results showed a moderately differentiated tubular adenocarcinoma. A CT scan showed a known transverse colon tumor in the right transverse colon, lymphadenopathy, multiple bilateral lung metastases, multiple liver metastases, and a left kidney mass. The renal mass was 10 cm in maximum diameter and was diagnosed as metastasis of colon cancer by biopsy. She was diagnosed with transverse colon cancer c-T4aN3M1b (H3, PUL2, It-renal) stage IVb. Because of anemia due to bleeding from the primary tumor and stenosis, a laparoscopic right hemicolectomy was performed palliatively. RAS/BRAF, MSI are under investigation and palliative chemotherapy will be introduced.

**[Conclusion]** The prognosis of patients with unresectable colorectal cancer has been prolonged with the development of chemotherapy, and the chances of encountering patients with renal metastasis may increase in the future. We experienced a rare case of renal metastasis from colorectal cancer.



### **B-3-3 Interval appendectomy of complicated appendicitis by single port laparoscopic surgery**

○Takanori Matsui<sup>1</sup>, Kohki Takeda<sup>2</sup>, Takeshi Yamada<sup>2</sup>, Hiromichi Sonoda<sup>2</sup>, Seiichi Shinji<sup>2</sup>, Akihisa Matsuda<sup>2</sup>, Kazuhide Yonaga<sup>2</sup>, Takuma Iwai<sup>2</sup>, Sho Kuriyama<sup>2</sup>, Toshimitsu Miyasaka<sup>2</sup>, Shintaro Kanaka<sup>2</sup>, Hiroshi Yoshida<sup>2</sup>

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#### **[Background]**

Interval appendectomy (IA) has greatly changed the treatment strategy for complicated appendicitis (CA). It involves removing the appendix a few months after non-operative management (NOM). In our department, single-port laparoscopic surgery is the preferred method for IA of CA. However, it can be technically challenging in some cases.

#### **[Methods]**

We analyzed the outcomes of CA patients in which IA was planned and performed from January 2012 to June 2021.

#### **[Results]**

IA was planned for 127 cases. NOM was successful in 92 cases (72.4%). One case in which cholecystectomy was performed simultaneously was excluded, and 91 cases were included. Laparoscopic surgery was completed in 90 cases (98.9%), with only one case requiring transfer to laparotomy. The median operating time was 80 (27-178) minutes, blood loss 0 (0-150) ml, and postoperative hospital stay 2 (2-9) days. Complications (Clavien-Dindo: CD grade ≥ I) were observed in 8 cases (8.8%), with severe complications (CD grade ≥ III) observed in one case (1.1%). Single port laparoscopic surgery without additional ports was successful in 90 cases (71.4%). During NOM, 15 cases (16.5%) revealed abscess requiring percutaneous drainage. In these cases, the rate of single port laparoscopic surgery was significantly lower (26.7%), compared to cases without abscess (80.3%, P < 0.01).

#### **[Conclusion]**

Single port laparoscopic surgery is a safe and effective procedure for IA of CA. However, in cases with abscess requiring percutaneous drainage in NOM, technical difficulties during surgery can be expected, and additional ports should be considered.

### **B-3-4 A case of Analectalgia due to Anorectal varices controlled by percutaneous transhepatic Portal obliteration**

○Takuma Otsubo<sup>1,2</sup>, Hiroshi Nakano<sup>1,2</sup>, Toshihiro Nakayama<sup>1</sup>, Shimpei Takagi<sup>1,2</sup>, Yuya Tanaka<sup>1</sup>, Takahiro Ozaki<sup>1</sup>, Toshiyuki Miyahara<sup>1</sup>, Tsunehias Matsushita<sup>1,2</sup>, Yasuhiro Sumi<sup>1</sup>, Takehito Otsubo<sup>1</sup>

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Anorectal varices most commonly develop in patients with portal hypertension due to liver cirrhosis. Although treatment guidelines for rectal varices are not established.

We report a case of percutaneous transhepatic varicocele obliteration (PTO) of an anorectal varicocele after transverse colectomy for transverse colon cancer.

#### **<Case Report>**

Chief complaint of a 75 y.o. woman was analectalgia. Her medical history was postoperative valvular heart disease, diabetes, and appendicitis. In her current medical history, she had analectalgia since a year ago, and referred to our hospital. Hepatic dysfunction was observed by blood sampling. At the contrast-enhanced CT, anorectal varices were detected. The inferior mesenteric vein and superior rectal vein were dilated. On the findings of colonoscopy, several varices were observed at the anal verge. In addition, type2 transverse colon cancer was detected accidentally by colorectal endoscopy. The cancer was 4 cm in diameter at the left side of transverse colon without lymph node metastasis or distant metastasis. The pathological diagnosis of the tumor was adenocarcinoma. We therefore diagnosed that the anorectal varices due to portal hypertension and stage IIA transverse colon cancer. We performed a partial transverse colon resection first. In order to perform PTO later, we preserved the inferior mesenteric vein. We perform PTO using monoethanolamine Oleate, microcoils, and gelatin sponges after 28 days after the colectomy.

Her analectalgia has been controlled for 6 months after these therapies, and her anorectal varices have been shrunk without recurrence. We herein report a case of the anorectal varices that was successfully treated with PTO.

### **B-3-5 A case of acute appendicitis diagnosed by subcutaneous inguinal abscess**

○Kosuke Isomura, Keisuke Ida, Masahiro Sawada, Sojiro Kato, Atsuhito Tsuchihashi, Shinjiro Kobayashi, Satoshi Koizumi, Takehito Otubo

(Department of Gastroenterology and General Surgery, St. Marianna University Hospital)

We present the case of a male patient in his 30s who presented to our department with a complaint of a gradually enlarging painful mass in his right inguinal region. A computed tomography (CT) scan showed a subcutaneous abscess in the right inguinal region measuring approximately 3.5 cm with increased fatty tissue content in the inguinal canal and retroperitoneum. A cord-like structure, which appeared to be an appendix with a fecolith at the root, was seen near the inguinal canal, and a diagnosis of a subcutaneous abscess in the inguinal region due to acute appendicitis was made. The patient was first treated for uncontrolled diabetes mellitus, and the subcutaneous abscess was percutaneously drained with a plan for a standby laparoscopic appendectomy. Surgically there was no obvious inguinal hernia, but the appendix had adhesions to the lateral inguinal fossa and retroperitoneum. After an adhesiolysis, the appendix was resected at the base. The postoperative course was good, with no recurrence of the abscess. We report a relatively rare case of appendicitis without an inguinal hernia, in which the appendiceal inflammation had spread subcutaneously through the inguinal canal, with a review of the literature.

## B-4-1 The characteristics of renal cell carcinoma patients on the renal replacement therapy

○Naoto Aoki, Yuhji Marui, Keisuke Matsubara, Takashi Shimizu, Masahide Sasaki, Ryuji Yamada, Hikaru Tsukada, Naoto Yoza, Tomohiro Nishi, Koichiro Aida, Nozomi Hayakawa, Ryuto Nakazawa, Kazunobu Shinoda, Eiji Kikuchi  
(Department of Urology, St Marianna University School of Medicine)

**Aim** In end-stage renal disease patients the increased incidence of renal cell carcinoma (RCC) has been reported. We investigated the characteristic of RCC patients who received dialysis as well as underwent kidney transplant (KT).

**Methods** We identified 29 patients on renal replacement therapy who were diagnosed with RCC between 2004 and 2019. We evaluated background of the patients and the clinical course of RCC.

**Results** The average age was 57.0 years, and the average time of dialysis before the diagnosis of RCC was 12.2 years. The average follow-up period was 5.3 years. Six patients underwent KT. Initial tumor stage I, II, III, and IV disease was observed in 24, 1, 1 and 3, respectively. Twenty-four (82.8%) patients were incidentally discovered as renal tumor during health check and 3 (10.3%) had symptom such as gross hematuria (N=1), fever (N=1) and general fatigue (N=1). Tumor recurrence was observed in 6 patients including contralateral renal tumor in 2, lung metastasis in 2, liver metastasis in 1 and cerebella metastasis in 1. Four patients were dead due to RCC. No significant difference on age, smoking history, initial tumor stage, duration of dialysis, KT performed was observed between patients with and without tumor recurrence. Furthermore, no significant difference on background of the patients between patients who were incidentally discovered without symptom and those had symptom.

**Conclusion** Most patients were diagnosed early staged RCC during follow-up of dialysis or KT. Establishment of more appropriate follow-up protocol for checking renal mass regularly would be warranted.

## B-4-2 Introduction of general skills training rotation

○Yohei Kojima, Taisuke Takagi, Tsurumi Masanao, Yoshikazu Hashimoto, Atsuko Ohki, Hirohisa Takeuchi, Nobutsugu Abe  
(Department of Gastroenterological & General Surgery, Kyorin University Faculty of Medicine)

**[Backgrounds and objectives]** Surgical skills have been rapidly diversifying in recent years. With this, the importance of simulation training has also increased, and the range of general skills has changed significantly from open to laparoscopic techniques. This paper introduces general skills of United States rotation program for young surgical residents and considers the educational environment for young surgeons.

**[Training curricula]** The University of Chicago conducts a two-week training rotation for second-year residents. The gastrointestinal anastomosis is performed with the tissue of the swine. These are performed by laparoscopic and open techniques respectively.

**[Discussion and Conclusion]** It is very important for young residents to be exposed to the diversity of surgical techniques. Such experiences can be valuable materials for objectively judging what procedures are efficient and safe, as well as improving one's own skills. This rotation curricula, as early intensive training, should be a great reference for future simulation training.

### **B-4-3 A case of femoral hernia repair with two stage repair**

○Takahiro Ozaki, Toshihiro Nakayama, Shinpei Takagi, Takuma Otsubo, Yuya Tanaka, Toshiyuki Miyahara, Tsunehisa Matsushita, Yasuhiro Sumi, Hiroshi Nakano  
(National Hospital Organization Shizuoka Medical Center Department of General Surgery)

The patient, a 47-year-old female, had no unusual medical or surgical history. She visited her local doctor complaining of upper stomach pain and vomiting, and was diagnosed with intestinal obstruction and admitted to our hospital.

Right inguinal bulge the size of a golf ball was noticed, and a CT scan revealed intestinal obstruction brought on by a right femoral hernia. We tried to manually fix the obstruction intraperitoneally, but it was difficult, therefore we decided to perform an urgent surgery. As laparoscopic surgery was being done, the intra-abdominal cavity was visible.

The intestinal tract had turned dark red in color, and resection of the small intestine was performed. The SAC was ligated with ENDOLOOP on the abdominal side.

Five months after the initial surgery, a laparoscopic femoral hernia repair was performed. Intra-abdominal observation revealed a depression beside the ligated SAC. The preperitoneal space was dissected and a 3D mesh size L was placed. The mesh near the femoral ring was suture-fixed. We report a case of two-stage repair.

### **B-4-4 STUDY OF THE EFFECT OF AUTOLOGOUS PLATELET RICH PLASMA THERAPY IN THE TREATMENT OF CHRONIC, NON-HEALING ULCERS**

○Shreya Raina, Hemantkumar Borse  
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Wound healing is a complex, multi stepped process which is dependent on an intricate interplay between a number of highly regulated factors working in concert to restore injured skin towards repaired barrier function. With numerous disease processes, the cascade of events involved in wound healing can be affected, resulting in chronic, non-healing wounds.

Evidence suggests that chronic wounds impose significant and often under-appreciated burden to the individual, the healthcare system and the society as a whole. debridement and regular dressings.

This study, hence, is being carried out to study the efficacy of autologous platelet rich plasma therapy in the treatment of chronic, non-healing ulcers.

A prospective, interventional study was carried out on a sample size of 34. Patients with ulcers of varied aetiologies of at least 3 weeks duration were selected for the study. The initial size of the ulcer was mapped out on a graph paper. Autologous Platelet Rich Plasma was produced which was applied over the wound every week for a period of six weeks or till complete resolution. The size of the ulcer was monitored every week.

It was found through this study that the reduction in size of the chronic ulcers was statistically significant following Platelet Rich Plasma therapy and the finding was consistent across ulcers of various aetiologies. and efficacious alternative for the management of chronic, non-healing ulcers.

## **B-4-5 A one-stage surgical case of inferior pancreaticoduodenal artery aneurysm and occluded origin of celiac artery complicated with liver cancer**

○Masahiro Tomita, Kan Nawata, Kiyoshi Chiba, Satoshi Kinebuchi, Hiroshi Nishimaki, Kazuyoshi Tanigawa, Masahide Komagamine, Shota Kita, Misa Kogo, Ryuji Nakamura, Masahide Chikada, Takeshi Miyairi  
(Department of Cardiovascular Surgery, St Marianna University School of Medicine)

A 72-year-old woman was referred to our department for surgery after a liver cancer of about 2 cm in diameter in the hepatic S 3 area and aneurysm of the inferior pancreaticoduodenal artery were noted during follow-up for hepatitis C. She was diagnosed as having Child A cirrhosis and median arcuate ligament syndrome (MALS). Since the origin of the celiac artery was occluded and improvement of celiac artery blood flow through dissecting the median arch ligament could not be expected, we first performed a partial hepatic resection through an upper midline abdominal incision, and after careful hemostasis, an abdominal aorto-gastroduodenal artery bypass anastomosis was performed using a great saphenous vein graft. The patient further underwent transcatheter coil embolization of the inferior pancreaticoduodenal artery aneurysm via the superior mesenteric artery, and the abdomen was closed after confirming that there was no posterior hemorrhage. Median arcuate ligament incision has been reported to be effective in treating ischemia in the region perfused by the celiac artery due to MALS; however, bypass surgery, as in this case, may be an option if the effect is not sufficient. When hepatectomy is performed concurrently, heparin-induced bleeding can be a problem, so meticulous hemostatic manipulation is essential.

## **B-4-6 Measuring salivary cortisol for non-invasive analysis of perioperative stress response in children: a pilot study**

○Ayaka Adachi<sup>1)</sup>, Kazuto Suda<sup>1)</sup>, Ketaro Fujiwara<sup>1)</sup>, Hiroko Watayo<sup>1)</sup>, Ailing Hu<sup>2)</sup>, Takuji Yamaguchi<sup>2)</sup>, Hiroyuki Koga<sup>1)</sup>, Geoffrey Lane J<sup>1)</sup>, Hiroyuki Kobayashi<sup>2)</sup>, Atsuyuki Yamataka<sup>1)</sup>  
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### **Purpose**

Precise non-invasive measurement of cortisol was correlated with surgical stress to improve the outcome of pediatric minimally invasive surgery (MIS) in this pilot study.

### **Methods**

Cortisol was measured with an enzyme-linked immunosorbent assay using approximately 200  $\mu$ L of saliva collected daily between 08:00 and 12:00 (AM) and between 17:00 and 21:00 (PM) for 5 days before and after selected elective cutaneous (n=19) and internal (n=22) procedures.

### **Results**

Subjects were 1-16 years old. All cutaneous procedures were open and internal procedures were thoracic (n=5; all MIS) and abdominal (n=17; MIS=13, open=4). Significant rapid increases in postoperative mean cortisol that decreased to preoperative levels were observed in all subjects ( $p<0.0001$ ). There was significant negative correlation between age and PM cortisol on the day of surgery (S0:  $p<0.05$ ) and AM cortisol for 3 days postoperatively (S+1:  $p<0.05$ ; S+2:  $p<0.05$ ; and, S+3:  $p<0.001$ ). PM cortisol on S0 also correlated significantly with duration of surgery and anesthesia ( $p<0.05$  and  $p<0.01$ , respectively) and was also significantly higher for abdominal surgery compared with cutaneous surgery ( $1.58\pm 0.80$  versus  $0.70\pm 0.44\mu\text{g/dL}$ ;  $p<0.05$ ) and on S+1 ( $1.1\pm 0.49$  versus  $0.60\pm 0.44\mu\text{g/dL}$ ;  $p<0.05$ ). MIS subjects had significantly lower AM/PM cortisol than open subjects on S+2 ( $0.53\pm 0.35$  versus  $1.18\pm 0.46\mu\text{g/dL}$  and  $0.67\pm 0.61$  versus  $1.38\pm 0.70\mu\text{g/dL}$ ;  $p<0.05$ , respectively).

### **Conclusions**

Non-invasive assessment of salivary cortisol accurately reflected longer procedures and younger age as significant stress factors in pediatric patients and could contribute to decreasing stress by considering the timing of surgery/invasive procedures. Further application of this technique is expected to identify trends for minimizing pediatric patient stress.

## B-5-1 A Study of Carotid Endarterectomy in Our Hospital

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### Introduction:

Carotid endarterectomy (CEA) is an established treatment for internal carotid artery stenosis. This study analyzes the CEA cases in our hospital, where CEA is the first choice.

### Subjects and Methods:

We analyzed 35 patients with 37 sides who underwent CEA from April 2018 to February 2023 at our hospital, where CEA is the first choice for the carotid stenosis. This study focused on risk factors for CEA and internal carotid artery stenting (CAS).

### Result:

The median age at the time of treatment was 75.4, with 29 men and 6 women. Risk factors for CEA were found in 16 patients, with 22 factors. Risk factors for CAS were found in 33 patients, 42 factors. There were 16 lesions that were high risk for both CEA and CAS. As for surgical outcomes, complications were asymptomatic in 7 cases, transient symptoms in 5 cases, no permanent symptoms, and no short-term restenosis.

### Discussion and Conclusion:

CEA is a basic vascular surgical procedures. Our treatment results were satisfactory. The risk factor prevalence for CEA was 48.6%, and all patients also had risk factors for CAS. On the other hand, the risk factor prevalence for CAS was 94.6%. The CAS era has come, with the improvement of devices, and the risk factors for CAS have been reduced. However, there are many cases in which CEA is appropriate regarding risk factors. It is necessary to retain the CEA technique to safely remove the embolic source, in preparation for CEA in real CAS high risk cases.

## B-5-2 Carotid-Artery-Stenting (CAS) risk analysis in multicenter retrospective study: treatment timing and antithrombotics affect functional outcome and complication

○So Ozaki<sup>1)</sup>, Jun Suenaga<sup>1)</sup>, Shigeta Miyake<sup>3)</sup>, Wataru Shimohigoshi<sup>2)</sup>, Taisuke Akimoto<sup>1)</sup>, Yasunobu Nakai<sup>1)</sup>, Katsumi Sakata<sup>2)</sup>, Tetsuya Yamamoto<sup>1)</sup>

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**Objective** For internal carotid artery stenosis, Carotid-Artery-Stenting (CAS) is sometimes adapted for patients with CAS risks or Carotid-Endarterectomy (CEA) risks. Appropriate treatment timing for stroke-onset case is also controversial. This study aimed to clarify the prognostic factors for functional outcomes and complications of CAS.

**Methods** This is a multicenter retrospective study for 152 CAS cases in 3 facilities in Yokohama, analyzing the risk factors such as patient background, CAS or CEA risks, stenosis characteristics, and treatment methods and timing. We defined CAS risks as tortuosity, calcification, eGFR <30, and etc. We also defined CEA risks as triple antithrombotic drugs, higher lesion, lung disease, and etc. The patients with stroke-onset were divided into some groups based on treatment timing. The primary endpoint was modified-Rankin-Scale(mRS) change after 90 days, and the secondary endpoint was perioperative complications.

**Results** The subjects had an average NASCET stenosis rate of 68.3% and lesion length of 20.5 mm. There were 107 patients (70.3%) with CAS risks and 70 patients (46.0%) with CEA risks. After 90 days, mRS deteriorated in 21 cases (13.8%) and symptomatic complications happened in 20 cases (13.1%). In multivariate analysis, treatment timing ( $p < 0.001$ ), triple antithrombotic drugs ( $p = 0.003$ ) among CEA risks, and highly calcified lesion ( $p = 0.019$ ) among CAS risks are independent factors for mRS worsening. Treatment timing ( $p < 0.001$ ) is also related to complications in univariate analysis.

**Conclusion** This study established that treatment timing for stroke-onset patients and triple antithrombotic treatment affect patient's prognosis. In these cases, treatment indications should be considered carefully and warrants further studies.



### **B-5-3 A case of aneurysm of the BA-SCA treated by hybrid surgery (STA-SCA bypass and stent assist coil embolization)**

○Masashi Uchida, Hidemichi Ito, Tomohiro Kaji, Yuichiro Kushiro, Gaku Hidaka, Hidetoshi Murata  
(Department of Neurosurgery, St Marianna university school of medicine)

A 75-year-old woman was referred to our hospital for treatment of an aneurysm (13mm) at the right BA-SCA bifurcation, which was incidentally detected on MRI performed at another hospital. After 2 years of follow-up, the aneurysm had increased to 16mm, and she was referred to our hospital for further treatment. Angiography showed that the aneurysm size was 16.5x11.0 x10.8mm, and its neck was 7mm. The right SCA was bifurcated from the body, and the right posterior cerebral artery was riding on the aneurysm. A simple stent assist coil did not ensure blood flow to the right SCA. We also considered that thrombus formation of the aneurysm is not expected to be complete in flow diverter. Therefore, we decided to perform a stent assist coil after preservation of the right SCA and blind end bypass of the Rt STA-SCA bypass to ensure blood flow to the right SCA. Embolization was performed through the bilateral distal radial artery. The right side was used as an access route for stent placement, and the left side as an access route for coil embolization. A double catheter technique was used for embolization. Finally, complete embolization was achieved with a VER of 34.3%. Postoperative MRI showed no ischemic changes, blood flow in the aneurysm disappeared.

When a vessel bifurcates from the aneurysm, embolization requires careful consideration. In this case, we decided on a hybrid surgical bypass and stent assist coil approach. We will present an alternative approach to embolization in this case.

### **B-5-4 A case of traumatic atlanto-occipital dislocation**

○Takahiro Tanaka<sup>1,2)</sup>, Tsuyoshi Watanabe<sup>2)</sup>, Masahiko Tanaka<sup>2)</sup>, Kazuko Hotta<sup>2)</sup>, Gakuji Gondo<sup>2)</sup>

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**【Background】** Traumatic atlanto-occipital dislocation (AOD) is being recognized increasingly as a result of advancement of critical care medicine and diagnostic modality. AOD is often overlooked by severe coexistent complication. Even if coexistent complications are mild, AOD may be overlooked by the anatomical specificity.

**【Case: 38-year-old woman】** She had fallen from 4th floor, was unconscious and had a Glasgow Coma Scale (GCS) of three points. In the emergency ward, chest drain was inserted for left traumatic hemopneumothorax. After vital sign became stable, clinical and radiological work-up revealed traumatic AOD together with subarachnoidal hemorrhage at the craniocervical junction. Furthermore, multiple rib fracture, traumatic aortic dissection, T10 burst fracture and dislocation of temporomandibular joint were diagnosed. After intensive care treatment, she awakened and could move her limbs fully except left deltoid muscle (MMT 4/5). Fixation for ribs and thoracic burst fracture was performed before Occipital-C2 fusion. She was able to walk and manage all the activities of daily life after two months of clinical treatment.

**【Conclusions】** As emergency medicine and care develops, survivor of AOD will increase. So immediate and appropriate diagnosis, treatment will be required in future. Traumatic subarachnoidal hemorrhage at the craniocervical junction is often complicated with AOD. This can be the adjuvant of the diagnosis for doctors who do not specialize in spinal cord.

## **B-5-5 One-stage reconstruction of surgical defect following resection of arteriovenous malformation in the lower lip using bilateral transverse triangular island flaps**

○Joji Sekine<sup>1,2</sup>, Yuki Matsuoka<sup>1</sup>, Takashi Kuwahara<sup>2</sup>, Hiroaki Togashi<sup>2</sup>, Masao Kishikawa<sup>1</sup>, Michael Veith<sup>3</sup>  
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Arteriovenous malformation (AVM), one form of hemangioma, arising at the head and neck region may develop in patients of all ages and provide challenging problems for clinicians from the view point of esthetic concerns.

This paper reports a case of AVM manifested in the lower lip, which is relatively rare. The patient, a 81-year-old Japanese man, visited our clinic with a chief complaint of dome-shaped mass lesion (2.5 x 2cm) in the lower lip. Clinically, the lesion showed dark red color being soft elastic. Magnetic resonance imaging showed a bright mass lesion like hemangioma involving about 1/3 of the lower lip.

Surgical resection was done under intravenous sedation on 6 Nov, 2020. The lesion was resected with 2mm surgical margin and the feeder blood vessel was ligated and cut, resulting in a 3 x 1cm surgical defect.

The surgical defect was immediately reconstructed using transverse triangular island advancement flaps (TTIAF) composed of the orbicular muscle of mouth whose blood supply is from the inferior labial artery. TTIAFs are raised on both sides of the wound, with the bases of the triangles facing each other. When the pedicles have been mobilized sufficiently, the triangles are moved together and bases are sutured to each other. Laterally, there is a V-Y closure.

The resulting lip margin closely resembled the normal anatomic situation. Histopathological diagnosis was AVM. Postoperative course including function and esthetic was uneventful for 2.5 years.

Our novel procedure is a safe and effective for correcting lower lip defects.



## **B-6-1 Oral soft tissue disorders are associated with gastroesophageal reflux disease**

○Joji Sekine<sup>1,2)</sup>, Hiroaki Togashi<sup>2)</sup>, Michael Veith<sup>3)</sup>

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Dental erosion (DE), one of oral hard tissue diseases, is known as one of the extraesophageal symptoms defined by the Montreal Definition of gastroesophageal reflux disease (GERD). We have already reported that oral symptoms particularly oral soft tissue disorders (OSTDs) as well as DE in gastroesophageal reflux disease (GERD) would likely be associated with impaired salivary flow volume or swallowing function (*J Gastroenterol.* 2012; 47: 412-420, *BMC Gastroenterol.* 2017; 17: 92-110). Our past studies revealed that inflammatory of oral mucosal regions in GERD patients may be caused by gastric acid reflux that spreads into the oral cavity.

OSTDs include oral dryness, periodontitis, gingivitis and glossitis. Recently, the number of patients with main complaint of oral irritation, discomfort and pain of the tongue increased. In such cases, the color of oral mucosa including tongue dorsum seems to be red and/or white. The first diagnostic step is to reveal the cause of symptoms.

Oral cytology is one of feasible tools to diagnose oral lesions, whether they are inflammatory, tumorous, due to viral infection or mycotic. Most of the OSTDs except cancerous lesions are caused by viral infections and candidiasis. However, when specific causes of the OSTDs are unclear, we refer the patients to gastroenterology to check for presence of GERD.

Patients with diagnosed GERD and prescribed proton pump inhibitor (PPI) show improvement of oral symptoms/lesions. Our analysis features the clinical signs and course of OSTDs and efficacy of PPI to treat the OSTDs in GERD patients.

## **B-6-2 A novel technique to diagnose oral potentially malignant disorders (PMDs)**

○Joji Sekine<sup>1,2)</sup>, Michael Veith<sup>2)</sup>

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Oral squamous cell carcinoma (OSCC) sometimes shows the features of oral epithelial dysplasia (OED), numerous histological criteria exist for the diagnosis of epithelial dysplasia, and there is not always a clear-cut distinction between what presents a mild dysplasia consisting only of focal dysplasia, which may represent carcinoma in situ (CIS). CIS or oral intraepithelial neoplasia (OIN) are lesions that have the morphologic characteristics of cancer, including atypical cells but do not penetrate the basement membrane. Recently, such borderline lesions are called potentially malignant disorders (PMDs).

The paper describes our immunohistochemical approach to distinguish PMDs in 114 biopsy specimens (64 men, 50 women). All participants provided informed consent to participate.

All specimens were formalin fixed and paraffin embedded. Histopathological diagnoses were carried out by specialized pathologist. There were 67, 10, and 37 patients with OED, CIS, and OSCC, respectively. The expressions of Nucleus accumbens-associated protein 1 (NAC1), cytokeratins 13 and 17, human papilloma virus (HPV) 16, 18, and p16 were examined. Furthermore, c-myc, E-cadherin, vimentin and Ki-67 were also used for distinguishing PMDs.

NAC1 labeling indices (Lis) cut-off values were 50%, which discriminate between OED and CIS/OSCC. NAC1 was also available for distinguishing normal and OED with Lis cut-off value of 60%. OED and OIN was distinguished using Ki-67 and c-myc, on the other hand, OIN and OSCC was distinguished by the expression of E-cadherin and vimentin.

In conclusion, our approach by various immunohistochemical stainings made it feasible to distinguish PMDs from normal and OSCC.

### **B-6-3 NOISE LEVEL AND SURGICAL TEAM STRESS DURING THYROIDECTOMY**

○Sabaretnam Mayilvaganan, Sarrah Idrees, Spandana Jagannath, Gyan Chand, Anjali Mishra, Gaurav Agarwal  
(SGPGIMS)

**In this study we correlated salivary cortisol levels of the surgical team with noise measurement and also whether the noise in OR subjectively affected the operating team.** We recorded the noise. Operating Surgeon (S), Anesthetist (A), Scrub Nurse (N) and Floor Nurse (F) all gave a salivary sample for measurement of cortisol at the end of the procedure. Salivary cortisol levels were analyzed using SLV -4635(formerly SLV-2930) DRG Instruments GmbH German using ELISA. Total of 37 procedures with 148 Salivary Cortisol samples and 111 responses from S, A and N were analyzed. All Patients with benign FNAC were operated (64.9% - Colloid). Mean TSH levels were  $3.5 \pm 6.7$ . Majority had STN (25/37 67.6%). 18 patients (48.6%) underwent open Hemithyroidectomy 10 patients TT and 8 patients Endoscopic HT and 1 Pt had sistrunk's procedure. the table1. There was significant Correlation between mean noise levels and S's levels. ( $P < 0.05$ ). Noise levels were high in the OR during initial phase and closure phase of thyroidectomy.. Noise is a distractant and the effect of long term effect on the surgical team needs to be studied. No studies in literature regarding noise correlation and surgeons stress.

### **B-6-4 Surgical Clipping of the Large Vestibular Aqueduct Syndrome**

○Nayu Yokoyama, Sakurako Iwatake, Yoshiyuki Sasano, Zenyu Yamada, Yuki Tamura, Yoshimitsu Saito, Manabu Komori  
(Department of Otolaryngology, St. Marianna University School of Medicine)

#### **Background**

The large vestibular aqueduct syndrome (LVAS) is a congenital inner ear malformation that commonly causes vertigo and progressive sensorineural hearing loss. Endolymphatic sac obliteration with incision is performed to control symptoms, but the procedure is arguable. We report a case of LVAS, who underwent endolymphatic sac obliteration of both ears by clipping and incision of the vestibular aqueduct.

#### **Case**

A 24-year-old woman presented with both-sided hearing loss and vertigo. She suffered from vertigo few times a week. She was diagnosed of Meniere's disease, underwent insertion of the ventilation tube bilaterally. However her symptoms were not improved, thus she was referred to our department for further evaluation and treatment. CT of the temporal bone was performed and her enlarged vestibular aqueduct on both-sides were found. By administering diuretics, vertigo was amended to some degree but it was not complete. She underwent endolymphatic sac obliteration by clipping followed by incision. After operation, vertigo disappeared and hearing stabilized.

#### **Conclusions**

It is believed that vertigo with LVAS is caused by direct propagation of cerebrospinal pressure and other factors into the enlarged vestibular aqueduct. Although endolymphatic sac surgery has been performed for Meniere's disease as a hearing preservation procedure, its efficacy in LVAS is unclear. In this case, the patient underwent clipping surgery in stages. After the surgery, symptoms resolved very well. If deafness progress and needs cochlear implantation in the future, the clip will not prevent cochlear implantation. However, additional cases are needed for confirmation.

## B-6-5 Comparison between 25-gauge and 27-gauge vitrectomy for rhegmatogenous retinal detachment

○Mizuki Otsubo

(Department of Ophthalmology, St. Marianna University School of Medicine)

**Purpose:** We investigated and compared surgical outcomes of 25G and 27G vitrectomy for rhegmatogenous retinal detachment.

**Subjects and methods:** We examined 170 cases and 173 eyes which underwent 25G or 27G vitrectomy for rhegmatogenous retinal detachment between January 2017 and January 2019. Patients with a history of vitrectomy or retinal reattachment surgery were excluded from the study. Included patients were divided into two groups: 25G and 27G system. The results were compared retrospectively and examined for visual acuity, intraocular pressure (incidence of ocular hypotension), and reattachment rate.

**Results:** The 25G group included 102 eyes and the 27G group included 71 eyes. There were no significant differences in patient history, including age, vision, intraocular pressure, number of retinal tears, extent of detachment, or whether there was macular detachment ( $p > 0.05$  each). The final logMAR vision was  $0.07 \pm 0.30$  in the 25G group and  $0.07 \pm 0.32$  in the 27G group, showing no significant difference ( $p = 0.510$ ). There was no significant difference in the incidence of postoperative ocular hypotension, which occurred in 3 out of 102 eyes in the 25G group and 5 out of 71 eyes in the 27G group ( $p = 0.206$ ). The initial reattachment rate was 94.1% (96/102) for the 25G group and 91.5% (65/71) for the 27G group, indicating that there was no significant difference ( $p = 0.513$ ). Operative time was  $81.8 \pm 33.5$  minutes in the 25G group and  $65.4 \pm 25.6$  minutes in the 27G group, with significantly shorter operating times in the 27G group ( $p < 0.001$ ).

**Conclusion:** There was no difference in vision or reattachment rate between 25G or 27G vitrectomy for rhegmatogenous retinal detachment. However, our findings suggest that shorter operating times are possible with a 27G vitrectomy.

## **B-7-1 Early laparoscopic cholecystectomy for acute cholecystitis— Introduction of bailout procedure—**

○Gaku Nakamura, Koji Asai, Hodaka Moriyama, Manabu Kujiroka, Ryutaro Watanabe, Manabu Watanabe, Yoshihisa Saida

(Toho University Ohashi Medical center the 3rd surgery Department)

### **Introduction**

The Tokyo Guidelines 2018 have proposed a bailout procedure to prevent bile duct and vasculo-biliary injury in acute cholecystitis (AC) with severe local inflammation. The bailout procedure has been actively performed in our department, and a single-incisional surgery (SILS) device was also introduced for such cases. The aim of this study was to assess the influence of laparoscopic cholecystectomy (LC) using the bailout procedure for AC.

### **Patients and methods**

A total of 362 patients were enrolled during the 15-year study period. Two trocars (5 mm and 12 mm) were inserted into the navel port by using a SILS device. Hemostasis using soft coagulation, appropriate counter traction, and suction was achieved via this port. The patient's characteristics, therapeutic strategies, and operative results were compared between the former period (n = 260) and a recent 3-year period (n = 102).

### **Results**

In both groups, approximately 30% of the patients had severe local inflammation, including gangrenous cholecystitis. Early LC within 3 days after admission was predominantly performed in the recent period (100 cases, 98.0%,  $p < 0.001$ ). Conversion to open surgery decreased from 6.5% to 1.0%. No bile duct injuries were observed in the recent period. The postoperative complication decreased from 11 cases (4.2%) to 2 cases (2.0%). The postoperative and total length of hospitalization was significantly shorter in the recent period than in the earlier period (3 days and 5 days, respectively).

### **Conclusion**

Active performance of the bailout procedure and technical modification was associated with fewer conversion to open surgery and postoperative complications.

## **B-7-2 A study on treatment strategy for acute cholecystitis in very older patients over 90 years old**

○Yui Yokokura<sup>1,2</sup>, Masanao Kurata<sup>1,2</sup>, Koki Akiyama<sup>1,2</sup>, Tomoaki Furuta<sup>1,2</sup>, Osamu Ishibashi<sup>1</sup>, Satoshi Inagawa<sup>1,2</sup>, Tatsuya Oda<sup>2</sup>

(<sup>1</sup>Department of Surgery, Mito Kyodo General Hospital, <sup>2</sup>Department of Gastrointestinal and Hepato-Biliary-Pancreatic Surgery, University of Tsukuba)

**[Background and Purpose]** With the aging of patients, the importance of management of laparoscopic cholecystectomy (LC) for acute cholecystitis (AC) is increasing, taking operative tolerance into consideration. We reviewed cases of AC in very older patients (VOPs) at our hospital, and discussed the pros and cons of surgical intervention and the criteria for surgical indications.

**[Methods]** A total of 172 cases of AC including conservative treatment performed from 2021 to 2022 were included, 19 of which were VOPs, excluding 2 cases due to malignancy. The following items were considered: Severity in Tokyo Guideline 18 (TG18), presence of drainage, days from onset to diagnosis, days from diagnosis to drainage or surgery, postoperative hospital stay until discharge or transfer, perioperative complications, outcome, Performance Status, and comorbidities.

**[Results]** The severity (I:II:III) at TG18 in 17 patients was 8:8:1, and in 7 patients who underwent LC, the severity was 2:5:0. Almost all other LC cases were performed on the same day as or the day after the patient's arrival. Median hospital stay was LC: non-resection = 10 (5-11): 18.5 (1-125) days. The median time to start meals was 3 (2-4) to 5 (0-10) days.

**[Discussion]** If the VOPs have the indications for surgery and the ability to tolerate surgery, LC for AC will lead to a faster time to resumption of eating, maintenance of ADLs, and an earlier return to society.

### **B-7-3 Our experience with cholecystectomy performed with the Senhance digital laparoscopy system**

○Masashige Nishimura<sup>1</sup>, Tomohisa Furuhashi<sup>1</sup>, Takahiro Sasaki<sup>1</sup>, Akiyoshi Noda<sup>1</sup>, Hirotaka Arifuku<sup>1</sup>, Takehito Otsubo<sup>2</sup>

(<sup>1</sup>ST. Marianna University school of Medicine Toyoko Hospital Department of Gastroenterological and General Surgery, <sup>2</sup>ST. Marianna University school of Medicine Department of Gastroenterological and General Surgery)

#### **Back ground**

The Senhance digital laparoscopy system (SDLS) is a novel platform developed for digitization in endoscopic surgery. We introduced the SDLS in September 2020 and have performed 51 SDLS surgery, including cholecystectomy, TAPP, and sigmoidectomy. We report on our experience in 34 patients who underwent cholecystectomy using the SDLS.

#### **Methods**

The subjects were 34 cholecystectomies performed in our hospital between September 2020 and December 2022 using the SDLS. The 30 cases were performed by qualified surgeon (Endoscopic surgical skill qualification system) and the 4 cases were performed by young surgeons who had not yet qualified.

#### **Results**

There were 16 men and 18 women with a mean age of 53.4 years. With the exception of 4 patients (11.7%) who underwent conventional laparoscopic surgery, the patients were classified into the group with qualified surgeon (n=27) and the group without (n=3), and the following analysis was performed. There were no significant differences in preoperative factors between the two groups. No significant differences were found in blood loss (1.63/1.00 ml), operation time (67.6/66.3 min), docking time (4.48/5.33 min), and cockpit time (35.5/36.0 min). Postoperative complications of Clavien-Dindo grade  $\geq$ II were not observed.

#### **Conclusion**

This retrospective study showed that cholecystectomy using the SDLS can be safely performed by younger surgeons compared to qualified surgeons.

### **B-7-4 A Case report of Gangrenous Cholecystitis developing while receiving Tocilizumab therapy**

○Li Luyang, Tomohiko Adachi, Shinichiro Ogawa, Shintaro Ryu, Hajime Imamura, Hajime Matsushima, Peilin Li, Yasuhiro Maruya, Takanobu Hara, Akihiko Soyama, Masaaki Hidaka, Kengo Kanetaka, Susumu Eguchi  
(Nagasaki University Department of surgery)

#### **[Introduction]**

Tocilizumab, a humanized anti-IL6 receptor antibody, is used in collagen disease. It is a drug that should be used with caution because of its potent anti-inflammatory effect, which can reduce or mask symptoms or inflammatory responses when a patient has an infection.

#### **[Case presentation]**

A male in his 60s, presenting Department of Collagen Diseases in our hospital with TAFRO syndrome, was being treated with tocilizumab. He had been suffering from mild right hypochondrium pain for 2 days prior to his regular outpatient visit, but he did not need to use any painkillers. At the initial visit, his vital signs were within normal range and, in his blood tests, WBC was 5800/ $\mu$ L, CRP was 0.18 mg/dL so inflammatory response were considered almost within normal range. A simple CT scan of the abdomen was performed just to be sure, and it revealed an enlarged gallbladder and wall thickening. Considering the possibility that the inflammatory response was masked because the patient was receiving tocilizumab, an emergency laparoscopic cholecystectomy was performed on the same day with a diagnosis of acute cholecystitis. Intraoperative findings showed gangrenous changes in the gallbladder and effusion of biliary ascites, and also final pathological diagnosis was also the gangrenous cholecystitis. Fortunately, the patient's postoperative course was uneventful and treatment with tocilizumab continues in the department of medicine.

#### **[Conclusions]**

Considering that symptoms and inflammatory response are masked during tocilizumab administration, early intervention should be necessary for inflammatory diseases in such patients.

## **B-7-5 Late-onset hemorrhage from pseudoaneurysm of the right posterior hepatic artery two months after pancreaticoduodenectomy for distal cholangiocarcinoma**

○Toshihiro Nakayama, Hiroshi Nakano, Shimpei Takagi, Takuma Otsubo, Yuya Tanaka, Takahiro Ozaki, Toshiyuki Miyahara, Tsunehisa Matsushita, Yasuhiro Sumi  
(Department of Surgery, National Hospital Organization Shizuoka Medical Center)

**Introduction** Bleeding from arterial pseudoaneurysms is a potentially life-threatening complication following pancreaticoduodenectomy; however, the incidence of onset more than two months after surgery is rare.

**Case** A man in his seventies was referred to our hospital for evaluation of jaundice. Upon assessment, he was diagnosed as unresectable distal cholangiocarcinoma with para-aortic lymph node metastasis.

After six cycles of gemcitabine plus cisplatin chemotherapy, a reduction in lymph node size and normalization of tumor markers, including CEA and the CA 19-9, were achieved. Further courses of chemotherapy were deemed intolerable due to thrombocytopenia, and we decided to proceed with conversion surgery. The patient underwent pancreaticoduodenectomy with D2 dissection and para-aortic lymph node dissection. The operative time was 7 hours and 10 minutes with an estimated blood loss of 937 ml. The postoperative course was uneventful. The patient was discharged on postoperative day 13, and adjuvant chemotherapy with S-1 was initiated.

Two months after surgery, he presented to our emergency department with dizziness. The underlying cause was hypovolemia secondary to a pseudoaneurysm of the right posterior hepatic artery, which was attributed to iatrogenic arterial wall injury during surgery. Hemostasis was achieved by transcatheter arterial embolization of the right hepatic artery. The patient was discharged without complications after x days of hospitalization. Adjuvant chemotherapy was resumed, and the patient remains alive with no evidence of recurrence four months after surgery.

**Conclusion** Late-onset hemorrhage from arterial pseudoaneurysms after pancreaticoduodenectomy was successfully managed with endovascular treatment. Notably, such bleeding can occur beyond two months after surgery.

## **B-7-6 Investigation of the relationship between complications after pancreaticoduodenectomy for distal cholangiocarcinoma and malnutrition diagnosed by the GLIM criteria**

○Yuki Okazoe, Hiroaki Yanagimoto, Daisuke Tsugawa, Masayuki Akita, Takeshi Urade, Yoshihide Nanno, Kenji Fukushima, Hidetoshi Gon, Shohei Komatsu, Tadahiro Goto, Sadaki Asari, Hirochika Toyama, Masahiro Kido, Tetsuo Ajiki, Takumi Fukumoto  
(Department of Surgery, Division of Hepato-Biliary-Pancreatic Surgery, Kobe University Graduate School of Medicine)

**Background:** In 2018, the Global Leadership Initiative on Malnutrition (GLIM), which includes the world's leading clinical nutrition societies, proposed the first global diagnostic criteria for malnutrition. Malnutrition has a negative prognostic impact on patients with extrahepatic cholangiocarcinoma, but the relationship between malnutrition diagnosed by the GLIM criteria and short-term outcomes after pancreaticoduodenectomy for distal cholangiocarcinoma (DCC) has not yet been fully examined. The purpose of this study was to investigate the relationship between them.

**Methods:** Between 2013 and 2020, 50 patients who underwent curative-intent resection for DCC were retrospectively analyzed. Preoperative nutritional status was assessed using the GLIM criteria. Postoperative complications were evaluated according to the Clavien-Dindo classification (CDC) and the comprehensive complication index (CCI), which is more sensitive than CDC by calculating the sum of all postoperative complications classified by the CDC.

**Results:** Thirty-seven (74.0%) patients were diagnosed with malnutrition using the GLIM criteria. There were no significant differences in background disease/tumor factors between the malnutrition and non-malnutrition groups. Regarding complications, there was no clear significant difference in the complication rates of CDC IIIa or higher between the malnutrition and non-malnutrition groups (56.8% vs. 61.5%,  $p = 0.764$ ), whereas compared by the CCI, the malnutrition group tended to have higher CCI, although not significantly so (median CCI: 34.6 vs. 26.2,  $p = 0.0569$ ).

**Conclusions:** Further studies with more cases would clarify the association between preoperative malnutrition diagnosed by the GLIM criteria and postoperative complications after pancreaticoduodenectomy for DCC.



## B-8-1 Laparoscopic left hepatectomy in a goat as a training model for laparoscopic anatomic liver resection

○Yusuke Kawamoto, Goro Honda, Chikai Ubukata, Yutaro Matsunaga, Yusuke Ome, Shunichi Ariizumi  
(Department of Surgery, Institute of Gastroenterology, Tokyo Women's Medical University)

**Background:** To create a suitable animal model for the training of laparoscopic anatomic liver resection, we performed left hepatectomy using a goat and found its suitability. We have since started using goats for wet-lab training and have gradually standardized the relevant procedures. Herein, we report our standardized training procedures using a goat and discuss its feasibility as a novel training model.

**Methods:** The standardized wet-lab training courses of laparoscopic liver resection conducted on 62 tables with a total of 70 goats were reviewed. The training course began by encircling the hepatoduodenal ligament for the Pringle maneuver, which was repeated during the parenchymal dissection. Following partial liver resection of the left lateral section, left hepatectomy was performed by a standardized procedure for humans in which the liver was split, exposing the entire length of the middle hepatic vein trunk from the dorsal side after extrahepatic transection of the left Glissonean pedicle. If a goat deceased before initiating left hepatectomy, the training was restarted with a new goat.

**Results:** A total of 184 surgeons participated in the training. Partial liver resection was initiated in 62 tables, with 8 (13%) dying during or after the procedure of partial liver resection. Subsequently, left hepatectomy was initiated in 61 and completed in 59 tables (98%), regardless of whether the goat survived or deceased, and was not completed in 2 tables (3%) due to time limitation. In 14 tables (23%), the goats deceased during the procedure, however, the procedure was completed.

**Conclusions:** Left hepatectomy in a goat is useful as a training model for laparoscopic anatomic liver resection.

## B-8-2 Expression of liver-specific immunohistochemical markers in pediatric and adult liver tumors

○Kosuke Kudo<sup>1</sup>, Toko Shinkai<sup>1</sup>, Kei Ohyama<sup>1</sup>, Kunihide Tanaka<sup>1</sup>, Yuri Nishiya<sup>1</sup>, Hiroaki Kitagawa<sup>1</sup>, Shigeyuki Furuta<sup>1</sup>, Nobuyuki Yanagisawa<sup>2</sup>, Junki Koike<sup>2</sup>, Tomoko Norose<sup>2</sup>, Nobuyuki Ohike<sup>2</sup>

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### (Background)

The biological differences between pediatric hepatocytic tumors (pHCT) and adult hepatocellular carcinoma (aHCC) remain unclear. We compared the expression of hepatocyte-specific proteins, liver stem cell markers, and sinusoidal endothelial cell proteins in children with pHCT treated at our hospital with those of patients with aHCC using immunohistochemistry.

### (Materials and methods)

Tumor biopsy or hepatic resection was performed in 10 pHCT cases (7 hepatoblastoma and 3 pediatric-onset hepatocellular carcinoma) and 5 aHCC cases. The expression of Hep Par-1, Arginase1, GPC3, CD56, c-kit, CD4 and CD34 in the tumor of the subjects was investigated.

### (Results)

Hepatocyte-specific markers Hep Par-1 and Arginase1 were positive in both pHCT and aHCC. The GPC3 was positive in 7 hepatoblastomas, 2 pediatric hepatocellular carcinomas and 1 aHCC case of normal liver tissue type. The liver stem cell markers CD56 and c-kit were negative in both pHCT and aHCC. For sinusoidal endothelial cell markers CD4 and CD34, CD4 was negative in both pHCT and aHCC, while CD34 was positive in both pHCT and aHCC.

### (Discussion)

pHCT tended to have stronger GPC3 expression compared to aHCC. This suggests that pHCTs may have properties that are biologically similar to fetal hepatocytes. It was thought that pHCTs originate from pathologically normal liver tissue, whereas aHCCs originate from a cirrhotic base. These findings suggest that aHCC develops during the process of hepatocyte regeneration, whereas pHCT has a different carcinogenic pathway from that of adults. These results may reflect this difference.

### **B-8-3 Laparoscopic surgery for congenital biliary dilatation type IV-A: a video case report**

○Yutaro Matsunaga, Yusuke Ome, Yusuke Kawamoto, Chikai Ubukata, Toru Tanahashi, Shunichi Ariizumi, Goro Honda

(Department of Surgery, Institute of Gastroenterology, Tokyo Women's Medical University)

An operation for congenital biliary dilatation type IV-A could be technically challenging. Besides, late severe complications including severe cholangitis and hepatolithiasis after primary surgery have been reported. Anastomotic problem or intra-hepatic biliary narrowing left behind were reported as the causes of these complications. For those reasons, laparoscopic surgery for congenital biliary dilatation type IV-A has been performed only in selected hospitals. Here we present a video case report of laparoscopic surgery for congenital biliary dilatation type IV-A, the case of a 37-year-old woman which required plasty of the left hepatic duct.

### **B-8-4 A successful case of left hemihepatectomy with right hepatic artery reconstruction for locally advanced perihilar cholangiocarcinoma**

○Yoshiaki Hyakutake, Tsukasa Takayashiki, Satoshi Kuboki, Shigetsugu Takano, Daisuke Suzuki, Nozomu Sakai, Isamu Hosokawa, Takashi Mishima, Takanori Konishi, Hitoe Nishino, Shinichiro Nakada, Masayuki Ohtsuka

(Department of General Surgery, Graduate School of Medicine, Chiba University)

A 78-year-old man presented to our department because follow-up computed tomography (CT) scan after endoscopic treatment for early gastric cancer revealed intrahepatic bile duct dilatation and led to the diagnosis of perihilar cholangiocarcinoma.

Imaging studies showed a neoplastic lesion located on the left branch of the bile duct, and that suspected to have plexus invasion at the bifurcation of proper hepatic artery (PHA) and left hepatic artery (LHA). There was no evidence of metastasis to other organs. Based on these findings, left hemihepatectomy, caudate lobectomy and extrahepatic bile duct resection were performed with right hepatic artery (RHA) reconstruction. The operation time was 483 minutes, blood loss was 570 ml, and no blood transfusion was required.

The postoperative liver dysfunction and bile leakage was not observed, and the arterial blood flow of reconstructed RHA was good on ultrasonography and CT scan.

We performed hepatectomy combined with arterial reconstruction for 12 cases of perihilar cholangiocarcinoma from 2010 to 2023 in our department, and that including 7 cases of left hemihepatectomy, 4 cases of left trisectionectomy, and 1 case of right hemihepatectomy. In these series, 5 cases were reconstructed with hepatic artery and portal vein simultaneously.

For locally advanced perihilar cholangiocarcinoma with arterial invasion, aggressive arterial resection and reconstruction was considered to be effective in improving the resection rate and short-term outcomes.

## **B-8-5 A case of pancreaticoduodenectomy for distal cholangiocarcinoma after post-ERCP pancreatitis with walled-off necrosis**

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**Background:** The timing of surgery after post-ERCP pancreatitis (PEP) with walled off necrosis WON is controversial. We report a case of a patient with distal cholangiocarcinoma after PEP with WON who underwent pancreaticoduodenectomy safely by performing adequate preoperative infection control.

**Case:** A 59-year-old man visited a previous hospital with a chief complaint of jaundice and was diagnosed with distal bile duct cancer (cT3aN0M0, cStage IIA). After he underwent ERCP at the previous hospital, he had PEP with WON. Endoscopic ultrasonography-guided pancreatic cyst drainage and CT-guided drainage were performed for the WON. The inflammation improved, so pancreaticoduodenectomy (SSPPD II-A-1) was performed for distal bile duct cancer at 231 days after the onset of PEP with WON. After laparotomy, adhesion around the pancreas, especially between the pancreas and the transverse mesocolon, and fibrosis around the portal vein were severe, and it was hard to dissect these tissue. Finally, pancreaticoduodenectomy was completed as planned. The operation time was 942 min and the blood loss was 2277 ml. Postoperatively, he had pancreatic fistula (ISGPF Grade B) and an intraabdominal abscess (CD grade II), but he was discharged on hospital day 57 after careful drainage management and administration of antibiotics. The pathological diagnosis was distal cholangiocarcinoma, mod, nodular type, pT3, pN1(2/15), pHM0, pPM0, pEM0, and the final stage was fStage IIB.

**Conclusion:** It is important to perform pancreaticoduodenectomy in patients with PEP with WON after adequate preoperative infection control, considering tumor progression.