### PUG-01

**Fatty Liver Is Associated with the Increased Risk of Erosive Reflux Esophagitis**

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**Background / aims:** Reflux esophagitis is related to obesity and metabolic syndrome. Nonalcoholic fatty liver disease is a hepatic manifestation of the metabolic syndrome. The aim of this study was to investigate the association between erosive reflux esophagitis and fatty liver diagnosed by ultrasonography.

**Table 1. Characteristics of all subjects (n=14,723)**

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Presence (n=4,232)</th>
<th>Absence (n=10,491)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>50.1 ± 12.2</td>
<td>46.3 ± 12.9</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Male</td>
<td>3078 (72.7%)</td>
<td>4766 (45.8%)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>BMI</td>
<td>25.9 ± 2.8</td>
<td>23.0 ± 2.9</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>SBP</td>
<td>136.0 ± 13.2</td>
<td>119.3 ± 14.2</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>DBP</td>
<td>76.8 ± 9.6</td>
<td>71.8 ± 10.4</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Fasting glucose</td>
<td>102.7 ± 27.1</td>
<td>92.5 ± 17.3</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>BMI</td>
<td></td>
<td></td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>&lt;18.5 kg/m²</td>
<td>11 (0.3%)</td>
<td>460 (4.4%)</td>
<td></td>
</tr>
<tr>
<td>≥18.5 &amp; &lt;25 kg/m²</td>
<td>1631 (38.5%)</td>
<td>7555 (72.0%)</td>
<td></td>
</tr>
<tr>
<td>≥25 kg/m²</td>
<td>2590 (61.2%)</td>
<td>2476 (23.6%)</td>
<td></td>
</tr>
<tr>
<td>High blood pressure</td>
<td>857 (20.3%)</td>
<td>1133 (10.8%)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>High fasting glucose</td>
<td>431 (10.2%)</td>
<td>285 (2.7%)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Erosive esophagitis</td>
<td>440 (10.4%)</td>
<td>637 (6.1%)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>LA-A</td>
<td>317 (7.3%)</td>
<td>480 (4.6%)</td>
<td></td>
</tr>
<tr>
<td>LA-B</td>
<td>115 (2.7%)</td>
<td>149 (1.4%)</td>
<td></td>
</tr>
<tr>
<td>LA-C</td>
<td>8 (0.2%)</td>
<td>5 (0.05%)</td>
<td></td>
</tr>
<tr>
<td>LA-D</td>
<td>0 (0%)</td>
<td>3 (0.03%)</td>
<td></td>
</tr>
</tbody>
</table>

High blood pressure: systolic blood pressure ≥140 mmHg or diastolic blood pressure ≥90 mmHg. High fasting glucose ≥126 mg/dL.

**Results:** Of a total of 14,723 subjects, 4,232 (28.7%) were diagnosed with fatty liver and 1,077 (7.3%) were diagnosed with erosive esophagitis. The prevalence of erosive esophagitis was 6.1% in subjects without fatty liver and 10.4% in subjects with fatty liver (p<0.0001). In multivariable analysis, fatty liver was independently associated with erosive esophagitis (odds ratio: 1.19, 95% confidence interval: 1.03-1.37, p=0.016).

**Table 2. Multivariable analysis for risk factors of erosive esophagitis**

<table>
<thead>
<tr>
<th>Risk factor</th>
<th>Odds ratio (95% CI)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fatty liver</td>
<td>1.19 (1.03-1.37)</td>
<td>0.016</td>
</tr>
<tr>
<td>Male</td>
<td>3.65 (3.11-4.29)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Obesity</td>
<td>2.02 (1.16-3.51)</td>
<td>0.013</td>
</tr>
<tr>
<td>High blood pressure</td>
<td>1.84 (1.88-2.4)</td>
<td>0.633</td>
</tr>
<tr>
<td>High fasting glucose</td>
<td>1.20 (0.94-1.54)</td>
<td>0.149</td>
</tr>
</tbody>
</table>

*Age is adjusted Obesity in Koreans: BMI ≥25 kg/m² High blood pressure: systolic blood pressure ≥140 mmHg or diastolic blood pressure ≥90 mmHg High fasting glucose ≥126 mg/dL.

**Conclusions:** Fatty liver is an independent risk factor of erosive esophagitis. The cause and effect relationship between fatty liver and erosive esophagitis should be further evaluated.

**Keywords:** Fatty liver; Erosive reflux esophagitis

### PUG-02

**Higher Grade of Gastroesophageal Flap Valve (GEVF) Correlates with Erosive Esophagitis and Hiatal Hernia**

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**Background / aims:** Endoscopic gastroesophageal flap valve (GEVF) grading system allows evaluation of the stepwise relaxation of the gastroesophageal junction and was shown to correlate with presence of regurgitation and erosive esophagitis (EE). To determine the relationship of GEFV grade and presence of esophagitis and other endoscopic findings in Filipino patients undergoing upper GI endoscopy.

**Methods:** A total of 336 consecutive patients who underwent esophagogastroduodenoscopy from April–September 2014 were included. GEFV grade was evaluated by three
observers and the kappa value was computed. Baseline characteristics and endoscopic findings were compared and analyzed.

**Results:** The kappa value for the observers grading GEFV during endoscopy was 0.9 (p=0.000). There was no correlation between GEFV grade and gender, smoking, alcohol consumption or co-morbid conditions. Mean BMI by GEFV grade was 23.9, 24.7, 24.6 and 22.9 for grades I, II, III and IV respectively showing no correlation between BMI and GEFV. Prevalence of EE was 55% (n=186). EE is significantly increased with higher GEFV grade while patients who did not have endoscopic evidence of erosions had lower GEFV grades (p=0.001). Hiatal hernia (HH) was seen in 29.5% of subjects (n=99) and is associated with EE. Prevalence of HH was likewise increased with GEFV grade (p=0.000). GEFV is not correlated with ESEM and presence of gastric mucosal atrophy.

**Conclusions:** In this study, higher grade of GEFV is associated with increased prevalence of HH and erosions. Endoscopic GEFV evaluation provides a useful index for diagnosis of erosive esophagitis.

**Keywords:** GEFV; Erosive esophagitis; Hiatal hernia

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**PUG-03**

**Refractory Gastro-Esophageal Reflux Symptoms in an Asian Cohort: Roles of Advanced Imaging and Functional Testing**

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**Background / aims:** Refractory gastro-esophageal reflux disease (GERD) symptoms are difficult to treat. Aim: To evaluate the underlying cause using gastroscopy with narrow band imaging (NBI), high resolution manometry (HRM) and 24-hour pH-impedance monitoring.

**Methods:** Patients with GERD symptoms had gastroscopy with NBI, Los Angeles (LA) Classification and NBI features of esophagitis noted. Patients counseled on correct PPI dose. Those with persistent symptoms despite adequate dose and compliance for 8 weeks had HRM and 24-hour pH-impedance monitoring (off PPI).

**Results:** 99 patients (72 Chinese; 47 male; mean age 50.0±13.4) recruited from February 2013 to December 2014. Gastroscopy: normal (74/99[74.7%]), LA grade A(19/99[19.2%]) and B esophagitis(6/99[6.1%]). NBI detected 32(32.3%) more cases of esophagitis. 86/99 patients had HRM and 71/86 patients 24-hour pH-impedance studies(Fig. 1). Persistent GERD symptoms: (A) Non-GERD related (52/99[52.5%]): eosinophilic esophagitis[n=1], gastric cancer[n=1], esophageal dysmotility[n=6] and functional heartburn[n=44] (B) Esophageal hypersensitivity for AR/NAR(n=19) (C) GERD-related (n=9): high AET[n=8] and Barrett’s esophagus[n=1].

**Conclusions:** 52% with rGERD symptoms had non-GERD related causes. NBI and functional esophageal tests have a role in the diagnostic algorithm to guide effective treatment.

**Keywords:** Gastro-esophageal Reflux; Reflux; Refractory; GERD

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**PUG-04**

**The Diagnostic Value of Esophageal High Resolution Manometry Parameters Predicting GERD**

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**Background / aims:** Esophageal manometry is usually done before esophageal pH testing. It is not known whether the detailed information of high-resolution manometry (HRM) can predict GERD. We aimed to determine to which extent HRM findings can predict...
GERD.

**Methods:** We compared HRM parameters in 137 patients suspected with GERD symptoms and 23 healthy subjects and the predictive value of HRM for the diagnosis of GERD was explored.

**Results:** 137 patients were diagnosed as 25 erosive esophagitis, 21 non erosive esophagitis (pathologic acid exposure or positive symptom association), 37 functional heartburn and 54 non-GERD by endoscopy and impedance pH test. GERD patients had a significantly lower distal contractile integral (DCI), basal LES pressure and esophagogastric junction- contractile integral (EGJ-CI) than healthy controls or non-GERD patients. GERD patients more often had defective EGJ morphology than healthy subjects (39% vs 8%; p<0.05) (Table 1), On multivariate logistic regression analysis, both esophagogastric junction contractability (EGJ-CI) (OR1.039, 95% C.I 1.021-1.057; p<0.01, sensitivity 58%-specificity 89%), but the other parameter had low AUC (0.55-0.66) in ROC curve.

**Conclusions:** EGJ-CI and DCI were significant HRM parameters predicting GERD, but the their predictive values are low.

**Keywords:** High resolution manometry; GERD

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**PUG-06**

**Association between Sarcopenia and Reflux Esophagitis in a Health Checkup: Based on Single Center Endoscopic Database**

Ga Hee Kim, Ji Won Kim, Kook Lae Lee, Byeong Gwan Kim and Seong Joon Koh

Internal Medicine, Seoul National University Boramae Hospital, Seoul, Korea

**Background / aims:** Visceral obesity is commonly involved in the pathogenesis of gastroesophageal reflux disease (GERD). Sarcopenia is more prevalent among elderly people with obesity and exists with metabolic syndrome. We tried to investigate the association between sarcopenia and reflux esophagitis using an endoscopic data base in a health checkup.
Methods: From January 2015 to December 2015, 3,140 subjects who underwent screening esophagogastroduodenoscopy (EGD) at Seoul National University Boramae Health Care Center. Skeletal muscle mass was estimated by bioelectrical impedance analysis. We categorized into reflux esophagitis group (n=283) and endoscopically normal group (n=359).

Results: The prevalence of erosive esophagitis was 9.0% (283/3140). When comparing with the normal group, reflux esophagitis group had higher fasting glucose \( (p=0.043) \), HbA1C \( (p=0.005) \). However reflux group also had higher skeletal muscle mass \( (29.74 \text{ vs } 25.82, \ p<0.001) \) and the prevalence of sarcopenia was 15.2% in reflux esophagitis group and 27.3% in normal group.

Conclusions: In our study, sarcopenia is reversely correlated with reflux esophagitis. Standardized, prospective data collection is needed to evaluate the association between the sarcopenia and reflux esophagitis.

Keywords: Reflux esophagitis; Skeletal muscle mass; Sarcopenia

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**PUG-07**

“Esophageal Remodeling” after Peroral Endoscopic Myotomy in Achalasia

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Background / aims: Peroral endoscopic myotomy (POEM) is a new efficacious treatment option for achalasia. We propose to denominate “esophageal remodeling” as functional restorations of esophagus with not only the decrease in LES pressure but also with the decrease in diameter and recovery of peristalsis of esophageal body. The aim of this study was to investigate the “esophageal remodeling” after POEM in achalasia.

Methods: We performed POEM from 2013, and prospectively collected data of preoperative and postoperative 2-month Eckardt symptom score, esophageal high resolution manometry (HRM) and/or timed barium esophagogram (TBE). From July 2013 to September 2015, 27 patients with achalasia underwent POEM in our institution, and among them, we analyzed 18 patients (10 male; mean age: 53.6 years; 5 type I, 8 type II, 5 type III) whose HRM and TBE were available both in preoperative and postoperative stage.

Results: All patients achieved treatment success (Eckardt score≤3). Partial recovery of body peristalsis was encountered in 2 patients with type I (40%), 5 with type II (62.5%), and 4 with type III (80%) achalasia after POEM. Among them, 2 of 5 patients with type III (40%) achalasia showed almost full recovery of body peristalsis after POEM. Panesophageal pressurization disappeared after POEM in 7 of 8 type II achalasia patients. In the 2 patients whose post-POEM integrated relaxation pressure was more than 15mmHg, one showed absent peristalsis and the other showed premature contraction in postoperative HRM. The average diameter of esophageal body after POEM was significantly decreased in all types of achalasia.

Conclusions: POEM resulted in excellent symptomatic success. Also, POEM decreased the diameter of esophageal body and restored peristalsis of body in a considerable number of patients. Thus, we conclude that POEM provides not only excellent clinical symptomatic success, but also esophageal remodeling in terms of restoration of peristalsis and diameter of esophageal body, especially in type III achalasia.

Keywords: Peroral endoscopic myotomy; Achalasia; Esophageal remodeling; Peristalsis

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**PUG-08**

Long-Term Outcomes of Peroral Endoscopic Myotomy for Achalasia

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Digestive Disease Center, Cha University, Seongnam, Korea

Background / aims: Peroral endoscopic myotomy (POEM) is now accepted as an important treatment option for achalasia. However, long-term clinical outcomes after POEM have been rarely reported.
Methods: The retrospective data were collected from 51 achalasia patients who had a POEM and followed up more than 1 year at our institution. The primary outcome was symptom relief (Eckardt score of <3). Secondary outcomes were reflux symptoms and lower esophageal sphincter (LES) pressure on manometry.

Results: All patients underwent successful POEM procedure. During a mean follow-up period of 22.5 months (range 12-42 months), 4 patients had repeated POEM. A total of 49 patients (96.0%) achieved symptom relief. Mean LES pressure also decreased from a mean of 27.8 mm Hg to 15.3 mm Hg after POEM (p<0.0001). Thirteen patients (25.5%) showed gastroesophageal reflux symptoms, but the symptoms did not correlate well with the endoscopic findings and the results of 24-hr pH monitoring.

Conclusions: Relatively long-term outcome of POEM for achalasia are excellent, resulting in symptom relief in almost cases and without serious adverse events.

Keywords: Esophageal achalasia; Peroral endoscopic myotomy; Treatment outcome

PUG-09

Clinical Outcomes of Endoscopic Submucosal Dissection for Esophageal Squamous Cell Carcinoma

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Department of Medicine, Samsung Medical Centre, Sungkyunkwan University School of Medicine, Seoul, Korea

Background / aims: Endoscopic resection is an effective and minimally invasive treatment for superficial esophageal cancer without distant metastasis. We investigate the clinical outcomes of endoscopic submucosal dissection (ESD) for superficial esophageal squamous cell carcinoma (SESCC).

Methods: We retrospectively analyzed SESCC patients who underwent ESD at Samsung Medical Center between March 2007 and February 2016. En bloc resection, complete resection, and curative resection were evaluated. Recurrence and mortality during follow-up were investigated. Procedure-related complications were also assessed.

Results: A total 157 patients underwent ESD for 161 for SESCC. The median patient age was 65 years (range 42-80), and 145 mens (92.4%) were included. The median tumor size was 14.7 mm (range 2-46 mm). En bloc resection was achieved in 146 patients (92.9%). Complete resection was achieved in 118 patients (75.1%), and curative resection was achieved in 89 patients (56.7%). Adverse events occurred in 31 patients (19.7%) including micro- and macro-perforation (n=10 and n=4, respectively total=14, 8.9%) and stricture (n=17, 10.8%). However, no procedure-related mortality occurred. Among patients achieving curative resection (n=89), tumor recurrence occurred in 12.4% (n=11) (local recurrence=2, metachronous recurrence=7, extraesophageal recurrence=2) during median follow up of 18.8 month. In recurred patients, 2 patients were underwent ESD, and 3 patients were underwent APC, 2 patients underwent operation, and 3 patients underwent chemotherapy and/or radiotherapy, and 1 patient had no other treatment. One patient died during follow-up of months. However, the patients died from other cancer, not esophageal cancer.

Conclusions: ESD for SESCC is oncologically safe and warrants good long-term outcomes when curative resection is achieved. Although procedure-related complication risk is acceptable, it seems to be lower.

Keywords: Esophageal squamous cell carcinoma; Treatment outcome; Endoscopic resection

PUG-10

Using of Biodegradable Stent Extension in Children with Cicatricial Stricture of Esophagus

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Background / aims: To study the possibility and efficiency of stent insertion of esophagus in children using biodegradable stents
Methods: 7 patients with postburn esophageal stricture are implanted biodegradable stents manufactured by ELLA-CS, Ltd (Czech Republic), from 2014 to 2016. Stent implantation procedure was executed within healthy tissue under X-ray and endoscopic control under short general anaesthesia. In current the first 7 days after implantation endoscopic control position of stent was executed.

Results: Caustic stenoses are formed after serious alkaline burns after more than 6 months. The length of stricture > 4 cm was revealed in upper and middle third of the esophagus with diameter < 4 mm on X-ray examination. Long term bougienage of esophagus and balloon dilation performed in every 3-4 weeks. These patients were candidate on coloesophagoplasty. 7 patients were treated using this method. Efficiency of this method depended on correctly chosen stent its length, radial power and diameter. Managing stents provided to hold "physiological" cavity of the esophagus at the level of stricture during more than 3 months. Six patients after one implantation of stent at periods 9-18 months have not dysphagia. One patient in 10 months is executed repeated bougienage on conductor of the zone restenosis with the repeated insertion of stents that has led to persistent positive effect.

Conclusions: Thereby, using biodegradable stents made polydioxanone in treatment postburn stenoses of esophagus in children can change systematic bougienage and balloon dilation shortens the time of the treatment. Biodegradable stents made polydioxanone render the therapeutic action for the whole period of the disintegration and reforms dilation of stenoses. Due to biological disinteration of the material, from which it's made, is not required removing of stents. This advantage avoids the risk, connected with procedure of the removing.

Keywords: Biodegradable stent; Cicatricial strictures of esophagus; children
poor features in surgery group, compared to ESD group, ESD was comparable with surgery for EGC fulfilled expanded indication of ESD, because of lower rates of acute complication and comparable overall survival rates.

**Keywords:** Endoscopic submucosal dissection; Absolute indication; Expanded indication; Undifferentiated histology; Outcomes

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**PUG-12**

**Clinical Outcomes of Endoscopic Submucosal Dissection in Patients with Early Gastric Cancer under 40 Years Old**

Kyu Yeon Hahn¹, Sang Kil Lee¹, Chan Hyuk Park², Hyunsoo Chung¹, Jun Chul Park¹, Young Hoon Youn¹, Sung Kwan Shin¹ and Yong Chan Lee¹

¹Department of Internal Medicine, Severance Hospital, Institute of Gastroenterology, Yonsei University College of Medicine, Seoul, ²Department of Internal Medicine, Guri Hospital, Institute of Gastroenterology, Hanyang University College of Medicine, Guri, ³Department of Internal Medicine, Gangnam Severance Hospital, Institute of Gastroenterology, Yonsei University College of Medicine, Seoul, Korea

**Background / aims:** The clinicopathologic features of gastric cancer in young patients are different from those of older patients. The aim of this study was to identify the clinicopathologic features of early gastric cancer (EGC) and clinical outcomes of endoscopic submucosal dissection (ESD) in young patients ($\leq 40$).

**Methods:** From January 2006 and June 2014, 55 patients aged 40 years old or younger with newly diagnosed EGC underwent ESD at two tertiary hospitals. Clinicopathologic features of EGC and clinical outcomes ESD in these young patients were reviewed retrospectively, compared with those of standard ESD cohort in our hospital.

**Results:** 55 patients with 57 EGC lesions underwent ESD in young patients group. Compared with older patients in our standard ESD cohort (older than 40 years old, 806 patients with 831 EGC), female patient, superficial flat or depressed lesions, undifferentiated histology, deep mucosal invasion were more common in young patients group. En-bloc resection rate and complete resection rate were not significantly different between two groups (93.0% vs. 88.1%, $p = 0.264$; 71.9% vs. 67.1%, $p = 0.456$). Although high proportion of undifferentiated cancers in young patients group, curative resection rate was not lower for the young patients groups compared with older patients groups (73.7% vs. 69.6%, $p = 0.706$). Among 16 patients with non-curative resection, 4 patients underwent additional surgery and 1 patient underwent Argon Plasma coagulation at ESD ulcer margin. 9 patients were under close surveillance examination without additional treatment and there was no recurrent tumor. Median follow-up periods were $37.20 \pm 23.6$ months in young patients group. During follow-up periods, one patient was diagnosed synchronous cancer and underwent surgery.

**Conclusions:** Different clinicopathologic features of gastric cancer in young patients did not affect short-term outcomes of ESD compared with the older patients. ESD is a feasible treatment for young patients with EGC fulfilled expanded indication of ESD.

**Keywords:** Young age; Early gastric cancer; Endoscopic submucosal dissection

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**PUG-13**

**Clinical Impact of Obesity for the Patients Who Undergo Endoscopic Submucosal Dissection**

Donghoon Kang, Jae Myung Park, Sung Eun Ha, Seung Bae Yoon, Chul-Hyun Lim, Jin Su Kim, Yu Kyung Cho, Bo-In Lee, Young Seok Cho, In Seok Lee and Myung-Gyu Choi

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**Background / aims:** Obesity is considered one of the unfavorable factors for perioperative outcomes in gastric cancer patients. This study aimed to investigate the clinical impact of overweight or obesity in the patients who received endoscopic submucosal dissection (ESD) with gastric adenoma or early gastric cancer.

**Methods:** A total of 1571 consecutive patients with gastric neoplasia who underwent ESD at Seoul St. Mary’s hospital between December 2010 and March 2016 were enrolled. We analyzed 1181 cases retrospectively, divided into three groups by patient’s body mass index (BMI) according to the International Obesity Task Force criteria for the Asia-Pacific population: Normal (BMI < 23 kg/m², n = 411), Overweight ($23 \leq$, < 25 kg/m², n = 312), and
Obesity group (≥ 25 kg/m², n = 458). Demographics, endoscopic findings, pathologic results and clinical outcomes were analyzed.

Results: No significant differences were observed in failure of procedure, en-bloc resection rate, resection margin involvement, submucosal or lymphovascular invasion between three groups. In contrast, men were more overweight or obese, and overweight and obesity patients showed longer procedure time (42.2 ± 42.6, 43.8 ± 35.6, 49.8 ± 46.6; p = 0.001) and the number of the cases which spent 60 minutes or longer were also different (17.3%, 22.4%, 25.8%, p = 0.010). There were no significant differences in the complication rates. We analyzed the factors in relation with longer procedure time over 60 minutes. Male sex (p = 0.008), obesity (p = 0.007), higher location of the lesion (p = 0.000), submucosal invasion (p = 0.012) and occurrence of the complication (p = 0.001) were independent factors associated with longer procedure time by multivariate analysis.

Conclusions: These results showed that obesity or overweight was not directly associated with clinical outcomes. However, obesity or overweight influenced longer procedure time. Although gastric ESD might be difficult in the obesity patients, it can be performed safely with sufficient precaution.

Keywords: Overweight; Obesity; Gastric endoscopic submucosal dissection; Complication; Procedure time

Quality of Life Outcomes after Endoscopic and Surgical Treatment of Early Gastric Cancer

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Background / aims: Literature on the comparison of quality of life (QOL) in patients who have undergone endoscopic resection (ER) and surgical treatment is limited. We evaluated changes in the QOL after treatment for early gastric cancer (EGC), and compared these changes by the treatment procedure.

Methods: The Korean Gastric Cancer Cohort Study started in 2010, and it includes 14 cancer centers. Newly diagnosed patients with gastric cancer who were expected to undergo curative treatment and met the eligibility criteria have been consecutively enrolled since January 2011. Among them, we included patients with stage IA EGC (T1N0M0) and reviewed baseline characteristics and questionnaire results of patients who underwent ER or surgery for EGC. The validated Korean version of the European Organization for Research and Treatment of Cancer 30-item core QOL questionnaire and its gastric module were used. We compared the QOL outcomes at pretreatment, and 1 year and 2 years after ER and surgery.

Results: We included 2,283 patients (ER 542, gastrectomy 1,741). Patients in the ER group were more likely to report a better QOL, except for the global QOL, after treatment than those in the surgery group. All the symptom domains were better in the ER group. Although the global QOL significantly improved postoperatively, patients who underwent ER had slight improvement at 1 year but deterioration at 2 years.

Conclusions: Physicians should not ignore the global QOL of patients with EGC after ER, even if the patients received noninvasive treatment and had fewer symptoms.

Keywords: Quality of life; Early gastric cancer
PUG-15

Three Year Outcomes of Endoscopic Sub-mucosal Dissection for EGCs in Korea: A Prospective with Multi-center Cohort Study

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Background / aims: Endoscopic submucosal dissection (ESD) has been established as one of the treatment options for selected cases of early gastric cancer (EGC). The aim of this study is to suggest 3-year survival and recurrence rate after ESD for EGC, based on incidence and patterns of local, metachronous recurrence and metastasis.

Methods: A prospective multicenter cohort study was performed in 12 Korean study group-related hospitals. Between 2010 and 2011, 712 patients were underwent ESD for EGC. They followed up with esophago-gastro-duodenoscopy and abdominal computed tomography under this study protocol. Three-year outcomes were analyzed for 697 patients with follow-up rate 92.8% and 15 patients withdrew their consent.

Results: During median 36 months of follow-up, the 3-year gastric cancer free survival rate was 96.1% (95%CI: 0.95~0.98), the overall survival (OS) rates was 98.1% (95% CI: 0.97-0.99) and there was no gastric cancer related deaths. Recurrence of index cancer, metachronous gastric cancer, and metastasis developed 0.9% (6/697), 2.7% (19/697) and 0.3% (2/697); 1.1% (1/95), 3.2% (3/95) and 2.1% (2/95) in non-curative resection group; 3.5% (5/602), 2.7% (16/602) and 0% (0/602) in curative resection group.

Conclusions: In this study, 3-year follow-up rate was over 90%. And there was no gastric cancer related deaths. Although the future long-term studies are needed, the interim results may represent that the ESD is safe and effective in the treatment of EGC. *This work was supported by Grant of the National Evidence-based Healthcare Collaborating Agency, NECA-NA15-004.

Keywords: Endoscopic submucosal dissection; Early gastric cancer; Prospective study

PUG-16

Outcomes of Endoscopic Submucosal Dissection in Patients with Early Gastric Cancer Beyond Preoperative Indication

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Background / aims: ESD can be chosen as an initial treatment modality instead of surgery in patients with EGC beyond preoperative indication of ESD, especially if patients hesitate or refuse surgery. The aim of this study was to identify the outcomes of ESD in patients with EGCs not meeting preoperative indication of ESD.

Methods: We reviewed the medical records of patients who underwent ESD between January 2011 and December 2015, at a single institution.

Results: A total of 222 patients underwent ESD for EGC lesions that were beyond preoperative indication of ESD with curative or diagnostic intent. They were classified 5 beyond preoperative indication groups according to the guideline of ESD: (1) differentiated histology, UL (-), cT1a, >30mm; (2) differentiated histology, cT1b; (3) undifferentiated histology, UL (-), cT1a, >20mm; (4) undifferentiated histology, cT1a, UL (+); (5) undifferentiated histology, cT1b. En-bloc resection rate and complete resection rate were 98.2%and 84.7%. Lymphovascular infiltration was shown in 40 lesions (18.0%). Less than half lesions met none of the absolute or expanded indication of ESD (33.8% [75/222]). As a result, 147 patients (59.9%) underwent curative ESD even though they had lesions that were regarded as beyond preoperative indication of ESD. The rate of curative resection was significantly different among the pre-ESD classification groups. Among the tumor-related factors of the curability, multivariate analysis revealed lesions with larger size (OR: 1.062; 95% CI: 1.015-1.112; p-value: 0.009) and un-
differentiated histology (OR: 5.167; 95% CI: 1.768-15.103; p-value: 0.003) were risk factors in non-curative resection.

**Conclusions:** Even though lesions were regarded as beyond indication of ESD on preoperative evaluation, curative resection could be achieved and surgery was avoided in a considerable numbers of patients. Preemptive ESD can be considerable prior to surgery in patients with EGC beyond preoperative indication of ESD.

**Keywords:** Beyond indication; Early gastric cancer; Endoscopic submucosal dissection

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**PUG-17**

**Endoscopic Submucosal Dissection for Superficial Gastric Lesion - A Safe and Feasible Option in Vietnam**

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Endoscopy Department, Choray Hospital, Hochiminh, Vietnam

**Background / aims:** Endoscopic submucosal dissection (ESD) is widely accepted as a curative method which enables en-bloc removal of superficial malignant or premalignant lesions; however, the experience with this technique is still limited in Vietnam. We aimed to evaluate the safety and feasibility of ESD in a tertiary center in Hochiminh city, Vietnam.

**Methods:** ESD was performed in a standard manner with the IT knife and Dual knife from August 2015 to April 2016. Details of the procedures, complications, specimens resected and recurrence at follow up were analyzed.

**Results:** Total of five cases of ESD for superficial gastric lesions have been performed including 4 males and 1 female, mean age 52 ± 09 years. Three lesions were located in the antrum. The other two were located in the lower body and angularis incisura, respectively. The median size of the lesion was 12 (8-20) mm. The Paris classification was used and the lesions were classified as follow: 1 case of type 0-IIa + 0-IIc, 3 cases of type 0-IIc and 1 case of type 0-Ip. En-block resection was successful performed in all lesions, with median procedure duration of 65 minutes (45-120 minutes). There were no cases of perforation, significant bleeding nor mortality. Histologically, all 5 en-block samples showed complete resection (R0).

Four cases were confirmed early gastric cancer and 1 case was confirmed adenoma with moderate dysplasia. Median follow up period was 12 (4 - 32) weeks. No recurrence was found.

**Conclusions:** ESD for treatment of superficial gastric lesions is safe and feasible in Vietnam, despite a low volume of such lesions.

**Keywords:** Endoscopic submucosal dissection; Early gastric cancer

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**PUG-18**

**Clinical Outcome after Endoscopic Submucosal Dissection for Early Gastric Cancer of Absolute and Expanded Indication**

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**Background / aims:** Recently, endoscopic submucosal dissection (ESD) has been the main procedure of treatment of early gastric cancer (EGC), and that area is gradually expanding, but there is still a controversial question. Thus, this study aims to evaluate the safety of ESD in SM invasion or undifferentiated EGC and find factors related to local recurrence after ESD.

**Methods:** A retrospectively reviewed the medical records of EGC patients who underwent ESD at a single tertiary hospital between January 2009 and December 2014. The patients’ characteristics and clinical outcomes were compared in an absolute indication, SM invasion and undifferentiated EGC groups.

**Results:** Of 885 patients in total, 729 were an absolute indication group, 65 were a differentiated, SM1 invasion group and 51 were an undifferentiated, confined mucosa group. Follow-up was conducted for average (± SD) 34.12 (± 10.6) months, and as compared to the absolute indication group, en bloc resection and curative resection rate were low in the other two groups, but there were no significant differences in procedure related complication, local recurrence and survival rate. ESDs performed at our hospital from 2005 through to 2009 were compared with that in this study, and en bloc resection
(80.5% vs 89.1%, \( p=0.001 \)) and curative resection rate (86.2% vs 92.1%, \( p=0.011 \)) were higher in this study. Non-curative resection, tumor size of more than 2 cm and invasion depth over SM2 were factors associated with local recurrence.

Conclusions: ESD in minute SM invasion or undifferentiated EGC showed an unfavorable short-term outcome as compared to that in the absolute indication group, but there were no significant differences in local recurrence and survival rate. Therefore, in minute SM invasion or undifferentiated EGC patients, ESD could be recommended as a therapeutic option.

Keywords: Endoscopic submucosal dissection; Early gastric cancer; Expanded indication

PUG-19

The Clinical Usefulness of Pronase Bowel Preparation before ESD for Gastric Neoplasms

Yoon Suk Park\(^1\), Seoug Hwan Kim\(^1\), Il Hyun Baek\(^2\), Young Kwan Cho\(^1\), Young Sook Park\(^1\), Yunju Jo\(^1\), Byoung Kwan Son\(^1\), Sang Bong An\(^1\), Jin Suk Chang\(^3\) and Young Dae Kim\(^4\)

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Background / aims: Endoscopic submucosal dissection (ESD) is a major treatment option for gastric neoplasia. However, gastric mucus and other substances influence to decline endoscopic visual score, safety of resection margin and complete resection rate. These factors were related with poor prognosis of patients. Pronase is a non-specific protease, endoscopic premedication. The primary end point of this study is the relations between the pronase premedication and improvement of procedure result

Methods: From July 2014 to July 2015, 70 patients with flat adenoma or early gastric cancer (EGC) type II will be investigated. The range of lesion size is between 0.5 cm and 5 cm. Before ESD, Pronase experiment group and simethicone contrast group are selected through randomization. Each group will provide pronase and simethicone. Endoscopic visual score, lesion marking time, total procedure time, complication, complete resection, lateral safety margin of resected specimen will be recorded. And, difference of each group will be analyzed.

Results: So far, total of 10 ESD cases diagnosed with flat adenoma or early gastric cancer collected. Adenoma was 4 cases. (Pronase group: 1, Simethicone group: 3) and EGC was 6 cases (Pronase group: 4, Simethicone group: 2). Mean lesion size of Pronase group is 1.5 cm x 1.42 cm. Mean lesion size of Simethicone group is 1.92 cm x 1.14 cm. Mean of endoscopic visual score was 1.2 and 2.4 (lower is better). Mean of total procedure time is 1096 seconds and 2526 seconds respectively. Lateral safe margin is 0.36 cm and 0.36 cm. Complication occurred 1 case (microperforation at simethicone group).

Conclusions: This study will demonstrate improvement of the endoscopic visual field and procedure result. So far, the result of pronase group is superior to the simethicone group. And further data collection and analyze are required.

Keywords: Endoscopic submucosal dissection; Gastric neoplasm

PUG-20

Comparison of ESD and EMR Method in Circumferential Esophageal Mucosal Resection in Minipig Model

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\(^1\)Division of Gastroenterology, Department of Internal Medicine, Inha University School of Medicine, Incheon, \(^2\)Department of Pathology, Inha University School of Medicine, Incheon, \(^3\)Department of Pathology, Inha University School of Medicine, Incheon, Korea

Background / aims: SD was reported superior to EMR in en block resection of early esophageal cancer. ESD in circumferential resection of early esophageal cancer demands long procedure time and has risk of damage in proper muscle layer. We compared ESD and EMR with piecemeal method in circumferential resection of esophageal mucosa in minipig model in respect of procedure time, feasibility and complication.

Methods: EMR was applied in normal mid or distal esophagus in 3 minipigs with 5 cm length. ESD was applied in 2 minipigs as same manner. EMR was done with plastic cap and disposable SD-7p snare. ESD was done
with dual knife and IT2 knife. 2 weeks after procedure, endoscopic observation was done at stricture site. Minipigs were sacrificed and the diameter of stricture segment was evaluated by low power microscopic measurement.

**Results:** Mean procedure time of EMR with piecemeal method was 60 minutes and mean resected pieces were 14, and 5 disposable SD-7p snares were used in each minipig. Mean procedure time of ESD method was 90 minutes, and complete enblock resection was achieved in both minipigs. No major bleeding occurred in both groups. One perforation occurred in the first minipig of EMR group, due to unadjusted high power suction. Perforation was sutured successfully with clips. The degree of stricture was not different in both groups by endoscopic examination. The long diameter and short diameter of stricture segment were measured by low power microscopic examination, and showed no difference in both group. But the stricture tended to be more severe in ESD group. The mean values of multiplicity of both diameter in EMR and ESD group were 12.75 and 10.15.

**Conclusions:** EMR with piecemeal resection could be considered an alternative method in circumferential resection of short segment early esophageal cancer.

**Keywords:** ESD; EMR; Esophagus; minipig model

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**PUG-21**

**Efficacy of a Patient Positioning Device during Endoscopic Submucosal Dissection for Gastric Epithelial Neoplasm**

Moon Won Lee, Bong Eun Lee, Sungyoung Han, InSub Han, OkGeun Kim, KyungLim Hwang, DongWoo Ha, DongHoon Baek, HyeKyung Jeon, GwangHa Kim and GeunAm Song

**Department of Gastroenterology, Pusan National University Hospital, Busan, Korea**

**Background / aims:** To assess the efficacy of a patient positioning device (EZ-FIX) during endoscopic submucosal dissection (ESD) for gastric epithelial neoplasm.

**Methods:** Eighty-six patients who had been diagnosed with gastric adenoma or early gastric cancer were prospectively randomized to EZ-FIX (n = 44) and non-EZ-FIX (n = 42) group. During ESD, midazolam and propofol was titrated and patient’s movement score was measured. The endoscopist completed a questionnaire after ESD, which assessed the level of satisfaction with sedation and overall satisfaction with the procedure. In the EZ-FIX group, a contribution of EZ-FIX was assessed and divided into four categories of none, low, medium and high. We defined the contribution group from low to high categories.

**Results:** There was no significant difference between the EZ-FIX and non-EZ-FIX groups in terms of age, gender, BMI, lesions’ characteristics and dose of sedatives. EZ-FIX group took a longer procedural time (p=0.044). En bloc and complete resection rate, procedure related complications, endoscopist satisfaction with sedation and overall satisfaction with procedure did not differ between the two groups. In the EZ-FIX group, 16 patients (36.4%) were a contribution group. Subgroup analysis between the contribution and non-contribution groups revealed that the contribution group had a larger lesion size (p=0.043) with a longer procedural time (p=0.037), and had a higher patient’s movement score (p=0.000) with a higher dose of propofol (p=0.004) and pethidine (p=0.001). Endoscopist satisfaction with sedation (p=0.00) and overall satisfaction with the procedure (p=0.01) was lower in the contribution group.

**Conclusions:** To achieve successful outcomes, patient’s cooperation is very important during ESD. In this study, we think EZ-FIX is an effective tool for patients with incomplete sedation and who are expected to take a long procedure time with a large lesion size, especially more than 2 cm.

**Keywords:** Patient positioning device; Endoscopic submucosal dissection

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**PUG-22**

**Endoscopic Pyloromyotomy for Gastric Drainage Disturbance Following Esophagectomy**

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**Department of Internal Medicine, Presbyterian Medical Center, Jeonju, Korea**

**Contents:** Gastric drainage disturbance is a common con-
Endoscopic pyloromyotomy can be a good alternative treatment for gastric drainage disturbance. Two male patients, 66 and 54 years old, had esophagectomy with gastric pull-up and vagotomy for esophageal squamous cell carcinoma. They presented postprandial vomiting and dyspepsia 9 and 3 months later, respectively. Esophagogastroduodenoscopy (EGD) showed gastric drainage disturbance. Both patients underwent pyloromyotomy. Submucosal tunnel was created and selective circular myotomy was performed with needle knife, and then closed using endoclips (Figure 1 and 2). At next day follow-up, the pyloric patency was markedly improved without stasis. We report two cases of endoscopic pyloromyotomy in patients with gastric stasis following esophagectomy. Conclusively, endoscopic pyloromyotomy using submucosal tunneling is a novel non-invasive promising technique for gastric drainage disturbance, especially following esophagectomy.

Keywords: Endoscopy; Pyloric stenosis; Esophagectomy

PUG-23
Diagnostic Yield of Endoscopic Ultrasonography Guided Incision Biopsy for Gastric Subepithelial Tumors
Tae-Geun Gweon, Byung-Wook Kim, Joon Sung Kim, Sung Min Park, Young Wook Kim and Gi Jun Kim
Internal Medicine, The Catholic University of Korea, Incheon, Korea

Background / aims: Several techniques are recommended for the histologic diagnosis of gastric subepithelial tumors (SETs). The purpose of our study was to evaluate the diagnostic yield and safety of endoscopic ultrasonography guided single-incision needle knife (SINK) biopsy for the diagnosis of gastric SETs.

Methods: A retrospective review of patients who received biopsy for gastric SETs from August 2012 to May 2015 was conducted. Patients who received endoscopic ultrasonography and were found to have a SET originating from the muscularis propria of the stomach were included in the study. The aim of our study was to investigate the safety and diagnostic yield of SINK biopsy for gastric SETs.

Results: A total of 31 patients received SINK biopsy for SETs. The diagnostic yield of SINK biopsy was 87% (95% CI 75% to 100%) and the diagnostic accuracy was 89% (95% CI 74% to 105%). The sensitivity of SINK biopsy to identify gastrointestinal stromal tumors was 83% (95% CI 52% to 98%); the specificity was 100% (95% CI 59% to 100%); the positive predictive value was 100% (95% CI 69% to 100%); and the negative predictive value was 78% (95% CI 40% to 97%). There were no procedure-related adverse events during and after procedure.

Conclusions: The use of SINK biopsy technique in patients with SETs is a good diagnostic tool with high diagnostic yield and accuracy. The method is simple, safe, and associated with few complications.

Keywords: Endoscopic ultrasonography; Subepithelial tumor
The Effectiveness of an Endoluminal Bariatric Gastroplasty Using New KUMC Endoscopic Suture Device

Byeong Kwang Choi1, Hoon Jai Chun1, Jae Min Lee1, Hyuk Soon Choi1, Eun Sun Kim1, Bora Keum1, Yoon Tae Jeen1, Hong Sik Lee1, Chang Duck Kim1, Yoonjin Kim1, Byunggon Kim1, Kyungnam Kim1, Youngnam Song1, Daehie Hong1, Sang Yup Lee1, Jung Min Lee1, In Kyung Yoo1 and Seung Han Kim
1Division of Gastroenterology and Hepatology, Korea University College of Medicine, Seoul, 2Division of Mechanical Engineering, Korea University, Seoul, Korea

Background / aims: Obesity is a major health problem worldwide. The primary treatment for obese patients is weight reduction, which can improve comorbidity. Procedure to reduce gastric volume has been widely used for surgical treatment of morbid obesity. Recently, it is reported that there is an effect on metabolic diseases such as diabetes. An endoscopic approach to treat obesity may be less invasive than laparoscopy or surgery. We made an endoscopic suture device with suction cap for reducing stomach volume. The objective of this study is to evaluate the feasibility and effectiveness of an endoscopic suturing procedure for weight loss in vivo.

Methods: A prototype suture device was created using needle, beads and suction cap. This novel device was used to suture wall of the fundus and body. After suturing, the thread was retracted to reduce the volume and was tied using the knotting device. After the suture procedure, water was reinjected to check the volume of the stomach. And we performed pig studies to evaluate safety and feasibility of this method.

Results: We performed ten in vivo animal studies. Mean volume was 1873.5ml before the experiment, but the volume reduced to 1304ml after the end of experiment. We could confirm about 29.9% volume reduction. All of the stitches were securely sutured with full thickness. The study showed that suturing of full thickness using continuous closure device resulted in the decrease of volume. We performed 10 short term experiments in a porcine model. It is possible to reduce gastric volume in live porcine model, and pigs had been survived for 30 days before sacrifice without complication. There were no technical problems during the procedure. Endoscopic gastric reduction with our device is technically feasible on a live porcine model.

Conclusions: It is possible to achieve transoral endoscopic gastroplasty with an endoscopic continuous suture device.

Keywords: Obesity; Gastroplasty; Bariatric

Clinical Impacts of Incisional Target Biopsy on Therapeutic Strategy for Proximal Gastric PM Mass

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Background / aims: The aims of this study is to evaluate the prevalence of leiomyoma and gastrointestinal tumour and difference in prevalence of these tumors by location, especially in cardia and anatomical location near esophagus by means of incisional target biopsy(ITB).

Methods: A total of 11 patients with SETs in the stomach were evaluated. ITB by endoscopy were done depend on size, layer of origin, and echogenic pattern of the lesion by EUS.

Results: Three patients were identified as having GIST, 8 patients as leiomyoma. All tumors identified as GIST or leiomyoma were located in upper 1/3 of stomach which

Table 1. Characteristics of patients with GIST and leiomyoma

<table>
<thead>
<tr>
<th>Sex</th>
<th>Male</th>
<th>Female</th>
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<tr>
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<td>3</td>
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<table>
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<th>Mean Age</th>
<th>Cardia</th>
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<th>Lower</th>
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<td>74.5</td>
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<th>Hypovascular</th>
<th>Mixed-type</th>
<th>Microvascular</th>
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<table>
<thead>
<tr>
<th>Lesion</th>
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<th>C,T, T*</th>
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<th>Margin</th>
<th>C,T,T*</th>
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Table 2. Distance of EGJ to clip on entry site under simple abd X-ray after incisional biopsy procedure(DETC) in patients with GIST and leiomyoma.

<table>
<thead>
<tr>
<th>EGJ to Clip</th>
<th>0-3cm</th>
<th>0</th>
<th>1</th>
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<tr>
<td>3-4cm</td>
<td>2</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>4-5cm</td>
<td>1</td>
<td>3</td>
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</table>

Results: Three patients were identified as having GIST, 8 patients as leiomyoma. All tumors identified as GIST or leiomyoma were located in upper 1/3 of stomach which
originated from muscularis propria. Mean distance from esophagogastric junction to tumor was 3.70 cm and 3.54 cm for GIST and leiomyoma, respectively. All of GIST were homogenous, hypoechoic with capsulation. 4 of leiomyoma were homogenous and rest were heterogenous and 2 of leiomyoma had lobulated margin.

**Conclusions:** ITB has been feasible, less invasive & the diagnostic option for hypoechoic pm mass lesions at proximal stomach, especially near cardia. ITB provide the correct differential diagnosis for malignant potencies out of pm masses of proximal stomach. So it is possible to avoid the adverse outcomes after invasive therapeutic procedure, especially proximal gastric area.

**Keywords:** Subepithelial tumors; Incisional target biopsy

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**PUG-26**

**Impacted Esophageal Foreign Body Removed by Grasping Forcep under General Anesthesia**

Jae-Kwon Jung1, Hyun-Soo Kim1, Chang-Keun Park1, Dae-Jin Kim1, Yun-Jin Chung1, Jae-Kwang Lee1, Jun-Ho Park1 and Yoon-Hyung Lee3

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**Contents:** Foreign body ingestion is a common complaint in the emergency department. Successful removal by endoscopy occurs in most cases. Less than 1% of the cases will need surgery for foreign body extraction or to treat complications. Here, we report a case in which an esophageal impacted food bolus was removed by grasping forcep under general anesthesia. 61-year-old woman visited emergency room, presenting with odynophagia and foreign body sensation after she had lotus roots for side dish of dinner. She had medical history of schizophrenia. She had no specific finding on physical examination. We performed emergency endoscopy. However, we failed to extract the lotus roots because it formed hard bolus and then it allowed no space to access accessory devices in upper esophagus. The impacted lotus roots did not move an inch, while we tried to push it down with alligator forcep. Chest CT scan revealed 50x30mm large bolus material is located at the upper esophagus. We made a decision to remove it under general anesthesia after we consulted otolaryngologist. However, the laryngeal microsurgerye (LMS) grasping forcep had a limit to remove the lotus roots completely because the device had flexible frame and the impacted material was hard. We tried to switch it into percutaneous nephrolithotomy (PNL) grasping forcep following instruction and tips provided by urologist. The impacted lotus roots were successfully removed by PNL grasping forcep via suspension laryngoscopy. We suggest PNL forcep could be another option to remove large impacted hard food bolus via suspension laryngoscopy under general anesthesia in case a which endoscopic removal failed to extract impacted food bolus.

**Keywords:** Foreign body; Anesthesia; Percutaneous nephrolithotomy grasping forcep

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**PUG-27**

**The Korean Registry on Peptic Ulcer Bleeding and Rebleeding (KPUB): Analysis of Factors Associated with Rebleeding**

Gi Jun Kim, Byung-Wook Kim, Joon Sung Kim, Sung Min Park and Young Wook Kim

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**Background/ aims:** Determining the risk factors of rebleeding after diagnosis of peptic ulcer bleeding is important. The purpose of our study was to examine the risk factors associated with rebleeding in patients with peptic ulcer bleeding

**Methods:** From the registry of Korean Peptic Ulcer Bleeding (KPUB), we examined basic patient characteristics and clinical outcomes. Logistic regression models were performed to identify factors associated with rebleeding.

**Results:** Between May 2014 and March 2015, 904 patients with PUB were registered in the KPUB data base. Median age was 63 years and 76% were males. Rebleeding occurred in 6.8% (58 patients) and 30 day mortality was 1.0% (9 patients). In multivariate analysis the use of NSAIDS (OR, 0.428; 95% CI, 0.227-0.808; p=0.009), BUN level (≥30: OR, 0.486; 95% CI, 0.249-0.950; p=0.035), albumin level (<3: OR, 2.089; 95% CI, 1.186-3.680; p=0.011) and transfusion (OR, 2.277; 95% CI, 1.366-3.132; p=0.001) were independent predictors of rebleeding.
CI, 1.126-4.605; \( p=0.022 \) were independently associated with rebleeding.

**Conclusions:** In conclusion, use of NSAIDS, elevated BUN and decreased albumin levels, and transfusion were associated with rebleeding in our study. The wide use of PPIs and prompt endoscopy and intervention may be the reason for the low rebleeding and mortality rates in our study.

**Keywords:** Peptic ulcer disease; Bleeding

**PUG-28**

**Comparison of 4 Scoring Systems for Predicting Clinical Outcomes in Korean Patients with Peptic Ulcer Bleeding**

**Sun Min Park**, Byung-Wook Kim, Joon Sung Kim, Young Wook Kim and Gi Jun Kim

**Internal Medicine, The Catholic University of Korea, Incheon, Korea**

**Background / aims:** The AIMS 65 score has not been sufficiently validated and compared with other scoring systems for its ability to predict diverse clinical outcome. The aim of this study is to validate and compare the AIMS 65 and other scoring systems for the prediction of mortality, re-bleeding, transfusion requirement, and endoscopic intervention in Korean patients with peptic ulcer bleeding (PUB).

**Methods:** A multicenter, prospective and observational study was conducted in 1052 patients who had received endoscopy due to peptic ulcer bleeding between April 2014 and September 2015. The performance of these scores for predicting 30 day mortality, 30 day re-bleeding, transfusion requirement, and endoscopic intervention were assessed by calculating the area under receiver-operating characteristic curve (AUROC).

**Results:** Of the 855 patients, 0.9% died within 30 days, 3.9% experienced re-bleeding, 75.1% required endoscopic intervention, and 65.4% needed transfusion. The AIMS 65 score was useful for predicting 30-day mortality (AUROC 0.804, \( p<0.0001 \), \( p<0.0001 \) and \( p<0.0001 \), respectively) and the GBS was superior to the AIMS 65, full Rockall and clinical Rockall score in predicting transfusion requirement (\( p<0.0001 \), \( p<0.0001 \) and \( p<0.0001 \), respectively).

**Conclusions:** The AIMS 65 score was useful for predicting 30-day mortality and transfusion requirement in Korean patients with PUB. However, it was inferior to the GBS and full Rockall score in predicting transfusion requirement and endoscopic intervention, respectively.

**Keywords:** Peptic ulcer disease; Rockall score; Glasgow-Blatchford score; AIMS65

**PUG-29**

**Effect of 40 mg Once Daily Versus Continuous Pantoprazole for Prevention of Ulcer Bleeding**

**Hyounsoo Lee**, Dae Hyeon Cho, Jung Won Lee, Ji Eun Oh, Gwang Min Kim, Chang Wook Chung, Gil Jong Yoo and Sang Goon Shim

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**Background / aims:** Current guidelines recommend an intravenous bolus dose of a proton pump inhibitor (PPI) followed by continuous PPI infusion after endoscopic therapy in patients with high-risk bleeding peptic ulcers. However, intermittent PPI regimens are not inferior to continuous PPI infusion regimens in several recent studies. The aim of this study was to compare the effect of intermittent (40mg as a blouse injection daily for 72 hours) versus continuous (40mg as a blouse injection followed by continuous infusion at 8mg/hour for 72 hours) intravenous pantoprazole for prevention of bleeding after endoscopic therapy of bleeding peptic ulcers. Also, the same comparison was performed in high-risk patients (Rockall scores \( \geq 6 \)).

**Methods:** This single center cross-sectional study was conducted from January 2010 through December 2013. Patients who presented with overt or suspected upper gastrointestinal bleeding based on hematemesis and/or melena were eligible. These eligible patients were required to have a peptic ulcer with bleeding on emergency endoscopy performed within 24 hours after hospitalization. Demographic and medical data were gathered.

**Results:** Of the 266 patients, 7.8% (11/141) given intermittent pantoprazole and 5.6% (7/125) given con-
Continuous pantoprazole ($p=0.47$). Among patients with Rockall scores $\geq 6$, the rebleeding rates within 7 days were 12.2% (6 of 49 patients) given intermittent pantoprazole and 11.8% (4/34) given continuous pantoprazole ($p=0.99$). The rebleeding rates during 4th-28th day were 2.8% (4/141) given intermittent pantoprazole and 3.2% (4/125) given continuous pantoprazole ($p=0.99$). Among patients with Rockall scores $\geq 6$, the rebleeding rates during 4th-28th day do not demonstrate statistically significant difference.

**Conclusions:** Intermittent pantoprazole is comparable to the continuous pantoprazole in patients with endoscopically treated bleeding peptic ulcers. Also, the result shows similar in high-risk patients.

**Keywords:** Peptic ulcer; Pantoprazole

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**PUG-30**

Epidemiology of Peptic Ulcer Disease and Its Complications in Korea: Results from the Nationwide Population-Based Study

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**Background / aims:** Several studies have demonstrated that epidemiology of peptic ulcer disease (PUD) is affected by environmental conditions, racial differences, genetic factors, cultural factors, and geographic variations. We aimed to evaluate the contemporary epidemiology of PUD and its complications in Korea.

**Methods:** We used the Health Insurance Review and Assessment Service claims database, which covers 97.2% of the Korean population. We analyzed data from 2009 to 2013 for the trend in PUD incidence by age, sex, seasonal variation, and regional difference as rates per 10,000 population. In addition, its complications, such as bleeding and perforation, were expressed as a percentage of total PUD.

**Results:** The average PUD incidence ranged from 0.99% in 2009 to 0.52% in 2013. From 2009 to 2013, the annual incidence of gastric and duodenal ulcers (GU and DU, respectively) decreased from 73.9 to 40.2 per 10,000 and 19.6 to 11.2 per 10,000, respectively. The incidence of GU was higher in females (54.5 vs. 60.8 per 10,000) while the incidence of DU was higher in males (18.5 vs. 12.6 per 10,000). The peak age of GU was 70-79 years (126.1 per 10,000), which was nearly twice that of the 30-39-year-old group (62.6 per 10,000). Meanwhile, the incidence of DU had two peaks, 30-39 (10.3 per 10,000) and 70-79-year-old groups (15.0 per 10,000). The incidence of PUD was the highest in winter, whereas the incidence was the lowest in fall. The incidence of PUD in metropolitan and urban areas was higher than that in rural areas. The bleeding rate related to GU slightly increased from 8.3% in 2009 to 10.7% in 2013. However, bleeding of DU and perforation of PUD remained the same.

**Conclusions:** This is the first nationwide report that showed the decreasing trend of PUD incidence and distinct characteristics, including seasonal variation and regional difference in Korea. The complication rates showed no significant change, except for GU bleeding, which showed a slightly increasing trend.

**Keywords:** Bleeding; Duodenal ulcer; Gastric ulcer; Peptic ulcer disease; Perforation

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**PUG-31**

The Role of Endoscopic Hemostasis for Periampullary Diverticular Bleeding

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**Background / aims:** Endoscopy often fail to visualize the exact focus of upper gastrointestinal bleeding when there is massive bleeding, large amount of bloody debris, or where it is difficult to approach such as periampullary diverticulum. This study is aimed to evaluate the role of endoscopic hemostatic modalities for periampullary diverticular bleeding.

**Methods:** We examined the successful hemostasis for the periampullary diverticular bleeding whether endoscopically or with other hemostatic modalities. The patients’ medical records were retrospectively analyzed during 5

Fig. 1. Initial angioembolization for periampullary diverticular bleeding

Fig. 2. Initial endoscopic hemostasis for periampullary diverticular bleeding

Results: During 5 years, 2,237 cases [1,583 patients] were treated with endoscopic hemostasis. Periampullary diverticular bleedings happened to 7 patients [M 4, F 3, mean age 80±11 years; 4 Dieulafoy’s lesions and 3 ulcerative lesions]. 4 patients were first endoscopically treated (3 hemoclippings and 1 band ligation) and the others were initially treated with angioembolization. 2 of 4 endoscopic hemostasis were done by cap assisted endoscopy. All 7 patients were recovered without rebleeding.

Conclusions: This study is limited by being single center observational study. However, the endoscopic hemostasis for periampullary diverticular bleeding could be considered as alternative to surgery or angioembolization.

Keywords: Endoscopic hemostasis; Hemoclipping; Endoscopic band ligation; Angioembolization; Periampullary diverticular bleeding

PUG-32

The Use of Self-expanding Metal Stent for Refractory Variceal Haemorrhage

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Background / aims: Balloon tamponade or Transjugular Intrahepatic porto-systemic shunt is mainstay of therapy for refractory esophageal variceal bleeding (EVB). Preliminary data suggest that a self-expandable, esophageal covered metal stent (SX-Ella DANIS stent) is an effective and safer alternative to balloon tamponade for control of refractory EVB. The primary aim of this study was to evaluate the use of self-expandable metallic stents (SEMS) to control refractory EVB.

Methods: Between November 2011 and April 2016, esophageal SEMS were implanted in 10 patients (9 men, one woman; Mean age 55; Range 27 to 72) with refractory EVB. All patients were stabilized with pharmacologic therapy and packed cell transfusion after admission.

Results: Ten child class- C cirrhotic patients (MELD: 20±6; mean±SD) with refractory EVB (post variceal ligation ulcer-6; uncontrolled bleeding-4) were managed with covered esophageal SEMS. Stents were successfully placed in all patients after prophylactic intubation. Eight SEMS were placed at endoscopy suite under fluoroscopic control and two at bedside. Stents were left in place for 7 - 30 days. No acute haemorrhage was noted on stent retrieval in 6 patients. Thirty days mortality was noted in 4 patients due to uncontrolled sepsis and worsening liver
functions.

Conclusions: In this prospective study, implantation of covered esophageal SEMS was found to be a safe and effective treatment for refractory EVB.

Keywords: Refractory variceal bleeding; Ella stent

PUG-33

Genetic Polymorphism in TLR1 Revealed a Difference in the Profiles between Helicobacter pylori Associated Gastritis

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Background / aims: Host genetic factors are hypothesized to confer H. pylori susceptibility.

Methods: TLR1 rs4833095 was determined by Tag Man SNPs Genotyping assay. Polymorphism was considered the difference in the presence of genotypes between H. pylori infection and non-infection. To evaluate the association between of TLR1 rs4833095 genotypes with precancerous gastric lesions or gastric cancer.

Results: A total of 400 patients with 204 cases of H. pylori positive and 196 cases of H. pylori negative was identified the polymorphism of TLR1 rs4833095. Genotype profiles between H. pylori infected and un-infected patients showed significant differences. CC and TT genotype carrier was 89.7% and 100% for H. pylori positive cases suggested to associate with H. pylori infection. Individuals with the highest H. pylori infection of gastritis also exhibited the highest 28% and 34% of CC and TT genotypes, respectively. Furthermore, TLR1-CC genotype revealed a difference in the presence of gastric lesions or gastric cancer. The percentage of H. pylori related positive detection of CC genotype was 10, 10 and 12% in intestinal metaplasia, gastric atrophy and gastric cancer.

Conclusions: This finding helps suggesting the effect or association with gastric cancer through TLR1 polymorphism among H. pylori infection with gastric patients.

Keywords: Helicobacter pylori; Gastritis; Toll-like receptor polymorphism; TLR1

PUG-34

H. pylori Associated with Gastritis and Gastric Cancer in Thailand “Thailand Enigma”

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Background / aims: The infection of H. pylori classified by WHO as a type I carcinogen This study aims to describe the “Thailand enigma” in term of geographical differences in Thailand.
Methods: A retrospective study was carried out by looking into those studies done between 2008-2013 in Thailand, A Nationwide Study of the Cag A Phenotype and gastric cancer incidence and Thailand national cancer institute. The prevalence of *H. pylori* infection and incidence of gastric cancer collected from different geographic distributions in Thailand were analyzed and reported in term of GIS base.

Results: The prevalence of *H. pylori* infection was different in geographical locations; North 46.9%, Central 39.0%, Northeast 60.6% and South 14.4%. However, the gastric cancer incidence was 4.58% in North, 3.10% in Central, 2.68% in the Northeast and 2.25% in South region. The results show that, no correlation between *H. pylori* infection and gastric cancer in Thailand.

Conclusions: The low incidence of gastric cancer in Thai population was noted, despite the high prevalence of *H. pylori* infection. From this result, there is something different in Thai population from other countries such as host response, bacteria and environment so called “Thailand enigma”. This hypothesis needs to be proven by large multicenter studying.

Keywords: *Helicobacter pylori* associated with gastritis; Gastric cancer; Thailand enigma

**PUG-35**

Site Specific Biopsy Reliable Endoscopic Technique for Detection *H. pylori* Infection and Pre-Malignant Gastric Mucosa?

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Background / aims: *Helicobacter pylori* infection and premalignant gastric mucosa can be reliably identified using the High Resolution Endoscopy. The aim of our study was to compare standard biopsy with site specific biopsy for diagnosis of *H. pylori* infection and premalignant gastric mucosa.

Methods: A total of 250 patients who underwent esophagogastroduodenoscopy (EGD) for investigation of chronic abdominal pain, 125 patients underwent site specific biopsy using High Resolution Endoscopy (Group 1) and 125 standard biopsy (Group 2). Sensitivity, specificity, and positive and negative predictive values were assessed. The efficacy of detecting *H. pylori* associated gastritis and premalignant gastric mucosa according to the updated Sydney classification was also compared.

Conclusions: In group 1 the sensitivity, specificity, positive and negative predictive values for predicting *H. pylori* positivity were 95.4%, 97.3%, 98.8% and 90.0% re-
respectively, compared to 92.9%, 88.6%, 83.2% and 76.1% in group 2. Site specific biopsy was more effective than standard biopsy in terms of both H. pylori infection status and premalignant gastric mucosa detection (p<0.01).

Conclusions: Site specific biopsy using High Resolution Endoscopy can improve detection of H. pylori infection and premalignant gastric mucosa in daily clinical practice.

Keywords: Site Specific Biopsy; H. pylori infection; Premalignant gastric mucosa

PUG-36

Triple Therapy and Sequential Therapy for Helicobacter pylori Infection: Single Center Study in Mongolia

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Background / aims: Treatment of Helicobacter pylori (H. pylori) infection is paramount for the management of prevalent gastrointestinal disorders including peptic ulcer disease and gastric cancer. Till now, gold standard of H. pylori eradication regimen has been triple therapy. However, successful H. pylori eradication rates with standard triple therapy have been plummeting down due to increasing antibiotic resistance, having declined to as low as below 70% in many countries. Recently, to overcome the problem of antibiotic resistance, sequential regimens are increasingly used as first line treatment. In Mongolia, no previous studies investigating the H. pylori eradication rate. The aim of this study was to evaluate the efficacy of standard triple therapy compared with sequential therapies as a first-line eradication treatment of H. pylori infection.

Methods: From September 2014 to February 2016, 125 patient with confirmed H. pylori infection(Upper endoscopy, Rapid urease test, Hystology, H. pylori stool antigen test- HpStAg) randomly received 10 days triple therapy (pantoprazole 20mg, AMX 1000mg, CAM 500mg, all twice daily for 10 days-TT group, n=45), sequential therapy (pantoprazole 20mg, AMX 1000mg twice daily for 5 days followed by pantoprazole 20mg, CAM 500mg, MNZ 500mg twice daily for 5 days-ST group, n=45). Successful eradication therapy for H. pylori infection was defined as a negative HpStAg test 4 weeks after the end of eradication treatment.

Results: The eradication rates by intention to treat (ITT) analysis were 71.1% (32/45) and 75.6% (34/45) in the TT and ST groups, respectively (p=0.447). The eradication rates by per-protocol (PP) analysis were 74.4% (32/43) and 81% (34/42) in the ST and SeqT groups, respectively (p=0.447). The adverse event rates were 17.7% (8/45) and 26.6% (12/45) in the ST and SeqT groups, respectively (p=0.206).

Conclusions: Triple therapy and sequential therapy were proven to be equally low efficient regimen as the first line treatment for H. pylori infection.

Keywords: Helicobacter pylori; Eradication rate (cure rates)

PUG-37

The Study of Gastric Mucosal Changes with Helicobacter pylori Virulent Genes and Host Immunologic Polymorphism

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Background / aims: We aimed to compare gastric mucosal changes in patients with dyspepsia with H. pylori virulent genes and immunological polymorphism of the host

Methods: Overall 68 patients were examined by a cross-sectional study. Detailed demographic, endoscopic, histological and molecular biological (virulent gene of H. pylori and IL-RN polymorphism) data were obtained. Statistical analysis carried out using commercially available package, SPSS for windows ver.13.0.

Results: Detection of H. pylori was 58.8% by urease test, 73.5% by histology and 64.7% by molecular biology among the patients with dyspepsia. Totally 44 patients had Ure C in PCR, 25 of them were positive for CagA, 24 and 19 were positive for VagA s1 and CagA+VagA s1, respectively. Patients with H. pylori infection, allelic fre-
frequency of IL-RN gene is 48 (70.6%) with IL-RN allele 1, 9 (13.2%) with IL-RN allele 2, and 11 (16.2%) with IL-RN allele 1/2. IL-RN allele 2 were identified 13% of all cases.

**Table 1.** Detection rate of *H. pylori* were 58.8% by urease test, 73.5% by histology and 64.7% by molecular biology among the patients with dyspepsia.

**Fig. 2.** Detection rate of *H. pylori* UreC genes were 64.7% by molecular biology among the patients with dyspepsia.

**Conclusions:** CagA gene can be the significant risk factor for gastric mucosal atrophy, intestinal metaplasia and dysplasia. VacA s1 gene can be the risk factor for intestinal metaplasia and dysplasia. The distribution of allele was identified and those people were more predisposed with gastric mucosal changes including atrophy, dysplasia and intestinal metaplasia.

**Keywords:** *Helicobacter pylori*; Urease test; *Helicobacter pylori* virulent genes

**PUG-38**

**Relationship between *Helicobacter pylori* Infection and Clinical Features of Gastric Cancer**

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**Background / aims:** There is substantial evidence that *Helicobacter pylori* (*H. pylori*) infection plays a role in the etiology of gastric cancer. The aims of this study are to evaluate the relationship between *H. pylori* infection and clinical features of gastric cancer.

**Methods:** A cross sectional study that carried out in Endoscopic Center, Dr.Soetomo Hospital. We collected the data from medical record of gastric cancer patients underwent endoscopy procedure (May 1, 2011 to June 30, 2015). We confirmed the diagnosis of gastric cancer from histopathology results of endoscopic biopsy sample. The clinical features of gastric cancer patients among positive *H. pylori* and negative *H. pylori* were analyzed with bivariate analysis (cramer and phi coefficient association).

**Results:** Thirty-five patients with gastric cancer enrolled in this study (21 patients were positive *H. pylori* and 14 patients were negative *H. pylori*). Among positive *H. pylori* patients, mostly are male (71.4 %), predominantly with age > 50 years old (61.1 %), mostly the location of the tumor are on corpus (52.4 %), the predominant symptoms are melena (23.8 %) and vomiting (28.6 %), the predominant UICC stage are II A (28.6 %), and the histopathologic features mostly are well differentiated adenocarcinoma (61.9 %). Among negative *H. pylori* patients, mostly are male (57.1 %), the count of age > 50 years old and < 50 years old are same (41.2 %), mostly the location of the tumor are on corpus (64.3 %), the predominant symptoms are melena (28.6 %), the predominant UICC stage are II A and II B (28.6 % and 28.6 %), and the histopathologic features mostly are well differentiated adenocarcinoma (42.9 %). There are no significant association between *H. pylori* infection and clinical features of gastric cancer (sex, age, tumor location, the symptoms, UICC stage, and histopathologic features (*p*<0.05).

**Conclusions:** The clinical features of gastric cancer patients with positive *H. pylori* status have no significant difference from the patients with negative *H. pylori* status.

**Keywords:** *H. pylori*; Clinical features; Gastric cancer

**PUG-39**

**Association of *Helicobacter pylori* Eradication with Obesity**

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**Background / aims:** *Helicobacter pylori* plays an important role in gastric ulcer and lymphoma. Eradication of such causative agent thus is crucial when dealing with upper gastric diseases. Numbers of studies are actively in
progress with subjects such as standardized first line therapy with decreased amount of dosage, dosage-related therapy effectiveness. To determine clinical dosage effectiveness in *H. pylori* therapy, we authors here tried to find correlation between eradication result and difference in body mass index.

**Methods:** Total of 166 patients were analyzed who were diagnosed with *Helicobacter pylori* infection between 2011 and 2014. Standard triple therapy were used in all cases. Eradication result after each therapy was checked with parameters that could affect the outcome such as age, sex, weight, height, body surface area, BMI, underlying disease and eradication indication. Correlation between BMI and eradication effectiveness were measured based on category of low weight (below 18.5), overweight (over 23), obesity (over 25), and morbid obesity (over 30).

**Results:** Among 166 patients, 117 people showed successful eradication outcome and 49 did not. 108 were men and 58 were women. Average BMI between successful and failed group were 23.5 and 24.7 (P value=0.028), showing higher index in failed group. Obese subjects with BMI over 25 were 50 (30.1%). Those who were not were 116 (69.9%). Eradication success rate were 56% in obese group and 76.7% in non-obese group.

**Conclusions:** Between successful and failed group, BMI did not differ prominently. However, the index was statistically higher in failed group. This result shows that obese patients have significantly lower success rate for *H. pylori* eradication, thus dosage modification in obese person should be considered henceforth.

**Keywords:** *Helicobacter pylori*; Eradication; Obesity

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**PUG-40**

**Analysis of Endoscopic and Histopathologic Features of Gastric Polyps**

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**Background / aims:** The prevalence of gastric polyps in esophagogastroduodenoscopies range between 0.33 and 6.35%. The relative frequency of histological subspecies varies widely among published series. The objective of this study is to determine the prevalence and describe the endoscopic and histopathologic characteristics of polyps.

**Methods:** This is a retrospective cross-sectional study including adult patients who underwent esophagogastroendoscopy in UST Hospital from 2012-2015. Diagnosis of polyps were made by direct visualization and analysis done by demographics, endoscopic and histologic characteristics.

**Results:** Among 4294 patients, 165 (3.8%) had gastric polyps. 57.7% did not undergo any therapeutic intervention. Majority of these polyps were size less than 5 mm (96.9%), location in the body (59.8%) and sessile appearance (96.9%). Among those with intervention, majority were fundic gland polyps (82.3%). 4% were inflammatory while 5.9% were hyperplastic. 4.4% were tubular adenomas. For fundic polyps, majority were less than 5mm (89.3%), found in the body (75%) and sessile (96.4%). For inflammatory polyps, majority were less than 5mm (60%) and sessile (80%). For hyperplastic polyps, all appeared sessile. For tubular adenomas, they were solitary, sessile, found in the body and mostly greater than 20mm. The size of the polyp was statistically correlated (R= 0.7) to its potential for malignant transformation.

**Conclusions:** Although histologic types may have common characteristics, the endoscopic manifestation of polyps can be variable. Distinguishing benign from malignant lesions can be challenging. Because of the risk of malignant transformation, polypectomy is recommended for all polyps especially larger lesions and these should be sent for histopathological analysis.

**Keywords:** Retrospective, Gastric Polyps, Fundic Gland Polyps, Hyperplastic Polyps, Gatsric Adenoma

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**PUG-41**

**Clinicopathological Features of Early Lymphoepithelioma-like Gastric Carcinoma**

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**Background / aims:** The prevalence of gastric polyps in esophagogastroduodenoscopies range between 0.33 and 6.35%. The relative frequency of histological subspecies varies widely among published series. The objective of this study is to determine the prevalence and describe the endoscopic and histopathologic characteristics of polyps.

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**Conclusions:** Although histologic types may have common characteristics, the endoscopic manifestation of polyps can be variable. Distinguishing benign from malignant lesions can be challenging. Because of the risk of malignant transformation, polypectomy is recommended for all polyps especially larger lesions and these should be sent for histopathological analysis.

**Keywords:** Retrospective, Gastric Polyps, Fundic Gland Polyps, Hyperplastic Polyps, Gatsric Adenoma
Background / aims: Lymphoepithelioma-like gastric carcinoma (LELC) is a rare disease highly associated with Epstein-Barr virus (EBV) infection. Because it is known to have a favorable prognosis compared to other carcinoma, we aimed to evaluate the clinicopathological features of early LELC and define the role of endoscopic submucosal dissection (ESD) for this type of gastric cancer.

Methods: We performed a retrospective analysis of 65 patients diagnosed with early LELC from January 2008 to April 2015 at Pusan National University Hospital in Busan, South Korea. The clinicopathological characteristics and clinical outcomes were assessed via a review of medical records.

Results: The patients mean age was 58 years (range 36-77) with a male predominance (3.6:1) and 53 (81.5%) showed EBV positivity. Tumors were located more proximally (upper or middle thirds: 53, 81.5%) and macroscopically depressed types (58.5%) were more frequent. As a primary treatment, 49 patients underwent surgical resection and ESD was done for 16 patients. After ESD, 6 had additional surgery, 9 were followed up and 1 was lost for follow-up. Of the 55 patients who underwent surgical treatment, submucosal invasion was seen in 46 patients (SM1: 2, SM2: 9, SM3: 35), but only one (1.8%) showed lymph node metastasis. Of the 9 patients who were followed up after ESD, submucosal invasion was seen in 3 (SM1: 2, SM3: 1), but they had no recurrence with a mean follow-up period of 24.4 months. Although, overall mortality rate was 3.1% within a mean follow-up duration of 33.4 months, cancer-related death was not seen. Carcinoma was recurred in one patient (1.5%).

Conclusions: In this study, we recognized a very low rate of LN metastasis of early LELC despite a deep submucosal invasion. Therefore we consider ESD as a curative treatment strategy for early LELC even with deep submucosal invasion, especially in patients with poor performance status and severe comorbidities.

Keywords: Early gastric cancer; Lymphoepithelioma-like gastric carcinoma

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PUG-42

Lymph Node Metastasis Risk for Histologic Type with Poorly Cohesive Components in EGC Confined to Mucosa

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Background / aims: Although early gastric cancer (EGC) confined to mucosal layer, the risk of lymph node (LN) metastasis may be different according to characteristics of tumor including histologic type. However, there is little information about the LN metastasis risk for histologic type with poorly cohesive components such as poorly cohesive carcinoma (PCC) and mixed adenocarcinoma (MAC).

Methods: Of 692 EGC patients who had undergone gastrectomy with LN dissection, 147 (21.2%) EGCs were confirmed as mucosal cancer with poorly cohesive components.

Results: 147 EGCs were classified as PCC group (n=127, 86.4%) and MAC (n=20, 13.6%) based on WHO classification. PCC group had LN metastasis in 8 (6.3%) of patients. LN metastasis was detected in 2 PCCs > 20 mm in size and without ulceration, 2 PCCs ≤ 20 mm in size and with ulceration, and 4 PCCs > 20 mm in size and with ulceration. In addition, lymphovascular (LV) invasion was found in 2 PCCs > 20 mm in size and with ulceration. However, there was no LN metastasis or LV invasion in lesions ≤ 20 mm in size and without ulceration. No LN metastasis or LV invasion was detected regardless of ulceration and tumor in MAC group.

Conclusions: The risk of LN metastasis is little for histologic type with poorly cohesive components in EGC with mucosal invasion, less than 20 mm in size, and no ulceration. Considering tumor size, depth invasion, and the presence of ulceration in EGC, ESD can be treatment modality even in PCC or MAC.

Keywords: Poorly cohesive carcinoma; Mixed adenocarcinoma; Early gastric cancer; Lymph node; Metastasis
**PUG-43**

**The Effectiveness of Carcinomatosis and Ascites Status of Treatment in the Patients of AGC with Bowel Obstruction**

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**Background / aims:** Advanced gastric cancer (AGC) patients with colorectal obstruction usually underwent palliative therapy by using self-expandable metal stent (SEMS) placement or surgery. However, the clinical efficacy and impact of carcinomatosis and ascites status have not been evaluated in patients with colorectal obstruction by AGC according to treatment modalities.

**Methods:** We retrospectively evaluated 232 patients with colorectal obstruction in AGC that were diagnosed between 2006 and 2014. The study population was analyzed by the patency and overall survival between SEMS placement versus surgery according to carcinomatosis and ascites status.

**Results:** The median age of the study population (126 men, 106 women) was 55 years (SD 12.8). During the follow-up period (mean 24 months, SD 32), 185 (79.7%) patients deployed SEMS and 47 (20.3%) patients received palliative colorectal surgery. The clinical success (57.3% vs 78.7%, \( p = 0.007 \)) and technical success rate (74.1% vs 93.6%, \( p = 0.004 \)) were higher in the palliative surgery group than the SEMS placement group. On multivariate analysis, over three lesions of obstruction (HR, 0.237; 95% CI, 0.065-0.860; \( p = 0.029 \)) and SEMS placement (HR, 0.340; 95% CI, 0.127-0.911; \( p = 0.032 \)) were independent factor of clinical success. The patency of palliative surgery group was longer than the SEMS placement group (\( p = 0.003 \) by log-rank test). In patients who had neither carcinomatosis nor ascites, patency duration was longer in the surgery group than in the SEMS placement group (\( p = 0.041 \) by log-rank test). In a subgroup of patients who had carcinomatosis without ascites, patency duration was not significantly different between surgery groups and the SEMS placement groups (\( p = 0.371 \) by log-rank test).

**Conclusions:** The efficacy of palliative treatment modal-

**Keywords:** Advanced gastric cancer; Colorectal obstruction; Stent placement; Palliative surgery; Ascites

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**PUG-44**

**Risk Factor of Synchronous Multiple Early Gastric Cancer**

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**Background / aims:** Missing cancer in the remaining stomach after organ preserving treatment of early gastric cancer (EGC) is a major problem. However, previous reports were focused patients who received the same treatment modality which may limit application to the general population. This study was designed to elucidate predictive risk factors of synchronous multiple EGC (SMEGC) regardless of treatment modalities.

**Methods:** Patients who underwent EGC treatment between July 2005 and June 2015 were retrospectively reviewed. 1529 patients who were treated for EGC were included. Further analysis was performed in order to verify the difference between the endoscopic and surgical treatment groups.

**Results:** Among the 1529 patients, 68(4.4%) patients diagnosed with SMEGC. Gender \( (p = 0.004) \), gross appearance \( (p = 0.038) \), depth of invasion \( (p = 0.007) \) and lymphovascular invasion (LVI) \( (p = 0.039) \) are statistical significance between solitary EGC and SMEGC by univariate analysis. In multivariate analysis, male (odds ratio [OR] 2.475, \( p = 0.011 \)) and submucosal invasion (OR 1.850, \( p = 0.033 \)) were independent predictive risk factors of SMEGC. In addition, many factors were statistical significantly differences between patients group depending on the mode of treatment in multivariate analysis, such as age, size of cancer, longitudinal location, depth of invasion, histology, LVI.

**Conclusions:** Male and submucosal invasion were pre-
dictive risk factors of SMEGC. Therefore, patients with these factors should undergo more meticulous endoscopic surveillance.

**Keywords:** Risk factors; Stomach; Endoscopy; Gastrectomy; Neoplasms

### PUG-45

**Clinical Outcome of Doublet and Triplet Neoadjuvant Chemotherapy for Locally Advanced Gastric Cancer**

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**Background / aims:** In gastric cancer, the rate of recurrence and metastasis following radical resection remains disappointingly high. Thus, improving the rates of survival and cure is a critical goal. Theoretically the administration of the neoadjuvant chemotherapy (NAC) appears to have potential benefits for locally advanced gastric cancer. While its survival gain and surgical benefit remains controversial. The aim of this study was to evaluate the effectiveness of NAC in treatment of locally advanced gastric cancer and compare clinical outcome of doublet and triplet regimen.

**Methods:** We retrospective reviewed the patient medical record. This study enrolled 383 patients who underwent NAC (n=41) or surgery only (n=342) for treatment of locally advanced gastric cancer. We were also classification according to chemotherapy regimen as follows; doublet (n=28) and triplet (n=13). The basal characteristics and clinical outcome were compared between NAC and surgery only groups. NAC related clinical response, safety, and toxicity were also analyzed.

**Results:** The basal characteristics including mean age, gender, WHO performance status, and tumor location were not significant difference between two groups. After NAC, the tumor down-stage rate was 51.2% (21/41). But overall survival (p=0.205), and disease-free survival (p=0.415) were not statistically difference between NAC and surgery only groups. In subgroup analysis we compared clinical outcome between doublet and triplet regi-

men group. As a result, drug toxicity (p=0.604) and clinical response (p=0.374) were not significant difference between two groups.

**Conclusions:** In patients with locally advanced gastric cancer, NAC showed tolerable drug toxicity and tumor down-stage. But, NAC fail to increase the survival, may be because of high D2-lymphadenectomy rate. Therefore NAC was considerable therapeutic option for selective patients.

**Keywords:** Neoadjuvant chemotherapy; Stomach; Adenocarcinoma
duplication cyst should be considered as a differential diagnosis of cystic lesions in the stomach. A high index of suspicion is warranted, and histopathologic confirmation is still necessary since malignant transformation has been reported.

**Keywords:** Gastric duplication cyst; Carcinoma

**PUG-47**

**A Rare Case of Langerhans Cell Histiocytosis of the Stomach**

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Contents: Langerhans cell histiocytosis (LCH) is characterized by monoclonal cellular proliferation and infiltration of bone marrow derived Langerhans cells. It is a rare disease of unknown etiology and noted in male patients with systemic disease. Isolated involvement of the stomach is very rare condition in LCH. Here we present a case of localized LCH to the stomach in a 32-year-old woman who successfully treated by endoscopic submucosal dissection (ESD).

**Keywords:** Langerhans cell histiocytosis; SS-LCH

**PUG-48**

**Autoamputation of Gastric Polyp**

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Contents: Auto-amputation of gastric polyps have been rarely reported. We report the case of auto-amputation of gastric polyp in Korea for the first time. A woman with 73-years-old visited our clinic for dyspepsia and abdominal pain at first. Four years ago she diagnosed gastric ulcer which was caused by nonsteroidal anti-inflammatory drug. She had been treated with metformin for diabetes for 15 years. Endoscopy revealed 1.8 cm sized pedunculated polyp (Yamada classification IV) at lesser curvature of prepyloric antrum. Pathologic finding of endoscopic biopsy showed hyperplastic polyp. We recommend the endoscopic polypectomy. However, polypectomy could not be performed due to patients’ refusal. After 9 months from the first visit, she came to hospital to receive gastric polypectomy. She experienced melena several times at 4 months ago. Laboratory examination showed anemia (hemoglobin 8.8 g/dl) and uncontrolled diabetes mellitus (fast blood sugar 276 mg/dl). Endoscopic examination showed that the pedunculated polyp previously located on prepyloric antrum disappeared and small active ulcer was formed at the same site with pedunculated polyp. We speculated that the pedunculated polyp previous located in prepyloric antrum was amputated due to ulcerogenic agents and peristalsis. Two months later, follow-up endoscopy showed scar change at the site of auto-amputation of polyp. We present a case of gastric polyp autoamputation which was diagnosed with pedunculated hyperplastic polyp and disappeared spontaneously after 9 months later.

**Keywords:** Autoamputation; Polypectomy; Gastric Polyp; Endoscopy

**PUG-49**

**Gastrointestinal Stromal Tumor Presenting As Gastroduodenal Intussusception: A Case Report**

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Contents: Gastroduodenal intussusception is one of the rare causes of intestinal obstruction, that occurs when a gastric mass prolapses into the duodenum. Gastrointestinal stromal tumor is a mesenchymal tumor commonly found in the stomach. When mobile, these tumors may present as gastroduodenal intussusception. We report the case of a 50 year old female, who presented with intermittent episodes of abdominal pain, vomiting and melena. Physical examination was normal. The patient underwent endoscopy and whole abdominal CT scan. Results supported the diagnosis of gastroduodenal intussusception. She was referred to surgery for intermittent symptoms of gastric outlet obstruction. Intraoperative endoscopy revealed a 4x5 cm wide based pedunculated, submucosal mass with
ulceration. An endoscopy-guided, laparoscopic wide excision of the mass was performed. Histopathology results showed spindle cell tumor. Gastroduodenal intussusception secondary to a gastric mass is a rare cause of intestinal obstruction; however, it should be considered when dealing with patients with non-specific upper gastrointestinal symptoms. A multidisciplinary approach in the diagnosis and management of such a case is important in centers where endoscopic submucosal dissection is unavailable.

**Fig. 1.** (A) and (B), EGD showing abnormal rugal folds passing through the pylorus. (C) and (D), CT scan showing gastroduodenal intussusception.

**Fig. 2.** (A) Intraoperative EGD showing pedunculated submucosal mass with ulceration at the greater curve of the distal body. (B) and (C) Resected mass en bloc and cut section, respectively.

**Keywords:** Esophagogastroduodenoscopy; Gastrointestinal stromal tumor; GIST; Intussusception, Gut obstruction, Spindle cell tumor

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**PUG-50**

A Case of Acute Gastric Injury-caused by Undissolved Sodium Picosulfate/Magnesium Citrate Powder

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**Contents:** Sodium picosulfate/magnesium citrate (SPMC) is a widely used oral bowel cleansing agent and considered to be relatively safe. However, partially dissolved or undissolved SPMC powder may cause very rare complications of the gastrointestinal tract such as severe injury of the esophagus and stomach. We report a very rare case of acute gastric injury without esophageal damage caused by ingestion of undissolved SPMC powder. A 69-year-old man experienced epigastric pain after swallowing SPMC powder without dissolving it in water to prepare for a screening colonoscopy. He realized his mistake immediately and subsequently drank 2 L of water. Esophagogastroduodenoscopy after 12 hours indicated an acute gastric injury including ulceration of the gastric body without injuring the esophagus or duodenum. After 6-weeks of oral proton pump inhibitor treatment, endoscopy showed healing of the gastric injury. This finding suggested that drinking large amounts of water after ingesting partially dissolved or undissolved SPMC powder prevents serious esophageal injury, however, there is no preventive benefit for acute gastric injury.

**Keywords:** Picosulfate sodium; Magnesium citrate; Cathartics; Adverse effects; Stomach ulcer

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**PUG-51**

ERCP Related Duodenal Perforation Repaired Withdouble Endoscopic Band Ligation and Hemoclipping: A Case Report

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**Contents:** Endoscopic methods are introduced for the closure of duodenal wall perforation during ERCP. However, those methods have limitation if the perfo-
ration size is larger than 1.0-cm. We report a case of a 2.0-cm duodenal wall perforation repaired successfully using double endoscopic band ligation (EBL) and a hemoclip. Lateral duodenal wall perforation occurred in a 93-year-old woman with acute calculous cholangitis during ERCP. We switched to a forward endoscope with transparent band. A 2.0-cm oval-type perforation at the superior duodenal angle was found. We repaired the perforation with double EBL and endoclipping, sequentially. First EBL at the proximal edge of the perforated orifice was done, and 2/3 of the perforated hole was partly repaired. Second EBL was performed including the first EBL content. An endoclip was applied at the distal end of the perforation, considering the possibility of residual microperforation. Detection and repair of the perforation were done within 10 min. Follow-up plain abdomen radiography revealed air shadow near the right kidney and retroperitoneal space without free air. During 1 week of hospital stay, her symptoms improved with only conservative management. We suggest that double EBL is an effective and convenient method for closure of medium sized duodenal wall perforation.

**Keywords:** ERCP; Duodenal perforation; Endoscopic band ligation

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**PUG-52**

**Portal Hypertensive Bile Reflux Gastroesophagopathy in Children with Portal Cavernoma**

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**Background / aims:** To define the role of portal biliopathy in the development of bleeding from esophagogastric varices

**Methods:** The study included 95 children with extrahepatic portal hypertension in age from 1 year to 18 years. All the patients underwent routine clinical and biochemical studies, upper gastrointestinal (UGI) endoscopy, abdominal Doppler ultrasound (US), multislice computed tomography (MSCT), magnetic resonance imaging (MRI) angiography of the visceral vessels

**Results:** On UGI endoscopy all children had mild to severe varices of esophagus. 14 (15%) children during endoscopy also had muddy bile in the lumen of the esophagus and stomach, with erosive esophagitis in distal part and gastritis of varying severity. Regarding endoscopic findings patients were divided into two groups: first group without bile reflux esophagitis 81 (85%) and second - 14 (15%) patients with bile reflux esophagitis and gastritis. Variceal hemorrhage occurred most commonly from the distal esophagus in second group. Second group also had moderate increased levels of alkaline phosphatase - 262,33 U/l ($p \leq 0.01$), while gamma-glutamyl transferase levels were in normal ranges. On US Doppler and MSCT all patients except signs of prehepatic portal hypertension revealed signs of portal hypertensive biliopathy, such as thickening of gallbladder wall, dilatation of common bile duct, varices in gallbladder wall. These symptoms was more pronounced in second group and most common in children above 7 years

**Conclusions:** Presence of muddy bile in the lumen of the stomach and sometimes in the esophagus is one of the signs of portal hypertensive biliopathy due to portal cavernoma. Bile reflux gastritis and esophagitis exacerbating the disease process in the mucosa, which leads to the development of erosion, thereby, increasing the risk of gastroesophageal hemorrhage

**Keywords:** Portal hypertensive biliopathy; Portal hypertension; Bile reflux gastropathy
A Study on Bowel Preparation Quality in Patients with a History of Colorectal Resection

Byung Kwang Choi, Dong Ho Lee, In Kyung Yoo

Background / aims: Bowel preparation for surveillance endoscopy following surgery can be impaired by suboptimal bowel function. We hypothesized that the bowel preparation quality of patients with colorectal surgery might be not inferior. Our study compares two groups of patients in order to evaluate the influence of colorectal resection on bowel preparation.

Methods: From January 2013 to June 2015, 200 patients were enrolled in our retrospective study and divided into two groups: resection group (RG) and control group. Surgical methods were classified as right hemicolectomy, left hemicolectomy including rectosigmoidectomy. Bowel cleansing was evaluated by one skilled endoscopist using the Aronchick scale and modified Boston scale. The patients received either a low-volume preparation (2L Polyethylene glycol with Ascorbic acid) versus a standard high-volume preparation (4L Polyethylene glycol) for bowel cleansing.

Results: Among the patients of the RG, surgery was as follows: left hemicolectomies (10%), right hemicolectomies (34%), rectosigmoidectomy (56%). No significant difference was observed between the resected population and control in achievement of adequate cleansing. (6-9 Modified Boston scale score: 88% vs 88%, 1-2 Aronchick scale: 76% vs 74%). According to the logistic regression analysis of the RG group, the predictors of unsuccessful cleansing were previous left hemicolectomy (OR 0.27, \(p=0.028\)). However, a longer elapsed time since the intervention and a low-volume preparation were not associated with unsuccessful preparation.

Conclusions: Our study highlights that previous colonic resection is not a risk factor for a worse bowel preparation.

Keywords: Bowel preparation; Colonoscopy; Colorectal resection

The Effect of 1L Polyethylene Glycerol Plus Ascorbic Acid with Prepackaged Low-residue Diet for Bowel Preparation

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Background / aims: 2L polyethylene glycol plus ascorbic acid (PEGA) is known to be as effective as standard 4L polyethylene glycol for bowel preparation. However, the volume of this regimen is still large to ingest. Therefore, we evaluated the potential of 1L PEGA with prepackaged low-residue diet (PLD) for an alternative to 2L PEGA. We report the interim results of this ongoing study.

Methods: The subjects were randomly assigned either to both group (n = 100 for each group). PEGA group received 2L PEGA (a split regimen for morning colonoscopy and a same-day regimen for afternoon colonoscopy). PLD group received PLD on the day preceding colonoscopy and 1L PEGA on the morning of colonoscopy. Comprehensive questionnaires about acceptability were gathered. One blinded endoscopist performed colonoscopy and evaluated the degree of bowel preparation using Boston bowel preparation score (BBPS).

Results: A total of 128 patients completed this study (68 in PEGA group, 60 in PLD group). There was no significant difference in the baseline characteristics such as sex, age, previous abdominal surgery, body mass index, and indication for colonoscopy between the two groups. The palatability of PLD was acceptable (bad taste 6.8%). The proportion of subjects who are willing to undergo colonoscopy with the same bowel preparation regimen used in the present study was higher in PLD group than in PEGA group (96.6% vs. 29.9%, \(p<0.001\)). Although total BBPS was significantly higher in PLD group than in PEGA group (median 9 vs. 8, \(p=0.005\)), the proportion of adequate bowel preparation (BBPS > 4) was not different between PEGA and PLD groups (98.5% vs. 96.6%, \(p=0.599\)). There were no difference in the cecal intubation rate (98.5% vs. 98.3%, \(p=1.0\)), cecal intubation time (median 240 seconds vs. 280 seconds,
p=0.230), and adenoma detection rate (40.3% vs. 42.4%, p=0.857) between PEGA and PLD groups.

Conclusions: 1L PEGA with PLD showed similar efficacy for bowel preparation to 2L PEGA and higher acceptability than 2L PEGA.

Keywords: Colonoscopy; Bowel preparation; Prepackaged low-residue diet

PLG-03

A Comparison of Bowel Preparation between 3L Ascorbic Acid Mixed PEG and 2L Ascorbic Acid Mixed PEG with Bisacodyl

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Background / aims: Background and Aims: Recently a low-volume polyethylene glycol containing ascorbic acid (PEG-Asc) formulation has proven as safe and effective as traditional 4-L PEG solutions for colonoscopy preparation. However, currently available aqueous purgative formulations are poorly tolerated. The aim of this study was to compare a split-dose 2-L PEG-Asc and a 1-L PEG-Asc with bisacodyl (10 mg) formulation for quality of bowel cleansing while preparing for colonoscopy and patient compliance.

Methods: A single center, randomized, observer-blinded study was performed between May 2015 and September 2015. Two hundred outpatients were prospectively enrolled. Patients referred for colonoscopy were divided into two groups: the split-dose 2-L PEG-Asc and 1-L PEG-Asc with bisacodyl 10 mg groups. The Boston Bowel Preparation Scale (BBPS) and Aronchick Preparation Scale (APS) were used to evaluate bowel cleansing with the two preparations. The tolerability and satisfaction of patients was determined based on a questionnaire-based survey.

Results: One hundred patients received either 2-L PEG-Asc or 1-L PEG-Asc with bisacodyl. Regarding colon cleansing outcome (BBPS and APS), the 1-L PEG-Asc with bisacodyl group showed similar, but non-inferior results compared to the 2-L PEG-Asc group on both BBPS (6.92 ± 1.63 vs. 6.57 ± 1.37, p=0.103) and APS (96% vs. 95%, p=1.000) scales. Tolerability was similar for both 1-L PEG-Asc with bisacodyl and 2-L PEG-Asc.

Conclusions: Our study shows the 1-L PEG-Asc plus bisacodyl preparation has comparable tolerability and results in adequate colon cleansing. Bowel preparation with bisacodyl and 1-L PEG-Asc is a suitable alternative to low volume bowel preparation for colonoscopy.

Keywords: Ascorbic acid; Bisacodyl; Bowel preparation; Polyethylene glycol

PLG-04

The Efficacy of Carbon Dioxide Insufflation during Consecutive Upper and Lower Gastrointestinal Endoscopy

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Background / aims: Endoscopy is performed with using air insufflations, and is associated with abdominal discomfort. It is well recognized that carbon dioxide (CO2) is absorbed quickly in the body than air. This prospective study was designed to assess the efficacy of CO2 insufflation instead of air insufflation during consecutive upper and lower gastrointestinal endoscopy.

Methods: From March 2014 to April 2016, a total of 215 consecutive patients were randomly assigned to CO2 insufflation (CO2 group, n=108) or air insufflation (Air group, n=107). Abdominal pain after consecutive upper and lower gastrointestinal endoscopy was chronologically recorded on visual analogue system (VAS) score. Also, we recorded of both group that change of abdominal circumference, the amounts of sedatives, the use of analgesics, and complication rates.

Results: Baseline patient characteristics (age, gender, body mass index, past history) were not different in both groups. The mean procedure time was no statistically significant difference between both groups. Abdominal
pain on VAS in the CO2 group vs. Air group was 1.5 vs. 2.0 one hour after the procedure \( (p=0.038) \), 0.9 vs. 1.3 three hours after the procedure \( (p=0.136) \), 0.4 vs. 0.5 six hours after the procedure \( (p=0.555) \), and 0.2 vs. 0.3 one day after the procedure \( (p=0.549) \). In the CO2 group, the abdominal pain on VAS only was significantly lower than that of the Air group at one hour after procedure. Amounts of sedative drugs, complication rates, using of analgesics were not statistically different between both groups. But, the mean increase in abdominal circumference was less with CO2 group than Air group \( (0.9 \text{ vs. } 2.3 \text{ cm}, p=0.002) \).

**Conclusions:** The amounts of sedatives, using of analgesics, and complication rates, there were no differences in the two groups. However, CO2 insufflation during consecutive upper and lower gastrointestinal endoscopy is less painful for patients than air insufflation.

**Keywords:** Carbon dioxide; Insufflation; Endoscopy

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**PLG-05**

**Risk of Post-Polypectomy Bleeding in Early Liver Cirrhosis**

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**Background / aims:** Post-polypectomy bleeding is the most common complication of colonic polypectomy, occurring in 0.3 to 6.1 percent of polypectomies in various reports. Bleeding can occur immediately following polypectomy or be delayed from hours to up to a month. The severity of bleeding ranges from arterial pumping to minor oozing. The risk is related to the type and size of the polyp, the location of the polyp, the technique of polypectomy, and the coagulation status of the patient. However, the risk of post-polypectomy bleeding in liver cirrhosis is unknown. So we aimed to investigate the incidence and risk factors of post-polypectomy bleeding \( (PPB) \) after a colonoscopic polypectomy in patients with early liver cirrhosis (LC).

**Methods:** We performed a retrospective study of patients with early LC who underwent colonoscopic polypectomy at a single center between January 2006 and December 2015. In total, 41 patients with early LC were enrolled. We investigated the incidence of immediate post-polypectomy bleeding \( (IPPB) \) and delayed post-polypectomy bleeding \( (DPPB) \) in these patients.

**Results:** Among 41 patients, 36 \( (87.8\%) \) were Child-Turcotte-Pugh class A, 5 \( (12.2\%) \) were class B. The mean prothrombin time was \( 1.26 \pm 0.33 \), and the mean platelet count was \( 124.87 \pm 71.32 \times 10³/L \). A total of 78 polyps in 41 patients were removed. IPPB was observed \( 4 \ (5.12\%) \) of the 78 removed polyps presented with mild oozing and were controlled by hemostatic procedures using endoscopic hemoclips. Both IPPB and non IPPB group, during the observation period there were no DPPB.

**Conclusions:** The risk of bleeding after polypectomy in the case of early cirrhosis of the liver did not increase significantly. However, when the size of the polyps is large, it is necessary to caution about bleeding after polypectomy.

**Keywords:** Colon polypectomy; Bleeding; Liver cirrhosis

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**PLG-06**

**Correlation between the Nature of Postpolypectomy Bloody Stool and the Risk of Postpolypectomy Bleeding**

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**Background / aims:** Postpolypectomy bleeding \( (PPB) \) is a significant adverse event related to colonic polypectomy. However, little is known about the correlation between the nature of bloody stool within 24 hours after polypectomy and the risk of postpolypectomy bleeding.

**Methods:** Between October 2015 and March 2016, a total of 2,514 patients underwent colonoscopic polypectomy or endoscopic submucosal dissection. Among these, 927 patients were admitted to the one-day care unit. Forty two of 927 patients \( (4.5\%) \) reported that their first stool after polypectomy contained blood and the photo of the
bloody stool was taken. The photos were scored between 1 to 4 by three well experienced endoscopists (score 1, least significant; score 4, most significant). Patients were divided into two groups according to post-polypectomy bloody stool score (PBSS): high PBSS group (score 3, 4) and low PBSS group (score 1, 2), and compared the hospital course and clinical outcomes of two groups.

**Results:** Of 42 patients, 6 (14.3%), 22 (52.4%), 9 (21.4%), and 5 (11.9%) patients were scored 1, 2, 3, and 4, respectively. The PBSS scores were positively correlated with clinically significant PPB ($\rho = 0.526$).

Based on the PBSS, 14 patients were categorized into the high PBSS group and 28 were into the low PBSS group. Second-look colonoscopy was performed for 5 (17.9%) of the low PBSS group and 10 (71.4%) of the high PBSS group ($p = 0.001$). Endoscopic hemostasis was required in 3 (10.7%) of the low PBSS patients and 8 (57.1%) of the high PBSS patients ($p < 0.001$). Among all the patients discharged without any treatment ($n = 27$), 2 patients in low PBSS group and 1 patient in high PBSS group developed delayed PPB. One of the 3 patients was large polyp (> 20 mm) with long stalk, and the other 2 patient had multiple polyps more than 5.

**Conclusions:** The nature of bloody stool immediately after polypectomy is associated with the significant bleeding stigmata at the second-look colonoscopy and the risk of clinically significant PPB.

**Keywords:** Polypectomy; Gastrointestinal hemorrhage; Hematochezia; Colonoscopy; Endoscopic hemostasis

**PLG-07**

**Narrow-band Imaging with Near-focus Magnification in Differentiating Small Colorectal Polyps**

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**Background / aims:** Many studies have reported that narrow-band imaging (NBI) is accurate in differentiating between adenoma and hyperplastic polyps. NBI without magnification is also reported a high accuracy rate according to the NBI international colorectal endoscopic (NICE) classification. However, some studies have reported a low accuracy rate in NBI without magnification. The aim of this study was to evaluate whether NBI with magnification improves the accuracy rate in differentiating small colorectal polyps.

**Methods:** 49 consecutive patients who have small polyps (<10 mm) between March and September 2015 were recruited. The optical diagnosis for each polyp was evaluated during colonoscopy in two stages by the same endoscopist, who first used NBI without magnifying endoscopy (NBI-NME) then NBI with near-focus magnifying endoscopy (NBI-ME). Each diagnosis was compared to that in the final histopathology reports.

**Results:** 102 lesions including 77 adenomatous polyps, 24 hyperplastic polyps 1 adenocarcinoma were analyzed in 49 patients. The overall accuracy for differentiating small colorectal polyps were 80.0% for NBI-NME, for 93.1% NBI-ME ($p = 0.006$). The rate of high confidence optical diagnosis when NBI-ME was used was significantly higher than the rate when NBI-NME was used (92.1% vs 68.6%, $p < 0.001$). Intra-observer agreement of NBI-ME and NBI-NME was 0.88 and 0.85. Interobserver agreement of NBI-ME and NBI-NME was 0.64 and 0.55 in trainees ($n = 5$).

**Conclusions:** NBI with near-focus magnification significantly improved the accuracy and the rate of high confidence level in differentiating small colorectal polyps.

**Keywords:** Narrow-band imaging; Magnifying; Colorectal polyp

**PLG-08**

**The Effect of Adjunctive Metoclopramide for Colonoscopy Bowel Preparation Using Polyethylene Glycol and Ascorbic Acid**

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**Background / aims:** Although various adjuncts had been
proposed to improve the quality of bowel cleansing for colonoscopy, the efficacy of prokinetics was still remains unclear. Moreover, inadequate bowel preparation and residual colonic fluid disturb the inspection during colonoscopic examination. In this study, we evaluated the effect of metoclopramide as adjunctive agent for colonoscopy bowel preparation using polyethylene glycol and ascorbic acid.

**Methods:** We performed a prospective, randomized, comparative study for adjunctive metoclopramide in bowel cleansing. A total of 192 patients were enrolled and randomly assigned to the group with metoclopramide (n=96) or not (n=96). An oral dose of 10 mg metoclopramide was administered about 30 minutes before split-dose of 2 litter polyethylene glycol and ascorbic acid (PEG+Asc). The experimental parameters included bowel cleansing quality (Boston bowel preparation scale and Aronchick scale), time to first defecation, time to bowel cleansing completion, and adenoma detection rate. The questionnaires reporting the acceptability and tolerability were also collected from patients.

**Results:** Administration of metoclopramide before taking PEG+Asc showed a significant improvement of bowel cleansing quality. Total Boston bowel preparation scale was higher in the group of metoclopramide than control (7.6±1.6 vs 6.6±1.4, p=0.001). The patients with adequate cleansing were 96% (95% CI 91-99) in metoclopramide group and 93% (95% CI 88-98) in control group. However, the average time for first defecation, completion of bowel preparation, and adenoma detection rate showed no significant difference between the patients with or without adjunctive metoclopramide. Abdominal fullness during bowel preparation was significantly attenuated with adjunctive oral metoclopramide.

**Conclusions:** Adjunctive metoclopramide improves the quality of colonoscopy bowel preparation with split dose PEG+Asc. It is effective to decrease the uncomfortable symptoms such as abdominal fullness.

**Keywords:** Colonoscopy; Bowel preparation; Polyethylene glycol; Ascorbic acid; Metoclopramide

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**PLG-09**

**Effect of Total Body Water after Colonoscopy**

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**Background / aims:** Bowel cleansing is important for effective diagnostic colonoscopy. Also bowel preparation agent should be safe and efficient. The osmotic pressure of polyethylene glycol plus ascorbic acid is approximately twice that of plasma osmolality and may cause dehydration. In this study we evaluated polyethylene glycol plus ascorbic acid safety for bowel preparation.

**Methods:** This was a prospective, uncontrolled, single center, before-and-after intervention study. The primary objective was to evaluate polyethylene glycol plus ascorbic acid induce dehydration and electrolyte imbalance. We checked blood test include electrolyte, BUN and creatinine. Total body water were measured with a body composition analyzer (direct segmental multi frequency bioelectrical impedence analysis method).

**Results:** We analyzed 67 patients who underwent colonoscopy after took glycol plus ascorbic acid. (male was 46, female was 21) There were significant increase in the serum chloride level (99.24±2.95 versus 102.71±2.25 mmol/L, p<0.001), and decrease in the Total body water (35.35±0.72 versus 34.60±0.71 liter, p=0.003) before and after colonoscopy. Repeated measures models supported total body water changes before and after colonoscopy statistically significant difference between sexes. (male was 0.65±0.10 liter and female was 0.94±0.75 liter, p<0.001). But total body water change was not different between ages. (younger than 65 years was 0.97±0.39 and older than 65 years was 0.41±0.19, p=0.210).

**Conclusions:** After bowel preparation and examined colonoscopy, total body water level decreased. Total body water changes were more pronounced in women.

**Keywords:** Colonoscopy; Total body water; Bowel preparation
**PLG-10**

**Analysis of Performance Screening for Colorectal Cancer in Certain Regions of Kazakhstan and in the Russia**

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**Background / aims:** comparative analysis of efficiency of colorectal cancer screening in individual regions of Kazakhstan and Russia

**Methods:** 29332 and 23995 people passed colorectal cancer screening programs in Astana and the Tyumen. In Astana, material collection was carried out with use hemoccult test. Positive hemoccult test result was carried out a screening colonoscopy. In Tyumen, the selection of materials was performed based on colorectal cancer risk factors

**Results:** In Astana 1055 patients had positive hemoccult test, which accounted for 3.6% of the total number of examined patients. Colonoscopy was performed on 600 patients, accounting for 57% of the total number of positive tests. Colorectal cancer was diagnosed by endoscopy in 26 patients (4.3%). In Tyumen colonoscopy was performed on 5997 patients. Cancer detected in 56 patients, accounting for 0.93% of the total number

**Conclusions:** The difference between the detection of colorectal cancer in Astana and Tyumen explained by differences in patient selection and a significant difference in the number of performed colonoscopies.

**Keywords:** Screening; Colorectal cancer; Colonoscopy

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**PLG-11**

**A Study for Recommendation of Screening Colonoscopy Interval; How often Do the Patient Repeat Screening Colonoscopy?**

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**Background / aims:** Colorectal cancer (CRC) is the third most common cancer and the second most frequent cause of cancer death of female and fourth most of male in South Korea. Most CRCs develop through the adenoma?carcinoma sequence, which allows for screening and prevention of CRCs by screening colonoscopic examination and polypectomy. However, there have been limited data on personalized optimal time interval of next surveillance colonoscopic examination. The aim of our study is to recommend personalized interval by analysis of various clinical factors obtained by health care examination.

**Methods:** We enrolled the patients who underwent two times more voluntary, complete screening colonoscopy at health care unit of Korea University Medical Center Anam Hospital from July 1, 2004 to July 31, 2010. The clustering analysis using the partitioning around medoids algorithm and Hierarchial cluster were conducted including the 32 clinical, geographic and laboratory data. For each cluster, we then performed survival analysis that provides the probability of having polyps according to the number of days until next colonoscopy.

**Results:** Totally 8332 patients underwent screening colonoscopy, among them 625 patients performed repeat colonoscopy exam. 625 patients divided four clusters by clustering analysis. Adenoma detection at first screening
colonic polyps was the most potent risk factor of develop
coli of adenoma at next screening. Male gender, triglyceride
(>134 mg/dL), and age (>56 years old) were significant
factor for decision of the personalized interval of next
screening colonoscopy. For example, male patient, who
had adenoma at fist screening, the predicted risk of ad-
menoma is 50% after 25 months.

Conclusions: Our study can provide personalized time
interval of next screening colonoscopy according to pa-
tients’ individual clinical data. Further study are neces-
sary for validation our results.

Keywords: Screening colonoscopy interval

PLG-12

A Risk of Interval Cancer Is Accentuated by
Seasonal Variation in Screening Fecal
Imunochemical Test

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Background / aims: Fecal immunochemical test (FIT) in
population screening has proved to be effective in re-
ducing mortality from colorectal cancer (CRC). The aim
of this study was to evaluate the impact of seasonal varia-
tion on the risk of interval cancer in the FIT-based, na-
tional screening programme.

Methods: A total of 5,006,534 patients 50 years of age
and older who underwent an FIT through the national
CRC screening programme between 2009 and 2010
were identified. We examined positive rates, cancer
detection rate, and interval cancer rate of FITs, as well as
the sensitivity, specificity, and positive predictive value
(PPV) of FITs.

Results: A total of 4,788,104 FIT results were examined.
In quantitative FIT, positive rate of FIT was 25% lower in
summer than in winter (adjusted odds ratio (aOR) 0.75,
95% CI 0.72-0.78). PPV and specificity were more re-
markable in the quantitative tests through all seasons. In
summer, the probability of developing interval cancer
was about 1.3 times higher than in the winter (aOR 1.31,
95% CI 1.12-1.52).

Conclusions: The risk of false negatives of FIT during the
summer is directly linked with a risk of interval cancer.
These results will have important implications for the
FIT-based screening programmes, particularly in coun-
tries with high ambient temperatures.

Keywords: Colon cancer; Fecal immunochemical test;
Screening; Temperature

PLG-13

Fecal Immunochemical Test Detects Sessile
Serrated Adenoma/Polyp with Low Level of
Sensitivity in a Screening Population

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**Background / aims:** The serrated pathway is a distinct pathway of colorectal carcinogenesis that has been implicated in a substantial proportion of interval colorectal cancers (CRC). The fecal immunochemical test (FIT) detects early neoplasms with higher levels of sensitivity than the guaiac test. We investigated the level of sensitivity with which it detects sessile serrated adenomas or polyps (SSA/P).

**Methods:** We performed a prospective study of 6198 average-risk subjects, patients, who received concurrent screening colonoscopies and FITs at the Health Management Center of National Taiwan University Hospital from August 2010 through November 2014. The sensitivity of FIT for conventional adenoma, advanced adenoma, and SSA/P at different cutoffs was calculated and results were compared using multivariate analysis adjusted for potential confounders.

**Results:** Prevalence values of SSA/P, adenoma, and advanced adenoma were 1.4%, 20.2%, and 5.5%, respectively. At cutoffs of 10, 15, and 20 ng Hb/g feces, the FIT detected all SSA/Ps with 12.3%, 6.2%, and 6.2% sensitivity, large SSA/Ps with 18.4%, 10.5%, and 10.5% sensitivity, and advanced adenoma with 32.4%, 24.5% and 20.9%, respectively. Multivariate analysis revealed that positive results from FITs did not differ significantly between individuals with SSA/P and those with non-advanced adenoma or those with negative findings from colonoscopy. Patients with large SSA/Ps were less likely to have positive results from the FIT than patients with advanced adenoma, with odds ratios of 0.44 (95% confidence interval [CI], 0.18-1.05), 0.30 (95% CI, 0.10-0.90), and 0.37 (95% CI, 0.12-1.12) after adjusting for lesion size, even with concurrent conventional adenoma.

**Conclusions:** In a prospective study of 6198 average-risk subjects undergoing FIT and colonoscopy, we found that the FIT detects SSA/Ps with lower levels of sensitivity than conventional adenoma. These findings could affect strategies to determine risk of interval cancer and the effectiveness of screening programs.

**Keywords:** Colorectal cancer screening; Sessile serrated adenoma; Fecal immunochemical test

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**PLG-14**

**EUS for Prediction of Invasion Depth in Large Polypoid Type of Colorectal Tumors**

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**Background / aims:** Magnifying chromoendoscopy (MCE) and narrow band imaging (NBI) for distinguishing deep submucosa (SM) invasion from superficial SM invasion in early colorectal cancer have been utilized. However, the diagnostic accuracy of polypoid lesions was inferior to that of flat and depressed lesions. The aim of this study was to evaluate the diagnostic accuracy when adding endoscopic ultrasonography (EUS) to MCE and NBI for prediction of invasion depth in large polypoid type of colorectal tumors.

**Methods:** From March 2014 to August 2015, 42 large polypoid lesions from 38 patients were evaluated by MCE and NBI and analyzed for a pit pattern and a capillary pattern. And then we predicted invasion depth. Subsequently, we performed mini-probe EUS and predicted invasion depth. Diagnostic accuracy was confirmed by comparing with pathologic findings of the specimens resected either by endoscopic submucosal dissection or surgical operation.

**Results:** There were 20 sessile polyps (Is), 18 subpedunculated polyps (Isp) and 4 pedunculated polyps (Ip). Diagnostic sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV) and accuracy of MCE were 81.0, 71.4, 73.9, 78.9, and 76.1% for deep SM cancer. Diagnostic sensitivity, specificity, PPV, NPV and accuracy of NBI were 61.9, 81.0, 76.4, 68.0, and 71.4% for deep SM cancer. In adding mini-probe EUS, the diagnostic sensitivity, specificity, PPV and NPV were 80.9, 95.2, 94.4, 83.3, and 96.4% for deep SM cancer. The overall accuracy for assessing deep SM invasion was 88.1%. Accuracy of mini-probe EUS is superior to NBI for prediction of deep SM invasion in Sano’s classification IIIa type (63.6% vs 90.9%, \( p = 0.031 \)). Accuracy rate of MCE and mini-probe EUS in VI pit pattern were 63.6 and 81.8% (\( p = 0.125 \)).
Conclusions: In patients with large polypoid type of colorectal tumors, adding mini-probe EUS may helpful for prediction of deep SM invasion.

Keywords: Polypoid lesions; Magnifying endoscopy; Narrow-band imaging; Endoscopic ultrasonosound; Mini-probe

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Local Recurrence and Subsequent Endoscopic Treatment after Endoscopic Piecemeal Mucosal Resection for Colonic Neoplasms

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Background / aims: Endoscopic piecemeal mucosal resection (EPMR) of colorectal neoplasia was associated with local recurrence. We aimed to identify risk factors associated with local recurrence after EPMR and to investigate the outcome of additional endoscopic treatment for recurrent lesions.

Methods: The medical records between January 2005 and December 2014 for colorectal EPMR for ≥10 mm in size in Asan Medical Center were retrospectively analyzed. Conventional endoscopic mucosal resection (C-EMR) and EMR with circumferential precut (precut EMR) were included.

Results: Among 359 EPMR lesions with follow-up endoscopy, C-EMR and precut EMR were 312 (86.9%) and 47 (13.1%), respectively. The local recurrence rate was 5.8% (18/312) in C-EMR and 6.4% (3/47) in precut EMR on first follow-up colonoscopy. In C-EMR, late local recurrence after 1 year without recurrence at first surveillance occurred in 3.9% (6/152), although there was no late recurrence in precut EMR. In univariate analysis, local recurrence was associated with tumor size, tumor morphology with laterally spreading tumor-granular type, number of resected pieces (≥4 pieces), and perforation. Multivariate analysis revealed that tumor size (≥40 mm) was the only independent risk factor for recurrence (OR=7.93, 95% CI 1.95-32.30; p

Conclusions: Tumor size was the only independent risk factor for local recurrence of EPMR. Additional endoscopic treatment for recurrent lesions provided high cure rates even though there were multiple recurrence.

Keywords: Endoscopic mucosal resection; Colonic neoplasm; Piecemeal resection

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Risk Factors for Delayed Bleeding after Endoscopic Mucosal Resection for Colon Polyp: Relevant to Post EMR Ulcer Status

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Background / aims: Delayed bleeding is a major complication of endoscopic mucosal resection for colorectal neoplasm. The aim of this study was to evaluate the risk factor of delayed bleeding relevant to post EMR ulcer status.

Methods: This study included 499 patients in whom 734 colorectal neoplasms were resected using EMR between January 2014 and August 2015. Logistic regression was used to evaluate risk factors for delayed bleeding, including EMR ulcer related-, patient related-, procedure related factors.

Results: Delayed bleeding occurred in 25 (3.4%) of 734 lesions, and all cases of delayed bleeding were successfully controlled by endoscopic procedures. With respect to EMR ulcer related factors, cut exposed vessel (n=11, p=0.029, odds ratio=6.4) was significantly related to delayed bleeding. Among patient related factors, aspirin

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Fig. 1. Cut exposed vessel. Fig 2. Grade of coagulation injury.
usage (n=109, p=0.005, odds ratio=3.4) was significantly related to delayed bleeding. No significant relations were found with respect to procedural factors.

Conclusions: We performed a prophylactic hemostasis of cut exposed vessel lesion, but some lesions showed delayed bleeding. These data emphasize the importance of careful examination of the patient after EMR as well as prophylactic hemostasis by endoscopists in case of cut exposed vessel in post EMR ulcer and aspirin usage.

Keywords: Colon; Endoscopic mucosal resection; Bleeding

PLG-17
Subepithelial Lesions of the Colon: Clinical Data and Result of Treatment in Single Center
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Background / aims: Subepithelial lesions (SEL) of the colon are discovered by accident. Clinically, most of them are not induced symptoms, but there is required for the caution because of malignancy potential. This report investigated the results of colonoscopic follow up in patients with colorectal subepithelial lesions

Methods: From January 2013 to February 2016, colonoscopy was performed in 72 consecutive patients with suspected colorectal SEL at a single medical center. Fifty-three of the 72 patients were performed endoscopic ultrasonography (EUS), and each case is confirmed histologically by biopsy, endoscopic mucosal resection (EMR) or endoscopic submucosal dissection (ESD).

Results: Of 72 cases, 54 lesions were in the rectum and 8, 4, 3, 2, 1 lesions in the ascending colon, transverse colon, sigmoid colon, ecum and descending colon respectively. Carcinoid were 51, most of them were located in the rectum (50/51). Inflammation (13), Lipoma (6), Schwannoma (1) and Lymphangioma (1) were found in order. ESD, EMR and Biopsy were the diagnostic procedure in this study. When the follow up colonoscopy were examined, 53 cases were showed in the state of scar change, 7 cases were without change, 10 cases were disappeared and there were no progression of lesion.

Conclusions: Although subepithelial lesions of colon are detected below 1% of total colonoscopic inspection, it is needed to effort to diagnose precisely using histological or image modality because of potential malignant neoplasm.

Keywords: SEL; Subepithelial lesion; Colonoscopy

PLG-18
Endoscopic Treatment in Rectal Neuroendocrine Tumor- Net Registry Multicenter Study
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Background / aims: Rectal neuroendocrine tumor (NET) incidence is low. So previous studies of Endoscopic treatment in rectal NET have been small sample size studies. The aim of this study was to investigate effectiveness of endoscopic treatment in rectal NET below 2cm.

Methods: From Jan. 2003 to Dec. 2012. 1366 patients diagnosed Rectal NET in 24center was enrolled. Inclusion criteria were endoscopic treatment, under 2cm size, over 18 age. Exclusion criteria included no treatment, treatment, operation, chemotherapy, octreotide therapy, incomplete data. After exclusion, 411 patients were enrolled. We analyzed the clinicopathologic data and factors affecting incomplete resection. We used K-squre, t-test statistically.

Results: In total 411 patients, Age was 49.64±11.33, Male were 238(57.9%), All symptom were 59(14.4%), Carcinoid symptom were 13(3.2%), Family history of NET were 4(1%), Multiple lesion were 15(3.6%), Elevated /Flat/ Depressed lesions were 407 (99)/2 (0.5%)/2 (0.5%),
Lesion size was 0.58 ± 0.32 cm. In histology, Well differentiated neuroendocrine tumor/Well differentiated neuroendocrine carcinoma were 403 (98.1%)/8 (1.9%), Mucosa/Submucosa/Proper muscle invasion were 117 (28.5%)/288 (70.1%)/6 (1.5%), Lymphovascular invasion were 4 (1%), EMR/ESD were 300 (73%)/111 (27%), Complete/Incomplete resection were 344 (83.7%)/67 (16.3%), Additional treatment after incomplete resection were 5 (1.5%), Recurrence were 8 (1.9%). The lymphovascular invasion, ESD, Recurrence were significant factor in Incomplete resection.

Conclusions: We suggest endoscopic treatment was effective in rectal neuroendocrine tumor below 2 cm size. But further study including complication result will be need.

Keywords: Neuroendocrine tumor; Rectal tumor

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**PLG-19**

**Endoscopic Submucosal Dissection for Colorectal Tumors: Long-term Outcomes**

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**Background / aims:** Endoscopic Submucosal Dissection (ESD) is a very useful endoscopic technique, making it possible to perform an en bloc resection of a lesion regardless of its size. We already reported the early outcomes of colorectal ESD in 2013. The aim of this study is to report the long-term outcomes of our colorectal ESD experience.

**Methods:** Between October 2006 and October 2015, we performed ESD on 2,025 consecutive colorectal tumors in 1,951 patients. We analyzed 944 epithelial lesions removed through ESD methods and received follow-up colonoscopies. We evaluated the clinical outcomes and recurrence rate of these cases.

**Results:** The mean resected tumor size was 27.2 ± 12.4 (5-145) mm. Our overall endoscopic en bloc resection rate was 97.4% and the en bloc R0 resection rate was 90.3%, respectively. Our perforation rate was 5.1% (48/944). Pathological examination showed adenocarcinoma in 38.0% of cases (359/944). During the median follow-up period of 32 (12-101) months, there were seven recurrences (0.7%). The local recurrence rate was higher in non-en bloc R0 resection group than in en bloc R0 resection group (3.4% vs. 0.5%, p=0.003). One patient developed an advanced cancer in the ESD site and underwent a radical surgery. Four cases received endoscopic resection and the remaining two cases received transanal excision.

**Conclusions:** Successful en bloc R0 resection through colorectal ESD can reduce tumor recurrence after endoscopic treatment and the resultant precise pathological assessment can reduce invasive surgical treatment.

**Keywords:** Endoscopic submucosal dissection; Colorectal tumors; Long-term outcomes

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**PLG-20**

The Risk of Colorectal Neoplasia According to the Presence and Severity of Non-alcoholic Fatty Liver Disease

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**Background / aims:** We investigated whether non-alcoholic fatty liver disease (NAFLD) is associated with increased risk of colorectal neoplasia (CRN).

**Methods:** A cross-sectional data from a comprehensive health screening program that included 26,540 participants without malignancy, chronic liver disease or heavy drinking, who underwent first-time screening colonoscopy and abdominal ultrasonography at Samsung Medical Center between April 2003 and December 2011 was analyzed. Advanced CRN was defined as cancer or adenoma that was at least 10 mm in diameter, had high-grade dysplasia, or had villous or tubulovillous histologic characteristics, or any combination thereof. The presence of NAFLD was diagnosed with abdominal ultrasonography and exclusion of secondary causes. Severity of hepatic fibrosis in patients with NAFLD was
determined by the NAFLD fibrosis score (NFS).

Results: NAFLD patients had a higher prevalence of all CRN (38.0% vs. 28.9%, \( p < 0.001 \)) and advanced CRN (2.7% vs. 1.9%, \( p < 0.001 \)) than individuals without NAFLD. In multivariable adjusted model, NAFLD patients showed higher risk for all CRN [odds ratio (OR) (95% confidence interval (CI)): 1.10 (1.03-1.17), \( p = 0.002 \)] and advanced CRN [OR (95% CI): 1.21 (1.01-1.18), \( p = 0.049 \)] compared to individuals without NAFLD. In addition, NAFLD patients with intermediate to high NFS (\( \geq -1.455 \)) had a higher prevalence of all CRN (47.2% vs. 34.4%, \( p < 0.001 \)) and advanced CRN (4.6% vs. 1.9%, \( p < 0.001 \)) than patients with low NFS (< -1.455). In multivariable-adjusted models, NAFLD patients with intermediate to high NFS were at higher risk of all CRN [OR (95% CI): 1.11 (1.01-1.24), \( p = 0.047 \)] and advanced CRN [OR (95% CI): 1.5 (1.14-2.10), \( p = 0.005 \)] than patients with low NFS.

Conclusions: NAFLD was associated with the increased risk of CRN independent of traditional risk factors. Also, NFS was able to further stratify risk of CRN among NAFLD patients. These findings indicate that NAFLD and NFS can be useful to evaluate individual risk for CRN.

Keywords: Nonalcoholic fatty liver disease; Colorectal neoplasia

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**PLG-21**

Incidence of Inflammatory Bowel Diseases in Metropolitan Medical Center: A Nine-year Retrospective Study

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Background / aims: The continuing rise in the incidence of Inflammatory Bowel Disease (IBD) in the Asia-Pacific region will have important implications. Incidence data can provide valuable information about the magnitude of the problem, as well as a means to estimate the burden of the disease and anticipate health care needs. This nine-year retrospective study aims to investigate the number of new cases of IBD in our institution.

Methods: This is a descriptive retrospective study determining the incidence of IBD in Metropolitan Medical Center from 2007 until 2015. All screened patients were required to meet the IBD diagnostic criteria on the basis of clinical symptoms, endoscopy and histology. Variables were collected for each incident case. Crude incidence rates were calculated for IBD, Crohn’s disease (CD) and ulcerative colitis (UC) based on the number of patients diagnosed compared with the total population at risk. Incidence rates were reported with 95% confidence intervals (CI), assuming a Poisson distribution. Significance was defined as \( p < 0.05 \).

Results: A total of 41 new IBD cases were identified, including 37 (90.2%) UC and 4 (9.8%) CD. The crude annual overall incidence of IBD was 6.31 (95% CI: 4.53-8.56), with 5.89 (95% CI: 4.01-7.85) for UC and 0.62 (95% CI: 0.17-1.58) for CD.

Conclusions: Incidence of IBD falls within the incidence range noted among Asian countries, UC still being more common than CD and with male preponderance for both types.

Keywords: IBD in asia; Incidence of ibd; Ulcerative colitis; Crohn’s disease

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**PLG-22**

Fecal Calprotectin Level Shows Well Correlation with Endoscopic Disease Activity of UC Patients: comparing MES Vs UCEIS

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Background / aims: The aim of this study is to determine the Fecal calprotectin level according to endoscopic disease activity and to evaluate correlation of MES and UCEIS.

Methods: We prospectively enrolled 55 patients with UC who underwent sigmoidoscopy or colonoscopy and calculated FC level at Eulji hospital from March 2015 to April 2016. Endoscopic disease activity was evaluated by
using the MES and UCEIS. The FC level measured by immunochromatography technique (Quantum Blue®, High range 100-1800 ug/g).

**Results:** In UC, the median levels of FC were 53ug/g in MES 0, 322 ug/g in MES 1, 868ug/g in MES 2, and 2926ug/g in MES 3. The FC level was increasing along with severity of endoscopic inflammation and were well correlated by MES (R=0.525, p<0.001) and UCEIS (R=0.518, p<0.001). The FC level in MES 2 has a wide range from 24 to 3507, which means variable inflammation status. Comparing to MES, UCEIS score from 3 to 6 shows more constantly increasing value in the FC level (R=0.570, p<0.001).

**Fig. 1.**

**Conclusions:** We suggest that FC can be used as a reliable tool to evaluate mucosal disease activity in UC. Our study showed significant correlation between FC level and mucosal inflammation activity. Moreover, the UCEIS score seems to show more discernable disease activity compare to MES, especially in active inflammation state of UC patients.

**Keywords:** Fecal calprotectin; Ulcerative colitis; MES; UCEIS

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**PLG-23**

A Mayo Endoscopic Subscore of 0 Predicts Long-term Remission in Patients with Ulcerative Colitis Treated with Mesalazine

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**Background / aims:** It is not clear whether a Mayo Endoscopic Subscore (Mayo ES) of 0 is associated with improved long-term outcomes compared with a Mayo ES of 1 in patients with ulcerative colitis (UC). Here, we evaluated the validity of a Mayo ES of 0 or 1 in predicting the long-term outcomes of patients with UC who have achieved remission using mesalazine.

**Methods:** We retrospectively analyzed the medical records of patients with UC treated using a pH-dependent release formulation of mesalazine (pH-mesalazine) between January 2010 and December 2012. The inclusion criteria were: 1) colonoscopy (CS) performed between 1 and 2 years after the start of pH-mesalazine; 2) no other therapy was received after the start of pH-mesalazine; 3) in remission, defined as a Lichtiger’s clinical activity index (CAI) score of ≤4, on the day of CS; and 4) a Mayo ES of 0 or 1 on the day of CS. Flare-up of UC was defined as a CAI score of ≥5. We investigated the cumulative remission rates and characteristics of the patients stratified by Mayo ES 0 and 1. Prognostic factors related to the cumulative remission rates were evaluated using log-rank tests and multivariate Cox regression analysis.

**Results:** A total of 74 patients were included in this study. On the day of CS, 23 and 51 patients had Mayo Endoscopic Subscores of 0 and 1, respectively. Compared to patients with a Mayo ES of 1, those with a Mayo ES of 0 were older and less pancolitis. The 1-, 2- and 3-year cumulative remission rates were 92%, 83% and 67%, respectively. The 1- and 3-year cumulative remission rates were 100% and 89%, respectively, for the Mayo ES of 0, 88% and 54%, respectively, for the Mayo ES of 1. The cumulative maintenance rates in the Mayo ES of 0 were significantly higher than those in the Mayo ES of 1. In the multivariate Cox regression analysis, a Mayo ES of 0 was identified as an independent prognostic factor of improved long-term clinical remission.

**Conclusions:** This study found a Mayo ES of 0 is a prognostic factor of higher remission rates for UC.

**Keywords:** Ulcerative colitis; Mucosal healing; Mesalazine; Mayo endoscopic subscore; Prognostic factor
PLG-24

Prevalence, Clinical Manifestation and Risk Factors of Ulcerative Colitis in Malang from 2010-2014

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Background / aims: Ulcerative colitis (UC) occurs worldwide. It is considered common in most of Europe and North America and uncommon in most of the developing Asian countries. The prevalence of UC in RSCM Jakarta in 1991-1995 is 2.5%. The precise etiology is not well understood and might be precipitated by a complex interaction of environmental (cigarettes, fiber diet, NSAID etc), genetic, and immune-regulatory factors. There are no reported data from Malang on the prevalence of this disease. So, we want to identify the prevalence, clinical manifestation and risk factor of UC in our hospital.

Methods: This is a retrospective survey analysis from medical record of 2170 patients who underwent colonoscopy in Saiful Anwar General Hospital Malang during Januari 2010-Desember 2014. Demographic setting (sex, age), clinical features, lifestyle, diagnosis based on colonoscopy were analyzed as the variables. Statistical analysis using $\chi^2$ test (significant if $p<0.05$) and $r$ determined for coefficient correlation.

Results: Total patients with UC were 176 patients. The prevalence of UC during 2010-2015 was 8.2%. Similar prevalence of sex between male and female patients, in which 95(53.4%) were male and 81(46.6%) were female. The average age of patients was 41.6 years. Most clinical manifestation were abdominal pain (32.9%) and weight loss (42.1%). Colonoscopy findings were pancolitis (36%), proctosigmoiditis/proctitis (31.8%), and left-sided colitis (21.9%). The risk factors of UC identified here were current smoker, use of NSAIDs/traditional herbs and frequency of consuming fiber diet. Majority of UC patients were non-smoker (75%; $p=0.642$), not consuming herbal treatment/NSAID (60.2%; $p=0.359$), and rarely consume fiber (36.9%; $p=0.000$). There is a significant association between frequency of consuming fiber diet and UC ($p=0.000$) but weak correlation ($r=-0.106$)

Conclusions: The prevalence of UC was 8.2% with most clinical findings are abdominal pain and weight loss. Less frequency of consuming fiber diet significantly related with UC.

Keywords: Ulcerative colitis; Prevalence; Clinical manifestation; Risk factors

PLG-25

Clinical Usefulness of Bowel Ultrasonography for Patients with Ulcerative Colitis

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Background / aims: Ulcerative colitis (UC) patients are often reluctant to undergo repeated colonoscopic procedures during follow-up. In these patients, bowel ultrasonography (US) can be considered a useful, non-invasive tool to assess disease activity. However, few studies have evaluated this. We therefore aimed to assess the accuracy of bowel US compared with colonoscopy for UC patients.

Methods: We retrospectively analyzed medical records of UC patients who underwent total colonoscopy and bowel US at our hospital between January 2013 and November 2014. The colon was divided into 5 segments: ascending colon (A), transverse colon (T), descending colon (D), sigmoid colon (S), and rectum (R). Endoscopic severity was evaluated with Mayo endoscopic subscore (Mayo ES). Mayo ES 0 or 1 was defined as inactive UC in this study. The bowel US parameters were evaluated using the maximum bowel wall thickness (BWT) of the colon (normal < 4 mm) and the presence of hypoechoic pattern with a complete or partial loss of the normal echostatification. First, we evaluated the visualization rates of each colonic segment using bowel US. Next, the mean value of BWT of each mayo ES was calculated. Finally, we examined the concordance rates between bowel US and colonoscopy.

Results: Sixty patients were included in this study (32 men, 28 women; age range 14-82 years). The visualization rates of each colonic segment using bowel US were 87% (A), 97% (T), 95% (D), 89% (S), and 23%
The mean value of BWT was 3.4 mm (mayo ES 0), 4.1 mm (mayo ES 1), 5.7 mm (mayo ES 2), and 6.7 mm (mayo ES 3). The concordance rates between bowel US and colonoscopy was 75% (A), 76% (T), 68% (D), 75% (S), and 71% (R).

Conclusions: This study showed good visualization rates of colon using bowel US, except for rectum. The concordance rates between bowel US and colonoscopy were about 70%. Bowel US might represent a useful first-line, non-invasive tool for UC patients.

Keywords: Ultrasonography; Ulcerative colitis; Colonoscopy; Bowel wall thickness; Mayo endoscopic subscore

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**PLG-26**

**Fecal Calprotectin Predicts the Relapse in UC Patients with Endoscopic Remission**

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**Background / aims:** Endoscopic remission has been recognized as the treatment goal of ulcerative colitis (UC). However, microscopic inflammation exists even in endoscopically normal mucosa. Fecal calprotectin (FC) reflects low-grade inflammation which cannot be detected on endoscopy. We aim to investigate fecal calprotectin as a biomarker in predicting the relapse in UC patients with endoscopic remission.

**Methods:** We performed a prospective study of patients with UC in endoscopic remission (Mayo endoscopic subscore of 0) from March 2014 to February 2016. Stool sample was collected near the time of the endoscopy and FC measured using a quantitative enzyme-linked immunosorbent assay. Patients were followed until the last outpatient clinic visit or the development of a relapse.

**Results:** Of the 33 patients in endoscopic remission, 7/33 (21%) relapsed after a median follow-up of 8 months (range 2-20 months). FC was significantly higher in patients who relapsed compared with patients who maintained remission (148 mcg/g vs. 70 mcg/g; p=0.039). A receiver operating characteristic analysis estimated a cutoff level of > 135 mcg/g for FC (area under the curve, 0.758 and confidence interval 95%, 0.579-0.937) for predicting relapse during follow-up with 71.4% sensitivity, 76.9% specificity, 85.7% positive predictive value and 76.9% negative predictive value.

**Conclusions:** High FC levels can predict relapse in patients with UC. Therefore, FC measurement should be considered in UC patients, even if they have endoscopic remission.

Keywords: Ulcerative colitis; Endoscopic remission; Fecal calprotectin

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**PLG-27**

**Abscess in Patient with Crohn’s Disease: Clinical Data and Treatment Result in Single Center**

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**Background / aims:** In crohn’s disease (CD), abscess was not a rare complication. It represents a serious condition requiring prompt diagnosis and therapeutic. We described clinical data in 19 patients with CD.

**Methods:** We performed a retrospective study, total 119 crohn patients were admitted at Pusan National University Hospital from January 2010 to February 2016. 19 crohn patients had abscess that was occurred to due to CD. Patients were classified by two groups according to abscess management. Ten patients underwent abscess operation (op group), and nine patients underwent medical or percutaneous drainage (Medical group).

**Results:** In each group, only one patient was proven microbiology by positive of blood or pus culture (Op group: E.coli, medical group: E. fecalis). When we compared hospitalization days, there was no significant different. However, operation group was longer stay in hospital (26.6 days, 14.4 days, p=0.130). We observed approximately 4.5 years. In medical group, 2 patients were recurred abscess (patient 1 : 9 months, patient 2 : 36 months).

**Conclusions:** In our experience, operation case had trend to fistula type, longer disease duration, more fre-
quent male sex, and older than medical treatment case. After treatment, operation case has a longer hospitalization, but there were no recurrence case.

Table 1. Baseline characteristics

<table>
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<th></th>
<th>Total</th>
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Keywords: Crohn; Abscess

PLG-28

Procalcitonin Levels Can Be Used to Discriminate between Inflammatory and Non-inflammatory Diarrhea

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Background / aims: To determine whether procalcitonin levels can be used to differentiate between inflammatory diarrhea and non-inflammatory diarrhea in patients with acute infectious diarrhea.

Methods: This was a retrospective case-control study based on electronic medical records from a single tertiary medical center. The records of 1,176 patients who presented with abdominal pain, fever (≥37.8°C), and diarrhea between March 2011 and May 2015 were reviewed, and 514 patients were selected. The eligible patients had undergone abdominal computed tomography (CT) or colonoscopy within 3 days of admission, and blood sampling on the day of admission. The selected patients were divided into two groups: group A (inflammatory diarrhea) and group B (non-inflammatory diarrhea). We then compared the clinical and laboratory characteristics of these two groups.

Results: White blood cell (WBC), absolute neutrophil count (ANC), blood urea nitrogen (BUN), C-reactive protein (CRP), and procalcitonin levels were significantly higher in group A than in group B (p<0.05, respectively). Multivariate analysis revealed that the procalcitonin level on admission was the most important predictor of inflammatory diarrhea (OR 1.321, p<0.05). The ROC analysis results also showed that procalcitonin had the highest AUC value (0.797; 95% CI 0.760-0.831; p<0.05) for distinguishing inflammatory diarrhea from non-inflammatory diarrhea. At a cut-off level of 0.08 ng/mL, procalcitonin had a sensitivity of 87.03% and a specificity of 68.75%.

Conclusions: Procalcitonin as a diagnostic marker of inflammatory diarrhea was superior to the other inflammatory markers and clinical characteristics that were evaluated in this study.

Keywords: Procalcitonin; Diagnostic marker; Inflammatory diarrhea

PLG-29

The Usefulness of Stool Hemoglobin and Fecal Calprotectin for Detecting Moderate to Severe Ulcerative Colitis

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Background / aims: Ulcerative colitis (UC) is a major type of inflammatory bowel disease that causes inflammation in colon with periods of exacerbation and remission. If the biomarkers reflect the status of mucosal inflammation and symptoms well, they may dispense with the requirement for invasive endoscopic examination. In this study, we analyzed the usefulness of fecal calprotectin (FC), quantitative stool hemoglobin (SHB) and CRP as a marker for reflecting UC disease activity.
Methods: A total of 71 patients with UC who performed FC, SHB, CRP from Mar 2015 to Mar 2016 were analyzed retrospectively. Among them, 30 patients had intervals less than 3 months between endoscopic exam and stool study. Fecal tests were compared with partial Mayo score and Mayo endoscopic score using Receiver operator characteristic (ROC) statistics.

Results: Among 71 patients, 19 patients have moderate to severe activity based on partial Mayo score. The area under the curve (AUC) in ROC analysis of SHB to predict partial Mayo score more than 5 was 0.850 with a cut-off value of 258 ng/ml yielding 89.5% sensitivity and 75% specificity. The AUC of FC was 0.825 at a cut off value of 350 mg/kg with 84.2 % sensitivity and 75% specificity. And the AUC of CRP was 0.629, which were significantly inferior to SHB and FC, but there was no significant difference between SHB and FC (P FIT vs CRP: 0.003, P FC vs CRP: 0.007, P FIT vs FC: 0.638). For detecting Mayo endoscopic score more than 2, the AUC of SHB and FC were 0.951, 0.896, which were superior to that of CRP, 0.543 (p<0.05).

Conclusions: SHB and FC can effectively and non-invasively detect moderate to severe UC. These methods might help evaluate the disease activity of UC.

Keywords: Ulcerative colitis; Stool hemoglobin; Fecal calprotectin; CRP; Mayo score

PLG-31

In Vivo Effects of S-pantoprazole, Polaprenzinc and Probiotics on Chronic Small Bowel Injury Induced by Indomethacin

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Background / aims: Treatment and prevention methods for non-steroidal anti-inflammatory drug-induced enteropathy have not yet been established. We tested the preventive effects of s-pantoprazole, polaprezinc (PZ), and probiotics on an indomethacin (Indo)-induced small bowel injury in a rat model.

Methods: Rats were randomized into to receive normal saline (control), Indo (6 mg/kg), s-pantoprazole plus Indo (PPI), or probiotics plus Indo (at 108 and 109 CFUs/head) for 2 weeks. We measured body weight, food intake, severity of small bowel damage, haemoglobin (Hb) levels in the small intestinal fluid, intestinal inflammatory cytokines, and faecal bacteria.

Results: The experimental groups were found to have the following survival rates: 0% for the Indo, PZ, and PPI.
groups; 50% for both probiotic groups; and 100% for control. Treatment with PZ and PPI did not reduce small intestinal lesion scores and intestinal fluid Hb, while the other measured parameters were markedly decreased in both probiotic groups as compared with the Indo group. The levels of pro-inflammatory markers in intestinal tissues increased in the PZ and PPI groups, similar to that of the Indo group. The anti-inflammatory marker IL-10 increased in both probiotic groups. Analysis of faecal bacteria revealed that Indo induced a significant increase in Gram-negative bacteria and decreases in Bifidobacterium and Lactobacillus. Similar changes were also observed in the PZ and PPI groups. However, opposite effects were found in both probiotic groups.

Conclusions: The use of probiotics appeared to be beneficial in preventing Indo-induced chronic small bowel injury.

Keywords: Non-steroidal anti-inflammatory drugs; Probiotics; Proton pump inhibitors; Mucosa protecting agent

What Is Optimal Time Interval for Small Bowel Preparation before Video Capsule Endoscopy?

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Background / aims: Capsule endoscopy (CE) has been considered as a gold standard for investigation of the small bowel. It has been challenging to determine the optimal preparation of the small bowel for accurate capsule endoscopy examination. Especially, there is a paucity of research for different time interval after small bowel preparation. The objective of this study was to evaluate the suitable preparation-to-CE time interval.

Methods: Total 24 inpatients who underwent CE from August 2014 to June 2015 were retrospectively investigated. Patients receiving bowel preparation by 3-L PEG-Asc were divided 2 groups. The one (Group A) began capsule endoscopy within 3 hour after bowel preparation. Also, we compared cleansing score scale through each 2, 4, 5 hours group. The quality of small bowel preparation was assessed using a previous cleansing score system. Representative frames were serially selected at 5-min intervals and scored by assessment of two properties (proportion of lumenal visibility and extent of obscuration). Completion rate, Small bowel transit time, overall Diagnostic yield, frequency of identified mucosal abnormalities was evaluated between two groups.

Results: Thirteen patients were in group A and 11 patients were in group B. A 3-h interval cleansing (2.35 vs 2.08). The frequency of mucosal abnormalities and diagnostic yield were similar between the two groups in criteria of 2, 3, 4 and 5 hours after preparation. There was significant difference of completion rate, small bowel transit time between two groups according to time interval.

Conclusions: A shorter interval (3hr) between end of bowel preparation and start of capsule endoscopy.

Keywords: Capsule endoscopy; Bowel preparation; Time interval

Clinical Relevance of Stool Multiplex Bacterial PCR in Patients with Acute Diarrhea: Single Center Appearance

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Background / aims: Stool multiplex polymerase chain reaction (PCR) test have gained interests as diagnostic tool due to high sensitivity, short turnaround time and detection of multi-organisms. The aims of this study were to investigate the clinical usefulness of stool PCR test in patients with acute diarrhea.

Methods: 621 patients who were hospitalized due to acute diarrhea performed stool multiplex bacterial PCR from August 1, 2014 to October 30, 2015. History, clinical parameters, and hospital course were investigated through medical record. We analyzed results of pathogens in stool PCR and clinical course of acute diarrhea.
Results: 325 patients were males and 296 were females. Mean age was 26.3 ± 28.3 years. In stool PCR, 220 pathogens were detected (203/220, 92%). Campylobacter spp. is most common pathogen (88/220, 40%). The prevalence of patients with the pathogens detected by stool PCR test was higher than that by stool culture (32.7% vs. 3.4%, *p* < 0.01). In the comparison of clinical findings between positive and negative PCR groups, bloody diarrhea (*p* = 0.01), frequent diarrhea (passage of ≥ 6 unformed stools per 24 hr) (*p* < 0.01), leucorrhea (*p* = 0.03) and severe acute diarrhea (*p* < 0.01) were more frequently found in positive group. Antibiotics was more frequently prescribed in positive group (*p* < 0.01). However, duration of hospital stay showed no significant difference (5.5±2.8 day vs. 5.4±3.6 day, *p* = 0.40). Also, Campylobactor spp. caused severe acute diarrhea (*p* = 0.03). In the comparison of clinical findings between positive and negative Campylobacter spp. by stool multiplex PCR, fever (*p* = 0.01), frequent diarrhea (*p* = 0.01), high CRP (*p* < 0.01) and leucorrhea (*p* < 0.01) were more frequently presented in positive group. Antibiotics was more frequently used in positive group (*p* < 0.01). However, duration of hospital stay showed no significant difference (*p* = 0.15).

Conclusions: Stool multiplex PCR is useful marker for severity of acute diarrhea. Indeed Campylobacter positivity helps to predict clinical course and make decision about antibiotics.

Keywords: Acute diarrhea; Multiplex polymerase chain reaction; Pathogen; Campylobacter

### PLG-34

**Fecal Calprotectin Levels in Patients with Chronic Diarrhea**

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**Background / aims:** Calprotectin is a small calcium-binding protein consisting of two heavy and one light polypeptide chains. Measurement of fecal calprotectin may become a marker for colorectal cancer, although calprotectin, similar to fecal occult blood (FOB) tests, is a non-specific test for colorectal pathology, also being elevated in inflammatory bowel diseases. The aim of this study is to compare fecal calprotectin in patients with Inflammatory Bowel Disease and Colorectal Cancer.

**Methods:** Subjects were patients with chronic diarrhea that underwent colonoscopy and fecal calprotectin examination. We devised the subject into patient with Colorectal Cancer, Inflammatory Bowel Disease, and Normal group based on clinical, laboratory, colonoscopy and histopathological findings. Stool specimen was measured for calprotectin levels. The comparison of fecal calprotectin levels among three groups (Colorectal Cancer, Inflammatory Bowel Disease, and Normal group) were analyzed with Oneway Anova Test.

**Results:** From 22 patients, 8 patients had colorectal cancer, 6 patients had inflammatory bowel disease, and 8 patients were normal. Mean age was 53.86 ± 16.12 year old. There were 11 male and 11 female. The mean of fecal calprotectin for colorectal cancer group, Inflammatory Bowel Disease Group and normal Group were 688.01±881.4 ug/g; 296.65 ± 420.7 ug/g; and 67.63± 60.4 ug/g, *p* = 0.029 respectively. The level of fecal calprotectin showed significant increase in colorectal cancer than normal patient (*p* = 0.026), but there was no significant difference between colorectal cancer and Inflammatory bowel disease patients.

**Conclusions:** The patients with colorectal cancer had higher fecal calprotectin levels than patients with Inflammatory bowel disease but not statistically significant.

**Keywords:** Fecal calprotectin; Colorectal cancer; Inflammatory bowel disease

### PLG-35

**Comparison of CT, Sigmoidoscopy, Colonoscopy As Initial Methods of Examination for Presence of Hematochezia**

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**Background / aims:** The purpose of this research is to compare whether computed tomography are no more
inferior than sigmoidoscopy and colonoscopy as the initial method of examination in patients who have sought medical assistance because of the presence of hematochezia.

**Methods:** The medical records dating from January 2012 to March 2015 of 279 adult patients over 18 years of age, who had sought medical attention and underwent Computed tomography, or sigmoidoscopy and colonoscopy, as a result of the presence of hematochezia were retrospectively analyzed. Patients with hematochezia were divided by groups who underwent initial examinations of Computed tomography, sigmoidoscopy, and colonoscopy. The data presents a comparison of each group by the detection rate of bleeding focus through initial inspection, hospital stay, and period until the final diagnosis.

**Results:** Of the 279 enrolled patients with hematochezia, 91 patients underwent sigmoidoscopy, 58 patients underwent colonoscopy and 130 patients underwent Computed tomography initially. There were no significant difference in the figures of patients in each group when comparing early detection rate of bleeding focus and hospital stay ($p=0.491$). With the exception of the 39 patients, whose bleeding focus could not be determined through examination, there were no significant differences in length of time required to obtain the final diagnosis when comparing the 240 target patients in each group ($p=0.258$).

**Conclusions:** This study showed that CT as an initial inspection of patients with hematochezia showed no significant differences in figures related to duration of diagnostics through initial inspection, hospital stay, and length of time required to obtain the final diagnosis when compared to patients who underwent sigmoidoscopy and colonoscopy. The results yield that CTs might be considered as an alternative to sigmoidoscopy when initializing exams related to hematochezia.

**Keywords:** CT; Computed tomography; Sigmoidoscopy; Colonoscopy; Hematochezia

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### PLG-36

**Prospective Analysis of Impact of Abdominal Ultrasound on Treatment Strategy in Necrotizing Enterocolitis**

Avajon Dekhongboev, Makhmud Aliev, Rustam Yuldashev and Shoilkhom Shakhaydarov

Pediatric Surgery, Republican Specialized Scientific Practical Center of Pediatrics, Tashkent, Uzbekistan

**Background / aims:** To evaluate the utility of abdominal ultrasound in determining treatment strategy of necrotizing enterocolitis (NEC)

**Methods:** 31 infants with stage Ia or IIIa NEC were prospectively included in the study. Infants with preexisting indications for surgery (n=3), such as presence of pneumoperitoneum on abdominal X-ray were excluded. As standard, all patients underwent plain radiography of the abdominal cavity

**Results:** According to abdominal X-ray bowel wall separation or loss of normal mosaic pattern determined in 26 (93%) neonates, 5 (18%) of them had pneumatosis intestinalis, 3 (11%) patients had signs of "fixed" bowel loop on serial films. Portal venous gas and free intraperitoneal fluid on X-ray was not detected. On abdominal ultrasound (US), free peritoneal fluid was determined in 13 (46%) neonates. Thickened bowel wall (more than 26mm) were found in 7 of 28 neonates. Signs of pneumatosis intestinalis were found in 12 (43%) patients. Increased perfusion of the bowel wall found in 4 (14%), two of them had “Y” type pattern. US Doppler demonstrated signs of intestinal necrosis in 8 (29%) of the 28 patients, of these 5 (18%) had signs of thinning of the bowel wall less than 1 mm. Absent or weakening of peristalsis were obtained in 8 (29%) infants. On Doppler US 6 (21%) patients had absent perfusion of bowel wall, only two had weakening. All of these 8 infants had surgical interventions. Bowel necrosis requiring resection was confirmed in 7 (25%) and the other was found to have NEC, but without necrosis of bowel wall. 20 (71%) infants based on US signs were assumed to not to have had bowel necrosis, they responded to medical treatment and improved without surgery

**Conclusions:** In our opinion ultrasound signs of thinning of the intestinal wall less than 1 mm, absence of per-
istalsis, decreased or absent perfusion of the bowel wall are pathognomonic signs of intestinal necrosis, which determines the need for surgery.

**Keywords:** Abdominal ultrasound; Necrotizing enterocolitis; Pneumatosis intestinalis

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**PLG-37**

**Ileal Submucosal Angiolipoma: A Case Report and Literature Review**

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Department of Internal Medicine, Section of Gastroenterology, University of Santo Tomas Hospital, Manila, Philippines

**Contents:** Significance: Angiolipoma is a benign tumor that is rarely found in the gastrointestinal tract. These tumors are primarily seen in the arms and trunk of young adults. In the literature review, there were only 31 cases of angiolipomas involving the gastrointestinal tract from 1964 to the present. To the best of our knowledge, this is the first report done in the Philippines. Clinical Presentation: We present the case of a 67-year-old female who complained of abdominal pain and 3 to 6 loose stools a day without any obvious etiology. Physical examination was unremarkable. Management: The patient underwent colonoscopy which showed a large polypoid mass that was intussuscepting and almost completely obstructing the lumen initially seen at 50cm from the anal verge, then the mass retracted and was seen to lodge at the ileocecal valve. Endoscopic biopsy revealed ileal mucosal fragments with active inflammation. CT scan demonstrated a fairly-defined non-enhancing hypodense focus with fat attenuation at the cecal region causing luminal narrowing, circumferential wall thickening with fungating areas at the distal ileal to the hepatic flexure. She underwent exploratory laparotomy and extended right hemicolectomy. The mass found at the terminal ileum was consistent with submucosal angiolipoma in the histopathologic examination. Recommendation: Gastrointestinal angiolipomas are rare and pose a diagnostic challenge to clinicians. Emphasis on the importance of correct interpretation of imaging tests, better sampling of tissue biopsy, and accurate histopathological diagnosis can provide the best management options with lowest risks for patients.

**Keywords:** Case report; Gastrointestinal submucosal angiolipoma; Ileal angiolipoma

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**PLG-38**

**Colonoscopic Cyanoacrylate Injection of Bleeding Ileal Varices in a Patient with Hepatocellular Carcinoma**

**Aeden Bernice Timbol, Eric Yasay and Mark Anthony De Lusong**

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**Contents:** Background: Ectopic varices are rare and can occur in approximately 1-3% of cirrhotics, with small intestinal varices occurring in 17-18% of these patients. Due to its rarity, there is still no current standard of care for the treatment of ileal varices. We present a case in which bleeding terminal ileal varices was successfully controlled by colonoscopic cyanoacrylate injection. Case Presentation: A 34-year-old male diagnosed with chronic hepatitis B was admitted due to hematochezia. Physical examination revealed a non-tender right upper quadrant mass. Laboratories showed severe anemia, deranged liver biochemical tests, and a markedly elevated alpha fetoprotein. Triphasic abdominal CT scan showed an arterially-enhancing mass with rapid wash out occupying and enlarging the left liver lobe. Management and Outcome: On admission, he was transfused with a total of 3 units packed red blood cells until esophagogastroduodenoscopy (EGD) and colonoscopy were performed. On EGD, four columns of engorged vessels were noted and 3 bands were deployed. No gastric or duodenal varices were found. On colonoscopy, an engorged vessel with nipple sign was noted 8-12 cm from the ileocecal valve. Intraluminal injection of N-butyl-2-cyanoacrylate (Histoacryl) on the ileal varices was performed without complications. Second-look colonoscopy showed sclerosed ileal vessels without any signs of active bleeding. CT-angiogram revealed absence of any vascular abnormalities or contrast extravasation. The patient was then primed for TIPS and palliative chemotherapy, however on the 9th day post-histoacryl injection, the patient expired due to respiratory failure.

**Conclusion:** Ectopic varices are uncommon and the op-
timal treatment remains to be a challenge. Colonoscopic injection sclerotherapy is a promising option for control of terminal ileal variceal bleeding even in poor risk patients presenting with massive hemorrhage.

Keywords: Cyanoacrylate injection ileum varices hepatocellular

PLG-39

Endoscopic Closure of Colonic Free Perforation during Diagnostic Colonoscopy Using Over-the-scope Clip: A Case Series

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Background / aims: So far, existing methods for endoscopic treatment are known to be less effective for closure of diagnostic colon perforations because those defects are relatively large and locate on difficult lesion to approach. While over-the-scope clip (OTSC) have been reported as easy and safe method for colorectal perforation, very little is known about its efficacy regarding free perforation of colon during diagnostic colonoscopy. We reviewed a case series which have undergone OTSC closure for the perforation during diagnostic colonoscopy.

Methods: We retrospectively reviewed consecutive 4 cases which were found to have intestinal perforation during diagnostic colonoscopy and treated by OTSC at single medical center between May, 2014 and October, 2015.

Results: A total of 4 female patients between the age of 54 and 83 years had treated with OTSC. Time intervals between perforation and closure were 12, 25, 85, and 285 minutes. All intestinal defects were more than the size of 10mm and located at recto-sigmoid junction. The length of stay in hospital were 6, 10, 12, and 30 days. The patient who stayed 30 days was diagnosed and treated ampullary cancer during admission. All patients were given prophylactic intravenous antibiotics and did not show the evidence of systemic infection. No complications were observed during or after the procedure. The tumor was resected en bloc, and the patient was discharged 2 days after ESD with a regular diet. The results indicate that ESD can be applied as safe and effective treatment for a large colonic angiolipoma.

Keywords: ESD; Angiolipoma; Colonoscopy

PLG-40

Endoscopic Submucosal Dissection of Symptomatic Angiolipoma of the Colon: A Case Report

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Contents: A colonic angiolipoma is a very rare benign tumor that is usually asymptomatic. They have a typical vascular component and are often located in subcutaneous tissues, and more rarely, in the gastrointestinal tract. Patients with a large colonic angiolipoma may present with symptoms such as abdominal pain, bleeding, and colonic obstruction or intussusceptions. Previously reported cases were mostly treated by surgery. We report the case of a 50-year-old woman who complained of abdominal discomfort in the right lower quadrant without any obvious etiology. Standard endoscopic submucosal dissection (ESD) was performed to remove the angiolipoma instead of conventional surgical resection. No complications were observed during or after the procedure. The tumor was resected en bloc, and the patient was discharged 2 days after ESD with a regular diet. The results indicate that ESD can be applied as safe and effective treatment for a large colonic angiolipoma.

Keywords: ESD; Angiolipoma; Colonoscopy

Fig. 1. 45mm sized huge colonic mass arised from IC valve.

Fig. 2. The endoscopically resected submucosal tumor, gross pathology.

Keywords: ESD; Angiolipoma; Colonoscopy

Conclusions: Iatrogenic free perforation of recto-sigmoid junction during diagnostic colonoscopy can be treated with OTSC preferentially.

Keywords: OTSC (Over-the-scope-clip); Perforation; Colonoscopy

Fig. 1. 45mm sized huge colonic mass arised from IC valve.

Fig. 2. The endoscopically resected submucosal tumor, gross pathology.
A Case of Celiac Disease Mimicking Amyotrophic Lateral Sclerosis
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Contents: A 60-year-old male visited hospital with a year history of progressive left sided weakness and impaired left ankle dorsiflexion without sensory symptom or sign. When he visited a hospital first, he suspected Lyme disease. Because there was no abnormal finding in brain and spine MRI, electromyography but Borrelia burgdorferi antibody was positive in laboratory finding. So he took doxycycline for a month. After 3 month, he visited other neurologic clinic for progressed neurologic symptom and presented bilateral muscle atrophy and hyperreflexia of biceps and brachioradialis so he repeated electromyography and nerve conduction study and demonstrated widespread denervation. So he was diagnosed with amyotrophic lateral sclerosis following these finding, and he has taken riluzole since then. But left sided weakness was progressed and gastrointestinal symptom includes diarrhea and poor oral intake and weight loss newly developed. Evaluation for gastrointestinal symptom includes diarrhea and poor oral intake and weight loss newly developed. Evaluation for gastrointestinal symptom, he had esophagastroduodenoscopy and colonoscopy and loss of villi was seen in proximal duodenum, so biopsy was done. We can detect characteristic histologic change on biopsy specimen include severe lympho-plasma cell infiltration with flattened villi (Figure 1), and tissue transglutaminase IgA was strongly positive (>100 U/mL). So he was finally diagnosed with celiac disease and started gluten-free diet.

Fig. 1.

Keywords: Celiac disease with neurologic manifestation; Intestinal malabsorption; Amyotrophic lateral sclerosis

A Case of Lower GI Bleeding Caused by Localized Amyloid Light-chain Amyloidosis in the Small Intestine
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Contents: Systemic amyloidosis can involve the gastrointestinal tract. However, cases of localized amyloid light-chain amyloidosis in the small intestine are rarely reported. Here we report a case of primary amyloidosis only in the small intestine without any other organ involvement. A 73-year-old male with history of alcoholic pancreatitis, hypertension was transferred to our hospital with complaints of hematochezia before 2 days ago. Laboratory tests revealed serum hemoglobin level decreased from 11.6 to 7.7 g/dL. There was no bleeding focus on gastroduodenoscopic and colonoscopic examination. Contrast enhanced CT enterography for evaluation of small bowel bleeding, showed that two sites of aneurysmal dilatation of small bowel loops with concentric wall thickening. Balloon enteroscopy to examine the lesions in the small bowel detected cystic mucosal lesion with hemorrhagic surface change with easily touch bleeding below the 2nd portion of duodenum. For control of bleeding, he underwent small bowel resection surgery. There were 2 segmental lesions (5cm in the jejunum, 8cm in the ileum) of small bowel wall dilatation and distended and edematous small bowel between the lesions in the operation finding. Histologic examination of the specimen revealed amyloid deposition and positive Congo red staining in the small intestine. According to the results of immunohistochemistry, deposits of amyloid were positive for amyloid kappa, lambda, but negative for amyloid A. Therefore the results were considered to be indicative of amyloid light-chain (AL) amyloidosis. Bone marrow biopsy for evaluation of systemic amyloidosis was founded that no definite evidence of plasma cell disorder. Serum and urine electrophoresis
revealed no monoclonal gammopathy. There was no evidence of other organ involvement. In conclusion, he was diagnosed with localized AL amyloidosis in the small intestine. Localized amyloidosis in the small intestine can manifest the symptom of lower GI bleeding.

**Keywords:** Amyloid Light-chain Amyloidosis; Small intestine; Lower GI Bleeding

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**Fistula between Appendicitis Induced Perirectal Abscess and Sigmoid Colon Detected with Endoscopy: A Case Report**

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**Contents:** Delayed diagnosis of appendicitis can result in complications such as suppurition, rupture, and localized abscess formation. A fistula between a pelvic abscess following untreated appendicitis and the sigmoid colon detected with endoscopy has not been previously reported. We report a case of perirectal abscess complicated by spontaneous fistulous decompression into the sigmoid colon detected with endoscopy. A 54-year-old man had left lower quadrant pain, fever, and diarrhea 2 months previously. At that time, he was taking analgesics on the advice of a pharmacist, after which his symptoms alleviated. However, he had continuous mild lower abdominal discomfort. Cap-assisted colonoscopy showed a fistula opening with pus drainage in the sigmoid colon and a normal appendiceal orifice of the cecum. Computed tomography showed a fistulous tract between the 1.5-cm sized perirectal abscess and the posterior wall of the sigmoid colon. After 6 weeks of oral antimicrobial therapy, the sigmoid fistulous communication was closed, but the perirectal abscess was not resolved. Laparoscopy showed an inflamed appendix with perforation and adhesion, and the appendix and perirectal abscess were successfully removed without resection of the sigmoid colon. Long-term oral antibiotic therapy followed by elective laparoscopic appendectomy can be an effective management option for pelvic abscesses with spontaneous enteral drainage in asymptomatic or mildly symptomatic patients with appendicitis.

**Keywords:** Appendicitis; Abscess; Pelvis; Sigmoid colon; Intestinal fistula

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**Acute Cytomegalovirus Enteritis in Young Adult Patient with Underlying Acquired Immunodeficiency**

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**Contents:** Introduction Cytomegalovirus (CMV) gastrointestinal infection is a rare event that has been reported mainly in immunocompromised patients. We report a case of young adult CMV enteritis with acquired immunodeficiency (AIDS). Case A 23 year-old male without past medical history visited our hospital with a complaint of diarrhea and abdominal pain. His abdomen was tender, especially RLQ area, however, vital sign was stable. Initial laboratory findings showed elevated CRP and stool occult blood was positive. He was treated conservatively with intravenous ciprofloxacin. However, his condition was not improved and even exacerbated with fever, hematochezia and rebound tenderness on RLQ. On laboratory examination, leukocytosis and elevated CRP were observed. Abdominal CT scan showed diffuse wall thickening on ileal loop and duodenal 2nd to 3rd portion. We suspected uncommon pathogen induced enteritis and performed laboratory tests of rheumatic disease and immunodeficiency disorder. As a result, human immunodeficiency virus (HIV) antibody test was positive. CD4 T cell count was 176/ul. and CD4/CD8 ratio was 0.2. Colonoscopy and esophagogastroduodenoscopy (EGD) revealed deep geographic ulcerations on terminal ileum and duodenum. Pathologic reports revealed cytomegalopathy of endothelial cell with intranuclear inclusion bodies. He was finally diagnosed as CMV enteritis with underlying AIDS, based on the homosexual behavior. Treatment with intravenous ganciclovir and highly active antiretroviral therapy
(HAART) were started and his condition was improved. Follow-up EGD showed healed ulcerations on duodenum.

Discussion The number of HIV infection increased annually and reached to 9,615 in 2014 in Korea. Young people aged 20 to 39 accounted for an estimated 54.5% of all new HIV infection. In young adult patients with enteritis or colitis, when they respond poorly to the treatment, physician should consider the possibility of immunocompromised status, such as HIV infection.

Keywords: CMV entritis; Acquired Immunodeficiency; Young patient

PPB-01

A Single Centre Audit of Sphincter of Oddi Dysfunction Managed by ERCP under Propofol Deep Sedation

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Background / aims: SOD management with ERCP is associated with high risk of complication including up to 20% risk of pancreatitis. Sphincterotomy has been indicated for type 1 and 2 SOD. In general, the use of propofol for deep sedation is reported and associated with increase success and reduced complications. We aim to review our outcomes for SOD type 1 and 2 treated with sphincterotomy under propofol deep sedation.

Methods: Prospective auditing of all ERCP cases done between 2011 and 2015 in a new service, at a private hospital performed by a single operator. SOD diagnosis made clinically with all cases being type 1 or 2. Complications and progress were recorded prospectively.

Results: There were 38 cases. Average age of 42 years and all cases were female. Overall, the canulation success rate was 97.4%, naïve papilla canulation rate was 100% (20 out 20). Complications were seen in 9 cases (23.7%) with 7 post ERCP pain (without perforation or pancreatitis), 1 (2.6%) pancreatitis and 1 failed to canulate the desired duct. No mortalities were recorded in our cohort. We performed 28 biliary sphincterotomies, 2 pancreatic sphicterotomies, 32 biliary stenting, 4 pancreatic stenting, 20 biliary balloon trawl, 1 bile duct brushing and 1 dilation.

Conclusions: SOD remains a challenging condition to treat needing recurrent procedures. High risk of management with ERCP, however our data shows low risk of pancreatitis in setting of well selected patients treated under propofol sedation by a skilled endoscopist.

Keywords: SOD; Propofol; ERCP
**PPB-02**

**The Efficacy and Safety of Left Lateral Position for Endoscopic Retrograde Cholangiopancreatography: A Pilot Study**

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**Background / aims:** Endoscopic retrograde cholangiopancreatography (ERCP) has been usually performed in prone position. The prone position for ERCP can facilitate selective bile duct cannulation, offer a better fluoroscopic image of pancreaticobiliary anatomy, and prevent aspiration of gastric contents. Compared with the prone position, left lateral position is more comfortable for patients, especially with limitation in cervical movement including cervical cord injury, cervical spine operation, parkinson’s disease, muscle contracture due to cerebral infarction, and allow more easy passage of the scope through the pharynx, and useful to secure airway. We aimed to evaluate the efficacy and safety of left lateral position for ERCP in this prospective, controlled study.

**Methods:** Between August 2015 and March 2016, a total of 62 patients with intact papilla who underwent ERCP at Chuncheon Sacred Heart Hospital, were enrolled. They were randomly assigned to left lateral position (n=31) and prone position (n=31).

**Results:** There was no significant difference between the two groups in demographic data, indication for ERCP, comorbidity, anticoagulation agent, ASA class, dose of sedative agent, and procedure time. The rate of pancreatic duct cannulation and acquisition of pancreatogram in the left lateral group were significantly higher than those in the prone group (9/30, 30.0% vs. 3/31, 9.7%, p=.046; 7/30, 23.3% vs. 1/31, 3.2%, p=.020). However, there was no significant difference in the rate of post-ERCP pancreatitis (6/30, 20% vs. 5/31, 16.1%, p=.694). The rate of technical success and adverse event were similar (96.8% and 40% in left lateral, and 100% and 32.3% in prone, respectively). There was no severe adverse event in each group.

**Conclusions:** Therefore, the left lateral position for ERCP can be as effective and safe as the prone position.

**Keywords:** Endoscopic retrograde cholangiopancreatography; Position; Efficacy; Safety.

**PPB-03**

**Usefullness of Direct Peroral Cholangioscopy with Intraductal Ultrasonography for Indeterminate Bile Duct Lesion**

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**Background / aims:** The evaluation of indeterminate bile duct lesions is clinical challenging. Direct peroral cholangioscopy (DPOC) may be helpful by allowing endoscopic visualization. However, the evaluation of bile duct wall layers or extraductal lesions is impossible with DPOC. Intraductal ultrasonography (IDUS) provides high-resolution ultrasonic findings of the bile duct wall and extraductal structures. We evaluated the usefulness of DPOC combining with IDUS in evaluation of indeterminate bile duct lesions.

**Methods:** Total 31 patients with indeterminate bile duct lesions in preceding conventional imaging modalities including ERCP were evaluated by IDUS and DPOC using an ultraslim upper endoscope. Asymmetrical irregular wall thickening and intraductal protruding or polypoid lesions with ductal disruption in IDUS were diagnosed as malignancy. Irregular surface with stricture, tortuous tumor vessels, protruding mass, and granular or papillary mucosal lesions in DPOC were diagnosed as malignancy. Final diagnoses were confirmed by histopathologic results and/or clinical follow-up outcomes.

**Results:** The final diagnosis of indeterminate bile duct lesions were 17 malignant, 1 adenoma and 13 benign lesions. The overall diagnostic accuracy of DPOC visual impression was 80.6% (25/31). Three nonspecific small polypoid lesions and one flat elevated lesion without dilated vessels or mucosal irregularity in DPOC had been diagnosed as polypoid masses with ductal wall thickening with or without invasion in IDUS. One papillary mu-
cosal lesion in DPOC was showed as symmetrical wall thickening in IDUS. And, one intraductal polypoid mass lesion in DPOC was revealed as extraductal invasion in IDUS. The diagnostic accuracy of DPOC-guided targeted biopsy was 92.6% (25/27).

**Conclusions:** DPOC with targeted biopsy was useful for differentiating indeterminate bile duct lesions. IDUS may provide adjunctive information before performing cholangioscopic evaluation by providing bile duct wall and periductal images of target lesions.

**Keywords:** Intraductal ultrasonography; Peroral cholangioscopy; Indeterminate biliary stricture

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**PPB-04**

Direct Peroral Cholangioscopic Evaluation with Narrow-band Imaging for Bile Duct Lesions

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**Background / aims:** Narrow-band imaging (NBI) provides enhanced endoscopic images of surface mucosal structures and superficial microvessels for gastrointestinal tract lesions. However, there are limited data in cholangioscopic evaluation with NBI for bile duct lesions. We evaluated the clinical usefulness of NBI evaluation during direct peroral cholangioscopy (DPOC) using an ultra-slim upper endoscope in patients with bile duct lesions.

**Methods:** Total 67 patients who had undergone DPOC with NBI evaluation was evaluated in this study. Two experienced endoscopists reviewed white light (WL) and NBI images, and assigned visual scores to identify the margin or surface structures to each lesion as followings; (1) difficult, (2) fair or (3) excellent identification. Reference standard for the final diagnosis was histopathologic results or clinical outcomes.

**Results:** Evaluated bile duct lesions included 29 malignant biliary strictures, 20 indeterminate biliary strictures, 5 indeterminate filling defects, and 13 incidentally detected mucosal lesions of the bile duct. Conventional WL imaging was “excellent” in 31.3% (21/67), and NBI imaging in 89.6% (60/67) (p=0.0001). NBI evaluation in comparing with WL images was more useful in tumorous lesions (85% vs 2.5%, p=0.0001) than inflammatory benign lesions (96.3% vs 74.1%, p=0.05). Diagnostic accuracies of the cholangioscopic visual impression with NBI and the forceps biopsy were 94.3%.

**Conclusions:** DPOC with NBI may be helpful for bile duct mucosal lesions, especially for tumorous mucosal lesions by emphasizing surface structure and superficial microvessels. Further prospective trials are demanded to confirm the usefulness of NBI for bile duct lesions.

**Keywords:** Peroral cholangioscopy; Narrow-band imaging; Bile duct lesions

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**PPB-05**

Peroral Cholangioscopy-Guided Biopsy or EUS-FNAB According to the Location of Suspected Malignant Biliary Stricture

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**Background / aims:** Recently, peroral cholangioscopy (POC) and EUS-guided fine-needle aspiration biopsy (EUS-FNAB) for a diagnosis of suspected malignant biliary stricture (MBS) has been assessed to compensate the limitation of ERCP-based sampling. The aim of this study was to evaluate the usefulness of a diagnostic approach using POC-guided forceps biopsy (FB) or EUS-FNAB according to the location of stricture in suspected MBS.

**Methods:** ERCP with transpapillary forceps biopsy (TPB) were performed as initial diagnostic procedures for patients with suspected MBS. According to the location of stricture, all patients were classified as proximal type (suprapancreatic CBD) and distal type (intrapancreatic CBD) of stricture. If the malignancy was not confirmed by TPB, POC-guided FB for proximal type or EUS-
FNAB using a core biopsy needle for distal type of strictures were performed, respectively.

**Results:** The diagnostic accuracy of TPB in a total of 120 patients (78 proximal type and 42 distal type) was 70.8% and was significantly higher in the proximal than the distal type (76.9% vs. 59.5%, \(p=0.038\)). Among 24 patients of proximal type with negative for malignancy on TPB, one (4.2%) technical failure was observed during POC. In patients with negative for malignancy on TPB, the diagnostic accuracy of POC-guided FB in 23 patients of proximal type and EUS-FNAB in 19 patients of distal type was 95.7% and 94.4%, respectively (\(p=0.076\)). The overall diagnostic accuracies of the combination of TPB with POC-guided FB for proximal type, and EUS-FNAB for distal type were 98.7% and 97.6%, respectively (\(p=0.583\)).

**Conclusions:** The approach using POC-guided tissue sampling or EUS-FNAB according to the location of stricture may be useful to diagnosis of MBS.

**Keywords:** EUS-FNA; Peroral cholangioscopy; Malignant biliary stricture

**PPB-06**

**Treatment of Malignant Biliary Obstruction Using Newly Developed Niti-S 14; Non-covered and 14mm Diameter Metal Stent**

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**Background / aims:** Malignant obstruction of the lower and middle portion of the extrahepatic bile duct can be relieved with endoscopic biliary stenting using an expandable metal stent (EMS). Larger diameter and covering of the stent contribute long patency. According to this concept, we selected a fully covered EMS with diameter of 12mm (Niti-S SUPREMO-12, Taewoong, Korea), and achieved favorable results, while migration of the placed stent as a late complication remained to be resolved. In this study, we evaluated the efficacy of the newly developed non-covered EMS with the diameter of 14mm (Niti-S 14, Taewoong, Korea), and report the results.

**Methods:** For 18 months, consecutive 28 patients with unresectable malignant obstruction of the extrahepatic bile duct were enrolled to this study and 3 were excluded. The end point of the observation was set based on the stent obstruction or the patient’s death. The results obtained by the observation were compared with those of previous treatments by other stents; A. SUPREMO-12, B. Niti-S SUPREMO-10, C. Niti-S ComVi, and D. Covered Wallflex.

**Results:** In all patients using Niti-S 14, stent placement was achieved. The observation period after the placement was 154±141 days. The average period of patency was 137±117 days. Early complications were observed in 7 patients (32%); 3 mild pancreatitis (12%), 2 mild cholecystitis (8%), 1 bile duct hemorrhage (4%), and 1 fever without exacerbation of liver dysfunction (4%). Stent occlusion was observed in 2 patients (8%). No migration of the stent occurred. In previous treatments by other types of EMSs, stent placement was succeeded in all patients except for 3 patients using SUPREMO-12 (success ratio, 88%). Stent occlusion and migration was observed in 18, 60, 35, and 30 (%), and 15, 10, 12, and 4 (%) in A, B, C, and D group, respectively.

**Conclusions:** Our results show that Niti-S 14 is easy to be delivered to the aimed position and has a long patency and a low risk of migration.

**Keywords:** Ems; Malignant biliary obstruction; Migration; Tumor ingrowth

**PPB-07**

**Risk Factors of Acute Suppurative Cholangitis in Patients with Acute Cholangitis Associated with Common Bile Duct Stones**

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**Background / aims:** Acute suppurative cholangitis (ASC) caused by presence of pus in the bile ducts is a life-threat-
ening disease. Urgent decompression of the bile duct should be performed in patients with ASC. The aims of the present study were to analyze the incidence and risk factors of acute suppurative cholangitis in patients with acute cholangitis associated with common bile duct (CBD) stones.

Methods: A total of 779 patients admitted due to acute cholangitis associated with CBD stones from January 2012 to March 2015 were reviewed retrospectively. Definition of acute suppurative cholangitis (ASC) is the gross visualization of pustular bile during endoscopic retrograde cholangiopancreatography (ERCP). The patients’ characteristics, endoscopic retrograde cholangiopancreatography (ERCP) findings and image studies were investigated.

Results: Mean age of the patients was 68.14 ± 13.49 (25~94) and male to female ratio was 1.25 to 1 (55.6% / 44.2%). 31.1% patients had hypertension, 10.3% patients had diabetes and 6.2% patients had chronic kidney disease. On the ERCP finding, 16.6% patients had periampullary diverticulum, 37.3% patients had CBD stone >10 mm and 4.7% patients had CBD stricture. In acute cholangitis, acute suppurative cholangitis was 10.5% and significant risk factors were hypertension, diabetes mellitus, chronic kidney disease, periampullary diverticulum, CBD stone >10 mm and 4.7% patients had CBD stricture. In acute cholangitis, acute suppurative cholangitis was 10.5% and significant risk factors were hypertension, diabetes mellitus, chronic kidney disease, periampullary diverticulum, CBD stone >10 mm and 4.7% patients had CBD stricture. In acute cholangitis, acute suppurative cholangitis was 10.5% and significant risk factors were hypertension, diabetes mellitus, chronic kidney disease, periampullary diverticulum, CBD stone >10 mm and 4.7% patients had CBD stricture. In acute cholangitis, acute suppurative cholangitis was 10.5% and significant risk factors were hypertension, diabetes mellitus, chronic kidney disease, periampullary diverticulum, CBD stone >10 mm and 4.7% patients had CBD stricture.

Conclusions: Diabetes mellitus, periampullary diverticulum and CBD stricture appear to be independent risk factors of acute suppurative cholangitis. More cautious treatments with earlier decompression of the bile duct are needed in these patients.

Keywords: Acute suppurative cholangitis; Acute cholangitis; Risk factor; Common bile duct stone

PPB-08

The ERCP Outcome and Clinical Significance in Young Patients 30 Years of Age or Less

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Background / aims: With age, the incidence of pancreaticobiliary disease is increasing. Biliary stone is the most common cause and is predominantly between 30 and 50 years. Endoscopic retrograde cholangiopancreatography (ERCP) is useful procedure for the diagnosis and treatment of pancreaticobiliary diseases but the outcome and clinical significance of ERCP are not well known in very young patients. So we report clinical characteristics, ERCP findings and complications of patients were 30 years of age or less.

Methods: This is a retrospective study by reviewing medical charts From January 2005 to December 2015. Total 5,037 cases of ERCP were performed at our institution. Of these, 131 cases (100 patients) involved patients 30 years of age and less.

Results: Total 100 patients were 35 males and 65 females and the mean age was 25.3±4.4 years. Most patients had no comorbidity, there was hypertension in 1 patient (1%), Diabetes mellitus in 2 patients (2%). The indications of ERCP were cholangitis (20%), choledocholithiasis (56%), pancreatitis (24%), biliary sludge (21%), and other causes (12%) such as benign stricture (3%), bile leakage after cholecystectomy (1%), choledochal cyst (1%), pancreatic duct stone (2%), pancreatic divisum (2%), and suspicious sphincter of Oddi dysfunction (3%). There was not biliary malignancy or pancreatic malignancy. Midazolam (4.5±0.9mg), propofol (32±17.9 mg) and meperidine (25.5±3.6mg) were used for conscious sedation and percentage of patients used each sedation drug were 89%,41% and 95%.39% of patients were used all three drugs. Mean number of ERCP session was 1.1±0.38 and mean procedure time was 33.7±22.1 minutes. Technical success rate of ERCP was 93%. Incidence of ERCP related complication (post-ERCP pancreatitis 9%, bleeding 2%, perforation 0%, and death 0%) was 11%.

Conclusions: In conclusion, ERCP was performed safely
and successfully in very young patients. But the incidence of post ERCP pancreatitis was high, the effort to prevent pancreatitis is needed. And we need to compare the data with other age groups.

**Keywords:** Cholangiopancreatography; Endoscopic Retrograde; Young age

**PPB-09**

Comparison of ERCP Success Rate in EST-Naïve Patients with Advanced and Non-advanced Liver Cirrhosis

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**Background / aims:** Although endoscopic retrograde cholangiopancreatography (ERCP) is one of the standard pancreatobiliary interventional methods, there is limited study about ERCP in patients with liver cirrhosis. The aim of this study is to assess the ERCP success rate in endoscopic sphincterotomy (EST)-naïve patients with cirrhosis.

**Methods:** In a single tertiary teaching hospital, total 135 EST-naïve patients with cirrhosis who had undergone ERCP were identified between 2003 and 2015. The ERCP success was defined with successful deep cannulation with drainage or stone removal. Advanced liver cirrhosis was defined as Child-Pugh-Turcot classification (CPT) C.

**Results:** Proportion of male sex was 71.1 (%) and median age was 62 years. Major causes of ERCP were CBD stone (60.7%), malignant biliary obstruction (24.4%), and others (14.8%). According to CPT A, B, and C, number of patients was 33, 67 and 35, respectively. The initial ERCP success rates of each group were 93.9%, 94.0% and 80.0%, which showed lower success rate in CPT C group. \( p=0.001 \). However, success rates increased to 97.0%, 98.5%, and 91.4% after the repeated ERCP trial. As a result, the eventual success rates between non-advanced (97.9%) and advanced group (91.4%) were not statistically different \( p=0.132 \).

**Conclusions:** Compared with patient with CPT A and B, there is a significant lower success rate of initial ERCP in patients with CPT C. However, there is no difference in final success rates including re-trial of ERCP. ERCP in patients with advanced cirrhosis is feasible with a proper preparation.

**Keywords:** Liver cirrhosis; Child classification; ERCP, Cannulation

**PPB-10**

Is Prophylactic Nafamostat Mesylate (FUT-175, Futhan®) Effective to Prevent Post-ERCP Pancreatitis or Hyperamylasemia

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**Background / aims:** Successful cannulation of the common bile duct (CBD) is an important benchmark of ERCP. However, difficult cannulation is one of the main risk factor for post-ERCP pancreatitis. The aim of this study was retrospectively to evaluate whether prophylactic Nafamostat mesylate (FUT-175, Futhan®) is preventing effect for post ERCP pancreatitis during difficult cannulation.

**Methods:** From January 2012 to December 2014, we retrospectively evaluated the medical records that performed ERCP for pancreatobiliary disease. Eligible patients were performed difficult cannulation and rescue precut papillotome was tried. Among eligible patients, one group was treated prophylactic Nafamostat mesylate injection during procedure (group A) in contrast to the other was not treated with Nafamostat mesylate (Group B). We evaluated developing post ERCP pancreatitis including hyperamylasemia or hyperlipasemia.

**Results:** The two groups were similar with regard to patient demographics. A total of 140 patients were enrolled. 73 patients were assigned to group A and 67 to the Group B. Successful CBD cannulation was achieved in 67 (91%) of 73 patients in Group A and 59 (88%) of 67 patients in Group B. The overall incidence of hyperamylasemia was 40% (27/67) in the Group B, and 18%
in Group A. Post-procedure hyperamylasemia was significantly higher in Group B ($p<0.001$). The overall incidence of post-procedure pancreatitis was 13.4% (9/67) in the Group B, and 5.5% (4/73) in Group A. Post-procedure pancreatitis was also significantly higher in Group B ($p<0.001$). There was no drug related complication in eligible patients.

**Conclusions:** Prophylactic Nafamostat mesylate is effective for post ERCP pancreatitis especially, in difficult cannulation situation. For establish the effect for post ERCP pancreatitis in usual ERCP procedure, further large scale, prospective randomized multicenter study was need.

**Keywords:** Nafamostat mesylate; Post-ERCP pancreatitis

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**PPB-11**

**Comparison Outcomes for Unresectable Hilar Cholangiocarcinoma Treated Photodynamic Therapy (PDT) Combined Gemcitabine-based Chemotherapy with Only Drainage Procedure**

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**Background / aims:** Photodynamic therapy (PDT) provides clinical benefit for patients with unresectable biliary malignancy. PDT with biliary stents is used for palliation of jaundice and improving survival and addition systemic chemotherapy to PDT might increase survival rate. In this study, we evaluate comparison outcomes for unresectable hilar cholangiocarcinoma (C.C.) treated PDT combined gemcitabine-based chemotherapy with only drainage procedure

**Methods:** In cases of unresectable hilar C.C., we performed percutaneous approach for Bisthmus type III or IV and performed transpapillary approach for Bisthmus type I or II, and then drainage procedure was done after PDT. Finally Gemcitabine-based chemotherapy was done for 6 cycles. Finally we compared to only internal drainage procedure in unresectable hilar C.C. (Group B) in terms of stent occlusion rate, progression free survival rate and 1-year survival rate.

**Results:** Between January 2009 and February 2016, 65 cases of Klatskin tumor (Bisthmus type III or IV), 15 cases of Klatskin tumor (Bisthmus type I or II), were enrolled for Group A, 80 cases Klatskin tumor were enrolled for control Group B. Median metal stent patency period is superior Group A to Group B that of 426±177 vs. 235±63 days, respectively ($p<0.005$). Progression free survival is superior Group A to Group B that of 13.4 months vs. 4.8 months, ($p<0.001$). Finally, Group A showed higher 1-year survival rate compared with Group Bn (69% versus 37%, $p<0.01$).

**Conclusions:** PDT plus chemotherapy promising efficacy for stent occlusion rate, progression free survival and 1-year survival rate compared with internal drainage alone in unresectable hilar C.C. Especially, percutaneous approach for high grade hilar C.C. was effective for evaluation of disease extent and apply to ablation therapy.

**Keywords:** Unresectable hilar cholangiocarcinoma; PDT; Gemcitabine

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**PPB-12**

**Efficacy, Safety, and Removability of Fully Covered Multi-Hole Metal Stent in Hilar Biliary Stricture of Swine Model**

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**Background / aims:** Uncovered biliary metal stent only has been used for palliative treatment of malignant hilar biliary stricture. The metal stent which is inserted bilaterally into the hilar bile duct has shorter patency and technical difficulties in doing stent re-intervention. To evaluate efficacy, safety, and endoscopic retrievability of fully covered self-expandable metal stents with multi-hole (FCSEMS-MH) in swine model.

**Methods:** Endoscopic retrograde cholangiography (ERC) with endoscopic placement of a FCSEMS-MH was performed in six swine hilar biliary stricture models. Follow-up ERC and endoscopic attempts to remove the stents were implemented 30 days after the stenting. Efficacy, adverse events, and endoscopic removability of the stents were evaluated in animal models.
**Results:** Bismuth type I and II were 2 and 4 animals respectively among the animals in terms of the types of hilar biliary stricture. Technical success rate was 100% (6/6) during the endoscopic metal stenting. Functional success rate evaluated 7 days after the stent insertion was 83.3% (5/6). Immediate adverse event rate was 0%. There was no any procedure-related mortality. And stent migration did not occur in all animals one month after the stenting. All stents were able to be removed in all 6 animals at post-stenting 30-day.

**Conclusions:** In vivo endoscopic placement and removal of FCSEMS-MH are feasible in hilar stricture models of swine.

**Keywords:** Fully covered multi-hole metal stent; Hilar biliary stricture; Swine model

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**PPB-13**

The Diagnostic Yield of EUS-FNA of Pancreatic Cancer in the Presence or the Absence of Chronic Pancreatitis

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**Background / aims:** Evaluation of pancreatic cancer with background chronic pancreatitis is a diagnostic challenge. The objective of this study is to compare the diagnostic yield of endoscopic ultrasound-guided fine needle aspiration (EUS-FNA) in the pancreatic cancer.

**Methods:** The study design was analysis of data collected consecutively on all patients with pancreatic cancer who underwent EUS-FNA at Daegu Catholic university hospital between January 2010 and March 2016. A total of 157 patients underwent EUS-FNA and chronic pancreatitis (CP) was defined by the presence of more than 4 EUS criteria in parenchymal factor (hyperechogenic foci, lobulation, stranding, calcification) or pancreatic duct factor (duct dilatation >3mm, irregularity, visible side branches). The final cytopathologic report was categorized into 3 groups: malignancy, atypical cell, nondiagnosis.

**Results:** The location of mass was as follow: head and uncinate process (n=70, 44.6%), body and neck (n=47, 29.9%), tail (n=25, 15.9%). The size of mass was 30.2 ± 12.4 mm and the number of FNA passes was 3.9 ± 1.5 times. Among 157 patients, CP was noted in 19 (12.1%) patients. Adenocarcinoma was observed in 9 patients in CP group and 67 patients in non-CP group (47.4% vs. 48.6%, p=0.723). Nondiagnosis was observed in 9 patients and 31 patients respectively and the difference was significant statistically (47.4% vs. 22.5%, p =0.015). The number of FNA passes was not different significantly in two groups (3.7 vs. 4.0 times). In CP group, diagnosis (adenocarcinoma and atypical cell) was achieved though more frequent passes of FNA (2.7 vs. 4.4 times, p=0.033).

**Conclusions:** EUS-FNA has a low diagnostic yield for pancreatic cancer in the setting of CP. However, the diagnostic yield was improved by performing more number of passes at FNA.

**Keywords:** Pancreatic cancer; Chronic pancreatitis; EUS-FNA

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**PPB-14**

A Prognostic Model Adopting New Criteria of Invasion Depth in Distal Bile Duct Cancer: A Better Predictor of Survival Than Previous Methods

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**Background / aims:** Depth of invasion is an important prognostic factor for patients with distal bile duct (DBD) carcinoma. This study aims to identify an optimal method of measuring the depth of invasion in relation to the prognosis in patients with DBD cancer.

**Methods:** Data of 179 patients with DBD adenocarcinoma treated in three institutions in Korea (2003-2015) were stored in a database. At pathologic review, depth of invasion was measured. The relationships between clinicopathological parameters and groups based on in-
Invasion depth (G1, ≤3mm; G2, 3-10mm; G3 >10mm) were evaluated, and the survival time of each group based on invasion depth and T classification was compared.

Results: The deeply invading tumor exhibit more tendency towards infiltrative pattern, higher histological grade, nodal metastasis, pancreatic, duodenal, lymphovascular, perineural invasions. In univariate analysis, the depth of invasion as well as the current AJCC T-staging system was significantly correlated with worse relapse-free and overall survival (all, \( p < 0.05 \)). After adjusting confounders, grouping based on invasion depth remained as one of the prognostic factors (all, \( p < 0.05 \)), while that of T category was not significant.

Conclusions: The grouping based on invasion depth could be a clear and meaningful concept overcoming the vagueness of the T classification in predicting clinical outcomes in patients with DBD carcinoma. Invasion depth should be measured on histopathological assessment of DBD carcinomas.

Keywords: Bile duct neoplasm; Extrahepatic; Invasion; Survival

PPB-16
Primary Hepatic Neuroendocrine Carcinoma with Multiple Liver Metastases Presenting As Jaundice Due to CBD Obstruction
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Contents: Neuroendocrine tumors (NETs), not only behave like benign tumors and also they exhibit characteristics of carcinomas. Whereas more than 80% of NETs found in the liver are metastatic, primary hepatic neuroendocrine tumors (PHNETs) are very rare. When a NET is found in the liver, it must be treated with great care to exclude metastasis from extrahepatic primary site, as that is much more common occurrence. We experienced a case of primary hepatic neuroendocrine carcinoma (PHNEC) with multiple liver metastases presenting as jaundice due to the mid CBD obstruction. His initial laboratory findings were total bilirubin 19.75 mg/dl, direct bilirubin 15.72 mg/dl, AST 65 IU/L, ALT 71 IU/L, alkaline phosphatase 525 U/L, r-GTP 313 U/L and CA19-9

Keywords: Case report; Pyloric gland adenoma; Common bile duct
529 U/ml. Abdominal CT showed mid CBD wall thickening with enlarged portocaval lymph node, diffuse intrahepatic and proximal CBD dilatation and multiple heterogenous low density lesions in right hemiliver. MRI with MRCP showed multiple variable sized T2 high signal intensity masses (the largest 3.6 cm) in the both hemiliver, which showed diffusion restriction and delayed enhancement, and diffuse intrahepatic and proximal CBD dilatation with conglomerated lymph nodes at portocaval space and hepatoduodenal ligament. PTBD was performed, but guidewire could not pass through the mid CBD obstruction site due to the very hardness. And, we could not performed biopsy at the CBD obstruction site because of concomitant hemobilia. So, we performed sono-guided liver biopsy at the intrahepatic masses. Histopathology revealed poorly differentiated carcinoma. The immunohistochemical staining for CD56, synaptophysin and TTF-1 revealed positive reaction. So, we confirmed the diagnosis of neuroendocrine carcinoma, large cell type. Chest CT for excluding metastasis from extrahepatic primary site or distant metastatic involvement showed no mass-like lesion in the both lung fields. He refused any methods of treatment such as chemotherapy or TACE, and wanted only conservative treatment. Therefore, he was discharged after insertion of self-expandable metal stent at the mid CBD obstruction site and then he died 5 months later during the regular follow-up outpatient clinic.

**Keywords:** Primary hepatic neuroendocrine carcinoma; Multiple liver metastases; CBD obstruction

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### PPB-17

**Duodenal Loop Obstruction As an Unusual Cause of Acute Pancreatitis; A Case Series**

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**Contents:** Duodenal loop obstruction is an unusual cause of acute pancreatitis. An increased intraluminal pressure impedes the pancreatic flow, causes dilatation of the pancreatic duct, and induces acute pancreatitis. We experienced three patients with acute pancreatitis developed in the proximal jejunal obstruction following operation; esophagectomy with gastric pull-up procedure for esophageal cancer, gastrectomy with Billroth I reconstruction for gastric cancer, and gastrojejunostomy for abdominal trauma in each patient. Abdominal CT scan revealed distended duodenal loop, dilated pancreatic duct, and pancreas swelling with fluid collection. Acute pancreatitis with small bowel obstruction was diagnosed by abdominal pain, elevation of serum amylase/lipase, and abdominal CT findings. Immediate decompression with nasogastric tube was done and each patient improved on 3rd, 3rd, and 7th days of admission. They followed up for more than 2 years without recurrence. We suggest nasogastric tube decompression for acute pancreatitis related to duodenal loop obstruction due to adhesion as the first treatment.

**Keywords:** Acute pancreatitis; Duodenal loop obstruction; Nasogastric tube

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### PPB-18

**A Case of Relapsed IgG4-related Sclerosing Mesenteritis after Discontinuation of Steroid in Autoimmune Pancreatitis**

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**Contents:** Sclerosing mesenteritis is a rare inflammatory and fibrosing disorder and the etiology is as yet unknown but the association with previous abdominal surgery,
trauma, autoimmune disorder and ischemia has been reported. In Immunoglobulin (Ig) G4-related sclerosing disease, the major manifestation is autoimmune pancreatitis and other common sites of involvement are the bile ducts, liver, gallbladder, lacrimal gland, salivary gland, lymph node, however practically any organ can be involved, including kidneys, retroperitonium, gastrointestinal tract, mesentery, prostate and lungs. But, solitary relapsed IgG4-related sclerosing mesenteritis does rarely occur. This report describes a case of relapse of IgG4-related sclerosing mesenteritis in autoimmune pancreatitis. A 77-year-old man visited our hospital with a chief complaint of hematochezia. He had a history of Whipple’s operation due to bile duct mass on suspicion of malignancy, but, finally he was diagnosed as autoimmune pancreatitis and had been treated with steroid for five years. Because of postoperative adhesions, colonscopy couldn’t be performed appropriately. Abdominal computed tomography demonstrated a soft tissue mass around the mesenteric root with mesenteric lymphadenopathy and superior mesenteric artery occlusion. On the laboratory examination, IgG4 level was 266 mg/dL. Diagnostic laparoscopic mesenteric lymph node biopsy was done and the histological results showed moderate to severe fibrosis with many IgG4 positive plasma cells. These findings are consistent with IgG4-related sclerosing mesenteritis. He was diagnosed with solitary relapsed IgG4-related mesenteritis after discontinuation of steroid in autoimmune pancreatitis. The patient is maintained on low-dose steroid

**Keywords:** Autoimmune disease; Mesentery; Panniculitis; Peritoneal

**PPB-19**

**Cholangiocarcinoma Misconstrued As Sclerosing Cholangitis : Report of a Case**

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**Contents:** It is not difficult to diagnose as cholangiocarcinoma if there is typical image finding in computed tomography (CT) or cholangiogram. However, the tumors may sometimes mimic a variety of non-tumorous lesions. We experienced one case of cholangiocarcinoma presumed sclerosing cholangitis. A 70-year-old male admitted to hospital presenting with abdominal pain. The initial laboratory findings were as follows: aspartate transaminase 73 U/L, alanine transaminase 53 U/L, alkaline phosphatase 400 U/L, gamma glutamyl transpeptidase 1,112 U/L and CA 19-9 506 U/mL, but total bilirubin was 0.9 mg/dL. Abdominal CT and magnetic resonance cholangiopancreatography revealed diffuse wall enhancement along the extrahepatic duct but upstream dilatation was not seen (Figure 1). On endoscopic retrograde cholangiopancreatography (ERCP), there was diffuse luminal narrowing with multifocal strictures from intrahepatic bile duct to distal common bile duct (CBD). On intraductal ultrasound revealed a heterogeneous, hypoechoic circumferential wall thickening in proximal CBD (Figure 2) and biopsy was performed. The histologic findings were consistent with adenocarcinoma. Because of undetermined resection margin, this patient started chemotherapy with gemcitabine and cisplatin rather than surgical treatment.
Keywords: Sclerosing cholangitis, Cholangiocarcinoma

PPB-20

Undifferentiated Carcinoma with Osteoclast-Like Giant Cells of the Pancreas Confusable with Solid Pseudopapillary Tumor

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Contents: Introduction: Undifferentiated carcinoma of the pancreas with osteoclast-like giant cells (UCPOGC) is a rare, highly malignant neoplasm composed of multinucleated giant cells admixed with mononuclear stromal cells. We report a case of UCPOGC misdiagnosed as a solid pseudopapillary tumor of the pancreas (SPT) based on endoscopic ultrasound-guided fine needle aspiration biopsy (EUS-FNAB). Methods We retrospectively reviewed the medical records of a patient diagnosed for the UCPOGC. Case A 58-year-old male was admitted to the hospital with abdominal pain. Abdominal CT (Figure 1a) and T1-weighted MRI (Figure 1b) revealed a low attenuated and heterogeneous mass with internal hemorrhage and necrosis in the body of the pancreas measuring 5x5 cm. The laboratory investigations including CEA and CA19-9 were within normal limits. EUS showed a hypoechoic mass with mixed cystic and solid components in the pancreas (Figure 2a) and FNAB showed vascular architectures with pseudopapillary pattern (Figure 2b), numerous neoplastic cells with sheet-like arrangement, several multinucleated giant cells and hemosiderin-pigments. Immunohistochemical stain revealed that the tumor cells were positive for alpha1-antitrypsin, vimentin, beta-catenin etc. These findings were consistent with SPT with marked degenerative change. A distal pancreatectomy and splenectomy were performed (Figure 2c) and histopathological analysis showed tumor cells consisting of atypical mononuclear cells admixed with abundant osteoclastic giant cells (OGCs) (Figure 2d). The OGCs were positive for CD68 (Figure 2e). Unlike the FNAB findings, the atypical mononuclear cells were positive for cytokeratin (Figure 2f). We finally diagnosed as UCPOGC on histopathologic examination of surgical specimens. Conclusion: An undifferentiated carcinoma with osteoclast-like giant cells of the pancreas can be misconceived as a SPT on EUS and EUS-FNAB.

Fig. 1.

Fig. 2.

Keywords: Pancreas; Undifferentiated carcinoma with osteoclast-like giant cells; Solid pseudopapillary tumor

PPB-21

Lymphoepithelial Cyst of the Pancreas Confirmed by Endoscopic Ultrasound-Fine Needle Aspiration: A Case Report

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Contents: Abstract Lymphoepithelial cyst (LEC) in the pancreas is a rare benign lesion. Most LECs reported were treated with surgical resection because of difficulty in preoperative diagnosis. We report a case of LEC of the pancreas in a 66-year-old woman, who was asymptomatic and detected incidentally. Abdominal US scan revealed mass like lesion at pancreas body, which was not seen by abdominal CT scan. Abdominal MRI showed slightly enhanced lesion by T2 image. Endoscopic ultrasonography (EUS) revealed two hypoechoic round masses, 2.0cm in pancreas body and 4.5cm in pancreas tail. Fine needle aspira-
tion (FNA) showed squamous cells, amorphous keratinous debris, and lymphocytes. LES of pancreas was diagnosed and follow up without progression. EUS-FNA is helpful in making a diagnosis and avoiding unnecessary surgery.

**Keywords:** Lymphoepithelial cyst; Atypical; Pancreas; EUS; FNA

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**PPB-22**

**A Case of Gastric Heterotopic Pancreatitis Clinically Diagnosed without Surgical Resection**

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**Contents:** Heterotopic pancreas is a rare condition which is defined as the presence of pancreatic tissue without anatomical and vascular continuity with the pancreas. Stomach is one of the most commonly involved site, but usually asymptomatic. Therefore in many cases, heterotopic pancreas is incidentally diagnosed by resection of the lesion by histopathological analysis. Here we report an unusual case of gastric heterotopic pancreatitis causing epigastric pain and mimicking abscess formation at gastric antrum diagnosed preoperatively using endoscopic ultrasonography and serological markers. A 46-year-old mad visited emergency department due to one-day history of epigastric pain with fever. His hematologic suggested systemic inflammation with mild elevation of lipase level. Initial CT scan showed thickening of gastric wall at gastric antrum without any lesion of pancreatic parenchyma, and subsequent gastroduodenoscopy, endoscopic ultrasound (EUS), and stomach MRI were done. Marked gastric wall thickening with heterogenous echogenicity, irregularity of gastric wall and multiple cystic small abscesses mostly confined in serosa were reported from those studies. Therefore, we presumed gastric microabscesses and started treatment with intravenous hydration and antibiotics. After initiation of the treatment, serum amylase and lipase level went up to the peak level, but decreased by continuing treatment. So we diagnosed gastric heterotopic pancreatitis. He was discharged with better well-being sensation and decreased serum amylase and lipase level. In outpatient’s office, follow-up endoscopy, EUS and blood tests were done and showed improvements. As heterotopic pancreas may conceal malignancies, surgical resection should be done at the end. However in our case, the lesion is relatively large so the resection might be too invasive for the patient. Therefore, we are planning to continue treatment for pancreatitis to minimalize the lesion small enough for minimal-invasive procedure.

**Keywords:** Heterotopic pancreatitis

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**PPB-23**

**Complications in Remnant Intrapancreatic Choledochal Cysts Presented with Pancreatitis and Choledocholitiasis**

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**Contents:** Several forms of complications including choledocholithiasis and pancreatitis seem to be common after incomplete resection of a Choledochal cysts when the cystic lesion extends deeply into the pancreas with remnant intrapancreatic Choledochal cysts. A 34-year-old woman who underwent cyst excision three years ago presented to us with pancreatitis. Computed Tomography revealed tiny stone inside remnant cyst in pancreas. After removing the stone through the endoscopic retrograde cholangiopanreatography (ERCP), symptoms and blood chemical test have improved. A 21-year-old woman who had a history of excision for choledochal cyst in the age of 1 month, came to us with epigastric pain. CT scan showed stone inside remnant cyst in pancreas. After removing the stone through the ERCP, symptom have improved.

We report two cases of complications in remnant intra-pancreatic choledochal cyst lead to pancreatitis.
pancreatic choledochal cysts and literature review.

**Keywords:** Remnant intrapancreatic Choledochal cysts

**PPB-24**

A Case of Rendezvous Technique for Intrahepatic Biloma after Living-Donor Liver Transplantation

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**Contents:** Combined endoscopic and transhepatic drainage that includes an intraduodenal ‘rendezvous’ technique frequently is used for the management of common bile duct obstructions, but not for biloma. We report a case of intrahepatic biloma in a patient after living donor liver transplantation, treated with a combined percutaneous radiologic and endoscopic approach (rendezvous technique). A 56-year-old man underwent living donor liver transplantation for hepatocellular carcinoma. 19 days after the operation, he complained of abdominal pain, and computed tomography showed a 10-cm intrahepatic biloma compressing the common bile duct (CBD). Percutaneous transhepatic drainage (PTBD) catheter was replaced for 2 months in biloma. Two weeks after the removal of pigtail catheter, he presented with jaundice and elevated serum bilirubin level of 23.01 mg/dL. We excluded acute rejection by liver biopsy. Ultrasound examination revealed biliary anastomotic stricture with recurrent biloma. An attempt to bypass the biloma by PTBD failed because the exit of the biloma could not be probed. A pigtail catheter was placed to drain the biloma externally. But jaundice got worse (Total bilirubin 29.7 mg/dL), a combined radiologic and endoscopic technique (rendezvous technique) was performed. The biloma was successfully probed by endoscopic retrograde cholangiography with a guide wire, which was caught and extracted with a snare via the PTBD access to achieve a pathway through the biloma. Two weeks after the procedure, the patient discharged in good condition with total bilirubin level of 7.64 mg/dL. 10 months later, follow up CT showed complete regression of biloma. This combined approach seems to be feasible procedure for complex patients with biliary complication after liver transplantation.

**Keywords:** Biliary stricture; Liver transplantation; Endoscopic retrograde cholangiography; Percutaneous transhepatic biliary drainage

**PPB-25**

Acute Cholangitis As the Presenting Manifestation of Hepatocellular Carcinoma in a 75-year-old Man

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**Contents:** A 75-year-old man presented with one day of epigastic pain and fever. Twenty years earlier, he had undergone a cholecystectomy for cholelithiasis. Laboratory
studies showed hyperbilirubinemia (11.1 mg/dl), hypertransaminasemia (AST: 190 U/L; ALT: 103 U/L), and elevated alpha-fetoprotein level: 23,460 ng/ml. Dynamic CT of liver revealed several hepatic tumors with typical signs of hepatocellular carcinoma (HCC) and dilated biliary tracts. Choledocholithiasis with acute cholangitis was suspected and ERCP was performed. Endoscopically, a bulging ampulla was seen (Fig. 1A). The cholangiography showed common bile duct (CBD) and intrahepatic ducts dilation with one nodular filling defect (Fig. 1B). Endoscopic sphincterotomy was performed, and a soft, non-lithiasic material was obtained from the biliary tract (Fig. 2A). The lesion was tumor thrombus and a confirmation of HCC was obtained with the histopathological examination of the lesion (Fig. 2B). Thereafter, successful endoscopic biliary stenting to facilitate biliary drainage was done. HCC presenting as bile duct tumor thrombi-related cholangitis is rare, but can be diagnosed with ERCP and tumor thrombi extraction, this not only confirms the diagnosis by obtaining tissue but establishes biliary drainage and relief of cholestasis.

Keywords: Hepatocellular carcinoma; Obstructive jaundice; Bile duct thrombus

PPB-26

Lung Cancer Recurrence with Solitary Pancreatic Metastasis Mimicking Primary Pancreatic Cancer: Report of a Case

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Contents: Solitary metastasis to the pancreas is rare in lung cancer with histologic type of adenocarcinoma. However, it is important to recognize pancreatic metastasis because the therapeutic plan is very different depending on whether it is primary pancreatic cancer or not. We experienced one case of lung cancer with recurrence of solitary pancreatic metastasis. A 54-year-old male admitted to hospital due to mass in pancreas body on chest computed tomography (CT) (Figure 1). He had received left pneumonectomy (T2N2M0, stage IIIA) 3 years ago and completed adjuvant chemotherapy with paclitaxel and cisplatin. The initial laboratory findings were unremarkable including carbohydrate antigen (CA 19-9, 6 U/mL) and carcinoembryonic antigen (CEA, 1.63 ng/mL). There was no abnormality except hypermetabolic mass lesion in pancreas body on positron emission tomography (PET CT) (Figure 2A). Endoscopic ultrasound with fine needle aspiration (EUS-FNA) was performed subsequently (Figure 2B) and the histologic finding was consistent with adenocarcinoma. Surgical resection (distal pancreatectomy) was performed and confirmed adenocarcinoma with metastasis from lung.

Fig. 1.

Fig. 2A and Fig. 2B.

Keywords: Metastasis; Pancreatic cancer; Lung cancer
POT-01

The Role of Endoscopic Ultrasound in a Tertiary Hospital: Past and Present

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Background / aims: Endoscopic Ultrasound (EUS) is an emerging diagnostic modality for the GI tract. The aim of this study is to determine the demographic profile, common indications, findings and diagnosis of patients who underwent endoscopic ultrasound. Also, another aim of this study is to compare the profile, usual indications and diagnosis of patients who underwent EUS before 2013 and from September 2015 to present.

Methods: This is a retrospective cross-sectional study which included all adult patients who underwent endoscopic ultrasound at the University of Santo Tomas Hospital from January 1, 2008 up to February 22, 2016. Patients were analyzed by age and gender, indications, EUS findings, interventions done and final diagnosis. Data were encoded using MS Excel and data analysis done using SPSS.

Results: Among 482 patients who underwent EUS, mean age was 57 with almost equal ratio for males (49.8%) and females (50.2%). Majority of patients had a CT scan (34%) done prior to procedure. Most patients were given sedation with Propofol (36.7%). Majority of patients (68.3%) had an upper EUS. The most common indication was to do further studies for rectal masses (23.9). The most common diagnosis was rectal malignancy (20.5). The difference among the past and present groups was found to be statistically significant with the type of sedation (increase in Propofol use) and type of endoscopy (increase in upper EUS) with p value

Conclusions: Endoscopic ultrasound has emerged into a highly effective tool in diagnosing and treating gastrointestinal diseases. Being a relatively underutilized tool in our country, there is a need to continue striving for increased utilization to maximize its benefit to our patients.

Keywords: Retrospective; Endoscopic ultrasound; EUS

POT-02

The Efficacy of Differential Diagnosis between Neoplastic and Non-neoplastic Gallbladder Polyp on Color-flow Doppler EUS

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Background / aims: Endoscopic ultrasonography (EUS) is useful imaging modality for identifying gallbladder (GB) polyps, however, the differential diagnosis between non-neoplastic polyps and neoplastic polyps of the gallbladder is limited. We evaluated the usefulness of color-flow doppler EUS (CFD-EUS) for differentiating neoplastic GB polyps from non-neoplastic polyps.

Methods: Between August 2014 and February 2016, a total of 172 patients with GB polyps who underwent CFD-EUS were consecutively enrolled in this prospective study.

Results: Of the 172 patients, 83 patients underwent surgical resection. Of these, there were 66 (79.5%) cases of non-neoplastic GB polyps and 17 cases (20.5%) of neoplastic GB polyps. The remaining 2 patients were not diagnosed with GB polyps (submucosal hyalinization and gastric heterotopia). The overall diagnostic accuracy of EUS for neoplastic polyps was 75.9%. In a multivariate analysis, color-flow imaging (CFI) was the significant predictive factor for neoplastic polyps (odds ratio [OR] 8.65, 95% CI, 1.48-50.44, p=0.017); the sensitivity, specificity, positive predictive value, and negative predictive value were 88.2%, 40.9%, 27.8%, and 93.1%, respectively. In addition, solitary polyp had an increased risk of neoplasm (OR 10.02, 95% CI, 2.28-43.96, p=0.002), as did those with polyps ≥ 15 mm (OR 6.60, 95% CI, 1.52-28.62, p=0.012).

Conclusions: The presence of CFI, solitary, polyps with diameters ≥ 15 mm on EUS could be predictive factor for neoplastic GB polyps. In view of no danger to the patient and no requirement for additional equipment, we regard that CFD-EUS is likely to become supplemental tool for differential diagnosis of GB polyps (CRIS: KCT0001373).

Keywords: Endoscopic ultrasonography; Color-flow doppler; Gallbladder polyp; Neoplasm
POT-03

Comparison of Diagnostic Accuracy between Base and Cover Slide of EUS-FNA Cytology for Pancreatic Cancer: Final Analysis

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Background / aims: Endoscopic ultrasound guided fine needle aspiration (EUS-FNA) has played an important role in diagnosing pancreatic cancer. The aim of this prospective single blind study is to compare the diagnostic accuracy between base and cover slides to lower the loading of cytopathologists.

Methods: The target population was 73 patients with suspicious pancreatic cancer in previous imaging studies. One endoscopist performs EUS-FNA and gets total 8 pairs of slides (8 covers + 8 bases). The cover and base slide sets are randomly assigned to two bottles. A pancreas-special pathologist blindly inspects these slides. We collect the cytopathologic results as a pair of outcome with 4 types of combination; (cover/base) = (+/+), (+/-), (-/+), (-/-).

Results: A total of 73 patients’ results were acquired for the final analysis. The target sites were 42 (58%) of head, 16 (22%) of body and 15 (20%) of tail, respectively. Transduodenal access was used in 37 (51%) patients. Among enrolled 73 patients, 71 (97%) patients were finally diagnosed with pancreatic cancer. The positive results of cytologic smear, cell block and biopsy were 60 (83%), 32 (44%) and 63 (86%), respectively. Both base and cover needed five slides to diagnose malignancy. Cytologic smear and biopsy showed higher sensitivity than cell block (p<0.001). Using McNemar test, the chi-square value was 0.14 (p=0.705) and relative difference between cover and base slide was -0.018 (95% CI: -0.073, 0.107), which means high consistency and no superiority between two slide sets.

Conclusions: Without an on-site cytopathologist, 93% of suspicious pancreatic cancer patients were finally diagnosed with pancreatic cancer on EUS-FNA. In cytologic smear of EUS-FNA, cover and base slide showed high consistency in diagnosing malignant results. The present study implicates that only one side of cover or base slides are enough to diagnose the pancreatic cancer.

Keywords: EUS-FNA; Cover slide; Base slide; Cytology

POT-04

Is Procore Needle Superior to Standard Needle in Diagnosing Pancreatic Cancer via EUS-guided Fine Needle Aspiration

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Department of Internal Medicine and Liver Research Institute, Seoul National University College of Medicine, Seoul, Korea

Background / aims: ProCore needle was designed to obtain core tissue under endoscopic ultrasound guidance. However, there are conflicting results reported from previous studies, which have variable conclusions in the superiority of ProCore needle over standard fine needles. This retrospective study aimed to compare the technical and diagnostic yield of ProCore needle with the Standard fine needle in diagnosing pancreatic cancer.

Methods: We reviewed all patients diagnosed pancreatic cancer from January 2015 to December 2015 which performed EUS-guided needle aspiration. Only cases which used 22-guage needle were included, and record of the needle, attempt of obtaining histologic sample, diagnostic yield of histology, overall diagnostic yield were obtained. Chi-square test was done to find out the difference of diagnostic yields

Results: A total of 181 patients were included in the study. Procore needle was used in 44 patients and standard needle in 137 patients. The overall diagnostic yield was 97.7% in ProCore group and 89.1% in standard needle group. (p=0.066) 20 patients in Procore group and 80 patients in standard needle group had an attempt to obtain histologic sample. The technical success rate of obtaining diagnostic histological sample was 90% in ProCore group and 82.5% in standard needle group. (p=0.405) And the overall diagnostic yield was 95.0% and 88.8% (p=0.405) in the ‘attempt of obtaining histologic sample’ subgroup.
Conclusions: ProCore needle has a tendency of higher diagnostic yield and higher possibility in obtaining histologic sample, but there was no statistically significant difference.

Keywords: ProCore; Pancreatic cancer; EUS; EUS-FNA

POT-05

Condom Method Endoscopic Ultrasonography Is Effective and Safe to Evaluate Esophageal Mass Lesions

Soo Yeon Jo, Jung Hwa Min, Jeong Seop Moon, You Sun Kim, Soo Hyung Ryu and Won Jae Yoon
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Background / aims: Endoscopic ultrasonography (EUS) is widely used to evaluate gastrointestinal mass lesions. Particularly in esophageal mass lesions, EUS is the method of choice to evaluate the origin and depth of invasion of the tumor. To overcome the disadvantages as aspiration and balloon rupture due to water filling and balloon, we used condom method EUS for esophageal tumor evaluation.

Methods: We investigated retrospectively twenty six patients examined by condom method EUS using high frequency ultrasound probes after diagnosed as esophageal mass lesion including submucosal tumor by standard endoscopy between January 2007 and April 2015 in Inje University Seoul Paik Hospital. We checked the originating layer, invasion depth and echogenicity of the tumor, and events complicated by procedure. If needed, we confirmed the histopathology by biopsy.

Results: Condom method EUS provided high quality images of well-defined five layers of esophagus through 360 degrees without aeration. In all segments of esophagus; upper, middle, lower esophagus (n=5, 10, 11) showed high resolution images without difference. Diagnosis were squamous cell cancer (n=4), leiomyoma (n=5), squamous intraepithelial neoplasia (n=2), acanthosis (n=2), inflammatory fibrinoid polyp (n=1) and extrinsic compression (n=1). Tumors were originated from mucosa (n=5), muscularis mucosa (n=10), submucosa (n=3), mucosa invading into submucosa (n=4), muscle propria (n=3). Size was divided into < 5.0 mm (n=4), 5.1-10 mm (n=13) and > 10 mm (n=8). No complications had occurred in all cases, aspiration from water filled EUS and balloon rupture from balloon EUS.

Conclusions: Condom method EUS is already known as a safe image diagnostic tool of high resolution. Simply to apply inexpensive latex condom filled with water can provide good EUS visual field and images of the esophageal mass lesions along the whole esophagus without aspiration risk. Later, by comparing other EUS tools with condom method, we can verify the effectiveness and safety more exactly.

Keywords: Condom method; Endoscopic ultrasonography; Esophageal mass

POT-06

Accuracy of Endoscopic Ultrasonography for Ulcerative Early Gastric Cancers

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Department of Internal Medicine, Inha University Hospital, Incheon, Korea

Background / aims: This study aimed to compare the diagnostic accuracy of endoscopic ultrasonography (EUS) and conventional endoscopy for predicting of tumor invasion in ulcerative early gastric cancer (EGC). In addition, we attempted to figure out the various clinic-pathologic factors affecting the diagnostic accuracy of EUS.

Methods: Medical records of consecutive 236 cases of ulcerative EGC who had received EUS for staging the depth of tumor invasion were retrospectively reviewed. The diagnostic accuracy of EUS and conventional endoscopy was compared. The correlation between accuracy of EUS and characteristics of EGC were analyzed. The shapes of ulcer were classified as definite ulcer, superficial ulcer, and ill-defined ulcer group.

Results: The overall accuracy of EUS and conventional endoscopy for the depth of tumor invasion in ulcerative EGC was 68.6% and 55.5%, relatively. The accuracy of EUS was related with tumor size (p=0.034), depth of invasion (p=0.023), and the type of endoscopic ulcerative lesions (p=0.001). In multivariate analysis, Superficial
ulcer (OR, 2.977; 95%CI, 1.255-7.064; P value, 0.013) was the significant independent factors in increasing the accuracy of EUS.

**Conclusions:** The accuracy of EUS in the ulcerative EGCs was superior than conventional endoscopy. The shape of ulcer was an important factor affecting the accuracy of EUS. In particular, the EUS accuracy in superficial ulcer was significantly increased.

**Keywords:** Endoscopic ultrasonography; Ulcerative early gastric cancers

**POT-07**

Associated Factors of Accuracy of EUS in EGC Difficult to Determination of Depth of Invasion by Conventional Endoscopy

Soon Young Kim, Yang Won Min, Hyuk Lee, Byung-Hoon Min, Jun Haeng Lee, Poong-Lyul Rhee and Jae J. Kim
Gastroenterology, Samsung Medical Center, Seoul, Korea

**Background / aims:** We evaluated the accuracy of EUS in EGC which difficult to determine depth of invasion by conventional endoscopy.

**Methods:** We retrospectively included 98 EGCs underwent EUS and ESD from Jan.2011 to Dec. EUS was performed using Miniprobe, results were compared with pathology.

**Results:** Overall accuracy was 66.3%. 36 of total 98 lesions were performed by trainee, their accuracy was 55.6%. Accuracy of experts was 72.6%, but there was no statistical significance (p=0.241). Size, location, Lauren classification, endoscopic morphology, histologic differentiation did not affect accuracy. Only the lesion classification according to ESD indication had effect to accuracy. Total accuracy of conventional indication was 82.4%, it was similar with experts and trainee. Total of expanded indication (EI) was 48.3%, which was 57.9% in experts, and 30.0% in trainee. Total of beyond expanded criteria (BEC) was 18.4 %, which was 14.5% in experts, and 25 % in trainee. Between EI and BEC, there was no significant difference in siz (p=0.627), but depth of invasion was significantly deeper in beyond expanded criteria (<0.001).

**Conclusions:** Lesion classification according to ESD indication is the factor affect accuracy of EUS at decision of whether submucosa invasion. Minute submucosal invasion was mainly misread especially in trainee.

**Keywords:** Endoscopic ultrasound; Early gastric cancer; Accuracy; Endoscopic submucosal dissection

**POT-08**

EUS-CPN for Pancreatic Cancer: A Clinical Survey in a Multiracial Asian Population in Malaysia

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**Background / aims:** Pancreatic cancer incidence is increasing worldwide. The symptoms of the disease are vague and appears usually in advanced stage. Pain is present in as many as 70-80% of patients at the time of diagnosis after considerable tumour growth and metastatic spread. Pain is the predominant symptom in pancreatic Ca where the lesion is mainly in body or tail of pancreas. EUS-Coeliac plexus Neurolysis (EUS-CPN) is a well establish technique for controlling pain and reduce the requirement of narcotics in pancreatic cancer. The aim is to determine the effectiveness of EUS-CPN in our local population.

**Methods:** Data of pancreatic cancer patients whom were referred for EUS-CPN to our endoscopy unit from 2014-2015 were reviewed retrospectively. They are histologically confirmed pancreatic ca patients. EUS-CPN was done in all patients who has pain despite on narcotics.

**Results:** 10 patients undergone EUS-CPN in our stud-
pain relief was achieved in 8 out of 10 patients. All our patients received centrally injected CPN. No documented complications noted in all our patients.

### Table 1.

<table>
<thead>
<tr>
<th>Patient</th>
<th>Age (y)</th>
<th>Gender</th>
<th>Laterality</th>
<th>Invasion</th>
<th>Pain relief</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>50</td>
<td>M</td>
<td>Right</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>2</td>
<td>60</td>
<td>M</td>
<td>Left</td>
<td>No</td>
<td>No</td>
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<tr>
<td>3</td>
<td>70</td>
<td>F</td>
<td>Right</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>4</td>
<td>45</td>
<td>M</td>
<td>Left</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>5</td>
<td>55</td>
<td>F</td>
<td>Right</td>
<td>No</td>
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<tr>
<td>6</td>
<td>65</td>
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<td>No</td>
</tr>
<tr>
<td>7</td>
<td>75</td>
<td>F</td>
<td>Right</td>
<td>No</td>
<td>Yes</td>
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<tr>
<td>8</td>
<td>40</td>
<td>M</td>
<td>Left</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>9</td>
<td>50</td>
<td>F</td>
<td>Right</td>
<td>No</td>
<td>No</td>
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<tr>
<td>10</td>
<td>60</td>
<td>M</td>
<td>Left</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

**HOP**: Head Of pancreas; **BOP**: Body of pancreas; **#**: Pain relief is considered yes if there is a reduction of more than 50% of initial pain.

**Conclusions**: EUS-CPN is an effective endoscopic procedure to relieve pain or to reduce the need for further pain-killers in Advanced Ca pancreas. It is a relatively safe procedure.

**Keywords**: EUS-CPN; Pancreatic cancer; Safe; Effective in pain relief

### POT-09

**EUS-guided Choledochoduodenostomy Versus Rendezvous Technique for Inoperable Malignant Distal Biliary Obstruction.**

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Division of Gastroenterology and Hepatology, Chulalongkorn University and King Chulalongkorn Memorial Hospital, Thai Red Cross, Bangkok, Thailand

**Background / aims**: We aimed to compare the efficacy and long-term outcomes of EUS-guided choledocho-duodenostomy (EUS-CDS) vs. rendezvous technique combining endoscopy with percutaneous transhepatic cholangiography (RV-EPC) in patients with inoperable malignant distal biliary obstruction after failed ERCP.

**Methods**: We conducted a retrospective study of 30 patients who had failed ERCP (18 EUS-CDS and 12 RV-EPC) between 2009-2016. Patients’ characteristics and outcomes of both groups were compared.

**Results**: Baseline characteristics were similar between the 2 groups, except the presence of duodenal invasion (Table 1). Technical success rate was likely to be lower in the EUS-CDS group, but did not reach statistical significance, resulting in lower clinical success with borderline significance (Table 2). Although EUS-CDS was unsuccessful in the 3 initial cases due to inability to place the stent, the procedure was successful in all subsequent patients. Adverse events and length of stay were not different between groups.

**Table 1.** Baseline characteristic of patients with inoperable malignant distal biliary obstruction who underwent EUS-CDS and RV-EPC after failed ERCP.

<table>
<thead>
<tr>
<th>Baseline characteristics</th>
<th>EUS-CDS (n=18)</th>
<th>RV-EPC (n=12)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, mean (SD), y</td>
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<td></td>
<td></td>
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<tr>
<td>Male, n (%)</td>
<td>M/F</td>
<td></td>
<td></td>
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<tr>
<td>Diagnosis, n (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pancreatic cancer</td>
<td></td>
<td></td>
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<tr>
<td>Ampullary cancer</td>
<td></td>
<td></td>
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<tr>
<td>Metastatic cancer</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Duodenal cancer</td>
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<td></td>
<td></td>
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<tr>
<td>Cholangiocarcinoma</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Total bilirubin, mean (SD), mg/dl</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Common bile duct diameter, mean (SD), mm</td>
<td></td>
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<tr>
<td>Ductal invasion, n (%)</td>
<td></td>
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<tr>
<td>Proximal to and no involvement of the ampulla of Vater</td>
<td></td>
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<tr>
<td>Affecting the second part of the duodenum and the ampulla of Vater</td>
<td></td>
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</tr>
<tr>
<td>Chemotherapy, n (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fever</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Septicemia</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Bile leak and peritonitis</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Intraperitoneal bleeding</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Retropertitoneal abscess</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>SAA/pancreatitis</td>
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<td></td>
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<tr>
<td>Time to follow-up, mean (SD/months)</td>
<td></td>
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</tbody>
</table>

**Table 2.** Clinical outcomes of patients with inoperable malignant distal biliary obstruction who underwent EUS-CDS and RV-EPC after failed ERCP.

Conclusions: Efficacy and safety of EUS-CDS and RV-EPC are comparable in patients with inoperable ma-
lignant distal biliary obstruction after failed ERCP. In EUS-CDS cases, technical success and morbidity seem poor during the first few cases due to learning curve effect. Stent malfunctions are uncommon during follow-up.

**Keywords:** Eus-guided choledochoduodenostomy; Rendezvous technique; Malignant distal biliary Obstruction

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**POT-10**

**Mild Acute Pancreatitis As the Presenting Manifestation of an Ampullary Neoplasm in a 76-year-old Patient**

**Jung-Chun Lin**, **Mei-Ju Lai**, **De-Chuan Chan**, **Peng-Jen Chen**, **Wei-Kuo Chang** and **Tsai-Yuan Hsieh**

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**Contents:** We report a case of a man with adenocarcinoma of the ampulla of Vater presenting as mild acute pancreatitis. The patient presented with an acute onset of upper abdominal pain and nausea after dinner, without fever, chills or rigors. Laboratory results demonstrated leukocytosis without left shift, creatinine of 2.1 mg/dL, amylase of 445 U/L, and lipase of 4,928 U/L. CT of the abdomen did not show pancreatic enlargement and diffuse stranding of the peri-pancreatic fat. Endoscopic retrograde cholangiopancreatography revealed an ampullary lesion (Figure 1A) and dilated common bile duct (CBD) and intrahepatic ducts. Pathology of the ampullary lesion revealed adenocarcinoma with well differentiation (Figure 1B). Endoscopic ultrasound (EUS) and intraductal ultrasound (IDUS) revealed a 19.6 mm iso-echoic ampullary lesion with intraductal extension into the pancreatic duct (PD) and CBD without vascular involvement and muscularis invasion (Figure 2). Combined EUS and IDUS features allow to demonstrate the extension into the PD and CBD in ampullary adenocarcinoma.

**Keywords:** Ampulla of Vater; Cholangio-pancreatography; Endoscopic ultrasound; Intraductal ultrasonography; Periampullary tumors

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**POT-11**

**EUS-guided Transjejunal Method for Strictures of Pancreateojejunostomy and Choledochojejunostomy after Pancreatoduodenectomy**

**Shinya Kawaguchi**, **Masataka Kikuyama**, **Naofumi Shirane** and **Kohei Enokida**

Gastroenterology, Shizuoka General Hospital, Shizuoka, Shizuoka, Japan

**Background / aims:** Strictures of pancreateojejunal anastomosis (PJA) and choledochojejunal anastomosis (CJA) are troublesome complications of pancreatoduodenectomy (PD). The optimal treatment of these disorders is to dilate the stricture anastomosis. However, in patients with highly strictured or occluded anastomosis, the treatment is difficult to accomplish.

**Methods:** We have encountered 2 patients with these disorders. One patient of them had highly strictured PJA with pancreatic fistula, and another patient suffered from jaundice due to occluded CJA. To treat pancreatic fistula and obstructive jaundice, we intended to reroute the pancreatic juice flow and the bile flow to the anasto-
mosed jejunum, respectively.

Results: A convex type EUS probe (GF UCT-260; Olympus, Tokyo, Japan) was introduced to the anastomotic site through the afferent loop of the jejunum using a fluoroscope. The main dilated pancreatic duct and the common bile duct were identified using EUS near the anastomosis, and the each duct was subsequently puncture from the jejunum by a 19-gauge needle (Echotip; Cook Medical, Indiana, USA, Sono Tip; Medi-Globe, Achenmuhle, Germany), under EUS guidance. After dilating the puncture route, a tapered 5Fr plastic tube stent of our own making and a fully covered metal stent (FCSEMS) (10x50 mm Bonastent: Standard Sci-Tech, Soul, Korea) was placed through the dilated puncture route to reroute the pancreatic juice flow and the bile flow to the anastomosed jejunum, respectively.

Conclusions: EUS-guided trans-jejunal method to reroute pancreatic juice flow and bile flow to the anastomosed jejunum is a novel treatment for highly strictured or occluded PJA or CJA after PD.

Keywords: Pancreatojejunostomy; Choledochojejunostomy; Pancreatodeodenectomy; Obstructive jaundice; Pancraetic fistula

POT-12

Simple and Safe Forcep Strip Technique for Gastric Submucosal Tumors Originating from Muscularis Propria Layer

In Kyung Yoo, Hoon Jai Chun, Jung Min Lee, Byeong Kwang Choi, Sang Yup Lee, Seung Han Kim, Jae Min Lee, Hyuk Soon Choi, Eun Sun Kim, Bora Keum, Yoon Tae Jeen, Hong Sik Lee and Chang Duck Kim
Department of Internal Medicine, Korea University College of Medicine, Seoul, Korea

Background / aims: Resection of submucosal tumors by means of endoscopy has been reported using a variety of techniques. However, lesions originating from the muscularis propria layer are unlikely to be resected completely and safely. Here, we report the first series describing the new technique of endoscopic resection for submucosal tumors of the stomach using the simple and safe forcep strip technique.

Methods: Endoscopic submucosal tumor resection using hot biopsy forcep was attempted in ten consecutive patients in clinical indications for lesion removal. Following injection around the submucosal tumor, the adjacent mucosa or submucosa was grasped with the forceps and pulled away forming a “tent”. Electrocoagulating current was applied for dissection of tissue. For repeating described process, the tumor was dissected from the muscularis propria layer and then carefully removed using forcep.

Results: All of the ten patients that underwent Forcep Strip Technique for the gastric submucosal tumors were successful, with the complete resection rate of 100%. There was no major bleeding and the procedure time was reduced compared to the conventional methods. No complications occurred and follow-up was unremarkable. It is possible to resect submucosal tumor any part of the stomach (fundus, cardia, body). On histology, all tumors were resected completely (eight gastrointestinal stromal tumor, two leiomyomas).

Conclusions: Forcep Strip Method appears to be an easy, safe, and effective procedure for treatment of gastric submucosal tumor originating from the muscularis propria layer.

Keywords: Gastric submucosal tumor; Forcep; Muscularis propria layer

POT-13

Single Balloon Endoscopy for the Diagnosis of Small Intestinal Diseases: Preliminary Results

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Department of Gastroenterology, Military Central Hospital, Hanoi, Vietnam

Background / aims: Single balloon enteroscopy is an alternative technique to double balloon enteroscopy that is quite new in Vietnam. Aim of the study was to investigate preliminary results of endoscopy findings of patients underwent single balloon enteroscopy since we applied this technique.

Methods: A retrospective study was done on 24 patients
underwent single balloon enteroscopy at a single institution, from January 2015 to March 2016.

**Results:** The most common indications for small bowel endoscopy were gastrointestinal bleeding (41.7%) and abdominal pain (37.5%). Some pathology findings were found as Crohn’s disease (16.6%), small intestinal ulcer (16.6%), small intestinal polyp and tumor (12.5%), eosinophilic enteritis (8.3%), and strongyloidiasis (8.3%), enteric tuberculosis (4.2%). In 20.8% of patients, etiology could not be found. Of note, 2 cases were identified the source of bleeding as duodenal ulcer which was previously overlooked by gastroscopy

**Conclusions:** Enteroscopy is very powerful tools in the investigation of small intestinal diseases.

**Keywords:** Single balloon Enteroscopy

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**POT-14**

**Standard Endoscopy vs Magnifying Narrow-band Imaging Endoscopy for Prediction of *Helicobacter pylori*-infected Stomach**

Min Young Baek and Jun-Hyung Cho  
Digestive Disease Center, Soonchunhyang University Hospital, Seoul, Korea

**Background / aims:** Compared to magnifying narrow-band imaging (NBI) endoscopy, we aimed to evaluate the diagnostic efficacies of non-magnifying standard endoscopy for predicting *H. pylori* infection status.

**Methods:** A total of 170 participants were prospectively enrolled in our hospital. Using non-magnifying standard endoscopy, we established the endoscopic classification of *H. pylori*-infected stomach: mosaic-like appearance (type A), diffuse homogenous redness (type B), and untypical pattern (type C; irregular redness with groove). By magnifying NBI endoscopy, *H. pylori*-infected mucosal patterns were divided into regular round pits with polygonal sulci (type Z-1), more dilated and linear pits without sulci (type Z-2), and loss of gastric pits with irregular arrangement of coiled vessels (type Z-3).

**Results:** Between standard and magnifying NBI endoscopy, there were no significant differences of predicting *H. pylori*-infected stomach (sensitivity, 88.4% vs 93.0%, \( p=0.125 \); specificity, 95.2% vs 95.2%, \( p=1.000 \); positive predictive value, 95.0% vs 95.2%, \( p=1.000 \); negative predictive value, 88.9% vs 93.0%, \( p=0.340 \); accuracy, 91.8% vs 94.1%, \( p=0.397 \)).

**Conclusions:** Standard endoscopy demonstrated non-inferiority of diagnostic efficacies predicting *H. pylori* infection status in comparison with magnifying NBI endoscopy.

**Keywords:** Magnifying; Narrow-band imaging; *Helicobacter pylori*

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**POT-15**

**3-Dimensional Stomach Volume Estimation with CT Gastrography for Endoscopic Bariatric Treatment**

Seung Han Kim, Bora Keum, In Kyung Yoo, Jae Min Lee, Hyuk Soon Choi, Eun Sun Kim, Yoon Tae Jeen, Hong Sik Lee, Hoon Jai Chun and Chang Duck Kim  
Internal Medicine, Korea University College of Medicine, Seoul, Korea

**Background / aims:** Endoscopic bariatric treatment may provide a minimal invasive alternative for surgical procedures in the treatment of obesity. Because several endoscopic treatments for obesity employs volume restriction mechanism, it is important to define anatomic factors of stomach in the obese patients for endoscopic bariatric treatment. But, there is no objective tool which could assess the structural component of the stomach and few literatures regarding proper measurement of the stomach in patients with obesity. The aim of study was objective estimation of individual stomach.

**Methods:** 93 patients with different degrees of obesity were compared using 3-dimensional CT gastrography.
Measurements included total volume of distended stomach, abdominal diameter and abdominal fat volume (visceral fat and subcutaneous fat). Patients’ baseline characteristics and laboratory findings were collected. We performed statistical analysis.

**Results:** Stomach volume measured by 3-dimensional CT gastrography ranged from 268 to 751 ml. In obese patients, stomach capacity was increased than non-obese patients. It presented 572 ± 301.60 ml in patients with BMI ≥25 kg/m², 438.56 ± 163.43 ml in patients with BMI <25 kg/m². Increased values of visceral fat volume, abdominal circumference, and visceral/subcutaneous fat ratio were shown to be associated with increased stomach volume.

**Conclusions:** In this study, we have demonstrated that stomach volume was associated the degree of obesity. Objective estimation of individual stomach may offer proper therapeutic approach to the obese patients who need less invasive and more effective bariatric treatment.

**Keywords:** Endoscopic bariatric treatment; 3-Dimensional CT Gastrography

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**POT-16**

**The Development of Novel Endoscopic Device Using Curved Needle for Full Thickness Suture: Ex Vivo Animal Study**

Sang Yup Lee1, Hyuk Soon Choi1, Hoon Jai Chun1, In Kyung Yoo1, Jae Min Lee1, Seung Han Kim1, Eun Sun Kim1, Bora Keum1, Yoon Tae Jeen1, Hong Sik Lee2, Chang Duck Kim2, Byeong Kwang Choi2, Jung Min Lee2, Seilhoon Park2, Byunggon Kim2, Yoonjin Kim2, Youngnam Song2 and Daehie Hon2

1Division of Gastroenterology and Hepatology, Korea University College of Medicine, Seoul, Korea 2Division of Mechanical Engineering, Korea University, Seoul, Korea

**Background / aims:** Nonsurgical endoscopic closure of the gastrointestinal wall may be desired in many situations, such as fistulae, perforation. With the emerging and development of natural orifice transluminal endoscopic surgery (NOTES) as a minimally invasive surgical platform, endoscopic suturing is especially important. Here, we studied the feasibility of new developed endoscopic suturing device by demonstrating the strength of closure in ex vivo animal study.

**Methods:** A total of 30 porcine stomachs were used for the test. Standard gastroscopy was made on each stomach by blade incision. Porcine stomachs were assigned randomly to 3 groups and closed by new endoscopic closer with curved needle (En-closer), endoscopic clips and hand sewn. Each stomach was inflated by an automated pressure gauge. After that, the stomach was dipped in water and air leakage pressure was measured by automated pressure gauge when an air bubble was first observed.

**Results:** The average leakage pressure for the En-closer, Endoclip, and full-thickness hand sutures was 43.25 mmHg, 44.10 mmHg, and 63.19 mmHg. The average closer strength of the En-closer does not significantly differ from that of the Endoclip (p>0.05). The standard deviation for the En-closer, Endoclip, and full-thickness hand sutures was 6.37 mmHg, 14.35 mmHg, and 12.97 mmHg, respectively. The standard deviation of the En-closer is significantly smaller than that of the Endoclip and full-thickness hand sutures (p<0.05). It is determined that the closer strength of the En-closer does not significantly differ, but is more consistent than the closer strength of the Endoclip.

**Conclusions:** The En-closer, which can performs multiple stitches with a single endoscope insertion showed feasible result comparing with Endoclip and hand-sewn suture. This research proposes a novel approach for minimally invasive endoscopic surgery.

**Keywords:** Endoscopic suture device; Endoscopic needle; suture

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**POT-17**

**The Development of New Endoscopic Gastrointestinal Bypass Device for Weight Loss: What Is the Optimal Material?**

Jae Min Lee, Hong Sik Lee, Jung Min Lee, Sang Yup Lee, Byeong Kwang Choi, In Kyung Yoo, Seung Han Kim, Hyuk Soon Choi, Eun Sun Kim, Bora Keum, Yoon Tae Jeen, Hoon Jai Chun and Chang Duck Kim

Department of Internal Medicine, Korea University College of Medicine, Seoul, Korea

**Background / aims:** Endoscopic therapy for weight loss...
has been emerged as alternative treatment to bariatric surgery and medical therapy. We developed the new endoscopically GI bypass device composed with metal stent and long-tailed sleeve. In this study, we performed the physical property experiment of various materials for the sleeve of our new device.

**Methods:** Four kinds of material; hydrophobic silicone, thin e-PTFE (Poly-tetra-fluoroethylene), thick e-PTFE, and FEP (Fluorinated ethylene-propylene) were evaluated. We performed the test for anti-tensile ability, durability, and the experimental aging test in pH2 and pH7 buffer solutions. The change of test materials was also shown by scanning electron microscopy (SEM) and infrared spectroscopy (FT-IR).

**Results:** The debris and cracks in surface on hydrophobic silicone were significantly increased after accelerated aging test with pH 2, 7 by SEM image. Mean maximum load was about 7.56 ± 0.4 N and significantly decreased the physical strength under acidic environment. Thin-PTFE and thick e-PTFE had the a few debris on the surface after accelerating test by SEM. Both e-PTFE showed a great strength against physical tension (Mean maximum load of thin-PTFE; 112.8 ± 5.6 N, thick e-PTFE; 64.5 ± 2.0 N). FEP showed no change in surface morphology after accelerating test. Although mean maximum load was about 11.4 ± 0.5 N, there was no significant decreased of physical strength in the acidic environment. All four materials were showed no change of wave form in FT-IR test. Hydrophobic silicone showed a poor anti-tensile force and durability. FEP had a moderate anti-tensile force and good resistance to corrosion environment. Thin e-PTFE has excellent physical strength, good chemical stability, and flexibility. The result of thick e-PTFE was between thin e-PTFE.

**Conclusions:** Thick e-PTFE and FEP were recommendable materials for making GI bypass liner. We expect our material studies would be useful for other medical device investigators.

**Keywords:** Gastrointestinal bypass; Material; Silicone; Poly-tetra-fluoroethylene; Fluorinated ethylene-propylene

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**POT-18**

**The Physical Properties of Newly Developed Intragastric Balloon for Obesity Treatment: In Vitro Study**

Seung Han Kim, Chang Duck Kim, In Kyung Yoo, Jae Min Lee, Hyuk Soon Choi, Eun Sun Kim, Bora Keum, Yoon Tae Jeen, Hong Sik Lee and Hoon Jai Chun

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**Background / aims:** Endoscopic bariatric approaches are gaining traction as possible treatment modalities for obesity. Especially, intragastric balloon was demonstrated to be associated with a significant weight loss in obese patients. Despite many advances in the design and material of intragastric balloon devices, there still remains a need for improved devices which is more durable than before or otherwise address certain drawbacks of intragastric balloons. For this reason, we developed new intragastric balloon and evaluated it under variable pressure and corroded environment.

**Methods:** Intragastric balloon was prepared for this study. It was composed of a shell having a wall enclosing an inner volume, and a fluid fill valve secured in the shell wall. The shell wall includes a barrier layer of thermoplastic polyurathane (TPU). The burst tests were performed with the air inflation device and the pressure and volume performance was measured with a pneumatic pressure sensor. SEM (scanning electron microscope) and UTM (universal testing machine) were performed to investigate the anti-corrosion property of intragastric balloon.

**Results:** Intragastric balloon with a volume of 250ml was used. The diameter of intragastric balloon was 13.5 cm under a balloon pressure of 135mmHg. When balloon volume presented about 9 liters, balloon surface consistency was still maintained. A corroded intragastric balloon surface was characterized by SEM and UTM. Results showed that balloon surface was suitable for intragastric placement. The balloon presented comparable result in strength (<10%) as the acidity increases from pH 7.0 to pH 1.0.

**Conclusions:** This intragastric balloon constructed with TPU showed comparable strength and anti-corrosion
property to previous silicon balloon under in vitro gastrointestinal environment. Further study is needed for more improved durability of intragastric balloon.

**Keywords:** Intragastric balloon; New device

**POT-19**

**A Novel Endoscopic Subserosal Dissection Technique of a Gastric Subepithelial Tumor Showing Exophytic Growth**

Woong Ki Lee, Jin Woong Cho, Yong Keun Cho, Ji Woong Kim, Gum Mo Jung, Young Jae Lee, So Hee Yun, Min A Yang, Byung Sun Kim, Hong Shik Shin and Sung Hyun Park

Internal Medicine, Presbyterian Medical Center, Jeonju City, Korea

**Contents:** A 65-year-old woman underwent a gastro-esophageal endoscopy, and a gastric subepithelial tumor protruding partially into the stomach lumen was found on the lesser curvature side of the gastric lower body. Endoscopic ultrasound showed a homogeneous hypoechoic lesion (about 20 mm) located in the fourth layer of the stomach, which was growing with compression into the perigastric area. A gastrointestinal stromal tumor or leiomyoma was suspected. We attempted endoscopic resection because of her high operation risk. After a submucosal injection was performed around the tumor with a mixed solution of indigo carmine and epinephrine by using an endoscope (GIF-Q260, Olympus), we cut the surface of the lesion with a needle knife (KD-1L-1, Olympus); dissected the submucosa, muscularis propria, and subserosa adjacent to the tumor using a hook knife (KD-620LR, Olympus) and IT knife 2 (KD-611L, Olympus) (Fig. A); and sutured the defective area with 8 long clips (HX-610-090L, Olympus) after making holes on both sides of the defect (Fig. B). The lesion was surrounded by a whitish capsule, and the pathology indicated a low-grade gastrointestinal stromal tumor (22 × 22 × 12 mm, mitotic count 3/50 high power field), which showed immunopositivity for the KIT and CD34 without lymphovascular invasion.

**Keywords:** Stomach neoplasms; Endoscopy; Dissection

**POT-20**

**Adverse Events and Long-term Outcomes of Endoscopic Sphincterotomy in a Pediatric Population; A Single Center Experience**

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2Pediatrics, Seoul National University Bundang Hospital, Kyunggi-Do, Korea

**Background / aims:** Background and Aims: The use of endoscopic sphincterotomy (EST) is increasing in the management of pancreaticobiliary disease in children. However, studies of adverse events and long-term outcomes of EST are limited in pediatric patients. The aim of this study was to evaluate the procedural related adverse events and long-term outcomes following EST for pancreaticobiliary disease in pediatric patients.

**Methods:** We retrospectively analyzed 203 pediatric patients who underwent ESTs for pancreaticobiliary disease at Asan Medical Center Children’s Hospital between June 1994 and December 2013. The male to female ratio was 1:1.5 and the median age was 8.7 years old (range, 18 months-17 years). We evaluated the indications, technical and clinical success, adverse events, and long-term outcomes.

**Results:** Procedure related adverse events (30 days) information was available in 198 patients with a median overall follow-up duration of 42 months (range, 1-232 months). Twelve patients (6.1%) developed late complications, including cholangitis with or without bile duct
stone (n=7), and minor papilla restenosis (n=5). The cumulative incidence rates of late complications were 3.1%, 6.1%, 9.3%, and 9.3%, at 1, 5, 10, and 15 year. There were no procedure-related pancreaticobiliary malignancies and deaths. All adverse events and long-term outcomes improved with appropriate managements.

Conclusions: Adverse events and long-term outcomes after EST in pediatric patients occurred with similar rate comparing to those in adults and could be managed safely. This study suggested that EST is a reasonable method for treating pancreaticobiliary disease, even in pediatric patients.

Keywords: ERCP; Endoscopic sphincterotomy; Child; Adverse events; Long-term outcome

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**POT-21**

The Clinical Significance of Histologic Determination of Proteins Bcl-2 and the P-53 in Children with Celiac Disease

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Gastroenterology, Republican Specialized Scientific Practical Medical Center of Pediatrics, Tashkent, Uzbekistan

Background / aims: The development of severe complications and adverse outcomes for diseases of the intestines depends on the degree of damage to the mucous membrane of the small intestine, apoptotic processes, including mitochondrial proteins, play an important role in its mechanisms. Aim of the study: To evaluate the significance of proteins Bcl-2 and the p-53 protein of the small intestine’s mucous membrane in children with celiac disease (CD).

Methods: The study included 57 children with celiac disease between the ages of 7 to 16 years, 23 of them abide by a strict gluten-free diet, 20 children-keeping non-strict diet and 14 children who did not follow the diet. The biopsy of duodenum bulb values defined levels of p53 protein and Bcl-2 labeled with mouse monoclonal antibodies to human proteins p53 (DO-7 clone, Denmark) and the Bcl-2 (clone 124, Denmark).

Results: It was found a 4-fold increase of p53 in children who are not on a diet, compared to children on a diet (p <0.001), and 1.9 times higher than in children who follow a diet partially (p <0.01). The content of the Bcl-2 in the small intestine mucosa had the reverse direction: it was accompanied by a pronounced decrease in Bcl-2 cells (2.5 ± 0.4%) in children, which were not on a diet, this rate was 16.6 ± 0.32% in children, who keep gluten-free diet (p <0.001).

Conclusions: The course of celiac disease in children is greatly influenced by compliance with a gluten-free diet and apoptosis factors, in turn, the accumulation of p53 and decrease Bcl-2 proteins lead to an unfavorable course and prognosis of celiac disease.

Keywords: Bcl-2 protein, P-53 Protein; Celiac Disease; Gluten-free diet; Apoptosis factor

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**POT-22**

Accidental Enema of 35% Hydrogen Peroxide in a 2-year-old Female: A Case Report

Joon Sang Lee, Jung Kyung Yoo, Hye Sun Lee, In Sil Lee and Hui Dai Park

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Contents: We report a rare case of acute severe chemical colitis caused by hydrogen peroxide enema. A 2-year-old girl, previously healthy, was brought to the Emergency Department because of significant cramping abdominal pain with recurrent hematochezia after an accidental hydrogen peroxide enema (35%, 5 mL) by her caregiver. Her vital signs were all normal. Physical examination revealed diffuse increased bowel sound and no specific lesion that can cause gastrointestinal bleeding. There were no clinical manifestations of child abuse (physical and sexual). Laboratory findings were relatively normal for her age except mild leukocytosis and diffuse colonic distension was noted on plain abdominal film and ultrasonography. She was hospitalized to the pediatric department and treated with NPO, intravenous fluid and parenteral antibiotic therapy. In the sigmoidoscopic examination, diffuse erythematous and edematous change with mucosal hemorrhage and friability were noted from the rectum to the distal sigmoid colon. Histologic study of tissue samples showed a prominent lymphocytic infiltration. On the 3rd hospital day, abdominal pain dis-
appeared and the patients started oral feeding. Bloody stool disappeared on the 6th hospital day. She was discharged with fully recovered state on 10th hospital day. This may be the first case report of acute chemical colitis by accidental hydrogen peroxide enema in children.

**Keywords:** Chemical colitis; Hydrogen peroxide; Hematochezia; Pediatrics

### POT-23

**Thirty-day Mortality after Percutaneous Gastrostomy by Endoscopic Versus Radiologic Placement: A Meta-analysis**

Joo Hyun Lim, Seung Ho Choi, Changhyun Lee, Ji Yeon Seo, Hae Yeon Kang, Jong in Yang, Su Jin Chung and Joo Sung Kim

**Department of Internal Medicine and Healthcare Research Institute, Healthcare System Gangnam Center, Seoul, Korea**

**Background / aims:** A percutaneous gastrostomy can be placed either endoscopically (percutaneous endoscopic gastrostomy, PEG) or radiologically (radiologically-inserted gastrostomy, RIG). However, there is no consistent evidence of the safety and efficacy of PEG compared to RIG. Recently, 30-day mortality has become considered as the most important surrogate index for evaluating the safety and efficacy of percutaneous gastrostomy. The aim of this meta-analysis was to compare the 30-day mortality rates between PEG and RIG.

**Methods:** Major electronic databases (MEDLINE, EMBASE, Scopus, and Cochrane library) were queried for comparative studies on the two insertion techniques of gastrostomy among adults with swallowing disturbance. The primary outcome was the 30-day mortality rate after gastrostomy insertion. Forest and funnel plots were generated for outcomes using STATA version 14.0.

**Results:** Fifteen studies (n = 2,183) met the inclusion criteria. PEG was associated with a lower risk of 30-day mortality after tube placement compared with RIG (odds ratio [OR] 0.60; 95% confidence interval [CI] 0.38-0.94; *p*=0.026). The pooled prevalence of 30-day mortality of PEG was 5.5% (95% CI, 4.0-6.9%) and that of RIG was 10.5% (95% CI, 6.8-14.3%). No publication bias was noted.

**Conclusions:** The present meta-analysis demonstrated that PEG is associated with a lower probability of 30-day mortality compared to RIG, suggesting that PEG should be considered as the first choice for long-term enteral tube feeding. Further prospective randomized studies are needed to evaluate and compare the safety of these two different methods of gastrostomy.

**Keywords:** Gastrostomy; Endoscopy; Fluoroscopy; Mortality

### POT-24

**Learning Outcome after Applying Esophagogastroduodenoscopy Application into Upper Gastrointestinal Tract Anatomy for 2nd Year Medical Student Teaching at Suranaree University of Technology**

Watanyu Daengsuwan and Taweesak Tongtawee

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**Background / aims:** An Esophagogastroduodenoscopy is a procedure where a thin and flexible tube called an endoscope is used to look inside the esophagus, stomach and first part of the small intestine during routine investigation. There are many ways of using endoscopy to visualize the anatomy of gastrointestinal tract for medical student. Aim of our study is to investigate learning outcome from an integration the Esophagogastroduodenoscopy to the upper gastrointestinal tract anatomy of the 2nd year medical students teaching at Suranaree University of Technology.

**Methods:** Prospective comparative study was carried out during January 2016. A total 80 of 2nd year medical students were enrolled in the study. We look for the learning outcome by using examination and questionnaire to analyze the difference between before and after teaching with our application. Student’s t-test was used for unpaired parametric data and Chi-square test was used for the comparison of nonparametric data. A *p*-value less than 0.05 were considered as significant.

**Results:** A total 80 medical students underwent the completion of the study (34 males and 46 females). Our results showed that up to 70% of respondents can be improved their learning outcome compared between pre-test and post-test by the application (*p*<0.01, 95 %CI: 0.49-0.73). In the
section of satisfaction scores, the result show that significant improve after teaching by application (p<0.01).

### Table 1. Summary of student responses to the evaluation (n=80)

<table>
<thead>
<tr>
<th>Question</th>
<th>Mean Pre-Test</th>
<th>Mean Post-Test</th>
<th>t-value</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1: The application was helpful</td>
<td>4.5</td>
<td>5.0</td>
<td>3.5</td>
<td>0.001</td>
</tr>
<tr>
<td>Q2: The application was easy to use</td>
<td>4.3</td>
<td>4.8</td>
<td>2.8</td>
<td>0.005</td>
</tr>
<tr>
<td>Q3: The application was well-organized</td>
<td>4.2</td>
<td>4.7</td>
<td>2.6</td>
<td>0.008</td>
</tr>
<tr>
<td>Q4: The application was useful for learning</td>
<td>4.1</td>
<td>4.6</td>
<td>2.4</td>
<td>0.012</td>
</tr>
</tbody>
</table>

**Fig. 1.** Summary of student responses to the evaluation.

**Conclusions:** Esophagogastroduodenoscopy Application can improve both learning outcome and satisfaction scores in 2nd year medical students. The application could be a good teaching tool for upper gastrointestinal tract anatomy.

**Keywords:** Learning outcome; Esophagogastroduodenoscopy application; Medical student

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**POT-25**

**Learning Outcome from Using Colonoscopy Application to Learn Lower Gastrointestinal Tract Anatomy during 2nd Year Medical Student at Suranaree University of Technology**

Pakorn Tangjanyatham and Taweesak Tongtawee
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**Background / aims:** Colonoscopy is a standard diagnostic tool for lower gastrointestinal tract diseases by detecting abnormality of anatomy and lower gastrointestinal tract mucosa. Also, 2nd year medical students at Suranaree University of Technology need to learn and have knowledge about gastrointestinal system. Aim of our study, to evaluate learning outcome of utilizing colonoscopy application to teach lower gastrointestinal tract anatomy during 2nd year medical student at Suranaree University of Technology.

**Methods:** We use the colonoscopy application to teaching a total 80 of 2nd year medical students and then evaluate the learning outcome by using examination with the two set of pre-test and post-test pictures from colonoscopy and questionnaire for their satisfaction. Student’s t-test was used for unpaired parametric data and Chi-Square test was used for the comparison of non-parametric data. A p-value less than 0.05 were considered as significant.

**Table 1.** Summary of student responses to the evaluation questionnaire (n=80)

<table>
<thead>
<tr>
<th>Question</th>
<th>Mean Pre-Test</th>
<th>Mean Post-Test</th>
<th>t-value</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1: The examination was clear and easy</td>
<td>4.5</td>
<td>5.0</td>
<td>3.5</td>
<td>0.001</td>
</tr>
<tr>
<td>Q2: The examination was well-organized</td>
<td>4.3</td>
<td>4.8</td>
<td>2.8</td>
<td>0.005</td>
</tr>
<tr>
<td>Q3: The examination was well-explained</td>
<td>4.2</td>
<td>4.7</td>
<td>2.6</td>
<td>0.008</td>
</tr>
<tr>
<td>Q4: The examination was useful for learning</td>
<td>4.1</td>
<td>4.6</td>
<td>2.4</td>
<td>0.012</td>
</tr>
</tbody>
</table>

**Fig. 1.** Summary of student responses to the evaluation question 1&2 (very positive and positive)
**Results:** Eighty medical students who were using colonoscopy application (100% response rate) showed that more than 70% of respondence considered that the application had helped improving their testing scores when compared between pre-test and post-test ($p<0.01$).

**Conclusions:** Applying of Colonoscopy application can improve learning outcome of lower gastrointestinal tract anatomy for 2nd year medical students and, most likely, could help them studying entire anatomy.

**Keywords:** Learning outcome; Colonoscopy application; Lower gastrointestinal tract anatomy; Medical student

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**POT-26**

*Is There Role for Pre-Reader in the Interpretation of Video Capsule Endoscopy?*

Eun Sun Kim, Sang Yup Lee, Hoon Jai Chun, In Kyung Yoo, Jae Min Lee, Seung Han Kim, Hyuk Soon Choi, Bora Keum, Yoon Tae Jeen, Hong Sik Lee, Chang Duck Kim, Byeong Kwang Choi and Jung Min Lee

Division of Gastroenterology and Hepatology, Korea University College of Medicine, Seoul, Korea

**Background / aims:** Capsule endoscopy (CE) has become an important tool for the diagnosis of small bowel disease. A major problem of CE is that it is time consuming to read one case. Although few previous studies have showed a supporting role of Pre-Reader in the reading of CE, it remains controversial. In this study, we aimed to show the complement role of low experienced endoscopy trainee (VCE < 20) in the interpretation of CE.

**Methods:** Before the study, pre-readers were educated about RAPID® for PillCam Software. The 50 educational cases (which including 12 vascular lesions, 21 ulcerative lesions, and 16 neoplastic lesions) were selected from our hospital. Two Endoscopy trainees, as a pre-reader, interpreted 50 cases of CE and completed the assessment form. After that, high experienced endoscopists (VCE > 100) reviewed each case individually with reference to the filled up assessment form. Same videos, which didn’t include the Pre-Readers assessment forms were reviewed by another high experienced endoscopists too. We evaluated the agreement, missed lesion, overcalled, and reading time between two expert groups.

**Results:** At assessment form, which filled up by Pre-reader, agreement (A)/missed lesion (M)/overcalled(O) were observed in 72.3%/ 8.9%/18.8% respectively. The agreement rate was high in vascular and ulcerative lesions. On the other hand, overcalled lesion was high in neoplastic, especially polyploid lesion. Pre-reader’s assessment form supported experts to get more abnormal findings (detection rate was improved by 10~20%), however final diagnosis was not changed. Pre-reader’s assessment form added more information as well as decreased expert’s time consuming significantly.

**Conclusions:** Pre-reader added more information on capsule endoscopy, even though the final diagnosis was not changed. Also, a group of pre-reader could decrease the time consuming. In this study, we showed complement role of pre-reader in the reading of CE.

**Keywords:** Capsule endoscopy; Video endoscopy

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**POT-27**

*Simvastatin Induces Heme Oxygenase-1 Via Nrf2 Activation through Erk and Pi3k/akt Pathway in Colon Cancer Cells*

Mikang Kim, Hyunjoo Jang, Jae Hyun Kim, Eun Mi Hong, Se Woo Park, Hyun Woo Byun, Dong Hee Koh, Min Hoo Choi, Sea Hyub Kae and Jin Lee

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**Background / aims:** Statin has been ascribed not only to their cholesterol lowering effect but also to their pleiotropic actions including anti-inflammatory and anti-oxidant effects as well as anti-neoplastic effect. Nrf2 is a transcription factor that controls the transcriptional response of cells to oxidative stress. We investigated whether simvastatin stimulates the expression of Nrf2 and nuclear translocation of Nrf2 and which signal pathway is involved in the expression of Nrf2 and antioxidant enzymes.

**Methods:** The effect of simvastatin on expression of Nrf2 and nuclear translocation of Nrf2 in two colon cancer cell lines, HT-29 and HCT 116. We also investigated which signal cascade such as ERK or PI3K pathway con-
trol Nrf2 activation and whether simvastatin affects induction of antioxidant enzymes.

**Results:** Simvastatin induced dose-dependent up-regulation of Nrf2 expression and stimulated Nrf2 nuclear translocation. And simvastatin induced anti-oxidant enzymes (HO-1, NQO1, and GCLC) in HT-29 and HCT 116 cells. In addition, PI3K/Akt inhibitor and ERK inhibitor blocked simvastatin induced Nrf2 and HO-1 expression in both HT-29 and HCT 116 cells.

**Conclusions:** simvastatin induces Nrf2 activation and nuclear translocation of Nrf2 and expression of anti-oxidant enzymes via ERK and PI3K/Akt pathway in colon cancer cells.

**Keywords:** Simvastatin; Colon cancer cells; Heme oxygenase-1; NF-E2-Related Factor 2; Erk and Pi3k/akt

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**POT-28**

**Characteristics and Long Term Outcome of Overt Obscure Gastrointestinal Bleeding**

Dongwon Lee, Ja Seol Koo, Jung Won Choe, Seung Young Kim, Jong Jin Hyun, Sung Woo Jung and Sang Woo Lee

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**Background / aims:** Capsule endoscopy or enteroscopy is commonly used as a diagnostic tool in obscure gastrointestinal (GI) bleeding. However, definite bleeding focus was not found in many cases even after multiple work-up studies, especially in users of antithrombotics or NSAIDs. We aimed to evaluate the clinical characteristics and long term outcomes of overt obscure GI bleeding.

**Methods:** Patients referred to Korea University Ansan Hospital between January 2007 and December 2013 with overt GI bleeding and negative upper and lower endoscopic findings were retrospectively reviewed. They performed the work-up studies, such as capsule endoscopy, enteroscopy, abdominal CT scan or angiography for elucidation of the bleeding cause

**Results:** A total of 74 patients with overt obscure GI bleeding were analyzed. Male was 50%, and mean age was 62.7 years. Thirty-three (43.2%) patients were taking NSAIDs, antiplatelet agents or anticoagulants, and the proportion taking these drugs was higher in older subjects over 60 years than younger patients (63% vs. 14.3%, \( p < 0.001 \)). The definite bleeding focus was more commonly found (46.4% vs. 19.6%, \( p = 0.019 \)) and hemostatic intervention or operation was more commonly performed (28.6% vs. 4.3%, \( p = 0.005 \)) in younger patients than in elderly patients. Among 50 patients who were followed up over 6 months, recurrent bleeding developed in 9 (18.0%) patients and there was no differences in recurrent bleeding rate according to age, the number of work-up studies, the use of antithrombotics or NSAIDs, or the presence of definite bleeding cause at first admission.

**Conclusions:** In younger patients with overt obscure GI bleeding, the definite bleeding focus was more commonly found and hemostatic intervention was performed. Regardless of clinical characteristics, recurrent bleeding rate was not low. Therefore, the patients of overt obscure
GI bleeding needed to be followed up regularly after bleeding events.

**Keywords:** Obscure gastrointestinal bleeding

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**POT-29**

Clinical, Pathologic, Endoscopic Characteristics and Treatment Outcomes of Primary Gastrointestinal Lymphoma: A Single Center Retrospective Study in the Philippines

_Maria Fleurdeliz Goco and Melchor Chan_

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**Background / aims:** The aim of the study is to determine the clinical, pathologic, endoscopic features and treatment outcomes of patients with Primary Gastric Lymphoma (PGL) in a referral center in the Philippines.

**Methods:** A retrospective study was done in patients diagnosed with PGL in a single institution in the Philippines, from January 2008 - September 2015. Patients’ clinical, pathologic, endoscopic characteristics were identified. The overall survival (OS) of PGL and OS in relation to age, tumor site, stage and treatment were computed using the Kaplan Meier method.

**Results:** Twenty four cases were reviewed. Fourteen patients were male with mean age of 62. The mean follow-up time was 14 months. Seventeen patients (71%) presented with abdominal pain and 22 were negative for B symptoms. Serum LDH was elevated in 14 patients (58%). Twenty three patients (96%) were classified as DLCBL and 1 patient as MAL T. Most common tumor site was the stomach (33%). Eight patients (33%) underwent surgery alone and 6 patients received chemotherapy. Three-year OS for PGL was 10%. Age, tumor site and tumor stage showed no significant difference in relation to the overall survival (p=.145, p=.373, p=.361). There was significant difference in the overall survival in relation to treatment (p=.003).

**Conclusions:** The study concluded that chemotherapy alone improved the overall survival rate of PGL as compared to surgery alone and supportive treatment. Thus chemotherapy should be the choice of treatment. The number of reviewed cases however was limited and future studies with multicenter approach and longer follow up period is recommended.

**Keywords:** Lymphoma

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**POT-30**

Fatal Adult-Onset Henoch-schonlein Purpura with Massive Gastrointestinal Hemorrhage: A Case Report with Autopsy

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**Contents:** Introduction: Henoch Schonlein Purpura (HSP), an IgA immune complex vasculitis, is uncommon in adults and may have an atypical and life-threatening course. This report aims to discuss a rare case of fatal HSP, its manifestations and management. Presentation: A 45-year old Filipina presented hematemesis and melena preceded by progressive palpable purpura, arthralgia, cough and diffuse abdominal pain. Patient was promptly given antibiotics, fluid resuscitation an Omeprazole drip and blood transfusion. Endoscopic examination showed granular mucosa with exudates, hemorrhages and erosions in the esophagus and duodenum, while biopsy of the lesions revealed nonspecific necrosis and inflammation. Skin biopsy showed leukocytoclastic vasculitis and direct immunofluorescence showed strong stippling of superficial dermal blood vessels with IgA, confirming the diagnosis of HSP. C-ANCA and ANA were both negative ruling out other subtypes of leukocytoclastic vasculitis. High doses of hydrocortisone were, thus, initiated. The patient’s renal function deteriorated necessitating hemodialysis. She succumbed to hypovolemic shock from intractable gastrointestinal bleeding brought by severe and diffuse vasculitis despite the hydrocortisone and omeprazole. Autopsy revealed hemorrhagic mucosa punctuated with diffuse ulcers spanning the esophagus to the colon and 270 mL of hemorrhagic fluid. On microscopy, small to medium-sized vessel vasculitis was noted. The kidneys showed diffuse proliferative glomerulonephritis with fibrocellular crescents consistent with HSP. Conclusion: HSP in adults has greater morbidity and mortality compared to its pediatric counterparts. Though typically noted in the duodenum and generally responsive to corticosteroids, a fatal course involving the entire gastro-
intestinal tract may ensue. A high index of suspicion is emphasized in adults presenting with cutaneous vasculitis. Timely and more aggressive immunosuppressive therapy, especially among adults, is important. A high index of suspicion is emphasized in adults presenting with cutaneous vasculitis. Timely and more aggressive immunosuppressive therapy, especially among adults, is important.

**Keywords:** Henoch schonlein purpura; Gastrointestinal bleeding

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### POT-31

**Polyethylene Glycols (PEGs)-Induced Anaphylactic Shock during Bowel Preparation**

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**Contents:** Abstracts Colonoscopy is the essential examination in colorectal evaluation and widely used. Polyethylene glycols (PEGs) are usually used for bowel preparation and relatively safe for use. But, few complications have been occurred and fatal complicated events such as anaphylactic shocks rarely have been occurred and reported. In this article, we report a patient with anaphylaxis during ingestion of PEGs. Case report A 40-year-old man with known Crohn’s disease prepared for colonoscopy. He started bowel preparation with Coolprep®, a PEG product composed of PEG-3350, potassium chloride, sodium chloride, sodium sulfate anhydrous, ascorbic acid, and sodium ascorbate. About forty minutes after ingestion, he experienced weakness, diaphoresis, both swelling of eyelids and nausea. He visited our emergency medical center. On presentation, his blood pressure was 50/30 mmHg, pulse 90 bpm, respiratory rate 24/min, body temperature 36.2℃. He was alert and physical examinations were normal. Blood tests were all within normal ranges. There were no significant findings on chest and abdominal radiography. The patient was detailed interviewed about previous allergic or anaphylaxis history. But, no other clues than the ingestion of the PEG agent could be identified. As anaphylactic shock by PEG was suspected, the patient was administered with 1L of saline (0.9%) and an intravenous injection of 0.1mg of epi-nephrine, 4 mg of chlorphenamine, and 5 mg of dexamethasone disodium phosphate. Three hours after treatment, vital signs returned to normal and the patient did not showed any specific symptoms. Conclusion PEG products have been widely used, recently. Rarely, severe complication like anaphylactic shock can be occurring. If the patient have the past allergic event with PEG components, bowel preparation should be attempted with alternative products such as Picolight®, Prepopik®.

**Keywords:** Colonoscopy; Polyethylene glycols; Anaphylaxis; Complications; Shock

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### POT-32

**Double Primary Aortoenteric Fistula with Hematemesis**

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**Contents:** Primary aortoenteric fistula (AEF) is an extremely rare cause of upper gastrointestinal (GI) bleeding that results in a life-threatening condition if not treated properly. Diagnosis of AEF is difficult and frequently delayed due to the rarity of the disease and low index of suspicion by physicians. This is particularly the case for primary AEF where the presence of abdominal aortic aneurysm (AAA) is unproven. A 58-year-old man was admitted to our emergency department with hematemesis and back pain. Abdominal examination was unremarkable. After fluid resuscitation, urgent esophagastroduodenoscopy was performed and showed a huge amount of fresh blood in the stomach and duodenum. No definite focus of bleeding could be identified and the patient was admitted to an intensive care unit. During hospitalization, the patient showed consistently hematemesis and back pain. Abdominal examination was unremarkable. After fluid resuscitation, urgent esophagastroduodenoscopy was performed and showed a huge amount of fresh blood in the stomach and duodenum. No definite focus of bleeding could be identified and the patient was admitted to an intensive care unit. During hospitalization, the patient showed consistently hematemesis and back pain. Abdominal examination was unremarkable. After fluid resuscitation, urgent esophagastroduodenoscopy was performed and showed a huge amount of fresh blood in the stomach and duodenum. No definite focus of bleeding could be identified and the patient was admitted to an intensive care unit. During hospitalization, the patient showed consistently hematemesis and back pain. Abdominal examination was unremarkable. After fluid resuscitation, urgent esophagastroduodenoscopy was performed and showed a huge amount of fresh blood in the stomach and duodenum. No definite focus of bleeding could be identified and the patient was admitted to an intensive care unit. During hospitalization, the patient showed consistently hematemesis and back pain.

**Keywords:** Aortic aneurysm; Abdominal; Hematemesis; Fistula