Evaluation of Polymerase Chain Reaction (PCR) Using Tissue Sample from Rapid Urease Test Kit (CLO® Test) in the Detection of Helicobacter Pylori: Comparison with PCR from Gastric Biopsy, Rapid Urease Test, and Histologic Result

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Background: In the diagnosis of Helicobacter pylori infection, the rapid urease test (CLO® test) alone is unreliable. Therefore, if the CLO test is negative, additional biopsies under endoscopy are usually required and it will be a burden for clinicians and patients. Polymerase Chain Reaction (PCR) is a DNA amplification procedure and it has the advantage of providing diagnostic results that are rapid, sensitive, and specific. We aim to investigate whether tissue samples from CLO test kit is suitable for PCR to the detection of H. pylori.

Method: A total of 54 patients with specific gastrointestinal symptom were enrolled in this study. During endoscopy, gastric biopsy specimens were taken from the greater curvature of the mid-antrum and corpus for histology, CLO test and PCR. PCR was performed on gastric biopsy sample and tissue sample obtained from the CLO test at two separate institutes. The diagnosis of H. pylori infection was made by the histological results with a Warthin-Starry silver stain and CLO test. The concordance rate of PCR test between tissue sample from rapid urease test (CLO test) and gastric biopsy samples was investigated in the detection of H. pylori.

Results: Diagnostic sensitivities of histology, CLO test, and PCR test were 90.9% (30/33), 78.8% (26/33) and 97.0% (32/33), respectively (p=0.05). The concordance rate of PCR test between tissue sample from CLO test kit and gastric biopsy samples was 94.4% (51/54). The rate of PCR (+) was 18.2% (6/33) in silver stain (+) / CLO (-).

Conclusion: For diagnosis of H. pylori infection, PCR test can be performed on tissue sample obtained from CLO test kit. In patients with CLO- negative results, PCR test with tissue sample from CLO test kit would be helpful for diagnosis of H. pylori infection.

Key Words: Helicobacter Pylori, PCR, Diagnosis

Clinical Outcomes of the Marginal Ulcer Bleeding after Gastrectomy: As Compared to the Peptic Ulcer Bleeding with Non-Operated Stomach

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Background: Marginal ulcer is a well-known complication after gastrectomy. Its bleeding can be severe, but the severity has rarely been reported. We aim to evaluate the clinical outcomes of marginal ulcer bleeding (MUB) as compared to peptic ulcer bleeding (PUB) with non-operated stomach.

Method: A consecutive series of patients who had non-variceal upper gastrointestinal bleeding and admitted to the hospital between 2005 and 2011 were retrospectively analyzed. A total of 530 patients were enrolled in this study, and we compared the clinical characteristics between 70 patients with MUB, and 460 patients with PUB.

Results: Patients with MUB were older (mean age: 62.86 ± 10.59 years vs. 53.33 ± 16.68 years, p<0.01). The initial hemoglobin was lower (8.16 ± 3.05 g/dL vs. 9.38 ± 2.49 g/dL, p = 0.01) and the duration of admission was longer in MUB (7.14 ± 4.10 days vs. 5.90 ± 2.97 days, p = 0.03). After initial hemostasis, the re-bleeding rate during admission was higher (16.2% vs. 6.5%, p = 0.01) in MUB. However, the mortality rate did not differ statistically between MUB and PUB groups. Helicobacter Pylori-positive rate with MUB was the lower than that of PUB (19.4% vs. 54.4%, p = 0.01).

Conclusions: Clinically, MUB after gastrectomy is more severe than PUB with non-operated stomach. Infection with H. pylori might not appear to play an important role in MUB after gastrectomy.

Key Words: Gastrointestinal bleeding, Gastrectomy, Helicobacter pylori

Gastric Neoplasm Arising from Hyperplastic Polyp: Endoscopic and Pathologic Feature

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Objectives: Some reports showed the predictive factors for ma-
lignant change in hyperplastic polyp. However, there is no indication about the removal of hyperplastic polyp when it is diagnosed in endoscopy and no pathologic feature with immunohistochemistry of gastric neoplasm arising from hyperplastic polyp matching with endoscopic and clinical findings.

Patients and Methods: Between May 1995 and January 2011, we retrospectively reviewed and analyzed the clinical outcomes about 809 cases of larger than 10mm sized hyperplastic polyp which was removed by endoscopic resection. Of them, associated dysplasia or carcinoma was present in 30 cases (3.7%, case group) and 31 cases without neoplasm were selected as control group to match age, sex, and size. Clinicopathologic features including location, multiplicity, intestinal metaplasia, growth pattern, the infection of Helicobacter Pylori (by Giemsa), and expression of p16, Cyclin D1, p53, and Ki-67 (by immunohistochemistry) were also evaluated between case group and control group.

Results: Of total 809 cases in 784 patients (313 men, 471 women; median age 60.5 years, interquartile range 51-67 years), associated dysplasia (n=15) or carcinoma (n=15) was present in 30 cases (3.7%). Univariate analysis showed that male, age, size of polyp, pedunculated shape, number of polyp, lobulation, and exudate are significantly associated with neoplasm. Multivariate analysis showed that the odd ratios for combined neoplasm were 1.002 (95% confidence interval (CI) 1.000-1.003; p=0.009) for the age, 1.006 (95% CI 1.004-1.008; p<0.001) for the size of tumor, and 1.090 (95% CI 1.049-1.132; p<0.001) for the exudates with the tumor. No difference was identified in location, multiplicity, intestinal metaplasia, growth pattern, and the infection of helicobater pylori between case and control groups. Dysplastic foci or carcinoma in hyperplastic polyps showed the loss of p16 expression (p=0.01) and the high expression of Ki-67 (p=0.02). However, the cyclin D1 and p53 expression did not show significant difference.

Conclusions: Endoscopic removal about larger than 10mm sized hyperplastic polyp should be considered due to possibility of combined dysplasia or carcinoma. Loss of p16 with high Ki-67 expression can be used as markers of dysplasia associated with hyperplastic polyp.

Key Words: Immunohistochemistry, Polyp, Stomach neoplasm

Acid Suppression Therapy as a Risk Factor for Candida Esophagitis

Background/Aims: As the prevalence of reflux esophagitis increases, so does the use of gastric acid suppressants. In recently performed esophagogastroduodenoscopies, asymptomatic cases of Candida esophagitis (CE) were more common than expected. This study aimed to document the prevalence of CE at a single Korean university hospital over the last 5 years and to evaluate its risk factors.

Methods: To investigate the prevalence of CE, we conducted a retrospective analysis of 55,314 individuals who underwent a screening esophagogastroduodenoscopy as part of a health check-up between January, 2006, and December, 2010, at Kyung Hee University Hospital in Seoul, Korea. Two-hundred patients who were treated for CE between January, 2008, and August, 2011, and 400 age- and sex-matched non-CE patients during the same period were enrolled in this study. Height, weight, smoking, glucose and creatinine levels, and rates of recent gastric acid suppression therapy in the two groups were compared.

Results: The prevalence of CE was 0.35% between January, 2006, and December, 2010, and was increasing every year (linear by linear association, p = 0.001, Fig 1). Univariate analysis showed that gastric acid suppression therapy and diabetes mellitus (DM) were related to CE. Multivariate analysis also
showed that gastric acid suppression therapy (odds ratio 5.547, confidence interval 2.517-12.225) and DM (odds ratio 2.614, 95% confidence interval 1.271-5.374) were related to CE (Table 1).

<table>
<thead>
<tr>
<th>Factor</th>
<th>OR (95% CI)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acid suppression treatment</td>
<td>5.54 (2.51-12.23)</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Male</td>
<td>1.13 (0.74-1.71)</td>
<td>0.577</td>
</tr>
<tr>
<td>Age</td>
<td>1.14 (0.75-1.71)</td>
<td>0.546</td>
</tr>
<tr>
<td>Creatinine</td>
<td>1.31 (0.40-4.28)</td>
<td>0.651</td>
</tr>
<tr>
<td>Diabetes mellitus</td>
<td>2.61 (1.27-5.37)</td>
<td>0.009</td>
</tr>
<tr>
<td>Total cholesterol</td>
<td>0.32 (0.091-1.11)</td>
<td>0.072</td>
</tr>
</tbody>
</table>

Conclusions: The prevalence of CE is increasing in Korea. Also, our results indicate that acid suppression therapy, in addition to DM, is a meaningful risk factor for CE.

Key Words: Candida esophagitis, Risk factors, Acid suppression therapy

UGI-5

A Second-Look Endoscopy after Endoscopic Submucosal Dissection for Gastric Neoplasm Might Not Reduce Delayed Bleeding

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Background: Bleeding after endoscopic submucosal dissection (ESD) is difficult to predict and can be a potentially life-threatening complication. However, the role of a routine post-ESD second-look endoscopy in cases with no signs of bleeding has not been fully characterized.

Methods: Between March 2011 and March 2012, 407 patients who underwent ESD for 445 lesions were reviewed retrospectively. Of these, 140 patients with 165 lesions underwent a second-look endoscopy. Delayed post-ESD bleeding was defined as the bleeding which occurred at ESD site after two days from ESD.

Results: Delayed post-ESD bleeding rates did not differ between the two groups (with second-look endoscopy vs. without; 3.0% and 2.1%, p=0.546). However, tumor in the upper third of stomach and specimen size greater than 40 mm were both independent risk factors for delayed post-ESD bleeding. And second-look endoscopy was not related with reduced delayed post-ESD bleeding. However, post-ESD bleeding of the patients who did not undergo a second-look endoscopy occurred significantly earlier than in patients who underwent a second-look endoscopy (4.5 and 14.0 days, p=0.022).

Conclusion: A second-look endoscopy did not reduce the risk of delayed bleeding after ESD. A routine second-look endoscopy after ESD would not necessary for all patients.

Key Words: Second-look Endoscopy, Endoscopic Submcosal Dissection, Bleeding, Hemostasis

UGI-6

Efficacy of Second-Look Endoscopy after Hemostasis in Peptic Ulcer Bleeding: Risk Factor Analysis of Recurrent Bleeding

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Background and Aims: Endoscopic therapy for gastrointestinal bleeding (GIB) is highly effective. But rebleeding occurs in 10% to 25% of cases after endoscopic hemostasis. Clinical value of a second-look endoscopy after initial endoscopic hemostasis with high-dose proton pump inhibitor (PPI) infusion therapy is controversial. We aim to determine whether routine second-look endoscopy is necessary and to assess predictors of rebleeding after endoscopic hemostasis and high dose PPI medication. In addition we make a comparison between Rockall score and AIMS65 score.

Patients and Methods: Both endoscopic and clinical data were analyzed in 101 acute peptic ulcer bleeding patients during August 2008 to June 2012. All peptic ulcer bleeding patients were treated with high-dose PPI infusion therapy after endoscopic hemostasis. To know the patients who need second-look endoscopy, we analysed predictors of rebleeding in patients with high risk on second-look endoscopy.

Results: Pre-endoscopic predictors of rebleeding were use of NSAIDs (p=0.016), transfusion requirements before endoscopic hemostasis (p=0.029), Complete Rockall score ≥ 4 points (p=0.045), albumin level ≤ 3.5 g/dL (p=0.011). No significant difference was found for the factors of sex, age, initial hemoglobin, systolic blood pressure, diastolic blood pressure, heart rate, INR level, use of antiplatelet drug, anticoagulant drug, diabetes, liver cirrhosis, cardiovascular disease, chronic kidney disease, malignancy, ulcer location, ulcer size ≥ 1cm, AIMS65 score ≥ 2 points. Rebleeding significantly influenced mortality rate (p=0.006).

Conclusion: Use of NSAIDs, transfusion requirements, Complete Rockall score ≥ 4 points, albumin level ≤ 3.5 g/dL are predictors of rebleeding. When patients have these factors, second-look endoscopy should be considered.

Key Words: Second look endoscopy, Peptic ulcer bleeding
Comparison of AIMS65 and Rockall Score in Prediction of Mortality and Recurrent Bleeding, In Non-Variceal UGI Bleeding

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Background/Aims: Non-variceal upper gastrointestinal bleeding (NVUGIB) is commonly encountered at emergent state, and early risk stratification is recommended. AIMS65 score was recently announced to simple scoring system and received much attention, whereas Rockall score has been most frequently used in prognosis prediction of upper gastrointestinal bleeding. So, we desire to compare predictive power of mortality and rebleeding between complete Rockall score and AIMS65 score.

Designs: Retrospective, single - center.

Patients: 380 patients with non-variceal upper gastrointestinal bleeding.

Primary outcome: Mortality, rebleeding and predictions of them with each scoring system.

Methods: From September 2009 to June 2012, there are 380 patients with NVUGIB. We measured complete Rockall score and AIMS65 score in patients with NVUGIB, and investigated for sensitivity and specificity of mortality and rebleeding in those scoring system. Also we made a comparison between two scoring systems in predictive accuracy.

Results: In all NVUGIB patients, there were 12 mortality cases and 28 recurrent bleeding, high Rockall score (more than 8 points) was seen in 37 patients (9.7%) and high AIMS65 score (more than 2 points) was observed in 111 patients (29.2%). Out of 37 patients with high Rockall score 5 patients (13.5%) died, among 111 patients with high AIMS65 score 9 patients (8.1%) died. As predict the mortality, high Rockall score showed 41.6% of sensitivity and 91.3% of specificity, high AIMS65 score showed 75.0% of sensitivity and 72.2% of specificity. Area under receiver operating characteristic (AUROC) curve of mortality is 0.443 in high Rockall score, 0.508 in high AIMS65 score. The percentage of rebleeding was 10.8% (4/37) with high Rockall score, and 6.3% (7/111) with high AIMS65 score. In prediction of recurrent bleeding, high Rockall score had 14.2% of sensitivity and 90.6% of specificity, high AIMS65 score had 25.0% of sensitivity and 70.4% of specificity. AUROC curve of rebleeding is 0.481 in high Rockall score, 0.465 in AIMS65 score.

Conclusion: In this study, complete Rockall score showed higher specificity and AIMS65 score showed higher sensitivity. However, both scoring system have insufficient predictive power about death and rebleeding, so it is necessary to design new scoring system which have far higher sensitivity and specificity in the future.

Key Words: prediction of mortality, rebleeding, AIMS65 score, Rockall score

Outcome of Endoscopic Therapy for Cancer Bleeding in Patients with Unresectable Gastric Cancer

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Background & Aims: Upper gastrointestinal bleeding (UGIB) is not rare clinical event in inoperable advanced gastric cancer (AGC) patients. The role of endoscopic therapy for the treatment of gastric cancer bleeding has remained to be investigated.

Methods: We reviewed retrospectively the medical records of all 113 patients received endoscopic therapy as a primary treatment of UGIB from unresectable AGC at National Cancer Center, Korea from May 2001 to April 2012. Initial success rate of endoscopic hemostasis, rebleeding and treatments for rebleeding, overall survival (OS) after initial successful hemostasis, 30-day and 1-year mortality after UGIB from unresectable AGC were investigated.

Results: Most patients had stage IV disease (97.3%) and presented with melena or hematemesis (85.0%). Initial successful hemostasis was achieved in 105 patients (92.9%) and coagulation using argon plasma or hemostatic forceps was the most commonly applied method for hemostasis (92.0%). Rebleeding occurred in 43 patients (41.0%), and more than half of the rebleeding (22 patients, 51.2%) occurred within 7 days after initial hemostasis. Endoscopic therapy was repeated in nineteen of the rebleeding patients and successful hemostasis was achieved in 89.5%. The median OS after initial hemostasis was 3.2 months and patients with early-rebleeding (< 72 hours after successful hemostasis, n= 24) or without rebleeding (n= 62) (1.0 vs. 3.1 vs. 4.3 months, respectively, p= 0.001). Thirty-day and 1-year mortality rate after UGIB from AGC were 15.9% and 77.0%, respectively.

Conclusions: Endoscopic therapy achieved high initial hemostasis rate for UGIB in unresectable AGC patients. However, rebleeding frequently occurred and early rebleeding was asso-
associated with poor expected survival.

**Key Words:** Bleeding, Gastric cancer, Endoscopy, Hemostasis

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**UGI PL-9**

**The Effective Length of Myotomy in Peroral Endoscopic Pyloromyoplasty using Submucosal Tunnel Technique**

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The field of peroral endoscopic pyloromyotomy is beginning; there is no standard strategy for decision of the length of myotomy. The aim of this study was to evaluate the proper cutting length of peroral endoscopic pyloromyotomy using submucosal tunnel technique.

**Methods:** This study was designed as a prospective, randomized, ex vivo study. Fresh ex-vivo adult pig stomachs weighing 80 - 100 kg (6 to 18 month) were used for pyloromyotomy with the EASIE-R simulator platform (Endosim, LLC, Berlin, MA). 4 different results of pyloric muscle tone were recorded by 4 different length of myotomy such as 1cm, 2cm, 3cm, and 4cm in a stomach. Total 48 results of pyloric muscle tone after myotomy were recorded by the EndoFLIP Imaging System using 12 stomachs. The results of each procedure were recorded by an independent observer such as total procedure time, distending diameter of pylorus, complications, opening size and the length of submucosal tunnel.

**Results:** The mean overall procedure time (± SD) of pyloromyotomy was 65.7 (± 14.3) minutes. The mean overall opening size and length of submucosal tunnel were 1.91 (± 0.44) cm and 5.89 (± 0.99) cm respectively. The overall serosal perforation rate was 26.1% (6/23) and mucosal perforation rate was 8.7% (2/23). The changes of the mean distending pyloric diameter (± standard deviation) were 13.3 ± 9.5 mm (7.1%), 20.7 ± 11.7 mm (10.6%), 31.1 ± 15.0 mm (15.2%), and 33.0 ± 15.0 mm (16.0%) after 1, 2, 3, and 4 cm of pyloromyotomy, respectively. The mean pyloric diameter was significantly larger after 3 and 4 cm of myotomy in comparison to 1 cm of myotomy (3 cm: \( p=0.011 \), 4 cm: \( p=0.004 \)) and there was not significantly different between 3 and 4 cm of myotomy. \( (p=1.00) \) There were some limitations of ex-vivo study, for example, we did not consider alkaline reflux, bleeding, and symptomatic change.

**Conclusions:** It seemed to be effective about 3cm of pyloromyotomy for adult stomach. However, large-scale animal or clinical trial will be needed with relevance of alkaline reflux and symptoms.

**Key Words:** Pyloromyotomy

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**UGI PL-10**

**The Effect of Irreversible Electroporation in Rat Stomach: According to Different Electric Energy**

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**Background/Aims:** Irreversible electroporation (IRE) is a novel, non-thermal method of tissue ablation using short pulses of high-voltage pulse current. IRE induces the breakdown of cell homeostasis and thereby cell death. Studies regarding the clinical application of IRE have been performed in humans, as well as in animals, for organs such as the liver, kidney, prostate, brain, etc. and IRE has been tried as a novel anti-cancer ablation modality. Recently, we have validated the effect of IRE on stomach. The aim of this study was to evaluate the effect of IRE in rat gastric tissue according to different electric energy.

**Methods:** Sixteen 8-weeks-old Sprague-Dawley rats were used throughout this study. A 3-cm midline abdominal incision was made, exposing the stomach. Small incision was done on greater curvature of stomach, a set of plate electrodes were gently applies on both side of the stomach. The measured distance between the two plate electrodes was approximately 1mm. From 50 to 160 pulses of 1000, 1500, 2000, 2500, 3000V/cm were delivered for each ablation. All samples for histologic analysis and tunnel assay were got at 10 hour/ 24 hour after IRE application.
Results: All animals survived for their designated times of 10 h (n=12) and 24 h (n=4), respectively. There was cell death within the IRE lesions without intervening live cells. The animals which were designed time of 24 h show weak positive signal than that of the 10 hours post IRE(2000V/cm). This may be regeneration of cells removing necrotic cells, which results in a mostly irreversible form of electroporation. Variable nucleic pyknosis and karyohexis, and vacuolar degeneration were observed within the IRE lesions. The apoptotic area and signals were increased according to applied voltages and pulse in H & E stain and tunnel assay.

Conclusions: This study showed that IRE ablated stomach tissue very effectively through the induction of cellular apoptosis. And apoptotic area was increased according to amplified IRE electric energy to some extent. This study suggests the potentiality of IRE application in the minimally invasive treatment of gastric cancer without metastasis.

Key Words: Irreversible electroporation, Gastric cancer

UGI PL-11

Risk Factors Associated with Multiple & Missed Gastric Neoplastic Lesions after Endoscopic Resection

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Introduction: Because only a small part of the gastric mucosa containing the visible lesion can be removed by endoscopic resection, accurate detection of multiple lesions is important. This study was aimed to identify the incidence rate and associated risk factors of multiple and missed gastric lesions, and proper timing of follow up endoscopy within one year after endoscopic resection.

Methods: The patients, who had gastric neoplastic lesion and scheduled to undergo endoscopic resection, were prospectively enrolled. Intensive endoscopic surveillance was performed on 1 week, and 1, 6, 12 months after endoscopic resection. All multiple gastric lesions were divided into main and accessory lesion, and accessory lesions were subdivided into detected and missed lesion.

Results: A total 250 lesions of 215 patients were analyzed, and there were 81 of early gastric cancer, 50 of high grade dysplasias and 119 of low grade dysplasias. The overall incidence rate of synchronous gastric cancer was 5.3%. And a total 30(14%) of 215 patients had multiple gastric neoplastic lesions, either adenoma or cancer, within 1 year follow up after endoscopic resection. In univariate and multivariate analysis, old age (odds ratio 1.063, 95% CI 1.009-1.121), men (odds ratio 3.412, 95% CI 0.955-1.097) and severe intestinal metaplasia (odds ratio 3.628, 95% CI 0.129-0.728) were independent risk factors of multiple gastric lesions. Of 35 accessory lesions in 30 patients, 25 lesions in 21 patients (25/35, 71.4%) were detected at preoperative endoscopic examination, and 10 accessory lesions in 9 patients were missed (10/35, 28.6%). Small size (≤1cm) and flat morphology were major risk factors for missed lesion by endoscopy (p=0.047, p=0.027). Among 10 missed lesions, 9 (90%) lesions could be detected within 6 month after endoscopic resection.

Key Words: After endoscopic resection, Multiple gastric lesion, Follow up edoscopy, Incidence rate, Associated risk factor

UGI PL-12

Clinical Significance of Detecting Early Esophageal Cancer in Patients with Head and Neck Squamous Cell Carcinoma

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Background: Patients with primary head and neck squamous cell carcinoma (HNSCC) often develop second primary tumors in the upper aerodigestive tract. Early detection of synchronous esophageal squamous cell carcinoma (ESCC) is important because the prognosis of HNSCC can be affected by the status of second primary tumor. Nevertheless, the efficacy and method of screening for second primary ESCC has not been established. Patients and Methods: In a prospective study, 308 patients with HNSCC were screened for synchronous esophageal cancer between May 2010 and April 2012. All patients underwent conventional white light endoscopic examination with Lugol chromoendoscopy and narrow band image.
**Results:** The median age was 61 years (range, 26-87), and the male-to-female ratio was 4.2:1. Two hundreds and thirty-four patients (76.0%) were current or ex-smoker, and 207 patients (67.2%) had a history of alcohol consumption. Fifty-six patients (18.2%) had a history of cancers. Synchronous ESCC was detected in 22 patients (7.1%). The location of HNSCC with synchronous ESCC was hypopharynx (12), larynx (6), oropharynx (2) and oral cavity (2). Synchronous ESCC was found in 25.5% (12 of 47) of hypopharyngeal cancer and 27.8% (15 of 54) of HNSCC involving pyriform sinus. Regarding treatment of 22 synchronous ESCC, 7 patients (31.8%) underwent endoscopic submucosal dissection, 5 (22.7%) had surgical resection, 4 (18.2%) received chemotherapy or radiation therapy, and 4 (18.2%) are under watchful waiting. One patient (4.5%) refused any therapeutic intervention and the remaining 1 patient (4.5%) with poor performance status has been treated conservatively. Multivariate analysis showed that smoking (current smoker vs. never smoker, OR 8.3, p=0.028), any history of cancer (OR 5.0, p=0.002), and the pyriform sinus involvement (OR 9.2, p<0.0001) increased risk of synchronous ESCC.

**Conclusions:** Patients with primary HNSCC, especially those who are current smoker, have any history of cancer, and with the pyriform sinus involvement, should undergo intensive endoscopic screening to detect synchronous ESCC.

**Key Words:** Squamous cell carcinoma of the head and neck, Esophageal neoplasms, Second primary neoplasm

**UGI PL-13**

**Long-Term Follow up Helicobacter Pylori Reinfection Rate and Its Associated Factors in Korea**

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**Background:** The reinfection rate of *Helicobacter pylori* has been reported to be low in developed countries but high in developing countries. The aim of this study is to evaluate the long-term reinfection rate of *H. pylori* and to investigate its associated risk factors in South Korea.

**Methods:** During 2003-2010, *H. pylori*-positive 970 patients received standard proton pump inhibitor (PPI)-based triple eradication therapy, and follow-up *H. pylori* tests were performed with 13C urea breath test or invasive tests (Giemsa histology, CLO test, and culture) 4 weeks after completion of treatment. A total of 331 patients who were maintained an *H. pylori*-eradicated state at one year after eradication were divided into two groups according to reinfection. For the evaluation of risk factors of reinfection, gender, age, smoking, alcohol, income, education, gastrointestinal symptoms, clinical diagnosis, histological atrophic gastritis or intestinal metaplasia, and clarithromycin resistance were analyzed.

**Table 1. Annual Reinfection Rate of Helicobacter Pylori**

<table>
<thead>
<tr>
<th>Follow up period</th>
<th>No. of Patients</th>
<th>Mean No. of H. pylori test</th>
<th>No. of reinfeched patients</th>
<th>Patient-years (yr)</th>
<th>Annual reinfection rate(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1≤ year &lt;2</td>
<td>106</td>
<td>1.76</td>
<td>3</td>
<td>136.8</td>
<td>2.19</td>
</tr>
<tr>
<td>2≤ year &lt;3</td>
<td>73</td>
<td>2.59</td>
<td>10</td>
<td>174.4</td>
<td>5.73</td>
</tr>
<tr>
<td>3≤ year &lt;4</td>
<td>49</td>
<td>3.29</td>
<td>6</td>
<td>168.1</td>
<td>3.57</td>
</tr>
<tr>
<td>4≤ year &lt;5</td>
<td>46</td>
<td>4.15</td>
<td>7</td>
<td>199.6</td>
<td>3.50</td>
</tr>
<tr>
<td>5≤ year &lt;6</td>
<td>33</td>
<td>5.15</td>
<td>6</td>
<td>181.2</td>
<td>3.31</td>
</tr>
<tr>
<td>6≤ year &lt;7</td>
<td>15</td>
<td>4.73</td>
<td>4</td>
<td>97.2</td>
<td>4.12</td>
</tr>
<tr>
<td>7≤ year &lt;8</td>
<td>9</td>
<td>6.67</td>
<td>0</td>
<td>67.1</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>331</td>
<td>3.11</td>
<td>36</td>
<td>1024.4</td>
<td>3.51</td>
</tr>
</tbody>
</table>

**Results:** The follow-up period was 18-95 months (mean: 37.1 months) and *H. pylori* reappeared in 36 of 331 patients (10.9%), resulting in the annual reinfection rate of 3.51% per year. Multivariate analysis showed that male gender (HR 2.28, 95% CI 1.05-5.00, p = .037) and low monthly family income (≤ 5000$ vs. > 5000$) (HR 3.54, 95% CI 1.08-11.67, p = .038) were associated with *H. pylori* reinfection.

**Conclusion:** This long-term reinfection rate of *H. pylori* stayed rather low (3.51% per year) and male and low income determined the reinfection, factors already known to be important for *H. pylori* infection.

**Key Words:** helicobacter pylori, Reinfection, Associated Factors

**UGI PL-14**

**Effect of Erythromycin on Food Stasis in Patients with Subtotal Gastrectomy: Preliminary Report**

Byoung Yoon Jun, Jong Yul Lee, Sung Jin Moon, Chul-hyun Lim, Jin Su Kim, Yu Kyung Cho, In Seok Lee, Sang Woo Kim, Kyu Yong Choi, Myung-gyu Choi

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

**Background:** Residual food is frequently encountered during endoscopy as a result of delayed gastric emptying in patients with subtotal gastrectomy (STG). It has been documented that erythromycin before endoscopy improves visibility in patients with gastrointestinal bleeding. We investigated whether an intravenous erythromycin reduces food stasis in these patients with STG.
Methods: Patients with curative STG of gastric cancer and final pathological stage, T1-2N0M0 were included and randomly assigned to erythromycin (125 mg) or placebo saline. Erythromycin was infused in 50 ml normal saline, 20 minutes before endoscopy for 5 minutes. The primary end point was the degree of food stasis. Grade of residual food was classified into 5 Likert scale; Grade 0, no residual food; Grade 1, a small amount of residual food; Grade 2, a moderate amount of residual food, but possible to observe the entire surface of the remnant stomach with body rolling; Grade 3, a moderate amount of residual food, which hinders observation of the entire surface even with body rolling; Grade 4, a great amount of residual food, for which endoscopic observation is impossible. Poor visibility was defined as Grade 2-4.

Results: Forty-six patients received erythromycin and 40 received placebo saline. Significant residual food (Grade 2-4) was found 9 patients in the erythromycin group and 19 patients in the placebo group (19.6% vs. 45.7%; \( p = 0.006 \)). In the placebo group, sex, age, BMI, postoperative elapsed time and scores of EROTIC-STO22 did not influenced the degree of residual food. Billroth I STG was associated with poor visibility than Billroth II STG. In the erythromycin group, patients with good visibility had longer postoperative elapsed time than patients with poor visibility (24.9 vs. 3.78 months, \( p<0.001 \)).

Table. Effects of Erythromycin and Placebo on Food Stasis

<table>
<thead>
<tr>
<th>Grade of Food Stasis</th>
<th>Erythromycin (n=46)</th>
<th>Placebo (n=40)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>29</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>8</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Good visibility</td>
<td>37 (80.4%)</td>
<td>21 (52.5%)</td>
<td>0.006</td>
</tr>
<tr>
<td>Poor visibility</td>
<td>9 (19.6%)</td>
<td>19 (47.5%)</td>
<td></td>
</tr>
</tbody>
</table>

Conclusion: Use of erythromycin before endoscopy improves mucosal visualization in patients with subtotal gastrectomy. Our findings recommend routine use for premedication in follow-up endoscopy in patients with STG.

Key Words: Erythromycin, Gastrectomy, Gastrointestinal Motility

UGI-15

Acetic Acid Chromoendoscopy for Detecting Extent of Gastric Intestinal Metaplasia : A Prospective Study

Jeong Ah Hwang, Kyung Ho Song, Hyun Jung Song, Yu mi Lee, Kyung Min Moon, Chang Gi Moon, Hoon Sup Koo, Yong Seok Kim, Sun Moon Kim, Tae Hee Lee, Kyu Chan Huh, Young Woo Choi, Young Woo Kang

Objective: The diagnosis of gastric intestinal metaplasia is currently possible with the histological assessment of multiple endoscopic biopsies or chromoendoscopy with methylene blue. But, both method is not practical; limited by accessibility or cost-effectiveness. The acetic acid (vigor) chromoendoscopy has not been used for this purpose. Therefore, we want to assess the diagnostic accuracy of acetic acid chromoendoscopy for detecting extent of gastric intestinal metaplasia and interobserver variability.

Patients and Method: Consecutive 106 patients for general health care from October 2011 to March 2012 were studied. They received surveillance gastroendoscopy with 1.5% acetic acid for detection of acetowhite reactions and were performed extensive random biopsy sampling from 5 standardized intra-gastric locations according to the updated Sydney System by 2 endoscopists. The accuracy of acetic acid chromoendoscopy was evaluated with biopsy report as the reference. We also conducted a substudy to assess interobserver variability by blind method.

Results: There was excellent interobserver agreement between the 2 endoscopists (k index =0.833, \( p<0.01 \)). The diagnostic accuracy of acetic acid chromoendoscopy was 86.5% and 86.3%, respectively by two endoscopists . The overall sensitivity, specificity, positive predictive value and negative predictive values were 74.6%, 91.7%, 79.9% and 89.1%, respectively.

Conclusions: The acetic acid chromoendoscopy is a valid tool for detecting extent of gastric intestinal metaplasia. It may serve as a practical method to screen population with high risk of gastric cancer, world-wide.

Key Words: Acetic acid chromoendoscopy, Gastric intestinal metaplasia
Background: Thanks to development of digestive endoscope, endoscopic treatment which makes abdominal operation done by endoscope has been done actively in the country, but most of gastric endoscopy for diagnosis has still been done by conscious sedated endoscopy. The problem here is safety and abuse of anesthetic based on condition. Transnasal endoscopy which can overcome the problems of conscious sedated endoscopy has been imported through Japan for around 7 years and used as a useful and safe method for gastric endoscopy for diagnosis at medical examination centers. According to the report, success rate of transnasal endoscopy ranges between 86 and 100 percent. Causes of failure is failure of passing the nasal cavity, rejection of patients, nasal pain, and women below 35 years old. Therefore, this study analysed failure rate of examination of 12,467 cases to young women who took the transnasal endoscopy. Subjects and Methods: We analysed all data for 2,116 men and women below 35 years old and 10,351 men and women above 36 years old out of 12,467 patients who had taken the transnasal endoscopy for digestive trouble or health check-up examined in the clinic from July 5, 2006 to May 31, 2012. The transnasal endoscope used for this study was EG-530N, whose diameter was 5.9mm produced by FUJINON Corporation. Results and Conclusion: The success rate out of 12,467 cases of transnasal endoscopy done in the clinic from July 5, 2006 to May 31, 2012 was 97.4%, and the failure rate was 2.6% (327 cases). Among 12,467 patients, men patients were 5,665 (45.4%) and women 6,802 (46.5%). Among 10,351 (83.0%) above 36 years old, men were 4,808 (46.5%), women 5,543 (53.6%). And among 2,116 (17.0%), men were 857 (41.0%) and women 1,259 (60.0%). Among 327 patients in failure, men were 56 (19.9%) and women 282 (80.1%). Among 228 (69.7%) above 36 years old, men were 52 (22.8%) and women 176 (77.2%). Among 99 (30.3%) below 35 years old, men were 13 (13.1%) and women 86 (86.9%). Although we need more study, we are recommended to decide more carefully before transnasal endoscopy examination and explain how the endoscopy will be done when we counsel women below 35 years old.

Key Words: Transnasal Endoscopy, Young Women, Failure Rate

UGI-17

Failure Rate of Transnasal Endoscopy and Young Women

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Background: Thanks to development of digestive endoscope, endoscopic treatment which makes abdominal operation done by endoscope has been done actively in the country, but most of gastric endoscopy for diagnosis has still been done by conscious sedated endoscopy. The problem here is safety and abuse of anesthetic based on condition. Transnasal endoscopy which can overcome the problems of conscious sedated endoscopy has been imported through Japan for around 7 years and used as a useful and safe method for gastric endoscopy for diagnosis at medical examination centers. According to the report, success rate of transnasal endoscopy ranges between 86 and 100 percent. Causes of failure is failure of passing the nasal cavity, rejection of patients, nasal pain, and women below 35 years old. Therefore, this study analysed failure rate of examination of 12,467 cases to young women who took the transnasal endoscopy. Subjects and Methods: We analysed all data for 2,116 men and women below 35 years old and 10,351 men and women above 36 years old out of 12,467 patients who had taken the transnasal endoscopy for digestive trouble or health check-up examined in the clinic from July 5, 2006 to May 31, 2012. The transnasal endoscope used for this study was EG-530N, whose diameter was 5.9mm produced by FUJINON Corporation. Results and Conclusion: The success rate out of 12,467 cases of transnasal endoscopy done in the clinic from July 5, 2006 to May 31, 2012 was 97.4%, and the failure rate was 2.6% (327 cases). Among 12,467 patients, men patients were 5,665 (45.4%) and women 6,802 (46.5%). Among 10,351 (83.0%) above 36 years old, men were 4,808 (46.5%), women 5,543 (53.6%). And among 2,116 (17.0%), men were 857 (41.0%) and women 1,259 (60.0%). Among 327 patients in failure, men were 56 (19.9%) and women 282 (80.1%). Among 228 (69.7%) above 36 years old, men were 52 (22.8%) and women 176 (77.2%). Among 99 (30.3%) below 35 years old, men were 13 (13.1%) and women 86 (86.9%). Although we need more study, we are recommended to decide more carefully before transnasal endoscopy examination and explain how the endoscopy will be done when we counsel women below 35 years old.

Key Words: Transnasal Endoscopy, Young Women, Failure Rate

UGI-18

Feasibility of Endoscopic Submucosal Dissection for Superficial Squamous Esophageal Neoplasms

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Background: Endoscopic submucosal dissection (ESD) is a potential alternative in the treatment of superficial squamous esophageal neoplasms (SSEN). However, there has been no report on the outcomes of ESD for SSEN in Korea. Aim: The aim of this study was to evaluate the outcomes of ESD for SSEN in Korea.
Materials and Methods: A retrospective analysis of patients with SSEN (dysplasia and noninvasive carcinoma or intramucosal carcinoma) resected with ESD method between January 2005 and April 2012 was conducted in two institutes affiliated to The Catholic University of Korea. Clinical and pathologic outcomes were analyzed.

Table 1. Demographic Features and Therapeutic Outcomes

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of lesions</td>
<td>27</td>
</tr>
<tr>
<td>Number of patients</td>
<td>25</td>
</tr>
<tr>
<td>Male:Female</td>
<td>23:2</td>
</tr>
<tr>
<td>Mean age (years)</td>
<td>64.3±8.2</td>
</tr>
<tr>
<td>Size of the lesion</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 2.0 cm</td>
<td>19</td>
</tr>
<tr>
<td>≥ 2.0 cm</td>
<td>8</td>
</tr>
<tr>
<td>Histologic type</td>
<td></td>
</tr>
<tr>
<td>Squamous cell carcinoma, poorly diff.</td>
<td>1</td>
</tr>
<tr>
<td>Squamous cell carcinoma, mod. diff.</td>
<td>4</td>
</tr>
<tr>
<td>Squamous cell carcinoma, well diff.</td>
<td>13</td>
</tr>
<tr>
<td>High grade dysplasia</td>
<td>7</td>
</tr>
<tr>
<td>Low grade dysplasia</td>
<td>2</td>
</tr>
<tr>
<td>En bloc resection rate</td>
<td>24/27 (88.9%)</td>
</tr>
<tr>
<td>Complete resection rate</td>
<td>23/27 (85.2%)</td>
</tr>
<tr>
<td>Early complications</td>
<td></td>
</tr>
<tr>
<td>Bleeding requiring transfusion</td>
<td>0</td>
</tr>
<tr>
<td>Perforation</td>
<td>1 (3.4%)</td>
</tr>
<tr>
<td>Delayed complications</td>
<td>Stricture requiring balloon dilatation</td>
</tr>
</tbody>
</table>

Results: ESD was performed for 27 lesions in 24 patients. En bloc resection was performed in 24 lesions (88.9%) and complete resection was achieved pathologically in 23 lesions (85.2%). There was no patient who required transfusion due to bleeding. Pneumomediastinum was developed in one patient (3.4%). There was no procedure-related mortality in the entire series. The results are summarized in Table 1.

Conclusions: ESD can be accepted as a therapeutic modality for the treatment of SSEN in Korea.

Key Words: ESD, Superficial squamous esophageal neoplasm

Feasibility and Efficacy of Argon Plasma Coagulation for Early Esophageal Squamous Cell Neoplasia

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

Background: There have been few reports regarding the outcomes and safety of argon plasma coagulation (APC) as the curative treatment modality for low grade squamous intraepithelial neoplasia (LGIN), high grade squamous intraepithelial neoplasia (HGIN), and early esophageal squamous cell carcinoma (ESCC).

Methods: A total of 19 APC procedures were performed in 19 patients with early esophageal squamous cell neoplasia (5 LGINs, 12 HGINs, and 2 early ESCCs). No treatment was performed for any of these lesions before APC. Follow-up chromoendoscopy was performed at 2 to 4 months and 12 months after initial APC. Complete response (CR) was defined as the absence of tumor from any biopsy taken from the ablated lesion.

Results: Median tumor size was 10 mm (range, 3-50 mm) and circumferential extent of all lesions was below 50%. At 2 to 4 months follow-up endoscopy, 94.7% of cases achieved a CR in single treatment session. Only 1 patient with HGIN showed remnant tumor in ablated area. This patient underwent additional APC and showed CR at 12 months after initial APC. At the 12-month follow-up endoscopy, 94.7% had a CR. Only 1 patient with HGIN showed local recurrence. This patient underwent additional APC for local recurrence. After 12-month follow-up endoscopy, no patient showed local recurrence during median follow-up of 22 months (range, 12-38 months). No significant complication (bleeding, perforation, and stricture) occurred during or after APC procedure.

Conclusion: This study suggests that APC is feasible and effective treatment modality for early squamous cell neoplasia.

Key Words: Argon Plasma Coagulation, Esophageal Neoplasia, Endoscopic Treatment

The Clinical Usefulness of Histoacryl Treatment for Esophagotracheal Fistula

Jin Ok Kim, Hang Lak Lee, Hye Jin Tae, Dong Chan Kim, Sang Pyo Lee, Won Sohn, Kang Nyeong Lee, Dae Won Jun, Oh Young Lee, Byung Chul Yoon, Ho Soon Choi and Joon Soo Hahm
Department of Internal Medicine, Hanyang University College of Medicine, Seoul, Korea

Objectives: Esophagotracheal fistula causes recurrent pneumonia. Surgical approach of it is difficult and is characterized frequent recurrence. This study evaluates about the usefulness of the histoacrylic treatment of esophagotracheal fistula through histoacrylic treatment. MATERIALS AND

Methods: In Hanyang University Hospital from 2008 to 2012, five patients of esophagotracheal fistula with recurrent pneumonia was performed histoacryl treatment through upper gastrointestinal endoscopy. In summary of procedure, destruction of the epithelial lining of the fistula was performed by using a brush (G22088; Cook Endoscopy, Winston-Salem, NC) with mechanical abrasion and open-ended suction before application of the Histoacrylglue. Lipiodol (Guerbet, Roissy, France)
was mixed with 2mL of the Histoacryl glue, and the mixture was injected into the entire length of the fistula through an esophagoscopic catheter. We observed their success rate and progression after this treatment.

**Table 1. The List of Patients Who Were Performed Histoacryl Treatment for Esophagotracheal Fistula**

<table>
<thead>
<tr>
<th>Case</th>
<th>Sex/Age</th>
<th>Type of GI leakage</th>
<th>Fistula size</th>
<th>Complication</th>
<th>Procedure time</th>
<th>Duration of follow up</th>
<th>Organ</th>
<th>No of procedure</th>
<th>Success or fail</th>
<th>Reason for failure</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F/75</td>
<td>Fistula to trachea</td>
<td>0.8 cm</td>
<td>No</td>
<td>15 min</td>
<td>4 months</td>
<td>Esophagus</td>
<td>1</td>
<td>Success</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>M/54</td>
<td>Fistula to trachea</td>
<td>0.8 cm</td>
<td>No</td>
<td>10 min</td>
<td>3 months</td>
<td>Esophagus</td>
<td>2</td>
<td>Success</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>M/75</td>
<td>Fistula to trachea</td>
<td>0.5 cm</td>
<td>No</td>
<td>10 min</td>
<td>2 months</td>
<td>Esophagus</td>
<td>1</td>
<td>Success</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>M/30</td>
<td>Fistula to trachea</td>
<td>0.5 cm</td>
<td>No</td>
<td>12 min</td>
<td>9 months</td>
<td>Esophagus</td>
<td>1</td>
<td>Success</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>M/70</td>
<td>Fistula to trachea</td>
<td>0.5 cm</td>
<td>No</td>
<td>15 min</td>
<td>12 months</td>
<td>Esophagus</td>
<td>2</td>
<td>Success</td>
<td></td>
</tr>
</tbody>
</table>

**Results:** All 5 patients were included 4 men and 1 woman. The mean age was 35.4±26.07 years. The mean time of procedure was 12.4±2.51 minutes, the mean duration of follow up was 21.4±19.61 months. All 5 patients were performed successfully by histoacryl treatment. Three patients were treated only once, the remaining two were performed twice.

**Conclusions:** Though this study has few patients, histoacryl injection can be a useful treatment in patients with small and inoperable esophagotracheal fistula.

**Key Words:** Tracheoesophageal fistula, Histoacryl

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**UGI-21**

**Incidence and Risk Factor of Post-ESD fever**

Chung Hyun Tae, Eun Ran Kim, Byung-Hoon Min, Jun Haeng Lee, Young-Ho Kim, Dong Kyung Chang, Poong-Lyul Rhee, Jong Chul Rhee, Jae J. Kim

Departments of Medicine, Samsung Medical Center, Sungkyunkwan University School of Medicine, Seoul, Korea

**Background:** In spite of many publications about ESD, there are few studies concerning complications, especially occurring during the post-ESD period. In addition, with exception of major complication such as perforation or bleeding, post-ESD fever has been rarely specified. Therefore, the aim of our study was to analyze the incidence and risk factor associated with post-ESD fever.

**Methods:** From January 2011 to August 2012, we analyzed 846 consecutive patients with EGC treated by ESD at Samsung Medical Center. We reviewed the information associated with lesion such as location, shape, final histology, tumor size and resected specimen size, procedure time of ESD and clinical course after ESD. Patients with fever (>37.8 °C) after ESD were regarded as the post-ESD fever group. None of the patients had perforation, infection, systemic inflammatory disease and bleeding associated with ESD. Univariate analysis was conducted using the chi-square test and student t test. Multivariate analysis was performed using logistic regression, based on the significant variables found by univariate analysis.

**Results:** Among them, 36(4.26%) patients were classified to the post-ESD fever group. Univariate analysis showed a significant association with post-ESD fever for tumor location (p=0.038), tumor size (p=0.038), resected specimen size (p=0.046) and total ESD procedure time (0.046). Multivariate analysis showed a significant association for location in upper third (OR=5.790, p=0.018), tumor size (OR=1.069, p=0.037) and resected specimen size (OR=1.037, p=0.008).

**Conclusion:** In our study, the incidence of post-ESD fever was 4.26%. The risk factor of post-ESD fever was location of the lesion, tumor size and resected specimen size.

**Key Words:** ESD, Endoscopy, Fever

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**UGI-22**

**Endoscopic Treatment to Treat Gastric Outlet Obstruction by Endoscopic Submucosal Dissection**

Jae-Won Yun, Jong-Jae Park, Hyejin Noh, Sung ho Kim, Beom Jae Lee, Jae Seon Kim, Young-Tae Bak

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

**Introduction:** Endoscopic Submucosal Dissection (ESD) is recently widely used in en-bloc resection of superficial gastrointestinal neoplasm. However, if the lesions are located on the distal antrum or especially directly invade the pylorus, resection of the lesions can cause symptomatic gastric outlet obstruction. The aim of this study was to determine the risk factors of post-ESD pyloric stenosis after ESD and evaluate the clinical management for stenosis.

**Methods and Results:** Between January 2008 and July 2012, a total of 1872 gastric neoplasms resected by ESD at Korea University Guro Hospital were reviewed retrospectively. The presence of stenosis was defined as having symptoms such as dysphasia or nausea/vomiting caused by a stenosis through the standard scope could not be passed. We examined the risk factors of post-ESD pyloric stenosis, and the clinical course and management of post-ESD stenosis patients. Post-ESD pyloric stenosis occurred with thirteen of pyloric and antral resections. Nine of the thirteen lesions were located in the pylorus and antrum, four in the antrum. The mean longitudinal diameter of the resected specimen was 5.17 cm (range 2.9 - 9.2 cm). The mean
resected circumferential ratio of the stenosis was 85% (range 60 - 100 %). The presence of direct invasion the pylorus was nine of thirteen (70%). Six of thirteen affected patients were treated by endoscopic stent insertion combined balloon dilatation. But the stent migration occurred in four of six, so they underwent additional balloon dilatation. The frequency of balloon dilatation was one to eight times (average, 2.8 times) and the duration with relief from stenosis after the initial treatment ranged from 1 to 6 months (average 2.7 months). The procedure was successful and provided symptom relief in all cases. However, one of the thirteen cases was complicated by a gastric perforation, but recovered following conservative therapy.

Conclusions: For the treatment of gastric outlet obstruction caused by ESD on the antrum and pylorus endoscopic balloon dilatation or preemptive stent insertion might be a choice. But, because the stent migration occurs frequently, balloon dilatation is preferred currently.

Key Words: ESD, Stenosis, Balloon dilatation, Stent insertion

UGI-23

Clinical Outcome of Lateral Margin Positivity after Endoscopic Submucosal Dissection for Gastric Neoplasia

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Background/Aims: The purpose of this study was to evaluate the clinical outcome of lateral margin positivity for gastric neoplasia resected by endoscopic submucosal dissection (ESD).

Methods: From February 2005 to December 2011, a total of 1334 cases of ESD for gastric neoplasia were performed. Among these cases, we analyzed the cases were pathologically diagnosed as lateral resection margin positivity (LM+) by medical record review, retrospectively.

Results: A total 46 cases of gastric neoplasia resected by ESD were pathologically diagnosed as LM(+). Early gastric cancer was 27 cases and adenoma was 19 cases. Initial management was follow-up endoscopy after 3 months(n=36, 78.3%), operation(n=3, 6.5%) and ESD(n=1, 2.2%). Follow-up loss was 6 cases(13.0%). There are 22 cases (61.1%) of carcinoma and 14 cases (38.9%) of adenoma in the follow-up endoscopy group (n=36). Local recurrence was developed at 12 cases (54.5%) of carcinoma and 4 cases (28.6%) of adenoma (p=0.176). Eventually 9 cases (40.9%) of carcinoma were resected by operation in the follow-up carcinoma group. Mean endoscopic follow-up period was 17.8 months. There was no lymph node metastasis on operation in the follow-up carcinoma group.

Conclusions: Initial management for the pathologically diagnosed LM(+) after ESD of gastric neoplasia was preferred close endoscopic follow-up, regarding the risk factors of lymph node metastasis.

Key Words: ESD, Gastric Neoplasia, Lateral Margin Positivity

UGI-24

Long-Term Results of Endoscopic Submucosal Dissection for Undifferentiated-Type Early Gastric Cancer

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Department of Internal Medicine, Pusan University School of Medicine, Busan, Korea

Background/Aims: Recently, endoscopic submucosal dissection (ESD) for early gastric cancer (EGC) with undifferentiated histology has been applied. However, the usefulness of ESD for undifferentiated type EGC (UD-EGC) still remains controversial because of the lack of long-term follow-up data. The aim of this study was to investigate long-term results of ESD for UD-EGC.

Methods: Between February 2006 and March 2012, a total of 55 patients with UD-EGC were treated using ESD regardless of the expanded criteria at the Pusan National University Hospital. Their medical records were retrospectively reviewed with respect to the overall mortality and disease free survival rate of ESD for UD-EGC.

Results: Of the included 55 UD-EGCs, 25 lesions met the expanded criteria for ESD. In 20 (80.0%) of these lesions, complete resection was achieved with ESD. The remaining 30 lesions were beyond the expanded criteria. Twelve of the 30 lesions were tumor free margins and no lymphovascular invasion. Among the 32 patients in whom complete resection of the primary lesion was achieved, a synchronous lesion was found in 1 patient 6 months after primary ESD and 1 patient died of pneumonia 4 months after the ESD. Median follow-up period was 32 months (range 6-88 months), the 3-year and 5-year overall mortality rates were both 4%, and 3-and 5-year overall disease-free survival rates were both 95%.

Conclusions: We suggest that ESD could be performed carefully in selected patients with for UD-EGC, especially within expanded criteria.

Key Words: Undifferentiated-type Early Gastric Cancer, Endoscopic Submucosal Dissection, Long Term Result
Clinical Outcomes of Endoscopic Resection for Undifferentiated Early Gastric Cancer

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Background: Endoscopic resection (ER) has become an important curative option for early gastric cancer (EGC). However, the application of ER for undifferentiated EGC remains controversial. The aim of this study was to evaluate the clinicopathologic outcomes of ER performed for undifferentiated EGC.

Methods: From October 2002 to June 2011, 59 lesions in 59 patients with undifferentiated EGC (42 poorly differentiated adenocarcinoma; 17 signet ring cell carcinoma) were treated by ER. The therapeutic efficacy of ER was assessed according to en bloc resection rate, complete resection (CR; en bloc resection with tumor-free lateral and vertical resection margins) rate, and recurrence rate during follow-up.

Results: A total of 23.7% of cases showed submucosal invasion. The mean size of lesions was 2.1 cm (range 0.1 to 5.2 cm). The rates of en bloc resection, tumor-free resection margins, and CR were 94.9%, 78.0%, and 72.9%, respectively. The en bloc resection and CR rates in poorly differentiated EGC were 95.2% and 76.2%, and those in signet-ring cell carcinoma were 94.1% and 64.7%, respectively. There were no significant differences between two histologic subtypes. The rate of lateral margin involvement (14.3% versus 29.4%) and vertical margin involvement (4.8% versus 0.0%) showed no significant difference between poorly differentiated EGC and signet-ring cell carcinoma. Of 59 cases, 44 lesions (32 mucosal lesions and 12 submucosal lesions) were resected by surgical gastrectomy. In surgical specimen, no case showed lymph node metastasis. Of 15 cases not undergoing surgery, no recurrence occurred during median follow-up of 27.5 months (range 8 to 109 months).

Conclusion: ER might be a feasible local treatment and could be considered as an alternative treatment modality for undifferentiated EGC in carefully selected cases.

Key Words: Endoscopic resection, Undifferentiated cancer

Clinical Outcomes of Endoscopic Submucosal Dissection of Early Gastric Cancer with Undifferentiated Histology

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Background: Endoscopic submucosal resection (ESD) is an effective treatment for selected patients of early gastric cancer (EGC). Recently, ESD of undifferentiated EGC has been reported to be feasible. The aim of this study was to examine the short term and long term outcomes of ESD of undifferentiated early gastric cancer.

Patients and Methods: Data on 1241 patients who underwent ESD for EGC at six medical centers in Daegu-Kyungpook, Korea between February 2003 and May 2010 were collected. We performed a retrospective analysis of the medical records of 74 patients diagnosed with undifferentiated EGC. We divided the enrolled cases into two groups, expanded-indication group versus non-indication group according to lesion size, presence of ulceration, and pathologic review.

Results: Of total 74 lesions with undifferentiated EGC, pathologic examination revealed that expanded indication group was including 29 cases and non-indication group 45 cases. The mean diameter of lesions was 19.86±12.50mm. The overall rates of en-bloc resection and complete resection were 90.5% (67/74) and 73% (54/74) respectively. The curative resection rate was low at 31.1%. If limited to pathologically diagnosed expanded-indication group, the curative resection rate was 79.3% (23/29). During median follow-up periods of 34 months (range, 1-75), local recurrences were observed in 5.5% (4/74). All of them were in non-indication group and underwent non-curative resection. There was no mortality related to EGC during follow up.

Conclusion: ESD may be feasible to treatment for selected patients of undifferentiated EGC, although our multicenter retrospective study may be considered to be only preliminary.

Key Words: Endoscopic Submucosal Dissection, Undifferentiated, Early Gastric Cancer

Long-Term Outcomes of Endoscopic Resection for Undifferentiated Early Gastric Cancer

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Background: Endoscopic resection for early gastric cancer (EGC) has become an important curative option for early gastric cancer. However, the application of ER for undifferentiated EGC remains controversial. The aim of this study was to evaluate the clinicopathologic outcomes of ER performed for undifferentiated EGC.

Methods: From October 2002 to June 2011, 59 lesions in 59 patients with undifferentiated EGC (42 poorly differentiated adenocarcinoma; 17 signet ring cell carcinoma) were treated by ER. The therapeutic efficacy of ER was assessed according to en bloc resection rate, complete resection (CR; en bloc resection with tumor-free lateral and vertical resection margins) rate, and recurrence rate during follow-up.

Results: A total of 23.7% of cases showed submucosal invasion. The mean size of lesions was 2.1 cm (range 0.1 to 5.2 cm). The rates of en bloc resection, tumor-free resection margins, and CR were 94.9%, 78.0%, and 72.9%, respectively. The en bloc resection and CR rates in poorly differentiated EGC were 95.2% and 76.2%, and those in signet-ring cell carcinoma were 94.1% and 64.7%, respectively. There were no significant differences between two histologic subtypes. The rate of lateral margin involvement (14.3% versus 29.4%) and vertical margin involvement (4.8% versus 0.0%) showed no significant difference between poorly differentiated EGC and signet-ring cell carcinoma. Of 59 cases, 44 lesions (32 mucosal lesions and 12 submucosal lesions) were resected by surgical gastrectomy. In surgical specimen, no case showed lymph node metastasis. Of 15 cases not undergoing surgery, no recurrence occurred during median follow-up of 27.5 months (range 8 to 109 months).

Conclusion: ER might be a feasible local treatment and could be considered as an alternative treatment modality for undifferentiated EGC in carefully selected cases.

Key Words: Endoscopic resection, Undifferentiated cancer
Background/Aims: Endoscopic resection (ER) has become an important curative option for early gastric cancer (EGC). However, the application of ER for undifferentiated-EGC (UD-EGC) remains controversial. The long-term clinical outcomes of the procedure have not yet been fully investigated. The aim of this study was to elucidate long-term outcomes of ER for UD-EGC.

Methods: From January 2001 to December 2011, 209 lesions in 209 patients with UD-EGC (82 poorly differentiated adenocarcinoma (PD); 127 signet ring cell carcinoma (SRC)) were treated by ER at Severance and Gangnam Severance Hospital. We assessed the clinical outcomes of ER in 209 patients who underwent ER for the first time. The survival rate and disease free survival rates after ER were evaluated as the long-term outcomes.

Results: The en bloc resection and complete resection (CR) rates were 91.4% (191/209) and 58.4% (122/209), respectively. The en bloc and CR rates in PD were 90.2% (74/82) and 47.6% (39/82), whereas those in SRC were 92.1% (117/127) and 65.4% (83/127). For patients with PD who underwent incomplete resection, 65% (28/43) were vertical margin positive and for those with SRC, 75% (11/14) were lateral margin positive with statistical significance (p<0.001). In those patients CR was completed, no cases of local recurrence and 1 case (0.8%, 1/122) of distant metastasis (52 months after ER) were observed during the follow-up period (4.2±18.02, 9-76 month). 2 cases (1.6%, 2/122) of synchronous lesions and 3 cases (2.5%, 3/122) of metachronous lesions were detected after ER without significant differences between CR patients with SRC and PD. The 3- and 5-year survival rates were both 99.5% and the 3- and 5-year overall disease-free survival rates were 92.3% and 91.4%.

Conclusions: ER may yield good long-term outcomes for UD-EGC if histologically CR is performed. However, in order to increase the current CR rate from 58.4%, stricter criteria for performing ER are required.

Key Words: Early gastric cancer, Undifferentiation, ESD

UGI-29

Accuracy of a Scoring System for Differential Diagnosis of Gastric Subepithelial Tumors

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Backgrounds and Aim: Gastric subepithelial tumor (SET) is difficult to diagnose using routine endoscopic examination with conventional biopsies. The aim of this study is to investigate the new scoring system for differential diagnosis before...
tissue acquisition.

**Material and Methods:** We developed a scoring system to predict the histology of gastric SET. The scoring system included four variables: tumor location, the layer of origin, echogenicity, and shape on EUS. The scoring system was composed with a total 16 score and a maximum 4 scores in each variable. The database of 239 patients who were treated by endoscopic resection or surgery for gastric subepithelial tumors between 2001 and 2012 was analyzed by the new scoring system.

**Results:** Among 239 gastric SETs, there were 31 tumors (13.0%) in the cardia, 25 tumors (10.5%) in the fundus, 73 (30.5%) in the body, 110 tumors (46.0%) in the antrum, respectively. Histologically, 69 (28.9%) were gastrointestinal stromal tumors, 68 (28.5%) were ectopic pancreases, and 35 (14.6%) were leiomyomas. In ectopic pancreas cases, 60 (88.2%) were located in antrum. In gastrointestinal stromal tumors, 1 (1.4%) was detected in cardia. On the other hand, 28 leiomyomas (80%) were identified in cardia. The median tumor size was 23±20 mm (range 3-200 mm). Gastric SETs in antrum were significantly smaller than those in other sites of the stomach (30±17 mm in cardia, 29±19 mm in fundus, 26±28 mm in body, and 18±13 mm in antrum; P<0.05). After application of scoring system, sensitivity and specificity were 77.3% and 85.3% for GIST; 84.6% and 69.4% for ectopic pancreas; 75.9% and 97.4% for leiomyoma; and 91.7% and 95.7% for lipoma.

**Conclusions:** The new designed scoring system is a relatively useful tool to predict the histology for gastric SETs without tissue acquisition.

**Key Words:** Gastric subepithelial tumor, Scoring system, Diagnosis, Histology

**UGI-30**

**Gastrointestinal Stromal Tumor (GIST) of the Stomach: Clinicopathologic Analysis of Recurred Case**

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**Purpose:** The vast majority of studies of GISTs suggest that the two most important prognostic features are mitotic activity and tumor size. Parameter for risk stratification by Miettinen and Lasota is generally used for evaluation of the clinical behavior of localized GISTs. Korean GIST study group adopted this proposed risk stratification. Throughout the last 10 years of gastric GIST patients, we have identified the variable predicting recurrences and classified the risk groups by Miettinen and Lasota risk stratification and UICC TNM stage.

**Methods:** From January 2000 to July 2012, 75 patients with pathologic confirm and surgical resection were diagnosed with GIST of the stomach. We characterized tumors by symptom, size, mitotic index, immunohistochemical markers such as KIT, CD34, PKC-theta, SMA, risk stratification by Miettinen and Lasota, and UICC TNM stage.

**Results:** The mean age of the 75 patients was 61.9 years, and the male to female ratio was 37 : 38. Positive rates of immunohistochemical markers such as KIT, CD34, PKC-theta, SMA was 89%, 90%, 60%, 19% respectively. Three patients experienced recurrence. Among recurred patients, 2 patients were stratified to high risk. Remaining one patient was stratified to low risk, but his TNM stage was IV due to regional lymph node metastasis.

**Conclusion:** Gastric GIST patients with high risk group require strict surveillance. Risk stratification by Miettinen and Lasota is useful prognostic parameter but in case of local or metastasis TNM stage is preferred for prognostic parameter.

**Key Words:** Gastrointestinal stromal tumors(gists), Stomach, Recurrence

**UGI-31**

**Diagnostic Utility of Endoscopic Resection in Patients with Small, Asymptomatic Gastric Submucosal Tumors**


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**Background/Aims:** There are no definite guidelines for the management of small (<3 cm in diameter), asymptomatic gastric SMT. Endoscopic ultrasonography (EUS) has been reported to be useful in the diagnosis of submucosal tumor (SMT). But EUS alone cannot substitute for a pathological diagnosis of SMT, and EUS is an imperfect tool for assessing the malignancy risk of these lesions. Hence the aim of our study was to evaluate the diagnostic utility and safety of endoscopic resection for the gastric SMTs.

**Methods:** 44 patients with gastric SMTs, who had undergone EUS and endoscopic resection between August 2007 and May 2009 were retrospectively selected. We excluded patients with gastric SMTs of <1 cm or >3 cm in diameter. The methods of endoscopic resection were standard snare resection, unroofing technique, endoscopic submucosal resection with ligation, endoscopic submucosal dissection, endoscopic full thickness
resection. Immunohistochemical staining with c-kit, CD34, SMA, actin, S-100 and ki-67 was done if a spindle cell tumor was found. Main outcome measurements were diagnostic utility of EUS and endoscopic resection, complications, factors related each resection methods.

**Results:** A total of 44 patients (52% female, mean age 56.6 years) underwent EUS and endoscopic resection. Sufficient specimens for a final diagnosis and the assessment of risk for malignancy were obtained in 100% of cases. The most common gastric SMT was GI stromal tumor (17 of 44, 37.8%), and 14 cases with GI stromal tumor were classified as very low risk for malignant potential (mitotic index < 5/50 high power fields). The concordance rate between the EUS and the pathologic diagnosis was 61.3%. Bleeding after endoscopic resection occurred in 3 cases (6.8%) but was safely managed by endoscopic hemostasis. Unintended perforation was not observed in any patient.

**Conclusion:** EUS alone is imperfect tool of diagnosis for gastric SMTs and Endoscopic resection appears to be an safe and effective technique for determining the definitive pathological diagnosis, evaluation of the malignant potential of small, asymptomatic gastric SMTs.

**Key Words:** SMT, EUS, Endoscopic resection

**UGI-32**

**Clinical Outcomes of Argon Plasma Coagulation for the Treatment of Gastric Neoplasm**

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**Objectives:** There are insufficient reports on the outcomes and local recurrence rates for gastric neoplasms treated using argon plasma coagulation (APC). The aim of this study was to analyze the clinical outcomes in early gastric cancer or gastric adenoma patients following APC treatment.

**Patients and Methods:** Seventy-one patients were enrolled and all of whom underwent APC at the Asan Medical Center between July 2007 and August 2011. Clinical and oncological outcomes were analyzed.

**Results:** The median follow-up period was 20 months (interquartile range [IQR]: 13-29 months). Among the 71 patients we evaluated, non-lifting after submucosal saline injection was found in 35 patients and 15 patients (21.2%) experienced local recurrence with a median period of 10 months (IQR 5-13 months). The rate of local recurrence was higher in the non-lifting group and the 40 watt group than in the lifting group and the 60 or 80 watt groups (31.4% vs. 11.1%, p=0.045 and 31.7% vs. 6.7%, p=0.017, respectively). Multivariate analysis showed that the power setting with the 40 watt and non-lifting groups after submucosal injection was associated with local recurrence.

**Conclusions:** APC therapy after submucosal saline injection using high power (60 or 80 watts) appears to be an effective alternative in the management of gastric neoplasm.

**Key Words:** Argon Plasma Coagulation, Recurrence, Stomach Neoplasm

**UGI-33**

**Argon Plasma Coagulation Is Feasible for Gastric Low-Grade Dysplasia: A Comparison with Endoscopic Submucosal Dissection**

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**Background and Aims:** The best therapeutic modality has not been established for gastric low-grade adenomas or dysplasia (LGD), which can progress to invasive carcinoma despite a low risk. This study aimed to investigate the clinical efficacy, safety, and local recurrence after argon plasma coagulation (APC) treatment of gastric LGD compared to endoscopic submucosal dissection (ESD). Patients and Methods: A total of 320 patients with gastric LGD 2.0 cm treated with APC or ESD between 2004 and 2011 were retrospectively analyzed. We compared local recurrence rate, complication rate, procedure time, and admission to hospital between APC and ESD groups.

**Results:** Of the 320 patients, 116 patients were treated with APC and 204 with ESD. During follow-up, local recurrence was more common in the APC group (3.8%, 4/106) than the ESD group (0.5%, 1/188; log-rank test p=0.036). However, all patients with local recurrence (n=5) were treated by additional APC, and followed-up without further recurrences. ESD was complicated by two perforations (1.0%, 2/204) compared to no perforations in the APC group (0%, 0/116). Bleeding complications were not different between the APC (1.7%, 2/116) and ESD (2.0%, 4/204) groups. Procedure time was shorter in the APC (7.8±5.1 min) than the ESD (53.1±38.1 min) group (p<0.001). The proportion of hospitalization was less in the APC group (31.0%, 36/116) than the ESD group (100.0%, 204/204) (p<0.001).

**Conclusions:** APC can be a good treatment option for patients with LGD equal to or less than 2.0 cm.
Key Words: Low Grade Adenoma, Dysplasia, Argon Plasma Coagulation, Submucosal Dissection

UGI-34

ESD as a Treatment For Gastric Low Grade Adenoma, Predictive Factors for Category 4 Lesions
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Background and Aims: From the revised Vienna classification, category 4 or 5 (high grade dysplasia or invasive carcinoma) lesions of stomach should be removed. Even though category 3 (low grade dysplasia) lesion can progress to invasive carcinomas, the clinical recommendation was endoscopic resection or follow-up. The aim of this prospective study was to know the clinical results of endoscopic submucosal dissection (ESD) of low grade dysplasia. Secondary aim was to determine the predictive factors to suspect Category 4 or 5 lesions from category 3 lesion by Endoscopic forceps biopsy.

Methods: Between November 2008 and October 2011, 413 ESD procedures were carried out. After exclusion, 218 cases of category 3 lesions from endoscopic forceps biopsy were enrolled. The clinicopathologic features, complete resection rate and associated factors to predict category 4 or 5 lesions were analyzed.

Results: The mean age was 62.00 ± 9.27 years. Complete resection rate was 96.8%. After ESD, 39 lesions (17.8%) were diagnosed category 4 or 5 lesions. Category 4 lesions were 15 cases (6.8%) and category 5 lesions were 24 cases (11.0%). On the univariate analysis, lesion diameter more than 1 cm and presence of surface redness were significant risk factors. But, on the multivariate analysis, lesion diameter more than 1 cm was the only significant predictive factor for category 4 or 5 lesions.

Conclusions: Gastric category 3 lesion more than 1 cm should be removed by endoscopic resection technique. ESD is a useful method for complete resection of gastric adenomas, regardless of size and location.

Key Words: ESD, Adenoma, Predictive factor

UGI-35

Results of the ESD for the Gastric Adenomatous Polyps: Predictive Factors for Category 4 Lesion
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Background: Recently, early gastrointestinal tumors including gastric adenoma can be treated by endoscopic submucosal dissection (ESD) technique. However, the discrepancy of histologic diagnosis may sometimes exist between the pretreatment endoscopic forceps biopsy (EFB) and post-ESD specimen. The aim of this study was to evaluate discrepancy rate between EFB and ESD specimen and to investigate the predictable factors of the Category 4 lesions (High grade adenoma or EGC) after ESD through the clinical, endoscopic features of the lesion.

Methods: Between December 2008 and May 2012, 448 ESD procedures were carried out with the diagnosis of gastric adenoma after EFB: low grade dysplasia (LGD) and high grade dysplasia (HGD). We compared the pretreatment EFB and post-ESD specimen results, then, analyzed the tumor characteristics associated with Category 4 lesions.

Results: 322 patients were diagnosed with LGD and 126 patients with HGD from EFB. Among the 448 patients who received ESD, discordance between the diagnoses from EFB and ESD specimen occurred in 139 patients (31.02%). In LGD from EFB, 30 patients (9.3%) were revealed to invasive cancers and 21 patients (6.5%) were revealed to HGD. In HGD from EFB, 70 patients (55.6%) were revealed to invasive cancers and 11 patients (8.7%) were revealed to LGD. On the univariate analysis, endoscopic depressed type, lesion diameter more than 1 cm and presence of surface redness were significant predictive factors for Category 4 lesion. Also, on the multivariate analysis, endoscopic depressed type, lesion diameter more than 1 cm and presence of surface redness were significant risk factors.

Conclusions: The rate of discrepancy between the diagnosis of EFB and the post ESD specimen was as high as 31.02% on the gastric adenoma after EFB. And in cases of endoscopic depressed type, lesion diameter more than 1 cm and presence of surface redness after ESD, we should consider more invasive change possibility. Therefore ESD technique might be treatment choice for en bloc resection.

Key Words: Gastric adenoma, Discrepancy, ESD, Category 4 lesion

UGI-36

A Bedside Portable Endoscopy Is Not Superior to Nasogastric Aspiration for Identifying Upper Gastrointestinal Bleeding
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Introduction: A novel bedside portable endoscopy (EG scan)
has been developed to evaluate upper gastrointestinal (UGI) tract with high convenience and notable accessibility. There is no data on the role of this endoscopy for assessing UGI tract bleeding compared with nasogastric (NG) aspiration. This study was aimed to compare the outcome of EG scan with that of NG aspiration in patients with GI bleeding.

**Methods:** Patients who underwent NG aspiration for evaluation of UGI bleeding were eligible for this study. After NG aspiration, we performed EG scan to identify bleeding evidence in UGI tract. Then, all patients underwent conventional UGI endoscopy. Sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV) and accuracy of EG scan for confirming UGI bleeding were compared with those of NG aspiration.

**Results:** A total of 129 patients who had GI bleeding sign or symptom were included in the study (age 64.46±13.79, male 91). UGI tract (esophagus, stomach, and duodenum) was the most common site of bleeding (81, 62.8%) and the cause of bleeding was not identified in 12 patients (9.3%). Overall outcomes for identifying UGI bleeding were not significantly different between EG scan and NG aspiration (sensitivity 64.2% vs. 74.1%, p=0.234; specificity 83.4% vs. 68.8%, p=0.088; PPV 88.1% vs. 80%, p=0.246; NPV 58.6% vs. 61.1% p=0.854; accuracy 72% vs. 72%). However, accuracy of EG scan was significantly higher than that of NG in the subgroup analysis of patients with bleeding site of esophagus (88.2% vs. 75%, p=0.046).

**Conclusion:** EG scan is not superior to NG aspiration for confirming UGI bleeding site. This portable endoscopy might give a marginal benefit over NG aspiration in patients with esophageal bleeding. (WHO ICTRP No. KCT0000298)

**Key Words:** Endoscopy, Gastrointestinal bleeding, Nasogastric aspiration

**UGI-37**

The Comparison of Hemostatic Outcomes Between Hemoclip Placement and Coagulation Methods in Non-Variceal UGI Bleeding

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**Background/Aims:** There is neither most suitable hemostatic method nor established procedure in non-variceal upper gastrointestinal bleeding (NVUGIB). The study aim was to compare endoscopic hemoclip placement with endoscopic coagulation method in non-variceal upper gastrointestinal bleeding.

Also we tried to find the risk factor of recurrent bleeding.

**Design:** Retrospective, single-center study.

**Patients:** 183 patients with non-variceal upper gastrointestinal bleeding who received endoscopic hemoclip placement or endoscopic coagulation methods. Main Outcome Measurement: Successful hemostasis rate and recurrent bleeding rate.

**Results:** From November 2008 to June 2012, there are 183 patients who received endoscopic hemoclip placement or endoscopic coagulation methods owing to non-variceal upper gastrointestinal bleeding. In patients received hemostatic methods by endoscopy, most common cause of NVUGIB is gastric ulcer (46.9%). The number of patients with endoscopic hemoclip placement and endoscopic coagulation were 66 and 117, respectively. There were 5 cases (7.6%) of primary hemostatic failure in hemoclipping, and 9 cases (7.7%) in coagulation. Recurrent bleeding was seen in 7 cases (10.6%) with hemoclipping group and 11 cases (9.4%) with coagulation group. In this study, chronic renal failure was associated with risk of recurrent bleeding, but other comorbid condition such as hypertension, diabetes mellitus, cardiovascular disease were not. Anti-platelet drugs did not show the significantly high risk of recurrent bleeding, too (recurrent bleeding rate: 13.3% with anti-platelet drug, 8.7% without those, p value = 0.612).

Additional hemostatic procedures such as angiography or operation were performed in 10 cases (15.2%) and 12 cases (10.3%), respectively. Death due to gastrointestinal bleeding was 1 in each groups. (1.5% vs 0.9%, p value = 0.552)

**Limitations:** Retrospective analysis, single-center study.

**Conclusions:** Between endoscopic hemoclip placement and endoscopic coagulation methods as initial hemostatic method in non-variceal upper gastrointestinal bleeding, there are no significant difference in hemostatic efficacy and clinical outcomes. Chronic renal failure is associated with recurrent bleeding risk, in this study.

**Key Words:** Non-variceal upper gastrointestinal bleeding, Hemoclip placement, Coagulation method

**UGI-38**

Argon Plasma Coagulation for the Treatment of Radiation-Induced Hemorrhagic Gastro-Duodenal Vascular Ectasia

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¹Center for Liver Cancer, ²Center for Gastric Cancer, National Cancer Center, Goyang, Korea

**Background:** There is no data on the role of this endoscopy for assessing UGI tract with high convenience and notable accessibility. There is no data on the role of this endoscopy for assessing UGI tract bleeding compared with nasogastric (NG) aspiration. This study was aimed to compare the outcome of EG scan with that of NG aspiration in patients with GI bleeding.

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**Key Words:** Endoscopy, Gastrointestinal bleeding, Nasogastric aspiration

**UGI-37**

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Additional hemostatic procedures such as angiography or operation were performed in 10 cases (15.2%) and 12 cases (10.3%), respectively. Death due to gastrointestinal bleeding was 1 in each groups. (1.5% vs 0.9%, p value = 0.552)

**Limitations:** Retrospective analysis, single-center study.

**Conclusions:** Between endoscopic hemoclip placement and endoscopic coagulation methods as initial hemostatic method in non-variceal upper gastrointestinal bleeding, there are no significant difference in hemostatic efficacy and clinical outcomes. Chronic renal failure is associated with recurrent bleeding risk, in this study.

**Key Words:** Non-variceal upper gastrointestinal bleeding, Hemoclip placement, Coagulation method

**UGI-38**

Argon Plasma Coagulation for the Treatment of Radiation-Induced Hemorrhagic Gastro-Duodenal Vascular Ectasia

Hee-Won Kwak¹, Woo Jin Lee¹, Sang Myung Woo¹, Young-II Kim¹, Ji-Hoon Kim¹, Bo Hyun Kim¹, Joong-Won Park¹, Chang-Min Kim¹, Tae Hyun Kim¹, Seong Hoon Kim¹, Sang Jae Park¹, Myeong Cherl Kook ²

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Background and Aim: Radiation-induced hemorrhagic gastroduodenal vascular ectasia (GDVE) is a rare but serious complication of radiation therapy which is difficult to manage. To the best of our knowledge, we report the efficacy of argon plasma coagulation (APC) in patients with radiation-induced hemorrhagic GDVE for the first time.

Patients and Methods: A total of 18 patients with GI bleeding caused by radiation-induced GDVE who were treated with APC were included. Their mean age was 59 years (range 42-80). Thirteen patients had hepatocellular carcinoma, 3 pancreatic cancers, and 2 cholangiocarcinoma. The efficacy of APC was evaluated on the basis of the patient’s symptoms, hemoglobin level, complication and recurrence.

Results: Median time interval between radiation and diagnosis was 4.6 months (range 3.3-21.5). A mean of 2.4 (range 1-4) treatment sessions per patient were required. All patients had an endoscopically observed response to therapy and all patients had a sustained rise in hemoglobin level after treatment. [(6.6 g/dl (range 2.9-9.5) to 9.7 g/dl (range 7.1-14.7)]. There was no serious complication. There was no recurrence, partly due to relatively short survival time.

Conclusions: APC is both effective and safe short-term treatment in controlling bleeding due to radiation-induced hemorrhagic GDVE.

Key Words: Hemorrhagic gastroduodenal vascular ectasia, Radiation therapy, Argon plasma coagulation

UGI-39

The Clinical Outcome of Acute Non-Variceal Gastrointestinal Bleeding at After-Hours: The Role of Urgent Endoscopy

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Objectives: This study was performed to record the clinical outcome of acute NVUGIB at after-hours and to investigate the clinical role of the urgent endoscopy (within 8 hours). Methods and

Results: Between January 2009 and December 2010, medical records of patients who visited to emergent unit for acute NVUGIB were reviewed. A total of 158 patients visited the emergent unit at after-hours for acute NVUGIB. Of all the patients underwent endoscopy within 24 hours by two experienced endoscopists. Among these 158 patients, 60 patients received urgent endoscopy (within 8 hours). The rate of hemodynamic instability (systolic blood pressure less than 100 mmHg) was significantly higher in urgent endoscopy group compared to early endoscopy group (between 8 and 24 hours) (33% vs. 19%, p=0.038). Among 60 patients in urgent endoscopy group, the success of endoscopic hemostasis was achieved in all except one patient and the rate of rebleeding was only 6.7% (four of 60 patients). The rate of endoscopic success and re-bleeding and the requirement of angiographic embolization or surgery were comparable to those in early endoscopy group. 30-days mortality occurred in three patients (one and two in urgent and early endoscopy group, respectively). In patients with high clinical Rockall score (more than 3), the urgent endoscopy tended to decrease the hospital stay, although which is not statistically significant (7.7 vs. 12.0 days, p>0.05).

Conclusions: Urgent endoscopy group, despite of more rate of high-risk patients compared to early endoscopy group, showed an excellent endoscopic success rate and favorable clinical outcome not inferior to early endoscopy group. The results of this study show a possible role of urgent endoscopy (when performed by experienced endoscopists) in high-risk patients. A prospective study to investigate the role of urgent endoscopy by experienced endoscopists would be required.

Key Words: Acute non-variceal upper gastrointestinal bleeding, Urgent endoscopy, After-hours, Clinical outcome

UGI-40

Effects of Using Antiplatelet Agent in Patients with Upper Gastrointestinal Bleeding after Endoscopic Treatment

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Background/Objectives: Upper gastrointestinal bleeding (UGIB) has been decreased recently, with the improvement of endoscopic treatment and more frequent use of proton pump inhibitor. As the aging society has begun, the use of antiplatelet agents has been increased and therefore UGIB during antiplatelet therapy has also been increased. If high risk patients taking antiplatelet agents have UGIB, recent studies recommend deciding a period of stopping the drug use by considering the patients’ and the endoscopic risk. In our study, we investigated the rate of recurrent bleeding after endoscopic hemostasis for acute UGIB and antiplatelet agents’ effect on the rebleeding rate.
Subject/Methods: This study was carried out from August 2004 to December 2011 in the Division of Gastroenterology of Kyung Hee University Hospital. Among 896 hospitalized patients, 361 patients who were under antiplatelet medication and had UGIB due to gastric and peptic ulcer, Mallory-Weiss tear were enrolled in this study. We divided the patients into two groups, with and without antiplatelet medications. Clipping, epinephrine therapy with cautery and epinephrine therapy with clamping were used as endoscopic treatment modalities.

Results: Among 361 patients, 128 patients had the antiplatelet agents and 233 patients had not. The mean age was significantly higher in the drug-given group (65.0±11.9 years) than the drug-free group (54.8±16.8 years, P<0.05). In the drug-given group, the comorbidities and ASA score were higher than the other group (P<0.05). The hemoglobin level at the time of hospital admission was significantly lower in the drug-given group (p=0.033). The rates of recurrent bleeding 3, 7, 10 days after endoscopic hemostasis were no significant difference related to the use of the antiplatelet drugs (p>0.05). The time of hospitalization, amount of transfusion, failure rate of endoscopic hemostasis, and mortality were also insignificant between the two groups. The factor related to recurrent bleeding by the 10th day was ASA score in a univariate analysis (p=0.025). However, there was significant relationship between recurrent bleeding and ASA score by the 7th and 10th day (p=0.038, p=0.010, respectively) in a multivariate analysis.

Conclusion: When UGIB occurs in high risk patients taking antiplatelet medications, the antiplatelet agents were not the factor of increasing recurrent bleeding after endoscopic hemostasis. Short-term withdrawal of the antiplatelet drugs had no effect on the cardiovascular and cerebrovascular complications as far as the drug effect was maintained.

Key Words: Antiplatelets, Upper gastrointestinal bleeding, Aspirin, Clopidogrel

UGI-41

Clinical Outcomes and Prognostic Factor for Clinical Success of SEMS in Malignant Gastric Outlet Obstruction

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Background and Aim: Endoscopically inserted self-expandable metal stents (SEMSs) are used to palliate gastric outlet obstruction (GOO). Peritoneal disease was considered a relative contraindication to SEMS insertion. However, the clinical success rate of SEMS in patients of carcinomatosis with ascites has not been fully characterized. The aim of our study is to evaluate clinical outcome and predictive factor for clinical success of SEMS in malignant GOO.

Methods: We analyzed a total 306 patients who were scheduled for SEMS insertion for malignant GOO in tertiary-care academic medical center. All patients were treated an uncovered or covered SEMS by using the over-the-wire placement procedure. We retrospectively evaluated clinical outcome of SEMS insertion including technical success and clinical success.

Results: Technical success was achieved in 304 in 306 patients (99.3%). Clinical success was achieved in 260 in 304 patients (85.5%). Patients were categorized into two groups according to the presence of carcinomatosis. Clinical success rates of patients without carcinomatosis group and carcinomatosis group were 93.5% (116/124) and 80% (144/180), respectively (p: 0.001). The ECOG (≥3, p: <0.001) and carcinomatosis (p=0.007) were independent poor predictive factors for clinical success of SEMS. In subgroup analysis in patients with carcinomatosis group, clinical success rates of patients without ascites group and ascites group were 93.1% (95/102) and 62.8% (49/78), respectively (p<0.001). The ECOG (≥3, p: 0.014) and ascites (p<0.001) were independent poor predictive factors for clinical success of SEMS in carcinomatosis group.

Conclusion: In palliation for malignant GOO, the status of carcinomatosis with ascites is a significant poor predictive factor for clinical outcome of SEMS insertion.

Key Words: SEMS, Malignant gastric outlet obstruction, Clinical outcome

UGI-42

Comparison Trial of Covered Stent and Uncovered Stent in Patients with Unresectable Malignant Gastric Obstruction

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Background: Insertion of self-expandable metallic stents (SEMS) can provide rapid relief of malignant obstruction and can be used as a palliative treatment or as a bridge to surgery. A SEMS can be classified as an uncovered or covered stent. Previous comparative studies are limited and often include few patients.

Objective: To compare differences in success rate, GOOSS
score, stent patency time, re-intervention rate, complication rates and patient survival between covered and uncovered metallic stents in patients with malignant obstruction of stomach, pancreas, duodenal, ampullary and bile duct cancer. Design and setting: A randomized prospective controlled single blind multi-center trial

**Method:** We studied 90 patients with malignant obstruction (stomach in 75, pancreatic in 7, duodenal in 2, ampullary in 2, bile duct in 4). Insertion of covered stents was attempted in 42 patients (stomach cancer in 38, pancreatic cancer in 1, duodenal cancer in 1, ampullary cancer in 1, bile duct cancer in 1) and uncovered stents were used in 48 (stomach cancer in 37, pancreatic cancer in 6, duodenal cancer in 1, ampullary cancer in 1, bile duct cancer in 3). Intervention: The stent was inserted into the obstructive sites by using the through-the-scope method. After stent insertion, the patients had check up every month. Main outcome measurement: Insertion success rate, pre and post GOOSS score, stent patency time, re-intervention rate, complication rate and patient survival.

**Results:** Technical and clinical success rates of covered and uncovered stents were not different (97.6%; 97.6%, p > .05, 100%; 95.8%, p > .05). The initial GOOSS score before intervention and lowest post-intervention GOOSS score were not different in both group (p > .05). There were no difference in stent patency time, early complication, late complication, re-intervention rate and patient survival between the 2 groups. Limitation: This was a small-sized study. Confirmation of large-scale sized outcome is required.

**Conclusions:** Insertion of either an covered or uncovered stent is similarly an effective treatment modality of malignant gastric outlet obstruction.

**Key Words:** Covered stent, Uncovered stent, Stent

**UGI-43**

Outcomes of Second Self-Expandable Metallic Stent Insertion for Malignant Gastric Outlet Obstruction

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**Background and Study Aim:** Self-expandable metallic stents are widely used to relieve the malignant gastric outlet obstruction (GOO). However, further interventions are sometimes needed to resume the loss of first-stent patency which is caused by re-stenosis or migration of stent. This study aimed to evaluate the effectiveness of second-stent in the patients with malignant GOO.

**Patients and Methods:** A total of 222 gastric cancer patients underwent first-stent due to inoperable GOO and follow-up interviews were performed every month in the tertiary-care cancer center hospital. In 59 patients, second-stent insertion was tried and the clinical outcome was evaluated. A Cox proportional hazards model was used to evaluate the prognostic factor of stent patency.

**Results:** Technical and clinical success rate were 98.3% (58/59) and 91.5% (54/59), respectively. Immediate clinical success rates of stent-after-migration (100% [11/11]) was not differ from stent-in-stent (89.6% [43/48], p=1.0). The patients who received the second-stent due to the late complications of first-stent (migration, re-stenosis and fracture) showed a higher clinical success rate (95.8% [46/48]) than the patients who received the second-stent due to the immediate clinical failure of first-stent (72.7% [8/11], p=0.040). The median patency of second-stent was 27.7 weeks. The median patency of stent-in-stent and stent-after-migration was 27.4 wks and 58.4 wks, respectively (p=0.177). The complications were developed in 17 patients (29.3%). The re-stenosis, migration and fracture rates were 18.6% (11/59), 5.1% (3/59) and 5.1% (3/59), respectively. There was no significant prognostic factor for second-stent patency.

**Conclusions:** Second-stent insertion is effective to treat the failure of first-stent in the gastric cancer patients with GOO, especially the immediate outcome of first-stent was successful. Stent-after-migration was effective as well as stent-in-stent.

**Key Words:** Gastric cancer, Stent, Obstruction

**Stenting Versus Gastrojejunostomy for Gastric Outlet Obstruction Caused by Gastric Cancer**

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**Background and Aim:** Gastric outlet obstruction (GOO) is a common complication of advanced gastric cancer. A self-expandable metallic stent (SEMS) is widely used in palliative treatment and as an alternative to surgery for malignant GOO. However, few studies have compared the responses to these treatments in patients with good performance status. The aim of this study was to compare the long-term efficacy and complications of SEMS placement and surgical gastrojejunostomy (GJJ) in palliation of malignant GOO caused by gastric cancer in patients with good performance status.
Patients and Methods: This retrospective study investigated patients with unresectable gastric cancer treated for GOO from January 2001 to January 2011 at Seoul St. Mary’s hospital, Korea. The outcomes assessed included clinical success rate, complication rate, patency and survival duration.

Results: Of the 113 patients in this study, 72 underwent SEMS placement and 41 had GJJ. There were no differences in age, tumor status, ECOG score, American Society of Anesthesiologists classification, or Gastric Outlet Obstruction Scoring System score. The two groups did not differ in the technical and clinical success and incidence of early complications. However, the rate of late complications was significantly higher in the SEMS group (44.4% vs 12.2%; \( p < 0.001 \)). The median patency duration was shorter after SEMS placement than after GJJ (125 vs 282 days; \( p = 0.001 \)), even after additional SEMS placement (210 vs 282 days; \( p = 0.044 \)). The median survival was also significantly shorter after SEMS placement than after GJJ (189 vs 293 days; \( p = 0.003 \)). Survival differed between treatments in patients with ECOG 0-1 (\( p = 0.006 \)) but not in those with ECOG 2 (\( p = 0.208 \)).

Conclusions: GJJ is preferable to SEMS placement for palliation of GOO caused by gastric cancer in patients with good performance status, especially ECOG 0-1.

Key Words: Stomach Neoplasms, Gastric Outlet Obstruction, Stents, Gastric Bypass

The Fully-Covered Metal Stent with Antimigration Property (Skidproof®) for the Management of Post-Surgical Complications: A Feasibility Study

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Background/Aims: A stent for post-surgical complications such as anastomotic leaks should be equipped with a membrane because the stent should cover the opening of the leak and could be retrieved after sealing. However, covered stents are prone to migrate because there is no significant narrowing in most cases. The purpose of this study was to evaluate the feasibility of the fully-covered metal stent with antimigration property (Skidproof®) for the management of post-surgical complications.

Methods: The covered stent with antimigration property was placed to patients who developed post-surgical complications such as anastomotic leak or swelling causing luminal obstruction. The stent has multiple protruberances on its body to prevent migration and its entire length is covered with a silicone membrane (Figure 1).

Results: A total of 5 patients were included. Four patients underwent stent placement for postsurgical leaks/fistulae and 1 patient for anastomotic swelling. Stent placement was successful in all patients. Migration was noted in one patient and was managed with repositioning and clip application. The stent could be removed without any serious complications in all cases after complete sealing of the leaks/fistulae or resolution of anastomotic swelling (Table 1).

<table>
<thead>
<tr>
<th>Patient</th>
<th>Age</th>
<th>Sex</th>
<th>Location</th>
<th>Etiology</th>
<th>Duration of stent placement (day)</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>70</td>
<td>M</td>
<td>Esophagojejunostomy</td>
<td>Anastomotic leak</td>
<td>14</td>
<td>Stent removal after complete sealing</td>
</tr>
<tr>
<td>2</td>
<td>86</td>
<td>F</td>
<td>Billroth-I gastrojejunostomy</td>
<td>Anastomotic leak</td>
<td>15</td>
<td>Stent removal after complete sealing</td>
</tr>
<tr>
<td>3</td>
<td>67</td>
<td>M</td>
<td>Esophagojejunostomy</td>
<td>Anastomotic leak</td>
<td>35</td>
<td>Stent migration and repositioning; Stent removal after complete sealing</td>
</tr>
<tr>
<td>4</td>
<td>60</td>
<td>M</td>
<td>Billroth-I gastrojejunostomy</td>
<td>Swelling of anastomosis</td>
<td>33</td>
<td>Stent removal after resolution of swelling</td>
</tr>
<tr>
<td>5</td>
<td>62</td>
<td>M</td>
<td>Esophagojejunostomy</td>
<td>Postsurgical tracheoesophageal fistula</td>
<td>ongoing</td>
<td>Resolution of symptoms; Pending stent removal after sealing</td>
</tr>
</tbody>
</table>

Conclusion: Endoscopic placement of the fully-covered metal stent with antimigration property is a feasible option for the
management of post-surgical complications such as anastomotic leak or swelling. The stent can be placed temporarily until the resolution of the post-surgical complications with acceptable migration rates. Future investigations would be required to confirm the preliminary findings.

Key Words: Post-surgical, Metal stents, Migration

Outcomes of Endoscopic Resection for Early Gastric Cancer: Focusing on Cases Mixed with Undifferentiated Component

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Background: Recent evolution of endoscopic resection technique has extended the indication of endoscopic treatment for early gastric cancer (EGC), but long-term clinical outcomes remains unclear. Clinicopathologic features and prognosis of EGC cases mixed with undifferentiated component are still unknown. Patients and

Methods: The study population was the patients who underwent their first endoscopic resection for differentiated EGC from October 2000 to June 2011. A total of 2135 lesions in 2078 patients were resected by endoscopic mucosal resection (EMR) or endoscopic submucosal dissection (ESD) technique. The therapeutic efficacy of endoscopic resection was assessed according to en bloc resection rate, complete resection (CR; en bloc resection with tumor-free lateral and vertical resection margins) rate, and local recurrence rate during follow-up.

Results: The en bloc resection and CR rates in patients undergoing ESD were 97.0% and 92.4%, and those in patients undergoing EMR were 72.8% and 68.8%, respectively. When compared to the expanded indication group, conventional indication group showed significantly higher en bloc resection (95.4% versus 92.9%) and CR rates (94.4% versus 86.4%). However, local recurrence rate was comparable between conventional and expanded indication group (0.5% versus 0.5%) during a median 25 months of follow-up. Extragastric recurrence in regional lymph node was found in one case of conventional indication group and in one case of expanded indication group. When compared to the cases mixed with undifferentiated component, the cases with pure differentiated EGC showed significantly higher en bloc resection (97.3% versus 94.0%) and CR rate (93.8% versus 82.0%). However, local recurrence rate was comparable between the cases with pure differentiated EGC and the cases mixed with undifferentiated component (0.3% versus 1.0%).

Conclusion: Endoscopic resection showed acceptable clinical outcomes with a relative high CR rate and a low local recurrence rate for EGCs meeting expanded indication and EGCs mixed with undifferentiated component.

Key Words: ESD, EGC

Long-Term Outcomes of ESD and Surgical Gastrectomy for EGC: Depending on the Criteria of ESD Indication

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Background and Aims: Surgical resection is the conventional treatment for early gastric cancer (EGC). However, endoscopic submucosal dissection (ESD) is also a main treatment option for selective cases of EGC. The aim of this study was to compare the long-term outcomes of ESD and gastrectomy according to the two indications for ESD (guideline criteria and expanded criteria).

Patients and Methods: Between Jan 2004 and Jul 2007, 413 EGC of 379 patients were treated by using ESD or gastrectomy in our hospital. The 269 EGCs of 251 patients belonged to the guideline criteria (GC) or expanded criteria (EC) for ESD and they enrolled in our study. The 234 EGCs of 214 patients (153 male, 61 female) were analyzed at least 60 months after their treatment for EGC. The mean age (years, ±SD) of the patients were 60.1±11.3 and the mean follow up duration (months, ±SD) was 73.0±17.2. We evaluated the clinical outcomes of these patients according to the criteria.

Results: 143 and 71 patients performed ESD and gastrectomy during the period. In GC, 35 patients received ESD, while 20 patients were received gastrectomy. And, 108 patients of EC received ESD, while 51 patients of EC were taken gastrectomy. The recurrence rates of ESD and gastrectomy were 0.0% in GC. In EC group, the recurrence rates were 1.9% (2/108) and 0.0% (0/51) (P=0.324). The 5-year disease-specific survival rates of ESD and gastrectomy were both 100% (55/55) in GC, and 100% (108/108) and 98.0% (50/51) in EC (P=0.144).

Conclusions: Long-term outcome of the patients who have ESD following GC and EC is not inferior to that of the patients who have gastrectomy.

Key Words: ESD, Gastrectomy, Long-term outcome, Indication
UGI-48

Long-Term Outcomes of Endoscopic Submucosal Dissection for Early Gastric Cancer: A Single Center Experience

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Background and Aims: Endoscopic submucosal dissection (ESD) has been widely accepted for treatment of early gastric cancer (EGC) in Korea. But long-term clinical outcomes of ESD for EGC remain unknown. The aim of the present study was to evaluate tumor recurrence and survival after ESD.

Methods: From January 2006 to December 2008, a total of 252 EGCs in 250 consecutive patients were treated by ESD in our hospital. 213 patients with 215 EGCs that met the following criteria, which are all differentiated adenocarcinoma and with no lymphovascular invasion, were enrolled: mucosal cancer without ulcer findings irrespective of tumor size; mucosal cancer with ulcer findings ≤3 cm in diameter; and minute submucosal invasive cancer ≤3 cm in size. Resectability (en bloc or piecemeal resection), curability (curative or non-curative), complications, local tumor recurrence, overall and disease-specific survival rates were assessed. All lesions were divided into 2 groups: mucosal cancer without ulcer ≤2 cm in size (standard group); cancer that did not meet standard guideline criteria (expanded group).

Results: En bloc and curative resection rates were achieved in 96.3% (207/215) and 84.7% (182/215), respectively. During a median endoscopic follow-up of 40 months (range 1-74 months), local recurrence of the cancers was two (2.3%) and six (11.3%) in the standard and expanded group, respectively; the difference between the groups was not significant. Local recurrence rate was significantly related to curative resection, but not en bloc resection. The 3-year overall and disease-specific survival rates were 93% and 100%, respectively; the difference between the standard and expanded group was not significant.

Conclusions: Although a risk for local recurrence remains, ESD for EGC in both the standard and expanded criteria is a feasible and promising management. Close follow-up surveillance after ESD should be taken especially in non-curative resection.

Key Words: Endoscopic submucosal dissection, Early gastric cancer, Local recurrence, Survival, Outcome

UGI-49

Clinical Impact of the ESD Technique Biopsy on Treatment for Patients with Submucosal Tumor

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Background: Preoperative pathologic diagnosis of a submucosal tumor(SMT) may improve clinical decision making. The aim of this study was to evaluate diagnostic yield and the impact of ESD technique biopsy(deep biopsy) on the clinical management of patients with SMTs.

Methods: A total of 37 cases of SMTs with both EUS and deep biopsy were compared retrospectively. EUS images were examined for mass size, echogenicity, invasion layer. We performed endoscopic biopsy of SMTs by using the ESD technique.

Results: The diagnostic yield of deep biopsy for the diagnosis was 91.9% (34 with diagnostic cytology; 3 with non diagnostic cytology). The mean long diameter of the 34 SMT with diagnostic cytology measured EUS was 20mm (range 10-40mm). Of these SMTs, 17 (50%) were less than 20mm in size. The clinical diagnosis according to EUS findings was GIST in 22 cases. Of 22 these cases, the histologic findings were as follows: 10(45.5%) benign lesion (5 ectopic pancreas, 4 leiomyoma, 1 lipoma), 9 (40.9%) GIST, 2 (9%) other cancer (1 lymphoepithelial cancer, 1 adenocarcinoma), 1 (4.6%) non diagnostic cytology. There were no complications such as bleeding or perforation during or after the procedures.

Conclusion: Diagnostic yield of deep biopsy by ESD technique was relatively high in patients with SMTs and was also useful in the diagnosis in the small size lesion (less than 20mm). Because of this, this method also would be able to reduce the need for unnecessary surgery.

Key Words: Submucosal, Tumor, Endoscopic Submucosal Dissection, Biopsy

UGI-50

Endoscopic Submucosal Dissection for Gastric Subepithelial Tumors; Safety, Efficacy and Limitations

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Background: Gastric subepithelial tumors (SETs) are generally considered benign. Some tumors, however, have malignant
Appropriate Indications of Endoscopic Resection for Subepithelial Tumor That Originated from the Proper Muscle Layer

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Background and Study Aims: Endoscopic submucosal dissection (ESD) is a well-established method for the treatment of gastrointestinal epithelial tumors. However, the treatment of gastric subepithelial tumors (SETs) that originate from the muscularis propria layer still depends primarily on surgical techniques. We aimed to evaluate the appropriate indications for ESD in the treatment of SETs that originate from the muscularis propria layer.

Methods: Thirty-five patients with gastric SETs that originated from the muscularis propria layer who underwent ESD were enrolled, and the charts were retrospectively reviewed to investigate the parameters predictive complete resection and complications.

Table. Predictive Parameters for Complete Resection in Patients Who Underwent Endoscopic Submucosal Dissection for Gastric Subepithelial Tumors

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Complete resection</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rolling sign, n (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>15 (93.8%)</td>
<td>1 (6.3%)</td>
</tr>
<tr>
<td>No</td>
<td>11 (57.9%)</td>
<td>8 (42.1%)</td>
</tr>
<tr>
<td>Tumor size, n (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤20 mm</td>
<td>20 (87.0%)</td>
<td>3 (13.0%)</td>
</tr>
<tr>
<td>&gt;20 mm</td>
<td>6 (50.0%)</td>
<td>6 (50.0%)</td>
</tr>
</tbody>
</table>

Results: The mean age of the patients was 54.15 ± 9.30 years, and the male/female ratio was 2:3. Twenty-eight of the 35 SETs (80.0%) were movable, and 15 (43.7%) had a positive rolling sign. The most frequent location of the SETs was high body (n=14). The most common pathological diagnoses were leiomyoma (60.0%) and gastrointestinal stromal tumor (28.6%). The complete resection rate was 74.3%. A positive rolling sign (p=0.022) and small tumor size (<20 mm) were significantly associated with complete resection. Two patients (6.1%) developed perforations that required surgical treatment; their SMTs were neurogenic tumors with fixed lesion. Tumor mobility was significantly associated with perforation (p=0.017).

Conclusions: The ESD method appears to be relatively safe for use in the complete resection of SETs that originate from the muscularis propria layer. Small tumor size (<20mm) and a positive rolling sign are appropriate indications for ESD.

Key Words: Subepithelial tumor, Muscularis propria, Endoscopic Submucosal Dissection

UGI-52

Endoscopic Characteristics of Missed Synchronous Gastric Neoplasms after Endoscopic Submucosal Dissection

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Background: A few studies have been published on missed synchronous lesions after endoscopic submucosal dissection (ESD), but endoscopic characteristics of missed synchronous lesions were lacking. The aims of our study were to define differences between missed synchronous gastric neoplasms and unmissed gastric neoplasms and to determine the endoscopic characteristics of missed synchronous lesions in multifocal gastric neoplasms after ESD.

Methods: The authors retrospectively analysed data on 638 gastric neoplasm patients who underwent gastric ESD in January 2008 and December 2011. The patients with endoscopic follow-up loss were excluded from our study. Missed synchronous lesions were defined as secondary gastric neoplasms detected within one year of ESD but initially missed. We compared endoscopic characteristics between patients with missed synchronous lesions and patients without missed synchronous lesions. The endoscopic characteristics of 17 patients with missed synchronous gastric lesions were evaluated.

Results: Missed synchronous gastric neoplasms were detected in 17 patients (3.29%) during mean of 16.0 months. Many of the missed lesions existed in the middle and lower third of the stomach. The mean tumor size was significantly larger in the missed synchronous lesions compared with that in the initially detected lesions (p=0.001). The tumor numbers at the time of ESD were a significant predictive factor for presence of missed synchronous lesions (p=0.003).

Conclusion: The entire stomach should be examined with particular care during EGD, especially when ESD of multiple gastric lesions is to be performed. Larger multicenter studies for the appropriate surveillance methods and interval are needed.

Key Words: Missed synchronous lesions, Gastric endoscopic submucosal dissection, Endoscopic characteristics

UGI-53

Clinicopathological Characteristics of Synchronous and Metachronous Gastric Neoplasms after Endoscopic Resection

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Background: Endoscopic submucosal dissection (ESD) has been accepted as a minimally invasive treatment for gastric neoplasms. However, the risk of synchronous and metachronous gastric lesions developing in the patient after endoscopic resection has become a major problem. The aim of this study was to investigate the characteristics of synchronous and metachronous multiple gastric neoplasms in patients with early gastric cancer or gastric adenoma after ESD.

Methods: A total 516 patients with early gastric cancer or gastric adenoma who had undergone ESD from January 2008 to December 2011 and were periodically followed up using endoscopic examinations. The incidence and variable factors of synchronous and metachronous gastric tumors were investigated in retrospective study.

Results: The mean period of endoscopic follow-up was 16.0 months (range 1-52 months). 61 patients (12.8%) had synchronous lesions within 1 year of the initial endoscopic treatment, and 13 patients (2.5%) had metachronous lesions. Old age (>65 years) was significant correlated with synchronous lesions (p=0.003). The median interval from the initial lesions to metachronous lesions was 31 months (range 15-45 months). Annual incidence rate of metachronous lesions were approximately 2.03%, 3.20%, and 7.01%. About one third of the multiple lesions were similar in endoscopic gross type and histologic type to the primary lesions.

Conclusions: We should follow-up more carefully in patients of old age (>65 years) after initial ESD because synchronous lesions might occur in remnant stomach. Regular and continual endoscopic follow-up is very important after gastric ESD to detect metachronous lesions. Larger and longer prospective studies for the appropriate surveillance methods and interval are needed.

Key Words: Gastric endoscopic submucosal dissection, ESD, Synchronous Lesions, Metachronous Lesions

UGI-54

Magnetic Marking Clip for Tumor Localization during Gastric Submucosal Tumor Resection: A Pilot Study


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Background: It is difficult to locate a tumor simply and correctly during laparoscopic surgery for intraluminal growing submucosal tumor (SMT). Because exact localization of tumor prevents to resect unnecessary normal stomach tissue. Various methods such as intraoperative sonography, intraoperative endoscopy, etc, are performed in localization gastrointestinal tumor for laparoscopic surgery. However there are limitations of methods, such as discomfort for surgeon, complexity, low cost.
performance. To overcome these limitation, we devised a simple marking clip with magnet to locate a tumor.

**Method:** This study enrolled 11 patients undergoing laparoscopic wedge resection for SMT. Enrolled criteria were intraluminal growing and suspicious of malignancy. We devised 10mm sized ring type magnet (outdiameter: D10 mm, indiameter: 4 mm, thickness: 3 mm, maximal magnetic force: 2660G), which was coated with silicon and fixed to endoclip using 3-0 nylon. A magnetic marking clip was applied on the center of lesion during preoperative esophagogastroduodenoscopy. During surgery, magnetic body hanged with long thread which was inserted through laparoscopic trocar, was used to find intragastric lesion which marked by magnetic clip. We analyzed tumor detection rate, detection time, proximal & distal margin from lesion and complication associated with method.

**Results:** In 7 patients, tumors located on the anterior wall of stomach, and 4 located on the posterior wall of the stomach. Tumor size ranged from 12.0mm to 18.0 mm. Magnetic marking clips were successfully detected in all 12 patients. The time required for detection ranged from 20 to 85 sec. The resected margin from lesion ranged from 5 to 30 mm. 8/12 of pathology was confirmed GIST, 3/12 was leiomyoma, 1/12 was schwanna. None of our patients experienced complications from this marking technique.

**Conclusion:** Magnetic marking clip method was simple and convenient for surgeon, and showed good results for accuracy of tumor localization, and tumor detection rate. Also complication associated with method was not shown. Therefore the magnetic marking clip method may be useful for tumor site detection during laparoscopic SMT wedge resection.

**Key Words:** Endoclip, Magnet, Laparoscopic Surgery, Submucosal Tumor

**UGI-55**

**Analysis of Preventive Effect of PPI Alone, PPI Plus Cytoprotective Agents & H2RA Plus Cytoprotective Agents on Bleeding**

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**Background:** The greatest merit of ESD is that it enables larger neoplastic lesions.

**Methods:** From April 2010 to February 2012, 283 patients with early gastric cancer or gastric adenoma who underwent ESD were randomly assigned to the PPI alone (group A, N=93), PPI+ cytoprotective agents (group B, N=92) and H2 RA+cytoprotective agents (group C, N=98). Oral administration of the drug was started on the day before ESD and administrated for 4 weeks. We performed endoscopy and measured intragastric pH on day 0, day 1, day 7 and day 28 after ESD. The primary end points were intraoperative bleeding and delayed bleeding related to ESD. The secondary end point was the healing state of ulcer. Ulcer stage and size were compared between the three groups at 4 weeks after ESD.

**Results:** A total 293 patients were enrolled, but, 10 patients were excluded during study. A total bleeding occurred in 36 patients of 283 patients (12.7%). Intraoperative bleeding occurred in 28 patients (9.9%); 13 patients of group A, 9 patients of group B, and 6 patients of group C. There was no significant difference of bleeding rate between the three groups (p=0.236). Delayed bleeding occurred significantly in group C (6.1%) compared with group A (0%) and group B (2.2%) (p=0.026). Also, intragastric pH levels were significantly very low in group C on day 7 and day 28 after ESD (p=0.001, p<0.001). Four weeks after ESD, the three groups had no significant difference with respect to ulcer stage (p=0.335). Size reduction rate of ulcer is higher in cytoprotective agents containing group (group B and group C), but not statistically significant (p=0.088).

**Conclusion:** In conclusion, delayed bleeding occurred most commonly in group C, and intragastric pH was significantly low in the group C on day 7 and day 28 after ESD. Therefore, administration of PPI offered additional benefit the prevention of delayed bleeding after ESD. But, adding of cytoprotective agent on PPI had no significant benefit of ulcer healing on day 28 after ESD.

**Key Words:** ESD, PPI, Delayed Bleeding, Ulcer Healing

**UGI-56**

**Preprocedural Rabeprazole Treatment before Gastric Endoscopic Resection**

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**Background and Aims:** The optimal time period of proton pump inhibitors (PPI) are slow, reported to be 5 days. Our aim was to evaluate the benefit of starting oral PPI treatment 5 days
before endoscopic mucosal resection (EMR) or endoscopic submucosal dissection (ESD) to prevent bleeding. Patients and Methods: This was a prospective randomized controlled trial. 120 patients who underwent either EMR/ESD were randomly assigned to the PPI or placebo group. Patients were given either oral rabeprazole 20mg or placebo b.i.d for 5 days before the procedure. On the morning of the procedure and the date after, pantoprazole 40 mg was intravenously administered. Afterwards, oral rabeprazole 20mg was administered once daily. Follow-up endoscopy was performed on days 1 and 28. Intragastric pH was measured in 25 patients who consented to 48-hour gastric pH measurement. The primary endpoint was major bleeding related to EMR/ESD. The secondary endpoints were the number of exposed vessels/ulcer area and ulcer healing rate on follow-up endoscopy and intragastric pH.

Results: Data for 98 patients who underwent EMR/ESD (PPI group: n=45; placebo group: n=53) were analyzed. The mean age of the PPI group was 59±8.9 years and the placebo group 58±10 years. There were 24 males in the PPI and 42 in the placebo group. Major bleeding occurred in four patients from the PPI and three from the placebo group. The number of exposed ulcer vessels/ulcer area on day 1 were 0.20±0.27 in the PPI and 0.36±0.41 in the placebo group (p=0.03). There were no significant differences in the ulcer healing rate. Intragastric pH over 4, 5 and 6 were 84.44±19.32, 80.55%±22.21 and 73.8%±25.44 in the PPI and 86.55%±25.85, 85.18%±26.37 and 82.79%±26.37 in the placebo group with no significant differences.

Conclusions: Preprocedural administration of rabeprazole of-±27.14 in the placebo group with no significant differences. ±25.44 in the PPI and 86.55%±25.85, 85.18%±26.37 and 82.79%

Key Words: Endoscopic submucosal dissection, Endoscopic mucosal resection, Proton pump inhibitor, Gastric neoplasm

UGI 58

Effect of Surgicel® (Fibrillar) on Prevention for Ulcer Bleeding after ESD of Gastric Epithelial Tumors

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Aims: Endoscopic submucosal dissection (ESD) provides larger gastric epithelial tumors to be completely resected, compared endoscopic mucosal resection (EMR). However, ulcer bleeding after ESD can occur more frequently. Proton pump inhibitor (PPI) has used to prevent bleeding from the post-ESD ulcer. Surgicel® (Fibrillar) is oxidized regenerated cellulose and absorbable hemostats, and has used to control of oozing bleeding. We assessed the effect of Surgicel® on preventing bleeding after ESD.

Methods: From January through September 2012, patients scheduled for ESD to treat the gastric epithelial tumors were prospectively enrolled in this study. Patients were assigned to combination therapy with Surgicel® and H2RA or monotherapy with PPI after ESD procedure. Bleeding rate and change of hemoglobin (Hb) were assessed to evaluate the effect on preventing ulcer bleeding after ESD.

Results: A total of 116 patients (87 male, 29 female) were enrolled in this study. Fifty-nine patients were assigned to combination therapy with Surgicel® and H2RA and 57 patients to monotherapy with PPI. There were no significant differences between the two groups in terms of age, sex, underlying disease, anti-platelet medication, location of lesion, and histological result from ESD. There was no significant difference in major bleeding including active bleeding on follow-up endoscopy, unstable vital sign, decreasing Hb of more than 2 g/dL, or need for transfusion (combination therapy 5.2%, monotherapy 9.5%, p=0.196). However, the laboratory result showed there was significant change of Hb (7 days after ESD) between two groups (-0.62±1.32 in combination therapy, -1.18±1.33 in monotherapy, p=0.024).

Conclusions: Combination therapy with Surgicel® and H2RA had similar effect on preventing major ulcer bleeding after ESD for gastric epithelial tumors, compared to monotherapy with PPI. Moreover Surgicel® enables oozing bleeding to be discontinued, resulting in a decreasing change of Hb.

Key Words: Endoscopic submucosal dissection, Gastric epithelial tumor, Bleeding

The Usefulness of Introducer Method Percutaneous Endoscopic Gastrostomy by Ultrathin Transnasal Endoscopy

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Background/Aim: The introducer method percutaneous endoscopic gastrostomy (PEG) minimized procedure-related peristomal infection. Ultrathin transnasal endoscopy (UTE) provides comfortable endoscopic examination to patients with fewer adverse effects and can pass narrow esophagus or oropharynx. The aim of this study was to investigate the clinical outcomes of introducer method PEG by UTE.
Methods: The patients who underwent introducer method PEG (Cliny PEG Kit; Create Medic, Yokohama, Japan) by UTE (GIF-XP260N; Olympus Optical Co., Ltd.; outer diameter, 5.5 mm, Tokyo, Japan) under sedation with 0.03 mg/kg midazolam and 50 mg pethidine between March 2009 and May 2012 were analyzed. The outcomes and complications of the patients within 180 days of gastrosomy placement were investigated.

Results: A total of 92 patients (male 31.9%, 67.7 ± 16.6 year) underwent introducer method PEG by UTE during study period. Major indications for PEG insertion were stroke (40.4%), esophageal cancer or head and neck cancer (26.6%), and neurologic disorders (14.9%). Esophageal stenosis was identified by endoscopy or imaging study in 14 patients before PEG. UTE was successfully introduced through nasal cavity in all the patients. PEG was successfully inserted in 90 out of 92 patients (97.8%). Insertion of endoscopy to stomach was impossible in 2 patients due to severe narrowing of upper esophagus due to head and neck cancer. There was no procedure-related peristomal infection, gastric content leaking, or bleeding within 30 days of gastrosomy placement. The catheter displacement occurred in 8 (8.7%) within 30 days. The catheter displacement occurred in 44 (47.8%) and gastric content leakage was found in 8 (9%) between 30 and 180 days of gastrosomy placement.

Conclusion: Introducer method PEG by UTE can be a useful method for gastrosomy placement with high success rate. This technique enabled to avoid procedure related complications and to insert endoscopy to patients with narrow esophagus or oropharynx. However, long-term durability of the balloon-type catheter was questionable.

Key Words: Percutaneous Endoscopic Gastrostomy, Transnasal Endoscopy, Ultrathin Endoscopy

UGI-59

The Comparison of Clinical Outcome between Pull Type and Introducer Type Percutaneous Endoscopic Gastrostomy

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Background/Aims: Percutaneous endoscopic gastrostomy (PEG) is a technique that makes a route for providing enteral nutrition with endoscopy. There are several techniques regarding PEG according to the insertion method; pull type and introducer type. Our aim was to compare clinical outcomes including complication rate between two types of PEG mentioned above at one of the largest tertiary centers in Korea.

Methods: We retrospectively reviewed 141 cases of PEG insertion performed during January 2009 to June 2012. Indications for PEG insertion, acute and chronic complications were analyzed. Complications occurred in and after 7 days were classified as acute and chronic complications, respectively.

Results and discussion: Indications for PEG insertion of 141 cases were neurologic disease (59.6%), malignancy (21.3%) and others. Successful PEG insertions were performed in 136 cases (96.5%). There was no PEG associated mortality. With the exception of self removal and unexpected death, 135 and 128 cases were analyzed as acute and chronic complications respectively. Bleeding was the most frequent acute complication (13.3%), and wound problem including infection and granulation was the most frequent chronic complication (10.9%). Complication rates between PEG insertion types were not statistically different (Table).

Conclusions: PEG insertion is a safe procedure and the most frequent complications involved bleeding and infection. There was no difference in complication rates between pull type and introducer type PEG.

Key Words: Percutaneous endoscopic gastrostomy, PEG, Complication, Pull type, Introducer type

<table>
<thead>
<tr>
<th>Acute complication</th>
<th>Total, n=135 (%)</th>
<th>Pull type, n=77 (%)</th>
<th>Introducer type, n=58 (%)</th>
<th>P value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bleeding</td>
<td>18 (13.3)</td>
<td>9 (11.7)</td>
<td>9 (15.5)</td>
<td>0.612</td>
</tr>
<tr>
<td>Major bleeding</td>
<td>2 (1.5)</td>
<td>1 (1.3)</td>
<td>1 (1.7)</td>
<td>0.597</td>
</tr>
<tr>
<td>Minor bleeding</td>
<td>16 (11.8)</td>
<td>8 (10.4)</td>
<td>8 (13.8)</td>
<td>1.000</td>
</tr>
<tr>
<td>Peritonitis</td>
<td>1 (0.7)</td>
<td>1 (1.3)</td>
<td>0 (0.0)</td>
<td>1.000</td>
</tr>
<tr>
<td>Aspiration pneumonia</td>
<td>3 (2.2)</td>
<td>2 (2.6)</td>
<td>1 (1.7)</td>
<td>1.000</td>
</tr>
<tr>
<td>Ileus</td>
<td>3 (2.2)</td>
<td>3 (3.9)</td>
<td>0 (0.0)</td>
<td>0.634</td>
</tr>
<tr>
<td>Wound infection</td>
<td>3 (2.2)</td>
<td>2 (2.6)</td>
<td>1 (1.7)</td>
<td>1.000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Chronic complication</th>
<th>Total, n=128 (%)</th>
<th>Pull type, n=72 (%)</th>
<th>Introducer type, n=56 (%)</th>
<th>P value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wound problem</td>
<td>14 (10.9)</td>
<td>8 (11.1)</td>
<td>6 (10.7)</td>
<td>0.774</td>
</tr>
<tr>
<td>Wound infection</td>
<td>8 (6.3)</td>
<td>5 (6.9)</td>
<td>3 (5.4)</td>
<td>1.000</td>
</tr>
<tr>
<td>Granulation tissue</td>
<td>6 (4.7)</td>
<td>3 (4.2)</td>
<td>3 (5.4)</td>
<td>1.000</td>
</tr>
<tr>
<td>Leakage</td>
<td>10 (7.8)</td>
<td>7 (9.7)</td>
<td>3 (5.4)</td>
<td>0.511</td>
</tr>
<tr>
<td>Tube obstruction</td>
<td>10 (7.8)</td>
<td>4 (5.6)</td>
<td>6 (10.7)</td>
<td>0.331</td>
</tr>
<tr>
<td>Spontaneous removal</td>
<td>6 (4.7)</td>
<td>1 (1.4)</td>
<td>5 (8.9)</td>
<td>0.086</td>
</tr>
<tr>
<td>Buried bumper syndrome</td>
<td>0 (0.0)</td>
<td>0 (0.0)</td>
<td>0 (0.0)</td>
<td>NA</td>
</tr>
<tr>
<td>PEG insertion with any complication</td>
<td>56 (43.8)</td>
<td>30 (41.7)</td>
<td>26 (46.4)</td>
<td>0.596</td>
</tr>
<tr>
<td>PEG insertion with no complication</td>
<td>72 (56.2)</td>
<td>42 (58.3)</td>
<td>30 (53.6)</td>
<td>0.596</td>
</tr>
</tbody>
</table>

*P value was calculated by chi square test and Fisher's exact test.

PEG, percutaneous endoscopic gastrostomy; NA, not applicable.
Risk Factor for Local and Systemic Infection after Percutaneous Endoscopic Gastrostomy

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Background/Aims: Percutaneous endoscopic gastrostomy (PEG) is widely used to maintain enteral nutrition in patients who cannot take food volitionally due to various causes such as permanent neurological impairment, oropharyngeal dysfunction, major trauma or burns. Local wound infection is the most common complication of this procedure (5.4%-30%). Several studies have been reported about risk factors for PEG-related local infection. But there is no data about local infection and systemic infection after PEG. So, we analyzed incidence of PEG-related infection and procedure-related risk factors for local and systemic infection after PEG.

Patients and Methods: We retrospectively reviewed 125 procedures of 120 patients who underwent for PEG between Oct 2005 and Jun 2012. We analyzed the age, underlying disease, underlying cause of PEG insertion, bed-ridden state and lab findings of the patients to investigated the risk factors for PEG related infection. Pull-string technique was used in PEG procedure. We analyzed PEG related infection patients include local infection and systemic infection after PEG. Local infection was defined as PEG site pus or discharge. Systemic infection was defined as procedure related fever, leukocytosis, elevated acute phase reactants and blood bacterial growth without other cause.

Results: The mean age of the patients was 63.3 years, and the most common underlying disease was cerebral hemorrhage (46.4%). Total of 24 patients (19.2%) has PEG related infections and bacteria growth. 21 cases (16.8%) was local infection, 9 cases (7.2%) was systemic infection. The most common growth bacterial species of local infection was Pseudomonas aeruginosa (52.3%, 11/21). Diabetes mellitus is a risk factor of PEG related infection (Odds ratio=5.244, p=0.013). Other factors such as underlying cause of PEG insertion, bed-ridden state, procedure related bleeding or injury are no increased the PEG related infection.

Conclusions: In this study, PEG was a relatively safe procedure, but infection was the most common complication. Diabetes mellitus was a significant risk factor for PEG related infection. PEG tube should be carefully inserted in diabetes mellitus patients.

Key Words: Percutaneous endoscopic gastrostomy, PEG related infection, Diabetes mellitus

Is the Endoscopic Reinspection Necessary for Referred Patients Diagnosed with Gastric Neoplasm?

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Introduction: The endoscopic reinspection is routine for referred patients diagnosed with gastric neoplasm in many tertiary hospitals. The aim of this study was to evaluate whether this endoscopic reinspection is necessary for referred patients diagnosed with gastric neoplasm.

Method: We investigated 514 lesions and 480 patients who were referred from other clinic and hospital and underwent endoscopic reinspection prior to ESD or gastrectomy for gastric adenoma and EGC from January 2011 to December 2011. We reviewed the data, including the characteristics of patients, location of lesions, pathology of lesions, and treatment modality.

Result: Median age of enrolled patients was 62.25 years old. Adenoma was 293 lesions (57%) and EGC was 219 lesions (42.6%) at initial outside hospital diagnosis. The endoscopic reinspection showed 99 (33.8%) pathology changes from adenoma to adenocarcinoma and 7 (2.4%) changes from differentiated cancer to undifferentiated cancer and founded 28 additional lesions. Change of treatment modality from ESD to gastrectomy was 5 cases and from gastrectomy to ESD was 7 cases. Finally, change of treatment extent and modality was 40 cases (8.3%) after the endoscopic reinspection.

Conclusion: In our study, patients who referred and diagnosed with gastric neoplasm could be receive proper treatment after the endoscopic reinspection.

Key Words: Gastric neoplasm, Endoscopy, reinspection, ESD, gastrectomy

Can Serum Pepsinogen and Intragastric pH Show Existence of the Atrophy in Gastric Neoplastic Lesion before ESD?

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Background: Gastric cancer and dysplasia are reported to be related to atrophic gastritis, in which the serum pepsinogen
and PG I/II ratio of ≤2.0; PG 2+, PG I of ≤50 ng/mL and PG I/II ratio of ≤3.0 but not meeting the criteria for PG index 3+; and PG I+, not meeting the criteria for PG index 2+ or 3+).

Results: There was 82 of LGDs, 37 of HGDs and 67 of EGCs were treated with ESD. Patients that met the criteria of serological atrophy group was subdivided into three group, from PG index 1+ to 3+ (PG 3+, PG I of ≤30 ng/mL and PG I/II ratio of ≤2.0; PG 2+, PG I of ≤50 ng/mL and PG I/II ratio of ≤3.0 but not meeting the criteria for PG index 3+; and PG I+, not meeting the criteria for PG index 2+ or 3+).

Methods: The patients who had gastric neoplastic lesion and scheduled to undergo ESD were enrolled. At the beginning of endoscopy, gastric juice was aspirated and measured intragastric pH. Serologically atrophy group was subdivided into three group, from PG index 1+ to 3+ (PG 3+, PG I of ≤30 ng/mL and PG I/II ratio of ≤2.0; PG 2+, PG I of ≤50 ng/mL and PG I/II ratio of ≤3.0 but not meeting the criteria for PG index 3+; and PG I+, not meeting the criteria for PG index 2+ or 3+).

Results: There was 82 of LGDs, 37 of HGDs and 67 of EGCs were treated with ESD. Patients that met the criteria of serological atrophy showed more commonly severe endoscopic atrophy (61% vs 18%, p=0.000). And the mean age and the number of lesion located in proximal stomach were significantly increased from PG index 1+ to PG index 3+ in a stepwise manner (p=0.000, p=0.020, respectively). The level of PG I/II ratio were significantly stepwisely decreased from EGC to adenoma (p=0.015). Patients with serological atrophy positive and H. pylori negative showed more commonly severe endoscopic atrophy (p=0.000).

Conclusion: In patients with gastric adenoma or cancer, low PG I and I/II ratio was well correlated with degree of endoscopic atrophy. It might be sensitive biomarker of precancerous lesion, adenoma and adenocarcinoma.

Key Words: Pepsinogen, Intragastric pH, Atrophy, Gastric Neoplastic Lesion, Endoscopic Submucosal Dissection

UGI-63

Clinicopathologic Significance of Lymphovascular Invasion in Early Gastric Cancer

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Background/Aims: Though lymphovascular invasion thought to be predictive factor of lymph node metastasis, the clinical evidences of lymphovascular invasion in early gastric cancer are not clearly identified. We retrospectively evaluate the clinicopathologic significance of lymphovascular invasion in early gastric cancer. Especially, we analyzed in subgroup with expanded indication of endoscopic submucosal dissection.

Methods: Among 1,046 patients who had undergone gastric surgery for gastric adenocarcinoma at the department of surgery Chungnam university college of medicine from 2007 to 2009, we retrospectively evaluate 517 patients who had mucosal or the submucosal cancer, regardless of regional lymph node metastasis. In subgroup analysis, expanded indication of endoscopic submucosal dissection was defined by following criteria: Depth of invasion was confined to the mucosa or submucosal level I. Differentiated adenocarcinoma with ulceration and up to 3cm in diameter. Differentiated adenocarcinoma without ulceration and any size in diameter. Undifferentiated adenocarcinoma without ulceration and up to 2cm in diameter.

Results: Lymphovascular invasion correlated significantly with tumor size and depth of invasion in multivariate analysis. Lymphovascular invasion was significant predictor of lymph node metastasis in early gastric cancer both in univariate and multivariate analysis. All patients of stage II or over have lymphovascular invasion. In 241 patients who had expanded indication of endoscopic submucosal resection, the prevalence of lymphovascular invasion was 12.0% and lymph node metastasis shows difference significantly according to the presence of lymphovascular invasion (0.9% vs 10.3%, p=0.013).

Conclusions: In early gastric cancer, lymphovascular invasion is a significant independent predictor of lymph node metastasis. In case of the presences of lymphovascular invasion after endoscopic resection, additional surgical treatments are recommended.

Key Words: Stomach neoplasms, Endoscopic resection, Lymphovascular invasion

Endoscopic Characteristics Suggesting Carcinoma Initially Diagnosed as Adenomas by Forceps Biopsy

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Background and Aim: Endoscopic resections are widely performed for the management of gastric neoplasia, but histologic results between the forcep biopsy samples and post-endoscopic resection specimens may be different. The aim of this study was to evaluate endoscopic characteristics of gastric adenocarcinoma that are initially diagnosed as adenomas by forceps biopsy.

Methods: We retrospectively reviewed 431 lesions diagnosed as gastric adenomas by forceps biopsy from January 2008 to December 2011. The endoscopic findings were reviewed for location, size, gross appearance, ulceration, and surface color. All patients underwent endoscopic resection and we compared the difference between the biopsy results before and after ESD.
Results: 101 lesions were initially diagnosed as depressed adenomas, and 328 lesions were diagnosed as non-depressed adenomas. The diameter of the lesions was 21.07±8.8 mm in the non-depressed group and 21.47±7.3 mm in the depressed group. On post-resection tissue biopsy, adenocarcinoma were diagnosed more frequent among depressed adenomas (20.4%) than non-depressed adenomas (9.1%) \( (p=0.003, \text{OR}=2.544) \). Similarly, adenocarcinoma were diagnosed more frequent among adenomas with ulceration (29.6%) than without ulceration (10.6%) \( (p=0.008, \text{OR}=3.535) \). In the multivariate analysis, combined high-grade dysplasia \( (p=0.001, \text{OR}=3.086) \), red discoloration \( (p=0.003, \text{OR}=2.612) \) were significant variables associated with carcinomas.

Conclusions: Gastric adenomatous lesions with endoscopic characteristics such as a depressed type, red discoloration, mucosal ulceration, and high-grade dysplasia should be considered for endoscopic resection.

Key Words: Depressed gastric adenomas, Gastric adenocarcinoma, Endoscopic submucosal dissection, Endoscopic characteristics

UGI-65

Characteristics of Gastric Adenoma Predicting Carcinomatous Transformation as a Final Diagnosis

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Aim: Endoscopic resections are widely performed for the management of gastric adenomas. The discrepancy rates between forceps-biopsied specimen and postresection specimen are 25-30%. Changes of diagnosis from adenoma to carcinoma, after endoscopic resection, require further investigation and a change in therapeutic strategies. This study aimed to evaluate the predictive factors for carcinomatous transformation in forceps biopsy proved (FBP)-adenomas on the basis of endoscopic features.

Method: This study investigated 378 samples from 378 patients. Gastric adenoma was diagnosed initially by forceps biopsy for all patients. The endoscopic findings were reviewed for location, size, gross appearance, surface nodularity, central dimple, surface color, and the presence of ulcer. These variables were analyzed and compared between an adenoma group (275 cases) and a carcinoma group (103 cases) on the basis of post-resection diagnosis.

Results: The mean age of the patients was 61 years, and 274 of the patients were male. The diameter of the lesions was 14.9±8.1 mm in the adenoma group and 17.9±9.3 mm in the carcinoma group. Variables such as size no less than 15 mm, depressed type, surface nodularity, central dimple, combined high-grade dysplasia were independently associated with carcinomatous transformation after endoscopic resection.

Conclusion: The present study revealed that FBP-adenomas with 15 mm or over in size, depressed appearance, central concavity, nodular surface should be considered for endoscopic resection and further evaluation rather than simple following up not to lose optimal point for treating lesions harboring carcinoma regardless of dysplasia grade.

Key Words: Stomach, Adenoma, Carcinoma

UGI-66

Efficacy of I-Scan in Determine the Lateral Margin of the Tumor for Endoscopic Submucosal Dissection

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Background: I-scan endoscopy is a new imaging modality to enhance endoscopic diagnosis of early gastric cancer (EGC) or gastric adenoma. For successful endoscopic submucosal dissection (ESD), it is important to accurately determine the lateral margin of the tumor. This study was performed to evaluate the efficacy of i-scan for determine the margin of the lesion before ESD.

Methods: We enrolled 44 patients treated with ESD from 2010. May to 2011. January. All patients are diagnosed tubular adenoma or adenocarcinoma before ESD. All patients were inspected of using i-scan following conventional white light endoscopy (W group). I-scan was performed under tone enhancement (TE) pattern (P group), TE gastric (G group), TE colon (C group). Then, we scored from lowest 1 point to highest 4 point depending on observed lesions. After detecting the lateral margin of the lesion on i-scan, adjacent to not leaved interval from lateral margin, marked by APC then ESD was performed. After ESD procedure, lateral resection margin was confirmed by pathology.

Results: Of 44 specimens, lateral resection margin was clear in 32 (73%). And involved lateral resection margin was 4 (9%). In 8 specimens (18%), whether lateral margin was involved is ambiguous by pathology. And classified 44 specimens by histologic type, low grade dysplasia is 15 (34%), high grade dysplasia is 9 (21%), well differentiated adenocarcinoma is 16 (36%), moderate differentiated adenocarcinoma is 4 (9%). Lateral safety margin rate showed no significant difference compared
Synchronous gastric epithelial neoplasms with endoscopic submucosal dissection: A multicenter study

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Background and aims: Unlike surgery, endoscopic submucosal dissection (ESD) removes gastric epithelial neoplasms within a tight margin, leaving most normal tissue around the neoplasm intact, thus resulting in a high risk for missed synchronous gastric epithelial neoplasms (SGeNs). The purpose of this study was to evaluate the characteristics and risk factors for missed SGENs (mSGENs) compared to simultaneously identified SGENs (siSGENs) in patients who underwent ESD.

Patients and Methods: We retrospectively examined 3018 patients treated by ESD at 3 hospitals in Korea between January 2004 and May 2011. The incidence and clinicopathological features of SGENs, mSGENs, and siSGENs were investigated. Any second epithelial neoplasm found within 1 year of the first ESD procedure was defined as an mSGEN and any neoplasm detected simultaneously with the first neoplasm was defined as a siSGEN.

Results: The overall incidence of ESD patients with SGENs was 9.1% (275/3018 patients). Of the SGENs, 45.2% were siSGENs and 54.8% were mSGENs. Independent risk factors for mSGENs were adenoma as the first gastric lesion (Exp (B) = 2.154, 95% CI = 1.282-3.262), and duration of endoscopic examination before the first ESD (Exp (B) = 1.074, 95% CI = 1.001-1.141). The results suggest that 33% of mSGENs could have been identified during the endoscopic examination prior to ESD.

Conclusion: Additional effort needs to be expended in identifying siSGENs, particularly prior to ESD for less serious adenomas. This should include sufficient time for endoscopic examination, prior to ESD, to ensure a thorough examination for siSGENs.

Key Words: Synchronous, Neoplasm, Gastric cancer

Oral Presentation - UGI

The Clinical Features of Synchronous and Metachronous Cancers in Patients with Gastric Cancer

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Background: The incidence of synchronous and metachronous gastric cancer in one patient has been increased in recent decades. We suspected the incidence of synchronous and metachronous cancer in early gastric cancer (EGC) is lower than advanced gastric cancer (AGC), because of the survival rate of EGC is better than AGC. In our study, we investigated that the real incidence rate of synchronous and metachronous gastric cancer in EGC group was lower than AGC group.

Materials and Methods: Total of 716 patients with gastric cancer in Kyung Hee University Hospital between January 2006 and December 2010 were reviewed retrospectively. Out of 716 patients, we enrolled 670 patients after exclusion of the patients who had previous malignancy or follow up loss within 12 months. We defined synchronous cancers as those occurring within 6 months of the first primary cancer, while metachronous cancers were defined as those occurring more than 6 months later. We collected the incidence rates of synchronous and metachronous cancer and the clinicopathologic features in EGC and AGC, respectively.

Results: Out of 670 patients, 441 patients(441/670, 65.8%) were diagnosed EGC and 229 patients(229/670, 34.2%) were diagnosed AGC. The mean follow-up period was no significant difference between two groups (30.8±16.4 months vs 30.8±16.4 months, p=0.288). The mean age of AGC group was higher than that of EGC group (<60 vs >60, p= 0.048). Synchronous cancers were diagnosed with 17 patients of EGC group and 10 patients of AGC group. Metachronous cancers were diagnosed with 18 patients of EGC group and 11 patients of AGC group. Overall incidence of synchronous and metachronous cancers has no statistically difference between EGC group and AGC group (3.90% and 4.1% vs 4.4% and 4.8%, p=0.062). Logistic regression showed that the protective fac-
tors for metachronous gastric cancer were female (Relative risk \( [RR] = 0.228, p<0.001 \) and non-smoker (\( RR = 0.309, p<0.001 \)). In contrast, \textit{Helicobacter pylori} infection may be considered as a risk factor for metachronous gastric cancer (\( RR = 2.391, p=0.007 \)).

**Conclusion:** The incidence rate of synchronous and metachronous cancer in the patients with gastric cancer has no significant differences between EGC and AGC group. Therefore, careful evaluation and close surveillance for detecting synchronous and metachronous cancer are strongly recommended in both groups.

**Key Words:** Synchronous, Metachronous, Early gastric cancer, Advanced gastric cancer

**UGI-69**

**The Clinicopathological Characteristics of Mixed Adenocarcinoma Diagnosed as Early Gastric Cancer**

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**Aims:** The histological type is an important factor of the disease progression and prognosis in patients with gastric cancer. The WHO classification of gastric adenocarcinoma modified in 2010 includes papillary adenocarcinoma, tubular adenocarcinoma, mucinous adenocarcinoma, poorly cohesive carcinoma (PCC), and mixed adenocarcinoma. This study aimed to assess the characteristics of mixed adenocarcinoma treated with endoscopic submucosal dissection (ESD).

**Methods:** The EGCs histologically proven by ESD between May 2002 and September 2009 were enrolled in this study. These tissues were reviewed by one pathologist and re-classified according to modified WHO classification. The clinicopathological features were analyzed and compared between histological types.

**Results:** The ESDs were performed in a total 418 EGCs that met expanded criteria before ESD. According to modified classification, the lesions were re-classified as 350 tubular adenocarcinomas (83.7%), 41 PCCs (9.8%), 26 mixed adenocarcinomas (6.2%) and 1 papillary adenocarcinoma (0.002%). Twenty 20 tubular adenocarcinomas with poorly differentiation and partly signet ring cell component and 21 signet ring cell carcinomas were re-classified as PCCs. Twenty-four tubular adenocarcinomas with poorly differentiation and 2 signet ring cell carcinomas were re-classified as mixed adenocarcinomas. There were significant differences in age of more than 60 years (61.0% vs. 36.6% vs. 38.5%, \( p<0.01 \)), macroscopic type (elevated lesion, 59.0% vs. 7.3% vs. 3.8%, \( p<0.01 \)), the presence of ulcer (14% vs. 26.8% vs. 46.2%, \( p<0.01 \)), and tumor size of more than 30 mm (12.8% vs. 24.4% vs. 46.2%, \( p<0.01 \)) according to histological type (tubular adenocarcinoma, PCCs and mixed adenocarcinoma), respectively. The SM2 invasion and lymphatic invasion were most frequent in mixed adenocarcinoma, but there was no significant difference (5.1% vs. 9.8% vs. 15.4%, \( p=0.061 \), 5.1% vs. 4.9% vs. 11.5%, \( p=0.393 \)).

**Conclusions:** Mixed adenocarcinoma had larger size and higher possibility of SM2 invasion than other histological types. Although the lesions are met expanded criteria before ESD, histological type after ESD can affect the prognosis and decision on additional treatment. Because mixed adenocarcinoma could have more risk of LN or distant metastasis, meticulous and long-term endoscopic surveillance might be needed.

**Key Words:** Mixed adenocarcinoma, Early gastric cancer, WHO classification

**UGI-70**

**Clinical and Endoscopic Characteristics Indicating Endoscopic Resection in Patients with Biopsy-Proven Low-Grade Gastric Dysplasia**

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**Background:** Gastric dysplasia is generally accepted as the premalignant form of gastric cancer. Of the pathological findings seen at the initial forceps biopsies, 18–42% are upgraded after endoscopic resection (ER). However, there is no established management strategy for biopsy-proven low-grade dysplasia (LGD). In this study, we aimed to determine the indication of ER for gastric LGD.

**Methods:** Between January 2007 and December 2010, 396 lesions were analyzed retrospectively. All cases of LGD (n=295) and high-grade dysplasia (HGD, n=98) were received ER and we reviewed the histological discrepancies between the forceps biopsies and resected specimens. Four endoscopists reviewed the endoscopic images in terms of the lesion location, size, surface configuration, including erythema, nodularity, depression, and erosion. The number of initial biopsy fragments, \textit{H. pylori} infection, atrophic gastritis, and intestinal metaplasia were also investigated. Univariate and multivariate analyses were performed to determine the risk factors for upgraded LGD.
Results: After ER, 239 LGD (83.9%) showed histological concordance and the remaining 46 (16.1%) cases revealed an upgraded histology (22 HGD, 7.7%; 24 differentiated adenocarcinomas, 8.4%). In HGD, 57 (differentiated adenocarcinomas, 8.4%) cases showed upgraded histology. Univariate analyses showed that lesion size, erythema, depression, and erosion were significant predictors of upgraded LGD (p<0.001, Table 1). Multivariate analysis showed that lesion size (≥ 2 cm), erythema, and depression were independent predictors of upgraded histology (p=0.014, odds ratio 3.27, 95% confidence interval 1.28-8.39, Table 2).

Table 1. Endoscopic Features in the Concordant and Upgraded Low- and High-Grade Dysplasia after Endoscopic Resection.

<table>
<thead>
<tr>
<th>Lesion size, mm, mean ± SD</th>
<th>Concordant</th>
<th>Upgraded</th>
</tr>
</thead>
<tbody>
<tr>
<td>Erythema</td>
<td>15 (6.3)</td>
<td>22 (62.9)</td>
</tr>
<tr>
<td>Nodularity</td>
<td>24 (10.1)</td>
<td>4 (11.4)</td>
</tr>
<tr>
<td>Depression</td>
<td>4 (1.7)</td>
<td>7 (20.0)</td>
</tr>
<tr>
<td>Erosion</td>
<td>17 (7.1)</td>
<td>9 (25.7)</td>
</tr>
</tbody>
</table>

Conclusions: Our study revealed that a substantial proportion of the diagnoses of LGD based on forceps biopsies were not representative of the entire lesion. We recommend ER if gastric LGD has at least one of the following risk factors: surface erythema and depressed type regardless of size, or size ≥ 2 cm regardless of abnormal surface configuration.

Key Words: Endoscopic forcep biopsy, Gastric Dysplasia, Discrepancy, Endoscopic resection

UGI-71

Technical Usefulness and Safety of Endoscopic Treatment for Epithelial Neoplasm in Duodenum

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Introduction: Data on endoscopic treatment of duodenal neoplasm are limited to identify its safety and efficacy. We suggest the technical feasibility of the endoscopic procedures by estimating the results of the endoscopic treatment for epithelial neoplasm in duodenum.

Patients and Methods: Forty-five patients who underwent endoscopic treatment for duodenal neoplasm between September 2003 and March 2012 were analyzed. One of endoscopic polypectomy of duodenal poly (DPP), duodenal endoscopic mucosal resection (DEMR), and duodenal endoscopic submucosal dissection (DESD) was selected as an endoscopic treatment for each lesion. The periodic follow-up endoscopies were performed at 3, 6, and 12 months after the procedure.

Results: Mean lesion size was 9.1 mm and most of lesions were located in the second portion of duodenum. According to the macroscopic type, there were 17 protruded lesions and 28 superficial lesions. Histopathologically, there were 40 adenomas and 5 adenocarcinomas. The adenomas divided into 33 tubular adenomas and 7 tubulovillous adenomas. The degree of dysplasia was low-grade in 33 lesions, high-grade in 7 lesions. Of the 45 duodenal neoplasms, 4 patients were treated with DPP, 34 patients were treated with DEMR, and 7 patients with large duodenal lesion underwent DESD. The “intraprocedural” bleedings were occurred in 31 cases and the “delayed” bleeding occurred in 2 cases. All bleeding cases were successfully controlled by argon plasma coagulation or clipping. The “perforations” were occurred in three cases of DESD. All perforations were noticed during the procedures and completely closed by clipping with hemoclips. There were no patients required blood transfusion or surgical intervention. In 1-year follow-up, one patient showed local recurrence at 4 months after initial DESD. The recurrent lesion was completely treated by re-DEMR.

Conclusion: Endoscopic treatment is an efficient and safe method for the treatment of epithelial neoplasm in duodenum. This treatment method helps to reduce the need for open surgery and offers an acceptable complication rate such as bleeding and perforation that can be managed by endoscopy.

Key Words: Epithelial neoplasm, Duodenum, Endoscopic resection

UGI-72

Feasibility of Endoscopic Resection for the Treatment of Non-Ampullary Duodenal Tumor; Multi-Center Retrospective Study

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Background: Duodenal tumors are relatively rare and endo-
Endoscopic resection in the duodenum is more challenging than in other site of gastrointestinal tract. The aim of this study was to evaluate the safety and efficacy of endoscopic resection of non-ampullary duodenal tumor.

**Method:** Patients who underwent endoscopic resection for non-ampullary duodenal tumor from July 2002 to July 2012 in 5 institutes affiliated to The Catholic University of Korea data were retrospectively reviewed. Clinical outcomes such as procedure technique of endoscopic resection, location, size, pathology, and complications were analyzed.

| Table 1. Characteristics of Cases with Endoscopic Resection of Non-Ampullary Duodenal Tumor |
|-----------------|-----------------|-----------------|
|                  | EMR (n=78)      | ESD (n=6)       | Total (n=84)     |
| Mean age         | 59.6 (range, 27-84) | 62.0 (range, 36-76) | 59.7 (range, 27-84) |
| Male/Female ratio| 45/33            | 3/3             | 48/36             |
| Location of tumor|                 |                 |                  |
| 1st portion of duodenum | 42              | 4               | 46               |
| 2nd portion of duodenum | 36              | 2               | 38               |
| Size (cm)        | (range, 0.3-3.8) | (range, 0.8-2.8) | (range, 0.3-3.8) |
| Complications    |                 |                 |                  |
| Microperforation | 1 (1.3%)         | 1               | 2 (2.4%)         |
| Bleeding         | 4 (5.2%)         | 2               | 6 (7.1%)         |

**Result:** A total of 84 patients were enrolled in this study. Seventy eight lesions were resected by endoscopic mucosal resection (EMR) and 6 lesions by endoscopic submucosal dissection (ESD). Demographic features of these lesions are summarized in Table 1. Procedure-related complications developed in 8 patients; micro-perforation in 2 patients (2.4 %) and bleeding which required additional endoscopic procedure in 6 patients (7.1 %). All the complications were managed effectively with endoscopic procedure and/or with conservative management. There was no procedure related mortality.

**Conclusions:** Endoscopic resection is safe and effective method for the treatment of non-ampullary duodenal tumor.

**Key Words:** Endoscopic mucosal resection, Duodenum, Neoplasm

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**Background and Aims:** Bleeding is a major complication after endoscopic resection (ER) for gastric mucosal lesions. We aimed to determine the risk factors and correlation of post-ER bleeding according to three periods after procedure.

**Patients and Methods:** Between March 2009 and December 2010, a total of 670 lesions in 610 patients who underwent ER were retrospectively enrolled. We classified into three types according to the time of post-ER bleeding: immediate bleeding (IB), early delayed bleeding (EDB), late delayed bleeding (LDB). We analyzed risk factors in each type focused on the patient’s baseline characteristics and procedure-related factors. The correlation between the occurrence of each bleeding type was also analyzed.

**Results:** Post-ER bleeding occurred in 408 events in 610 patients, IB in 302, EDB in 88 and LDB in 18. Univariate analysis showed that gross type of lesion, size of lesion, submucosal fibrosis, location of lesion, piecemeal resection, resection time were significant predictors of all bleeding types. Invasion depth of lesion and method of ER were additional predictors of IB and EDB. In multivariate analysis, gross type of lesion and resection time were significant predictors of IB (p<0.001) and piecemeal resection was a predictor of significant EDB (p<0.001). Of 302 events with IB, 42 (13.9%) had EDB. Only 1 (2.4%) patient in 42 EDB showed LDB, while 4.6% (12/260) of without EDB encountered LDB. Of 368 events without IB, 46 (12.5%) had EDB, which was similar to the IB group. One (2.2% of 46 EDB) and 4 (1.24% of 322 without EDB) had LDB, respectively. IB event revealed higher risk of EDB (p<0.001) and LDB (p<0.001), while EDB event did not show increased risk of LDB (p=0.997). The risk of IB and EDB was higher in endoscopic submucosal dissection than endoscopic mucosal resection (p=0.0001and 0.0109, respectively).

**Conclusion:** Gross type of lesion, resection time, piecemeal resection (in significant EDB) of lesion increased the risk of...
bleeding related to ER. As for the time of post-ER bleeding, IB increased the risk of EDB and LDB. Interestingly, the number of LDB without EDB was higher than that of LDB with EDB. We believe this tendency might result from the effectiveness of proper endoscopic coagulation at the time of EDB occurrence. Moreover, it shows a message that the patients with IB must be followed up carefully with second look endoscopy.

**Key Words:** Risk Factor, Endoscopic Resection, Gastric Mucosal Lesion, Immediate Bleeding, Delayed Bleeding

### UGI-74

**Delayed Bleeding Rate without Routine Coagulation of Visible Vessels in Second-Look Endoscopy after Endoscopic Resection**

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**Backgrounds and Study Aims:** Delayed bleeding is a major complication of endoscopic resection of gastric neoplasm. However, there has been not enough research on bleeding after gastric endoscopic mucosal resection (EMR) or endoscopic submucosal dissection (ESD), especially related to routine coagulation of visible vessels in second-look endoscopy. We, therefore, aimed to evaluate the efficacy of performing the routine coagulation of visible vessels in second-look endoscopy.

**Patients and Methods:** Between July 2011 and February 2012, we investigated prospectively 905 lesions in 845 consecutive patients who performed second-look endoscopy after EMR or ESD and endoscopic finding was described according to the Forrest classification at the Asan Medical Center. All the visible vessels (Forrest Ila) in second-look endoscopy were not treated and bleeding was monitored by visiting out-patient clinic 1 month after discharge. Delayed bleeding was defined as clinical evidence of bleeding and categorized into early delayed bleeding which was occurred from day 1 after EMR or ESD until second-look endoscopy and late delayed bleeding occurred from second-look endoscopy until 1 month.

**Results:** Among 905 lesions, early delayed bleeding occurred in 84 lesions (9.3%) and late delayed bleeding in 32 lesions (3.5%) after ESD or EMR. All cases were controlled by endoscopic hemostasis and/or blood transfusion without surgical intervention. At second-look endoscopy, Forrest I were found in 84 cases (Ia, 9 lesions, 1.0%; Ib, 75 lesions, 8.3%; total, 9.3%) and all of which underwent endoscopic hemostasis in second-look endoscopy without further bleeding after discharge.

Forrest II and III were 821 cases (Ila, 76 lesions, 8.4%; Ib, 137 lesions, 15.1%; IIC, 603 lesions, 66.6%; III, 5 lesions, 0.6%; total 90.7%) and there is no significant difference of late delayed bleeding rate between the three of Forrest II or III groups (Ila, 2/76, 2.6%; Ib, 5/137, 3.6%; IIC and IIC, 25/608, 4.1%; total 32/821, 3.9%; \( p = 0.953 \)). In multivariate analysis using selected variables, any risk factors for delayed bleeding group were not significant as compared to non-bleeding group.

**Conclusions:** Preventive coagulation of visible vessels in second-look endoscopy after gastric EMR or ESD may contribute little to the prevention of late delayed bleeding.

**Key Words:** Bleeding, Second-look endoscopy, Endoscopic submucosal resection, Endoscopic mucosal resection, Gastric neoplasm

### UGI-75

**A Second-Look Endoscopy after ESD for Gastric Epithelial Neoplasm may be Necessary in High-Risk Patient**

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**Background:** A second-look endoscopy is routinely performed after endoscopic submucosal dissection (ESD) in many institutes. Additional hemostatic procedures might be necessary for the high risk bleeding of post-ESD ulcers. But the role of routine second-look endoscopy is controversial.

**Objective:** To investigate the incidence and predictive factors of high risk of post ESD bleeding.

**Methods:** Between December 2008 and May 2012, 616 ESD (270 early gastric cancers and 346 gastric adenomas) procedures were carried out. Second-look endoscopies were performed on the next day after ESD in all patients. And, the post-ESD ulcers were categorized into two groups according to the Forrest classification: high risk (type I and IIa) and low risk of bleeding. Associated predictable risk factors of high risk bleeding ulcer were also analyzed.

**Results:** Post-ESD bleeding occurred in 2.27% (14/616). The incidence of High risk group was 17.2% (106/616) on the second-look endoscopy. Post-ESD bleeding occurred only in high risk group. On the univariate analysis, submucosal fibrosis was the only significant predictive factor. Also, on the multivariate analysis, presence of submucosal fibrosis was the only significant risk factor for post-ESD bleeding of high risk group.

**Conclusions:** The routine second-look endoscopy may be beneficial for selected patients who have presence of submucosal fibrosis on endoscopic finding.
**Key Words:** ESD, Second-look endoscopy, Forrest classification, Submucosal fibrosis

**UGI-76**

**The Clinical Outcomes of the Observational Follow-Up Compared with Hemostasis after Endoscopic Submucosal Dissection**

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To prevent delay bleeding, prophylactic coagulation of exposed vessel after ESD is well known. However, the clinical course of patients who choose the observational follow-up after ESD have blood clots and exposed vessel on the artificial ulcer is not well known. The aim of this study was to evaluate the clinical course of observational follow-up compared with active hemostasis after ESD.

**Methods and Procedures:** Between January 2007 and September 2012, a total of 103 cases of ESD which was enrolled has blood clots or exposed vessel on ulcer base after ESD. The cases of active bleeding or oozing, perforation, and having a clear ulcer base without exposed vessel after ESD were excluded. Patient characteristics, the number of follow-up gastroduodenoscopy, type of treatment, and hospital days were retrospectively assessed for patients separated into observation group and hemostasis group (active hemostasis after clots removal).

**Results:** The mean age of the patients was 63.5 ± 11.0 years (74 men, 29 women). 43 patients were not performed any treatments during the follow-up gastroduodenoscopy after ESD (Observation group) and 60 patients were performed active hemostasis after clot removal. (Hemostasis group) In the hemostasis group, Hemostasis was performed by 43 cases of APC, 10 cases of hemoclipping, and 7 cases of APC with hemoclipping. There was no significant difference between the mean numbers of follow-up gastroduodenoscopy after ESD. (Observation group: 1.16 ± 3.74, hemostasis group: 1.27± 5.16, p=0.239) However, the mean numbers of hospital days were significant shorter in the observation group in comparison with the hemostasis group (Observation group: 4.4 ± 1.2, hemostasis group: 5.2± 1.8, p=0.005).

**Conclusions:** It seems that there were no disadvantages of observational follow-up of the blood clots and exposed vessels after ESD in compared with active hemostasis.

**Key Words:** Endoscopic submucosal dissection, Hemostasis