Risk Factors of Delayed Healing of Iatrogenic Gastric Ulcer after Endoscopic Resection

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Background: Iatrogenic ulcers after Endoscopic resection (ER) were thought to heal faster than peptic ulcers. But, about 10% of iatrogenic gastric ulcer was still remained as incomplete healing state at 8 week. We conducted to clarify the contributing factors of delaying gastric ulcer healing after ER.

Methods: We conducted a retrospective analysis of 486 patients who performed ER due to gastric adenoma or cancer from January 2007 to December 2011 at Kyung Hee University Hospital. Total 541 lesions in 486 patients were analyzed. Follow-up endoscopy was performed at 8 week in the H. pylori negative group and at 12 week in the H. pylori positive group. Standard doses of PPI were administered in all patients.

Results: After ER, 56 in 541 lesions (10.4%) were healed incompletely at the first follow-up endoscopy. In logistic regression analysis, the following factors were significantly associated with incomplete healing of iatrogenic ulcers: presence of erosion or ulcer, removed specimen size, and use of anti-platelet agents (Table 1).

Table 1. Logistic Regression Analysis: Predictors Associated with Delayed Healing of ER Induced Ulcer

<table>
<thead>
<tr>
<th>Predictor</th>
<th>p-value</th>
<th>Hazard ratio</th>
<th>95% CI* Lower</th>
<th>95% CI* Upper</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASA 3-4</td>
<td>0.959</td>
<td>0.971</td>
<td>0.315</td>
<td>2.991</td>
</tr>
<tr>
<td>Comorbidities</td>
<td>0.213</td>
<td>1.525</td>
<td>0.785</td>
<td>2.963</td>
</tr>
<tr>
<td>Use of anti-platelet agents</td>
<td>0.035</td>
<td>2.462</td>
<td>1.065</td>
<td>5.687</td>
</tr>
<tr>
<td>Use of NSAIDs</td>
<td>0.201</td>
<td>2.718</td>
<td>0.587</td>
<td>12.593</td>
</tr>
<tr>
<td>Presence of depression</td>
<td>0.242</td>
<td>1.544</td>
<td>0.746</td>
<td>3.197</td>
</tr>
<tr>
<td>Presence of erosion or ulcer</td>
<td>0.035</td>
<td>2.325</td>
<td>1.060</td>
<td>5.102</td>
</tr>
<tr>
<td>H. pylori infection</td>
<td>0.115</td>
<td>1.694</td>
<td>0.880</td>
<td>3.261</td>
</tr>
<tr>
<td>Treatment (ER)</td>
<td>0.260</td>
<td>1.590</td>
<td>0.709</td>
<td>3.566</td>
</tr>
<tr>
<td>Specimen size (≥ 3.0 cm)</td>
<td>0.006</td>
<td>3.452</td>
<td>1.422</td>
<td>8.380</td>
</tr>
</tbody>
</table>

*N: NSAIDs, non-steroidal anti-inflammatory drugs.

Conclusion: Delayed healing of iatrogenic ulcers in ER was associated with use of antiplatelet agents, presence of ulcer or erosion, and removed specimen size.

Key Words: Iatrogenic ulcer, Endoscopic resection (ER), Gastric cancer

Endoscopic Submucosal Dissection by Using a Novel Versatile Knife: An Animal Feasibility Study

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Background: For the purpose of reducing the procedure time and the number of accessory changing during ESD, we developed a novel versatile knife, which has combined advantages of several conventional knives. The aim of this study was to evaluate efficacy, safety, operation time and histologic quality assessment of ESD using a novel versatile knife, compared with using a combination of several conventional knives.

Methods: This was a prospective, animal case control trial comparing 2 different modalities for the ESD in micro-pig. The procedure was repeated by using a randomly assigned modality. Completion time of each resection was documented, and the resected specimen was retrieved and evaluated for completeness. To assess quality control of procedures and adverse events, detailed histopathological examinations were performed.

Results: We resected a total of 18 ESD specimens safely and easily (9 specimens by using a new versatile knife; 9 specimens by mixing conventional knives). All resections were completed as en bloc resections. There was no significant difference in procedure time (456 sec vs. 355 sec, p=0.258) and cutting speed (1.983 mm2/sec vs. 1.57 mm2/sec, p=1.000). Adverse events rate and histologic quality analysis of both resected specimen and remaining gastric bed tissue revealed no statistical difference in two groups.

Conclusions: ESD with a new versatile knife appeared to be an easy, safe, and technically efficient method.

Key Words: ESD, Endoscopic submucosal dissection, Experimental animal models, Instruments
**Prediction of Clinical Outcome in Achalasia Patients Underwent Peroral Endoscopic Myotomy (POEM)**

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**Background/Aims:** Peroral endoscopic myotomy (POEM) was introduced as an alternative treatment for achalasia patients. However, predicting factors for clinical outcome remain undetermined in patients underwent POEM.

**Methods:** From November 2011 to August 2013, we reviewed clinical outcome and medical records of 28 patients, retrospectively. Clinical variables including patient’s sex, age, disease duration, achalasia subtype (sigmoid or non-sigmoid), esophageal diameter, HRM finding (type 1,2,3), length of myotomy, type of myotomy (full or partial) were analyzed. Clinical symptom score (Eckardt score) was compared before and after POEM. When post-POEM score was 0 or the score was decreased by 6 or more, it was defined as successful outcome.

**Results:** A total of 21 patients showed successful outcome. Of these, 17 patients showed post-POEM score was 0. However, the remaining 7 patients did not show successful outcome. Univariate and multivariate analyses were performed for finding the predictors related to successful POEM. On univariate analyses, the short disease duration and non-sigmoid type achalasia were related to successful POEM (p=0.092 and p=0.056, respectively). However, there were no statistical significance. The small esophageal diameter was significantly associated with successful outcome (p=0.020). Multivariate analyses also showed the significant association between the small esophageal diameter and successful outcome (p=0.027).

**Conclusions:** The small esophageal diameter was associated with successful POEM outcome. In the future, large prospective study is needed to confirm that POEM can be considered as standard treatment in early stage achalasia patients.

**Key Words:** Achalasia, POEM, Prediction, Outcome

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**Is the Edema of Interarytenoid Mucosa Related to Erosive Esophagitis?**

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**Background/Aims:** Laryngopharyngeal reflux (LPR) have been thought to be caused by the retrograde flow of gastric acid up to the larynx and hypopharynx. Recent study verified that the edema of interarytenoid mucosa was independent predictor of endoscopic confirmed esophagitis. But there have been different perspectives about the relationship of endoscopic findings between LPR and GERD. And there have been no data about investigation of both findings in Korea. The aim of this study was to evaluate the correlation between endoscopic findings of LPR and GERD.

**Methods:** Between March 2013 and September 2013, 103 consecutive patients who were referred for endoscopic evaluation were enrolled in this study. In the present study, Reflux symptom index (RSI), Frequency scale for the symptoms of gastro-esophageal reflux disease (FSSG) were examined and the presence of erosive esophagitis and laryngopharyngeal reflux were evaluated. We analyzed the relationship between erosive esophagitis and laryngopharyngeal reflux finding.

**Results:** About 60% patients with endoscopic laryngopharyngeal reflux finding showed erosive esophagitis. Mann-Whitney test presented no statistical significance on edema of the interarytenoid mucosa in patients with erosive esophagitis (p value 0.54). On multivariate analysis, the existence of erosive esophagitis was not significantly associated with the edema of the interarytenoid mucosa (odds ration [OR]: 1.78; 95% confidence interval [CI]: 0.35-9.0, p value 0.48). Also, RSI measures were not correlated with the existence of erosive esophagitis (odds ration [OR]: 0.69; 95% confidence interval [CI]: 0.035-13.74, p value 0.81).

**Conclusions:** This study showed that the edema of interarytenoid mucosa had no significant association with erosive esophagitis. Also, LPR symptoms were not correlated with erosive esophagitis.

**Key Words:** Laryngopharyngeal reflux, Erosive esophagitis
Comparison of Accuracy of Marking Methods between Magnifying Endoscopy with NBI and Chromoendoscopy in Gastric Neoplasm

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Background/Aims: Magnifying endoscopy with narrow-band imaging (ME-NBI) and acetic acid-indigocarmine chromoendoscopy (AIC) have been used for determining lateral extent of gastric tumor before endoscopic submucosal dissection (ESD). The aim of this study was to evaluate the accuracy between ME-NBI and AIC for determining the tumor margin in gastric neoplasm.

Methods: A total of 23 cases of gastric neoplasm (adenoma: 12, EGC: 11) was enrolled. Two different marking methods were performed in each case. Marking method was randomly determined by drawing envelopes. Initially, the demarcation line was carefully identified by ME-NBI or AIC. Marking dots were placed on normal mucosa within 3 mm from the tumor by using an electrocautery with needle knife. Subsequently, the same lesion was examined by using the other method then marking was performed as same before. After performing ESD, the resection margin was carefully assessed by experienced pathologist. If the demarcation of the lesion was clear and the lesion was confined within the markings, it was classified as successful delineation. If the lesion was undemarcated or cancerous tissue was present outside the markings, it was classified as unsuccessful delineation.

Results: 23 cases of ESD were performed successfully. The mean size of resected specimen was 207 mm² in ME-NBI group and 269 mm² in AIC group. The total rate of successful delineation was significantly higher AIC group in comparison with ME-NBI group. (95.7% (11/23) vs 60.9% (14/23), p=0.004).

In early gastric cancer, the rate of successful delineation was not significantly difference between two groups (AIC: 100% (11/11) vs ME-NBI: 81.8% (9/11), p=0.476). However, in the case of gastric adenoma, the rate of successful delineation was significantly higher AIC group than ME-NBI group (91.7% (11/12) vs 41.7% (5/12), p=0.027).

Conclusions: AIC seems better marking method than ME-NBI before performing ESD in gastric adenoma.

Key Words: Magnifying endoscopy with narrow-band imaging, Chromoendoscopy, Gastric neoplasm, ME-NBI, ESD

Clinicopathologic Characteristics of Interval or Missed Early Gastric Cancer after a Negative Esophagogastroduodenoscopy

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Background/Aims: Esophagogastroduodenoscopy (EGD) has become the standard procedure of investigation when gastric cancer is suspected. However, the clinicopathologic characteristics in relation to interval early gastric cancer (EGC) is not well known in contrast to understanding of colonoscopy missed rate and risk factor for colorectal cancer. The aim of this study was to evaluate the clinicopathologic and endoscopic characteristics of interval EGC after a negative EGD.

Methods: We retrospectively analysed data on 1055 gastric adenocarcinoma patients who confirmed EGC by endoscopic resection or operation from July 2006 to May 2013. The referred patients who diagnosed or suspected gastric neoplasm from other medical clinics excluded from our study (n= 771). Interval EGC was defined as a gastric cancer that is diagnosed within 2 years of negative EGD result. We compared clinicopathologic characteristics between patients with initially diagnosed EGC and patients with interval EGC. The variable risk factors of interval EGCs were investigated.

Results: We identified interval EGCs in 54 (19%) of 284 patients. Average age was 65.4 years old and average interval time between the time of diagnosis and previous EGD was 12.6 months. Pathologic analysis showed that interval EGC group was significantly more smaller (1.85 Vs 1.31 cm; p<0.001) and more showed intestinal metaplasia (OR 4.85; p<0.001) than initial diagnosed EGC group. There was no differences in location, differentiation, gross morphology and H. pylori infection. In factors associated with procedure, short procedure time (7.14 Vs 5.55 min; p<0.03) and negative symptoms (OR 3.23; p<0.02) were a predictive factors for interval or missed EGC.

Conclusions: Small sized lesion and intestinal metaplasia could be predictive factors for the presence of interval or missed EGC during screening EGD. Careful examination with sufficient inspection time is very important to detect EGC with or without symptoms of patient.

Key Words: EGC, Interval gastric cancer, Missed gastric cancer
Deep Biopsy via Endoscopic Submucosal Dissection in Upper GI Subepithelial Tumors: A Prospective Study

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Background: Preoperative pathologic diagnosis of subepithelial tumors (SET) may improve clinical management decisions in patients with upper GI SETs. The aim of this study was to evaluate the diagnostic yield of deep biopsy via endoscopic submucosal dissection (ESD) and its impact on management of patients with upper GI SETs.

Patients and Methods: Eighty-seven patients with upper GI SETs were voluntarily assigned to two groups. The specialist A group underwent EUS and endoscopic deep biopsy using the ESD technique. The specialist B group underwent surgical resection after EUS without obtaining preoperative pathological diagnosis, in accordance with accepted clinical management algorithms.

Results: The diagnostic yield of deep biopsy for patients with upper GI SETs was 90% (36/40). Deep biopsy results changed treatment plans in 14 of 40 deep biopsy patients (35%) in specialist A group. One patient with lymphoepithelial carcinoma was scheduled for surgical resection, whereas 13 patients with benign SETs ≥2 cm in diameter avoided unnecessary operations. In addition, 13 of 28 patients (46.4%) in specialist B group who underwent surgical resection without preoperative pathological diagnosis, in accordance with accepted clinical management algorithms.

Conclusions: Deep biopsy by the ESD technique is a safe, high-yield diagnostic method in patients with upper GI SETs. This method could improve clinical decision-making in the management of patients with upper GI SETs.

Key Words: Subepithelial tumor, ESD, Biopsy

Risk Factors and Clinical Outcomes of Gastric Cancer Identified by Screening Endoscopy: A Case-Control Study

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Background and Aim: A customized screening program for gastric cancer would optimize the benefits of screening endoscopy. This study investigated the risk factors for gastric cancer detected during screening, and factors affecting clinical outcomes. Methods: From April 2000 to December 2010, subjects who underwent screening endoscopy at Asan Medical Center were included. To investigate risk factors, age and sex-matched control group were selected. The clinical outcomes of gastric cancer identified during screening (screening group) were compared with age, sex and date of diagnosis-matched subjects who were diagnosed with gastric cancer in the outpatient clinic (outpatient group).

Results: Of 109,530 subjects, 327 were diagnosed with gastric cancer. The median age of the screening group was 63.6 years (interquartile range: 56-71 years), and the male to female ratio was 2.4:1. When comparing with the control group, H. pylori seropositivity (odds ratio [OR] 2.933, p<0.001), carcinoembryonic antigen (OR 8.633, p=0.004), family history of gastric cancer (OR 2.254, p=0.007), and drinking (OR 3.312, p<0.001) were independent positive risk factors, and the use of aspirin a negative risk factor for gastric cancer (OR 0.445, p=0.012) in multivariate analysis. Low density lipoprotein cholesterol (hazard ratio [HR] 0.987, p=0.005), cancer antigen 19-9 (HR 21.713, p<0.001), resectability (HR 59.833, p<0.001), and family history (HR 0.308, p=0.009) were independent risk factors for death. The 5-year survival rate was significantly higher in the screening group than in the outpatient group (p<0.001).

Conclusions: Early detection of gastric cancer by screening endoscopy while asymptomatic enhances patient outcomes, especially in high risk groups.

Key Words: Stomach neoplasms, Risk factors, Cancer screening, Endoscopy
UGI-9

What Is the Optimal Timing for Image Analysis of Freshly Excised Tissue for Multiphoton Microscopy?

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Background and Aims: Probe based multiphoton microscopic image analysis can provide long time and deep tissue imaging which allow dynamic functional information of fresh live tissue from patient. In contrast, confocal microscopy had limitation that short observation time by photodamage and shallow image depth in cellular level. Traditionally, it was considered that freshly excised tissue give a detectable fluorescence signal if imaged within 2-3 hours from excision. However there have been no controlled data about available time limit from excision for fresh live tissue image analysis. The aim of our study is to assess the change of live tissues according to time duration using probe based multiphoton microscopy.

Patients and Methods: We obtained fresh live stomach mucosal tissues during gastroscopic biopsy from patients in outpatient clinic. Patients who had contraindication for biopsy were excluded. 6 pieces of mucosal tissues from one patient were obtained and merged in phosphate buffer solution immediately, and stained with multiphoton probe. Tissues were imaged using multiphoton microscopy at 30 min, 60 min, 90 min, 120 min, 150 min, and 180 min respectively. We assess changes of mucosal structure and fluorescence from multiphoton probe.

Results: At 30 minutes, tissues were intact but fluorescence from probe was not fully stained. At 60 minutes, all tissues were intact and probe was fully stained. At 90 minutes some tissues were denatured but fluorescence was consistent. At 120, 150, and 180 minutes, almost tissues had deformation of glandular structure and fluorescence was rapidly changed.

Conclusion: Live tissue image using probe based multiphoton microscopy should be obtained between 60-90 minutes, optimally. From over 120 minutes, structural deformation and functional change occurred completely.

Key Words: Multiphoton microscopy, Image, Live tissue, Optimal time

UGI-10

Magnifying Images by Using a Near Focus Method and a Conventional Method under Narrow Band Imaging for Gastric Epithelial Tumors

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Background: A dual focus two-stage optical lens technology was recently introduced. In the near focus mode, endoscopists can perform a close examination of mucosal tissue and capillary networks. The aim of this study was to investigate the magnifying images on the near focus method (NFM) compared to those on the conventional magnification method (CMM) under narrow band imaging (NBI) in the patients with gastric epithelial tumors.

Methods: An experienced endoscopist performed endoscopies by using NFM and CMM in the 20 enrolled patients with gastric epithelial tumors, respectively. We selected 40 images of 40 sessions of endoscopy in the patients. Ten endoscopists asynchronously reviewed for image quality. The image quality was rated on a 5-point Likert scale (from poor, 1 to excellent, 5) for mucosal microsurface structure, subepithelial microvascular architecture, and demarcation line. The all of enrolled patients received endoscopic submucosal dissection (ESD).

Results: The final diagnosis of the gastric epithelial tumors revealed 10 cases of early gastric cancer, 2 cases of high grade dysplasia, and 8 cases of low grade dysplasia after ESD. The median number of magnification images was 11 in each method. The average observation time (±SD) for magnification was 99.9±64.1 s in NFM and 91.5±64.6 s in CMM (p=0.54), respectively. Judgments of image quality in mucosal microsurface structure were 4.09±0.39 in NFM and 3.73±0.40 in CMM (p=0.015). Those of in subepithelial microvascular architecture were 3.53±0.45 in NFM and 4.29±0.45 in CMM (p=0.001). Judgment of clear demarcation line were 3.91±0.41 in NFM and 3.61±0.54 in CMM (p=0.089).

Conclusion: The near focus mode which is controlled by experienced endoscopists seems to be a useful method for magnification as the conventional method in gastric epithelial tumors. Further evaluation of this novel technology is necessary and awaited.

Key Words: Magnification, Gastric Epithelial Tumor, Method
Clinical Outcomes of Full Myotomy vs. Partial Myotomy in Peroral Endoscopic Myotomy for Achalasia Patients

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Background/Aims: Peroral endoscopic myotomy (POEM) is known to be safe and effective endoscopic surgery compared with surgical myotomy for achalasia patients. Although full myotomy may be more effective than partial myotomy in symptoms resolution, the effectiveness of full myotomy is not established. Moreover, concerns for perforation during POEM have been an obstacle in performing full myotomy. The aim of this study was to compare the clinical outcomes and complication rates between full myotomy and partial myotomy among the patients underwent POEM for achalasia.

Methods: A total of 34 POEM procedures was performed from November 2011 to September 2013 at Soonchunhyang University Seoul and Bucheon Hospital.

Results: Among 34 procedures in 31 patients, 16 full myotomy and 18 partial myotomy were included. The length of full and partial myotomy were 8.4±2.6 and 7.9±1.7 cm (p=0.562), There was no difference in pre-POEM Eckardt score, basal LES pressure, and integrated relaxation pressure (IRP) between full and partial myotomy group (5.8±1.7 vs. 6.6±2.6, 27.2±12.8 vs. 33.8±14.0 mmHg, and 21.7±13.6 vs. 25.8±11.8 mm Hg). All patients showed a significant improvement in Eckardt score after full or partial myotomy during median follow-up of 8 months (1.1±1.3 vs. 0.5±0.8; p<0.001). Significant decrease in LES pressure and IRP was found in partial myotomy group (p=0.003, p=0.001). However, no significant difference in Eckardt score, LES pressure and IRP score between full and partial myotomy groups. There was no significant procedure-related complication and no significant difference in the procedure-related complication rates including pleural effusion, pneumoperitoneum, retropneumoperitoneum, pneumomediastinum, and subcutaneous emphysema on CT or X-ray between two groups.

Conclusion: POEM showed good clinical outcomes and safety. Full or partial myotomy did not show significant clinical outcomes.

Key Words: Peroral endoscopic myotomy, Outcome, Complication

A Novel Occluder Device for Endoscopic Closure of Gastrointestinal Leaks and Fistulas

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Background and Aims: Endoscopic treatments of gastrointestinal (GI) leaks and fistulas meet with only limited success. Although successful closure of GI fistulas by using the cardiac septal defect closure device has been reported, the cost is very high and cannot be delivered through-the-scope.

Method: The novel occluder device for GI leaks (Leakludder®, S&G biotech, Seongnam, Korea) is a short self-expandable metal stent which looks like a flattened hourglass. While the both flares of the occluder are coated with silicone which can lead to immediate sealing after deployment, the central portion between the flares is uncovered to permit tissue ingrowth and permanent sealing (Fig. 1). The device is preloaded in the 3.3-mm tube for though-the-scope delivery. After a perforation was made at an ex-vivo porcine stomach by a needle knife and an 11-mm balloon, the occluder device was applied through the perforation. The amount of leakage was measured 30-min after 1 L-normal saline was infused to the stomach. An endoclip application model was employed as a control.

Results: The occluder device could be applied to the perforation site easily under the endoscopic guidance. The elapsed time to seal the perforation is shorter in the occluder model than in the endoclip model (65 sec vs. 630 sec). The amount of leakage for 30-min was comparable between the occluder and the endoclip model (6 mL vs. 19 mL).

Conclusions: The novel occluder device can provide effective and immediate sealing for a GI leak in an ex vivo porcine stomach model. In-vivo animal studies and clinical trials will be followed.

Key Words: Digestive System Fistula, Anastomotic Leak, Stents, Septal Occluder Device
Trucut Biopsy Using Forward-Viewing Endoscopy for Diagnosis of Upper Gastrointestinal Subepithelial Tumors

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Background and Aims: For pathologic diagnosis of large upper gastrointestinal (GI) subepithelial tumor (SET), fine needle aspiration and trucut biopsy are usually performed under guidance of endoscopic ultrasonography (EUS). However, there are no reports about the feasibility of trucut biopsy without EUS guidance. We conducted a pilot study to evaluate the usefulness of trucut biopsy using forward-viewing endoscopy for the diagnosis of upper GI SETs.

Methods: A total of 19 patients were enrolled into this study. Before trucut biopsy, all patients underwent EUS or Computed tomography (CT) to confirm SETs. Inclusion criteria were size of >2 cm, tumor location of esophagus or stomach body. Under moderate sedation state by midazolam, this procedure was performed by forward-viewing conventional gastroscope. 19 gauge biopsy needle (EUSN-19-QC, Cook medical) was inserted through the working channel of endoscope and trucut biopsies were performed three times. Biopsied specimens were reviewed by single experienced GI pathologist. Additional immunohistochemical staining were performed, such as CD117, CD34, smooth muscle actin, desmin, S-100.

Results: Tumors were located in the esophagus (73.6%, n=14) and stomach (26.4%, n=5). Mean size of tumor was 2.73 cm. All procedures were performed successfully. Immediate complications including bleeding, perforation did not occur. Pathologic results of trucut biopsy specimen showed GIST (10.5%, n=2), leiomyoma (78.9%, n=15). The remaining cases showed insufficient material (10.5%, n=2) and located in the stomach. In two patients with inconclusive trucut biopsy result, laparoscopic wedge resection were performed and final pathology revealed ectopic pancreas. Overall technical success rate of this technique was 89.4% (n=17/19).

Conclusions: Trucut biopsy using forward-viewing endoscopy is a feasible and safe for diagnosis of upper GI SETs. If SETs more than 2 cm size are suspicious of GIST or leiomyoma on EUS, our technique can be applied in clinical practice.

Key Words: Subepithelial tumor, Diagnosis, Trucut biopsy

A Novel Reinforcement Method for the Surface of Gastric Metal Stent: Gas Plasma Treatment in Vitro Study

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Background/Aim: A gastric stent, which is made of nickel-titanium (NiTi) alloy coating with a silicone polymer, has been using for the relief of obstructive symptom in both malignant and benign stricture of stomach. Although coating with the silicone polymer on the stent plays a key role in corroding, corrosion property may differ from along statues of surface of NiTi alloy wire as coating the silicone polymer. The surface modification with gas plasma is a way to improve a surface adhesive property to the silicon polymer. We systematically investigated a surface modification to stick the silicone employing gas plasma treatment.

Methods: The NiTi alloy stents were treated in a few conditions of the plasma treatment, in which vary mixture rates of Ar and O2 gas, applied voltages and duration of exposing time. We prepared three kinds of stents; normal stent (product by normal process), slightly etched normal stent (product by plasma treatment) and natural oxide layer-eliminated normal stent (product that removed natural oxide regions by plasma treatment). The stents were analyzed with a TEM to examine surface topographies of the stents and performed a potentiodynamic test to compare corrosion state.

Results: The surface profile of the samples showed that some content of oxide layer for the normal stent was formed in thickness of about 100nm, while the others was less than 60nm. Moreover, the oxide layer for normal product and slightly etched normal stent showed deposition of oxygen without interlocking that enhances cohesion, whereas natural oxide layer-eliminated normal stent showed behavior of strong interlocking. It imply that an interlocking between nickel and oxide layer plays a significant role of corrosion resistance. In a potentiodynamic test, the sample by plasma treatment indicated strong corrosion resistance.

Conclusions: These results revealed that the plasma treatment would be employed to improve the surface property of gastric stent.

Key Words: Stent, Gas plasma, Nickel-Titanium
UGI-15

Prevalence of Gastric Subepithelial Tumor in Korea: Single Center Experience

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Background and Aims: Incidental gastrointestinal subepithelial tumor (SET) is increasing with national cancer screening endoscopy. In previous report, prevalence of SET was about 0.36%. However, there is no report examining the prevalence of SET in stomach in Korea. The aim of this study was to evaluate the prevalence of SET in stomach, in health examinee.

Patients and Methods: We reviewed retrospectively the endoscopic reports of 11,712 subjects who underwent esophagogastroduodenoscopy (EGD) for screening purpose at Hanyang University Hospital from July, 2012 to June, 2013. SET was defined as "elevated lesion covered with normal-appearing mucosa, and it is not lost by changes in posture". EGD was performed by 11 endoscopists with endoscopic certification.

Results: Among 11,712 health examinee, 194 (1.66%) had SET in stomach. 71 (1.33%) males had SET, and 123 (1.99%) female had SET. The average age of examinee with SET was 50.9 year old (male 50.9 year old, female 51.1 year old). When separated by age, the prevalence of SET was as follows. Twenties had 1.31%, thirties had 1.15%, forties had 1.63%, fifties had 2.18%, sixties had 3.62% and seventies had 3.66%. In both male and female, there was a correlation between age and the prevalence of SET (**p**=0.000). When classified according to size of SET, 145 (74.7%) was <10 mm, 38 (19.6%) was 10-19 mm, 4 (2.1%) was 20-29 mm, and 7 (3.6%) was >30 mm. When classified according to location of SET, 36 (18.6%) was in antrum, 14 (7.2%) was in lower body, 5 (2.6%) was in mid body, 52 (26.8%) was in upper body, and 87 was in cardia or fundus.

Conclusion: The overall prevalence of SET in stomach among health examinee was 1.66%. There was a correlation between age and the prevalence of SET. In the future, a community-oriented well organized study should be warranted.

Key Words: SET, Subepithelial tumor, Prevalence, Korea

UGI-16

Further Diagnostic Treatments Are Necessary for Gastric Atypical Cell on Pathologic Findings of Endoscopic Biopsy

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Background: Gastric atypical cell (GAC) on endoscopic forceps biopsy is the indefinite pathologic finding between benign and malignant. This case often needs other diagnostic treatments such as endoscopic submucosal dissection (ESD), endoscopic mucosal resection (EMR) or operation (OP). Aims: We aimed to analyze the initial endoscopic and histologic findings and to discuss the necessity of further diagnostic treatments for cases of GAC.

Methods: This retrospective study enrolled 96 patients (M:F 61:35, mean age 59±14 years old) proven GAC on initial pathologic finding of endoscopic forceps biopsy (January 1999-December 2012). ESD (n=16, 16.7%), EMR (n=5, 5.2%), OP (n=23, 24.1%) and follow-up or other treatment after diagnosis by re-biopsy (n=52, 54.0%) were performed. This study analyzed the initial endoscopic (lesion of size, location, or type) and histologic (presence of intestinal metaplasia or *H. pylori*) characteristics of GAC lesions related with the final pathology. The univariate and multivariate logistic regression analysis were presented as odds ratio (OR; 95% confidence intervals (CI)).

Results: The final pathologic diagnoses were cancer (n=36, 37.6%), adenoma (n=9, 9.4%) and non-neoplasm (n=51, 53.0%). Sex, lesion of location, and presence of intestinal metaplasia did not significantly influence the result of final outcome. With multivariate analysis, there was no independent characteristic factor. With univariate analysis, age (**p**=0.020, OR=1.04 CI 1.01-1.07), lesion of 10 mm and above (**p**=0.003, OR=3.94, CI 1.61-9.61), lesion of depression (**p**=0.030, OR=2.50, CI 1.09-5.72), and presence of *H. pylori* (**p**=0.030, OR=2.83, CI 1.11-7.25) were statistically associated with the final diagnosis of neoplasm.

Conclusions: Considering the neoplastic rate of GAC cases was near 50%, further diagnostic treatments can be performed for suspicious neoplastic lesions, related with the significant findings (≥10 mm, depression, or *H. pylori*) or age of GAC patients.

Key Words: Gastric atypical cell, Indefinite pathology, Endoscopic biopsy, Stomach neoplasm
Magnifying Endoscopic Findings in Adenomatous and Foveolar Gastric Dysplasia

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Background and Aims: Gastric epithelial dysplasia (GED) can be morphologically categorized into adenomatous (or intestinal) and foveolar (or gastric) types. Although some studies showed the difference in the clinicopathologic features and mucin profiles between these types, there has been no report on the magnifying endoscopy (ME) in these types. Therefore, the aim of this study was to investigate the difference in the ME-NBI findings between adenomatous and foveolar GEDs.

Patients and Methods: A total of 46 patients with a final diagnosis of GED who underwent ME-NBI before endoscopic submucosal dissection were included in this study. During ME-NBI, microvascular (MV) pattern, microsurface (MS) pattern, and the presence of light blue crest (LBC) and white opaque substance (WOS) were investigated. GEDs were categorized into adenomatous, foveolar, and hybrid types. In addition, the expression of MUC2, MUC5AC, MUC 6 and CD10 were evaluated.

Results: Adenomatous type was seen in 27 GEDs (58.7%), hybrid type in 15 (32.6%) and foveolar type in 4 (8.7%). Irregular MV pattern was observed in 55.6% of adenomatous type, 73.3% of hybrid type and 75.0% of foveolar type (p=0.517). Adenomatous types showed mainly tubular (55.6%) and mixed (37.0%) MS pattern, and hybrid type showed mainly mixed (33.3%) and absent (33.3%) MS pattern; all 4 foveolar GEDs showed MS pattern (p<0.001). MUC5AC and MUC6 expression was associated with absent and papillary MS pattern, and CD10 expression was associated with round pit and/or tubular MS pattern.

Conclusions: MS pattern in ME-NBI might be helpful in predicting the morphological categorization and mucin phenotype in GEDs.

Key Words: Gastric epithelial dysplasia, Magnifying endoscopy, NBI
Oral Presentation - UGI

UGI-19

A Study of Pathologic Uniformity in Gastric GISTs
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Background: GISTs are mesenchymal tumors originate from the interstitial cells of Cajal. It is well recognized that all GISTs have some degree of malignant potential. Mitotic count is important to predict malignant potential. Accurate pathological diagnosis is mandatory for proper treatment of GISTs. In general, EUS-FNA is used for pathologic diagnosis of gastric SMT. The aim of this study is to evaluate the presence of pathologic uniformity in GIST in aspect of mitotic count.

Patients and Methods: Total twenty gastric GIST patients who performed a wedge resection were reviewed retrospectively in Hanyang University Hospital from 2006 to 2011. We used AFIP criteria for classification of gastric GISTs. To identify the pathologic uniformity of gastric GISTs, we compared GIST risk stratification between central site and peripheral site of GIST mass.

Results: The mean size of the GISTs was 3.27 ± 0.46 cm. Six lesions were located in the antrum, four in the fundus, five in the cardia, six in the body. The mean age was 53.25 ± 8.11 years; 10 patients were male and 10 were female. Among twenty cases, eighteen cases (90%) showed same risk stratification between two sites (central site vs. peripheral site). Only two cases (10%) showed a different risk between two sites. Conclusions: In case of GIST, EUS-FNA results can represent the surgical pathologic results.

Key Words: Gastric GISTs, Pathologic uniformity, EUS-FNA

UGI-20

Discrepancy between Pretreatment and Posttreatment Diagnosis of Early Gastric Cancer and Its Impact on Treatment Choice
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Background and Aims: In the era of endoscopic submucosal dissection (ESD), pretreatment diagnosis and posttreatment diagnosis are sometimes different. However, the extent of pre- and post-treatment discrepancy and its impact on patient care is not known.

Patients and Methods: A total of 2,096 patients with gastric adenoma or cancer underwent curative endoscopic resection or surgery at Samsung Medical Center in 2012. Pretreatment diagnosis groups were low-grade dysplasia (LGD) in 162, high-grade dysplasia (HGD) in 164, atypical cell in 15, conventional indication early gastric cancer (Ix-EGC) in 396, extra-conventional indication EGC (Elx-EGC) in 824, and advanced gastric cancer (AGC) in 495. The choice of initial treatment and final pathologic diagnosis in each pretreatment diagnosis group were analyzed retrospectively.

Results: 31.9% of EGC (407 of 1276) were treated by ESD alone. 6.1% of the LGD, 34.2% of the HGD, and 46.6% of the atypical group were found to be gastric cancer after ESD. 33.3% of pretreatment Ix-EGC were shifted to posttreatment Elx-EGC due to size change, submucosal invasion, lymphovascular invasion, and change of cell differentiation (53.4%, 49.6%, 19.6%, and 6.9%, respectively including duplication). 2.7% of pretreatment Elx-EGC were found to be posttreatment Ix-EGC mainly due to the size change (86.4%). In 10.4% of pretreatment Ix-EGC, surgery were initially performed. In 6.6% of pretreatment Elx-EGC, ESD were initially chosen. Of them, 92.7% were size larger than 2 cm and their additional operation rate was not significantly higher than ESD for Ix-EGC (20.9% vs 15.8%; p=0.147).

Conclusions: About one third of pretreatment Ix-EGC were changed to posttreatment Elx-EGC by pathologic examination. In selected cases with differentiated EGC larger than 2 cm without ulceration, ESD were chosen initially and had acceptable clinical outcome.

Key Words: Early gastric cancer, Pretreatment diagnosis, Endoscopic submucosal dissection
**UGI-21**

**CagA Antigen Is the Important Factor to the Level of Anti-Helicobacter pylori IgG and IgA and the Grade of Urease Test**

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**Purpose:** We sought to evaluate whether the serum antibody levels could predict the presence of gastroduodenal disease, to identify factors that correlate with antibody levels in a multivariate context, and to determine the correlation of the levels of anti-HP IgG and IgA antibody with the grade of urease test, the presence of CagA antigen, the degree of gastritis, and age.

**Methods:** A total of 1,271 subjects who underwent upper gastroduodenoscopy at Gyeongsang National University Hospital were enrolled. The subjects were stratified into 4 age groups: 0-4 years (n=145), 5-9 years (n=285), 10-15 years (n=111) and 20-29 years (n=730). The results of urease test were classified into 4 grades: Grade 0 (no color change), 1 (24-48 hr), 2 (6-24 hr) and 3 (< 6 hour). Histopathologic findings were determined by pathologist using Updated Sydney System. Anti-HP IgG and IgA titers were measured by ELISA and anti-cagA IgG and IgA antibody was evaluated by Western blot using whole cell lysate of H. pylori strain 51.

**Results:** The positivity rate of the urease test was 50.3% for 0-4 years, 51.0% for 5-9 years, 47.2% for 10-15 years, and 67.2% for 20-29 years (p<0.0001). The degrees of chronic and active gastritis, and HP infiltration increased with age groups (<0.001). The titers of anti-HP IgG were lower in 0-4 y and in 5-9 y than in 10-15 y and 20-29 y (p<0.005) and the titers of anti-HP IgA were higher in 20-29 y than other 3 age groups (p<0.005). The cagA positive rate was 24.1% in 0-4 years, 32.7% in 5-9 years, 42.3% in 10-15 years, and 52.5% in 20-29 years for IgG and 11.7% in 0-4 years, 14.4% in 5-9 years, 16.2% in 10-15 years, and 36.0% in 20-29 years for IgA. In the cases of cagA positive pattern and highest grade of urease test, the titers of IgG and IgA were higher in all age groups (p < 0.0001).

**Conclusion:** This result showed that the presence of CagA antigen is the influencing factor for high grade of urease test and high level of anti-H. pylori IgG and IgA antibodies.

**Key Words:** CagA, Helicobacter pylori, Antibody, Urease test

**UGI-22**

**Diagnostic Yields of PCR Using Tissue Sample from CLO Test Kit for the Detection of H. pylori in Peptic Ulcer Bleeding**

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**Background:** In patients with peptic ulcer bleeding (PUB), the prevalence rate of Helicobacter pylori infection may be underestimated. The causes for decreased diagnostic sensitivity of H. pylori test in PUB are still controversial. We aim to investigate the diagnostic yield of Polymerase Chain Reaction (PCR) to the detection of H. pylori in PUB.

**Method:** A consecutive series of patients who had PUB and admitted to the hospital between 2012 and 2013 were enrolled, and a total of 170 patients were analyzed. During the 2nd look endoscopy, two sets of gastric biopsy specimens were taken from the greater curvature of the mid-antrum and corpus for histology and CLO test. After interpretation of CLO test, the tissue samples from the kit were used, and dual-priming oligonucleotide-based multiplex PCR (DPO-PCR) was performed to the detection of H. pylori and antibiotic resistance. If the result was H. pylori negative, re-biopsy specimens under endoscopy was taken after 4-8 weeks of initial examination.

**Results:** In PUB, the prevalence rate of H. pylori infection was 64.1% (109/170). At initial diagnostic sensitivities of histology, CLO test, and PCR test were 65.1% (71/109), 47.7% (52/109) and 98.2% (107/109), respectively (p<0.01). The rate of clarithromycin resistance by using the 23S rRNA point mutation was 22.0% (24/109).

**Conclusion:** For diagnosis of H. pylori infection in PUB, DPO-PCR test with tissue sample from CLO test kit were the most sensitive test. Additionally, the information of clarithromycin resistance would be helpful for selection of the eradication regimens for H. pylori.

**Key Words:** Peptic ulcer bleeding, Helicobacter pylori, PCR
**UGI-23**

**Helicobacter Colonization and Its Inflammatory Responses in C57BL/6 Mice**

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**Background and Aims:** The establishment of *Helicobacter pylori* infection in laboratory mouse contributed to understanding of the pathogenesis of chronic gastritis and gastric carcinoma. The aim of this study was to evaluate colonization and inflammatory responses by *H. pylori* and *H. felis* in C57BL/6 mice stomach with different methods.

**Materials and Methods:** Total 104, 4 and 7-week-old female mice were used. Experimental mice were gavaged with *H. pylori* strain Sydney-1 (SS1) or *H. felis* and control mice were dosed with vehicle. In addition, they were divided into 4 groups based on Helicobacter infection and two kinds of diet such as a basal (0.25%) or high (7.5%) salt diet. SS1 were inoculated 3, 4 and 5 times, respectively. The infection status and inflammation were checked by culture and histopathology after 4 weeks.

**Results:** The overall infection rate was 68.3% and 5 times of inoculation increased the infection rate (88.5%) than 4 times (52.2%), however no differences were found in the degree of inflammation between 2 groups. Mean colonization were $2.8 \times 10^5$ in basal diet group and $5.1 \times 10^5$ CFU/OD/ml in high-salt diet group ($p=0.087$). Mean neutrophil infiltration in infected group was $1.6 \pm 0.6$ (1, minimal; 2, mild; 3, moderate; 4, marked). In uninfected high-salt diet group, neutrophil infiltration was higher in 4-week-old mice than that of 7-week-old ($p<0.05$). In infected group, high-salt diet did not elevate inflammatory grade. In *H. felis* group ($n = 4$), mean neutrophil infiltration was $2.0 \pm 0.4$ and one mouse showed high grade dysplasia with marked inflammation.

**Conclusions:** *H. pylori* was found to be relatively well colonized but the inflammation was not severe in spite of different trial such as high-salt diet or increasing inoculation times or 4 weeks age of mice. High grade dysplasia in *H. felis* group might be related with immunologic mechanism. To increase the gastric inflammation further trials are planned in the *H. pylori* infection mice model.

**Key Words:** *Helicobacter pylori*, *Helicobacter felis*, Inflammation

**UGI-24**

**Clinical Characteristics and Outcomes of Angiodysplasia Presented as Upper Gastrointestinal Bleeding**

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**Background and Aims:** Angiodysplasia is considered as the differential diagnosis of upper gastrointestinal bleeding (UGIB), but the clinical features and outcomes associated with UGIB from angiodysplasia have not been characterized. The aim of this study is to analyze the clinical characteristics and outcomes of angiodysplasia presented as UGIB.

**Methods:** Between January 2003 and December 2012, a consecutive series of patients who had UGIB and admitted to St. Vincent’s hospital, The Catholic University of Korea were retrospectively analyzed. A total of 35 patients with bleeding from angiodysplasia were enrolled in this study. We compared the UGIB group from angiodysplasia with asymptomatic control group (incidental findings of angiodysplasia during endoscopic examination in health screening center).

**Results:** When patients with UGIB caused by angiodysplasia were compared with asymptomatic control group, there were significant differences of age, hemoglobin level, hematocrit, blood urea nitrogen, sodium, albumin, fasting blood sugar (FBS), location (body/ fundus) and size of the lesion (>1cm) in univariate analysis. Also, the history of diabetes (FBS >126 mg/dL or HbA1c >6.5%) and medication history (anti-platelet agents, warfarin, NSAIDs, steroids) were different. In multivariate analysis, there were significant differences of the level of albumin, sodium, FBS, location and size of the lesion. The rate of clinical recurrence of UGIB from angiodysplasia was 14.2% (5/35).

**Conclusions:** When angiodysplasia was larger than 1cm or located in gastric body/ fundus, it was associated with UGIB. In patients with angiodysplasia, strict control of blood sugar and good general condition might reduce the risk of bleeding.

**Key Words:** Angiodysplasia, Gastrointestinal bleeding, Endoscopy
CRP as a Screening Marker for Rebleeding in the Patients with Acute Non-Variceal Upper Gastrointestinal Bleeding

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Background and Aims: Acute non-variceal upper GI bleeding (NUGIB) is an important clinical issue with high mortality rate. Rebleeding occurs in the 10% to 25% of acute NUGIB patients irrespective of the treatment methods. Identification of patients at high risk of rebleeding is important to decide appropriate treatment plan. C-reactive protein (CRP) has been reported as a prognostic indicator in various disorders. We were to investigate whether the initial CRP level can provide prognostic information for the risk of rebleeding in acute NUGIB patients.

Patients and Methods: Between May 2011 and August 2013, 286 patients with acute NUGIB were investigated. The initial CRP level in the whole blood was evaluated in all patients. Occurrence of rebleeding was observed in these patients after initial treatment for 30 days. The clinical characteristics, endoscopic features, and CRP levels were compared between the patients with and without rebleeding. Dichotomization of CRP level was performed with ROC curve for the rebleeding.

Results: The incidence of 30-day rebleeding was 28% (n = 80). The ROC curve area of CRP level in rebleeding was 0.649 (95% confidence interval, 0.576-0.721; p<0.001). Univariate analysis showed that old age (≥60 years), underlying comorbidities, hematochezia, shock (systolic blood pressure <100 mmHg), low hemoglobin level (<10 g/dL), high CRP level (≥0.5 mg/dL) and the presence of blood in the stomach were associated with the high risk of rebleeding. Multivariate logistic regression analysis indicated that initial CRP level of ≥0.5 mg/dL (p=0.026; OR, 2.0), initial hemoglobin level of <10 g/dL (p<0.001; odds ratio [OR], 3.4), shock (p=0.02; OR, 2.1), and the presence of blood in the stomach (p=0.001; OR, 3.1) were the independent risk factors for rebleeding.

Conclusions: CRP can be a useful screening indicator for predicting the risk of rebleeding in the patients with acute NUGIB. Further validation in prospective studies is warranted.

Key Words: C-reactive protein, Gastrointestinal hemorrhage, Risk factors

Difference of Acute Upper Gastrointestinal Bleeding between NSAID Induced Ulcer and Helicobacter Pylori Induced Ulcer

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Background and Aims: The main causes of acute upper gastrointestinal (UGI) bleeding are Helicobacter pylori (H. pylori) infection and non-steroidal anti-inflammatory drugs (NSAIDs). However, difference of two causes are not well known. Therefore, this study aimed to investigate the difference in the clinical characteristics and outcomes between NSAID-induced ulcer bleeding and H. pylori-induced ulcer bleeding.

Methods: Data obtained from 320 patients who were treated for acute UGI bleeding from June 2006 to December 2012 in our hospital were reviewed retrospectively. Among these, 200 patients were excluded by exclusion criteria. The patients were divided into two groups: NSAID-using patients negative for H. pylori (NSAIDs group) and patients positive for H. pylori and not using NSAIDs (H. pylori group). The differences between these groups in clinical characteristics, endoscopic characteristics (location, multiplicity, and size) and clinical outcomes (admission days, transfusion, rebleeding within 30 days, follow-up gastro-duodenal fibroscopy (GFS) number, and follow-up GFS treatment) were determined.

Results: There were 45 (37.5%) and 75 (62.5%) patients in the NSAID and H. pylori groups, respectively. The clinical features were not significantly different between both groups. However, the NSAIDs group had a higher incidence of multiple ulcers (1.6 ± 1.1 vs 1.2 ± 0.43, p=0.007) and larger ulcers (1.5 ± 1 vs 1.15 ± 0.6 cm p=0.039). The H. pylori group had a higher risk of rebleeding within 30 days (7 [9.3%] vs. 1 [2.2%], p=0.044).

Conclusions: NSAID-induced ulcer was greater in number and size than H. pylori-induced ulcer, whereas H. pylori-induced ulcer had a higher incidence of rebleeding. These factors should be considered before making a plan for diagnosing and treatment in UGI bleeding.

Key Words: UGI bleeding, NSAID, Helicobacter pylori , Ulcer
A Comparative Study of Transfusion Strategies for the Non-Variceal Upper Gastrointestinal Bleeding

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Background/Aims: Hb threshold is controversial in patients with acute GI bleeding. Several studies suggested that restrictive transfusion strategy (Hb threshold of 7 g/dL) showed acceptable outcomes in patients with acute upper GI bleeding, in which included variceal bleeding. We compared the two different transfusion strategies in the patients with non-variceal upper GI bleeding.

Methods: Retrospective analysis was carried out in the patients with non-variceal upper GI bleeding. We analyzed the re-bleeding, Hb level, total consumption of packed RBC, and clinical symptoms during follow up. We also proceed with the prospective randomized study of transfusion strategy in upper GI bleeding. They were randomly assigned to two groups; Restrictive transfusion group (Target Hb of 8 g/dL) or control group (Target Hb of 10 g/dL). Clinical data such as re-bleeding rate, Hb level change, and symptoms were analyzed at 7 days and 45 days after discharge.

Results: During 12 months, 112 patients satisfied the criteria in the retrospective study. Whereas, Hb levels at 7 days after discharge showed difference (9.9 g/dL vs. 10.6 g/dL; \( p=0.002 \)), there was no significant difference of clinical outcome at 45 days after discharge. Increase of Hb level was more dominant in restrictive transfusion group than control group (after 7 days, 1.4 g/dL vs. 0.6 g/dL; \( p=0.001 \), after 45 days; 4.0 g/dL vs. 2.1 g/dL, \( p=0.007 \)). In prospective study, we enrolled 50 patients with non-variceal upper GI bleeding. Similar result was presented in prospective study. Although Hb level at 7 days after discharge shows higher level in control group, restrictive transfusion group come close to control group after 45 days. Clinical symptoms such as general weakness, dizziness were showed no difference between two groups.

Conclusion: In this study, patients in restrictive group were showed tolerable outcomes. Hb level of 8 g/dL may be considered an acceptable target in patients with non-variceal upper GI bleeding.

Key Words: Gastrointestinal Bleeding, Transfusion, Hemoglobin

Usefullness of Covered Self-Expandable Metal Stent for the Treatment of Anastomotic Leaks after Upper GI Surgery

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Background/Aims: Anastomotic leaks and tracheoesophageal fistulas (TEFs) are severe complications of upper gastrointestinal surgery with serious morbidity and mortality. Endoscopic placement of cSEMS is emerging as a less-invasive alternative to surgery for the treatment of leaks and TEFs. The aim of this study was to investigate treatment success rate of cSEMS, removal rate of successful cSEMS, and complications of procedure.

Methods: Patients with postsurgical gastrointestinal leaks and TEFs treated with fully cSEMS between September 2009 and September 2012 were retrospectively reviewed. Treatment success was defined as complete and persistent closure of leaks or TEFs after cSEMS removal (primary closure) or after complementary endoscopic treatment (reposition or re-insertion).

Results: 19 patients were treated with covered self-expandable metal stent (cSEMS). Included patients had anastomotic leaks or TEFs after total gastrectomy (9), esophagectomy (6) and etc (4, esophageal diverticulectomy, submucosal tumor enucleation, transcervical mediastinal drainage, primary esophageal closure). Overall treatment success rate of the leaks or TEFs occurred in 89% (17 of 19, including multiple procedures). Repositioning was done in 26% (5 of 19, d/t migration) and successful repositioning was done in 4 of 5. (additional re-insertion was needed in 1 case and was successful) Re-insertion was done in 16% (3 of 19, d/t migration) and 2 of 3 were successful. (1 case was failed due to stent site erosion) Stent removal after successful treatment was done in 94% (16 of 17, average 30.6 days, range 11-43 days, 1 was lost to follow-up) There was no procedure-related complication including perforation or death.

Conclusion: cSEMSs are a minimally invasive, safe and useful alternative for treating postsurgical leaks in the upper gastrointestinal tract and can be easily removed after cSEMS insertion. Migration is a major problem, but most can be cured by complementary endoscopic procedure.

Key Words: Covered self-expandable metal stent, Anastomotic leak, Upper gastrointestinal surgery
UGI-29
Clinical Usefulness of Self-Expandable Esophageal Metal Stents for Malignant Extrinsic Compression
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Background/Aims: Self-expandable metal stents (SEMSs) are effective palliation for malignant esophageal obstruction. Malignant esophageal obstruction can occur from intrinsic or other extrinsic malignant lesions, but the clinical usefulness for SEMSs in extrinsic lesions are yet to be elucidated. The aims of study were to evaluate clinical usefulness of SEMSs for the palliation of dysphagia due to extrinsic esophageal compression compared with intrinsic obstruction.

Method: A retrospective review was conducted for 105 patients (intrinsic, 85; extrinsic 20) with malignant esophageal obstruction who underwent endoscopic SEMSs placement from July 2006 to May 2013. Technical and clinical success rates were evaluated and clinical outcomes were compared between extrinsic and intrinsic group. Stent ingrowth, overgrowth, migration, and patency were evaluated.

Results: Most of extrinsic group were pulmonary origin. Technical and clinical success was achieved in 100% and 90% without immediate complications. Clinical success rate was not significantly different between extrinsic and intrinsic group. The median stent patency time was 131.3±85.8 days in intrinsic group while 54.6±45.1 days in extrinsic group due to shorter survival after stent insertion (131.3±85.8 vs 49.9±43.7 days, p<0.001). The 4-, 8-, and 12-week patency rates were 90.5%, 78.8%, and 64.9% respectively, while stents of extrinsic group remained patent until death. Uncovered, fully covered, or double-layered stent were used evenly in both groups and the stent types did not influence the patency in both groups.

Conclusion: Esophageal SEMSs can be safely and effectively used for the palliation in malignant extrinsic compression as well as intrinsic obstruction. The factor related to stent patency was only survival in malignant extrinsic compression.

Key Words: Esophagus, SEMS, Palliation, Malignant obstruction

UGI-30
Follow-Up Results of Expandable Metal Stents for Malignant Esophageal Obstruction and Fistula in 210 Cases
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Background: Expandable metal stents palliate malignant esophageal obstruction and fistulae in most cases, but complications and failures have not been well described in cardiac cancer with esophageal invasion as well as esophageal and lung cancer.

Methods: Over a 12-year period, 210 stents were placed in 183 patients with malignant esophageal obstruction and fistulae from esophageal cancer, lung cancer or Cardiac cancer with esophageal invasion. Dysphagia score, early and late complications, duration of palliation, and reintervention were evaluated.

Results: Esophageal cancer group was 109 of 210 cases (51.9%), lung cancer group was 31 to 210 cases (14.8%), and cardiac cancer with esophageal invasion group was 70 to 210 cases (33.3%). In most patients need a admission (198 to 210, 94.3%), and average length of admission was 21.7 days. Median dysphagia score improved form 3.8 to 1.7. In 53 patients (25.2%) required rein tervention. Complication occurred in 23 (11%) patients. Procedure-relagted mortality was 2.4% (5/210). Comparison of clinical outcome of patients between esophageal, lung, and cardiac cancer, migration was a significant difference in the cardiac cancer group but there was no significant difference in complication.

Conclusions: Expandable metal stents offer excellent palliation of malignant obstruction, several factors should be considered before applying palliative therapy for malignant esophageal obstruction. But major complications were also noted, so factors such as medical comorbidity and overall expected duration of survival are important.

Key Words: Esophagus, Stenosis or obstruction, Fistula, Esophagorespiratory, Stents and prostheses
Self-Expandable Metallic Stent for Postoperative Strictures of Laparoscopy-Assisted Gastrectomy: Outcomes for 9 Cases

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Background: The partially covered self-expandable metallic stent (PCSEMS) is of proven benefit in patients with unresectable or inoperable malignant gastric outlet obstruction. However, its use in patients with benign stricture of anastomosis after laparoscopy-assisted gastrectomy (LAG) is not well established.

Methods: Between April 2007 and May 2012, nine patients who had a PCSEMS placed for benign anastomotic stricture after LAG were included in this retrospective analysis. The efficacy, feasibility and safety of PCSEMS in benign anastomotic strictures after LAG were assessed.

Results: Nine patients (6 women, 3 men, mean age 55 years, range, 15-76 years) had PCSEMS placed successfully for benign anastomotic strictures after LAG and were followed for a mean of 1.7 years (8 months to 4.6 years). Immediate symptomatic improvement occurred in 7 patients. After 1 week, all of the patients were able to tolerate solid diet. Spontaneous distal migration of stent was occurred in 2 patients (22.2%) without recurrence of symptoms. There was no serous procedure related complication or mortality. Stent removal was successful in remaining 7 patients after 1.1 to 3.0 months (mean 2.0 months). Recurrence of obstructive symptom was occurred in one patient after the removal of PCSEMS but resolved after the PCSEMS.

Conclusions: PCSEMS placement in benign anastomotic strictures after LAG is a feasible and effective option which may avoid secondary surgery. PCSEMS is relatively safe and can be easily removed on 1 to 3 months after insertion without major complications.

Key Words: Partially covered self-expandable metallic stent, Laparoscopy-assisted gastrectomy, Anastomotic stricture, Stomach neoplasms

The Clinical Characteristics of Local Recurrence after Argon Plasma Coagulation for Gastric Adenoma

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Background and Aims: Treatment options for gastric adenomas are not established yet. The argon plasma coagulation (APC), a method of contact-free electrocoagulation, is one of options to treat gastric adenoma. This study aims to investigate the clinical characteristics of local recurrence after APC for gastric adenoma.

Patients and Methods: A total of 121 patients with 175 lesions of gastric adenoma were treated by APC from Samsung Medical Center between January 2005 and December 2011. We analyzed the rate, and the clinical characteristics of local recurrence, retrospectively.

Results: The median follow-up period was 15.8 months (interquartile range (IQR) 7.0-34.8 months). The rate of local recurrence was 25.2% (44/175). Among the 44 recurred lesions, 29 lesions were low-grade dysplasia, 12 lesions were high-grade dysplasia, and 3 lesions were proven to be adenocarcinoma. The median interval between APC procedure and local recurrence was 7.5 months (IQR 6.0-18.8 months). The age (p-value 0.041), presence of high-grade dysplasia (p-value 0.002), previous history of endoscopic mucosal resection or ablation treatment (p-value 0.01), metaplastic background gastric mucosa (p-value 0.035) were higher, and median size (p-value 0.006) of the lesion was larger in recurrence group than non-recurrence group. Multivariate analysis showed that high-grade dysplasia (odds ratio (OR) 3.087, 95% confidence interval (CI) 1.068-8.922) and metaplastic background gastric mucosa (OR 4.146, 95% CI 1.424-12.066) significantly associated with local recurrence. There were 6 cases (3.4%) of complication. All complications were delayed bleeding, and the median interval between APC procedure and bleeding event was 6 days (IQR 3.0-12.0).

Conclusion: The gastric adenoma with high-grade dysplasia, or metaplastic background gastric mucosa were risk factors for local recurrence after APC treatment.

Key Words: Stomach, Adenoma, Argon Plasma Coagulation
Comparison of Continuous Infusion and Bolus Injection of Proton Pump Inhibitor for the Prevention of Bleeding after ESD

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**Background and Aims:** To prevent bleeding and healing the artificial ulcer after endoscopic submucosal dissection (ESD), elevated intra-gastric pH is important. Intravenous bolus loading followed by continuous infusion of proton pump inhibitor is the standard treatment of choice for the prevention of gastric ulcer bleeding. The optimal dose of PPI for the prevention of bleeding after ESD is unclear. Our aim is to compare the effects of continuous infusion and bolus injection of PPI for the prevention of delayed bleeding after gastric ESD.

**Study design:** Prospective randomized controlled study

**Methods:** From March 2012 to Feb 2013, 273 patients with gastric superficial epithelial neoplasm were enrolled. All patients who undergo ESD are randomly assigned to either the continuous-infusion or bolus group. After initial pantoprazole 80mg bolus loading for 30 min before ESD, 8mg/hr continuous infusion for 72 hours is done after initial 80mg bolus loading for continuous infusion group. For bolus group (n=136), pantoprazole 40mg bolus is injected q 12 hours for 72 hours. After 72 hours, Oral pantoprazole 40 mg daily for 4 to 8 week. Follow-up endoscopy is performed the 2 days after ESD and 4 weeks after ESD. (In case of incomplete ulcer healing, 8 week endoscopy and pantoprazole 8 wk medication was done.)

**Results:** Clinical characteristics were not different between treatment groups. Bleeding events were occurred 8.1% (22/273) of patients. High risk of stigma during second-look endoscopy was found 15.8% (43/2730) of patients. Pantoprazole treatment groups were not significant different for clinical outcomes. On multivariate analysis, submucosal invasion and hypertension were significant risk factors for rebleeding events.

**Conclusion:** A continuous infusion of high-dose pantoprazole does not show the superiority compared to pantoprazole 40mg bolus injection in the prevention of bleeding after ESD. Submucosal invasion and hypertension were significant risk factors for rebleeding.

**Key Words:** ESD, Endoscopy, Proton pump inhibitor

Quality of Life and Fear of Cancer Recurrence after Endoscopic and Surgical Treatment for Early Gastric Cancer

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**Background/Aims:** As early detection and improved treatment have led to higher survival rates and an increasing number of long-term survivors, the importance of quality of life (QOL) and fear of cancer recurrence have increased. However, the influence of endoscopic therapy on QOL and fear of cancer recurrence is unknown. We explored QOL and fear of cancer recurrence after endoscopic submucosal dissection (ESD) and surgical treatment for early gastric cancer (EGC), using a cross-sectional design.

**Methods:** Overall, 566 with EGC were enrolled in this cross-sectional study (ESD 263, surgery 303). QOL was measured using the SF-36v2, EORTC- QLQ-C30, and the EORTC-QLQ-STO22 questionnaires. Fear of recurrence and anxiety were measured using the Worry of Cancer Scale (WOCS) and the Hospital Anxiety and Depression Scale (HADS).

**Results:** Questionnaires were completed by 154/263 (59 %) patients with ESD and 182/303 (60 %) patients with surgery. Surgery group had more functional and symptomatic problems related to QOL than ESD, such as nausea, vomiting ($p=0.017$), diarrhea ($p<0.001$), pain ($p<0.001$), reflux symptoms ($p<0.001$), eating restrictions ($p<0.001$), anxiety ($p<0.001$), and lower body image ($p<0.001$). ESD group reported significantly more fear of cancer recurrence at the time of visiting the physicians on the WOCS questionnaire. However, no significant differences were found between the two groups on the overall WOCS and HADS.

**Conclusions:** Preservation of the stomach after endoscopy treatment, which is preferred from a clinical perspective, improves QOL, whereas it may induce fear of cancer recurrence. In addition, it would be necessary to inform patients about possible QOL and fear of cancer recurrence outcomes while they are receiving information about endoscopic and surgical treatment. (WHO ICTRP KCT0000791)

**Key Words:** ESD, EGC, QOL, Fear of cancer recurrence
UGI-35

Long Term Outcome of Endoscopic Submucosal Dissection versus Gastrectomy for Early Gastric Cancer

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Background/Aims: Endoscopic submucosal dissection (ESD) for early gastric cancer (EGC) is considered as standard therapy in Korea. However, the long term outcome compared to gastrectomy remains unknown. We investigated the 5 year overall survival and disease free survival of ESD versus gastrectomy for EGC.

Methods: We reviewed medical records of 666 patients who underwent ESD or gastrectomy for EGC from May, 2003 to December, 2007.

Results: 276 and 390 patients underwent gastrectomy and ESD, respectively. The 5 year overall survival rates of ESD and gastrectomy were 92.6% (361/390) and 90.2% (249/276). The 5 year disease free survival of the patients who were followed up for over 5 years was 100% and 95.3% for the ESD group and gastrectomy group respectively. A total of patients 34 expired (4 gastric cancer related, 6 other cancers, 21 other causes, 3 post operative complications). 19 patients underwent additional surgery for incomplete resection following ESD.

Conclusions: The 5 year overall survival and 5 year disease free survival of ESD and gastrectomy for EGC are comparable. Expanded indications for ESD can be applied safely to EGC.

Key Words: EGC, ESD, Gastrectomy, Long-term outcome

UGI-36

Is Endoscopic Submucosal Dissection Safe for Papillary Adenocarcinoma of Stomach?

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Background: Papillary adenocarcinoma, despite poorer outcome than tubular adenocarcinoma, is treated similarly to tubular adenocarcinoma on indications of endoscopic submucosal dissection (ESD). This study was aimed to evaluate the LN metastasis and outcomes of ESD in early gastric cancers(EGCs) with papillary carcinoma.

Methods: Total 64 patients diagnosed as EGCs with papillary adenocarcinoma were enrolled from January 2005 to May 2013 in our hospital. Papillary adenocarcinomas were divided into pure type, and mixed type with differentiated and undifferentiated-components.

Results: Overall prevalence of LN metastasis was 14.0% (9/64). Univariate analysis demonstrated large tumor size (>2 cm), submucosal invasion, and presence of LVI were associated for LN metastasis (p=0.042, p=0.043, p=0.004). On multivariate analyses, only LVI was an independent risk factor of LN metastasis (p=0.005). In addition, submucosal invasion was an independent risk factor of LVI in univariate (p=0.002) and multivariate analysis(p=0.005). Among 16 patients belonged to the extended criteria of ESD, 4 patients (25%) had LN metastasis or LVI.

Conclusions: The indication of ESD in papillary adenocarcinoma should be reduced due to high risk of LN metastasis, compared to other differentiated-type.

Key Words: ESD, Papillary adenocarcinoma
Oral Presentation - UGI

UGI-37

Is New Criteria for Mixed Histology Necessary for Endoscopic Resection in Early Gastric Cancer?

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Background/Aims: Mixed histology has been reported to show more aggressive behavior than other histologies in early gastric cancer (EGC). We also reported that signet ring cell (SRC) mixed histology showed more submucosal invasion and higher lymph node metastasis (LNM) than others. However, there are no individual criteria for endoscopic resection (ER) in mixed histology. The aim of study was to investigate whether new criteria for mixed histology is necessary for ER in EGC.

Methods: From January 2005 to December 2012, 3,419 patients with EGC underwent surgery. Lesions were classified into three histological classifications: Japanese classification, WHO classification including SRC mixed histology, and Lauren classification. Mixed type in Lauren classification was reclassified into four types according to the proportion of differentiated and undifferentiated components. Clinicopathologic characteristics were compared according to histological classifications, special reference to ER criteria.

Results: 179 (5.2%) lesions were classified as mixed type in Lauren classification. Among them, 54 (30.2%) lesions were differentiated-predominant mixed type. 361 (10.6%) lesions were classified as SRC mixed histology. Mixed type lesions in Lauren classification and SRC mixed lesions were significantly associated with larger size and higher LNM than others. Among the lesions meeting ER criteria, 20 and 55 lesions were categorized into mixed type in Lauren classification and SRC mixed histology, respectively. However, there was no LNM among the lesions recategorized into mixed histology.

Conclusions: Mixed histology in EGC showed higher LNM than other histologies. However, there was no LNM among the lesions meeting the present ER criteria.

Key Words: EGC, ESD, Mixed histology

UGI-38

Retrograde Endoscopic Submucosal Dissection of Gastric Neoplasm Involving the Pyloric Channel

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Background/Aims: Recently, successful resection of the pyloric tumors by ESD using retroflexion in the duodenum has been reported. However, the detailed dissection method of the procedure was not well defined yet. We also had done the retroflexion ESD of dissecting retrogradely from the duodenum to the pyloric channel of duodenal part, after then antegradely from the antrum to the pyloric channel. Since February 2012, we introduced a new retroflexion method of retrogradely dissecting mucosa from duodenum to trans-pyloric antrum as extensively as possible. We studied the feasibility and effectiveness of the new retrograde prepyloric antral dissection using retroflexion ESD.

Methods: 61 patients with gastric neoplasm involving the pyloric channel underwent ESD from January 2007 to March 2013. In 27 patients, the conventional anterograde ESD were performed without using the endoscope retroflexed in the duodenum. The other 34 patients were procedured by the retroflexion method. Among that 34, the latest 16 patients underwent the new retrograde prepyloric antral dissection method. We retrospectively analyzed the procedure times, en bloc rates, complete resection rates and complications associated with each different techniques.

Results: In newly attempted retrograde prepyloric antral dissection method group, en bloc resection and complete resection rate were 100% and 94%. The average time of procedure was 42min. Compared with the previously procedured retroflexion ESD, the new technique had an advantages of saving procedure time (42min vs 48min, p=0.035). But there were no statically significant differences at en-block resection and complete resection (100% vs 94%, p=0.054/ 94% vs 83%, p=0.059.

Conclusions: This new retrograde prepyloric antral dissection method for resecting tumors involving the pyloric channel tumor is feasible and effective therapeutic ESD method. So it should become the standard treatment in such cases, based on the favorable outcomes.

Key Words: Pyloric channel, Endoscopic submucosal dissection, Retroflexion, Retrograde
Multiplicity at the Initial Endoscopic Resection as a Prognostic Factor for Recurrence

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**Background and Aims:** Multiple gastric cancers can be found in up to 14% after endoscopic resection. It is not known if the gastric remnant after the initial endoscopic resection for multiple gastric neoplasia has a greater risk for metachronous neoplasia. The purpose of this study was to determine the incidence of metachronous neoplasia in this patient subset compared with that after solitary cancer in the initial gastric neoplasia.

**Patients and Methods:** Data on a consecutive series of 1,281 patients who underwent endoscopic resection for early gastric cancer or dysplasia from 2004 to 2012 were analyzed retrospectively. Multiplicity was defined as more than two apart lesions at initial endoscopic resection. Clinicopathologic characteristics were compared between the patients with single and multiple neoplasia. Recurrence was evaluated with the follow-up endoscopic examination for 5 years after the initial treatment.

**Results:** Among 1,218 patients, 439 (%) had cancer and 130 (10.7%) had multiple lesions at the initial endoscopic resection. Recurrence with adenoma or cancer was observed in 113 patients (%) and the risk of this recurrence was higher in the patients with multiple lesions than single lesion at the initial treatment \(p<0.01\). Patients with single cancer lesion had a significantly lower recurrence rate than those with cancer and the other cancer/dysplasia at the resection \(p<0.01\). Recurrence risk was not significantly different between the patients with multiple and single adenoma \(p=0.06\). Univariate analysis showed that age, cancer pathology, and lesion multiplicity were significantly associated with recurrence. Multivariate analysis showed that age \(p=0.03\); odds ratio, 1.02) and multiplicity \(p<0.01\); odds ratio, 2.10) were independent risk factors for recurrence.

**Conclusions:** Multiplicity can be a prognostic factor after endoscopic resection of gastric neoplasia, especially initial cancer.

**Key Words:** Stomach neoplasms, Recurrence, Endoscopic resection

Clinical Outcomes of Endoscopic Submucosal Dissection for Early Gastric Cancers in Elderly People

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**Background and Aims:** Endoscopic submucosal dissection (ESD) has been widely accepted for treatment of early gastric cancer (EGC) in Korea. Elderly patients often have surgical operative risks due to disease, and the feasibility of this treatment for such patients will improve the quality of life. Our study investigated whether ESD was suitable of elderly people with early gastric cancers.

**Patients and Methods:** We studied 845 early gastric cancers that were treated with ESD at Kyungpook National University of Medicine between 2005 and 2013. The patients were classified into an elderly group (age ≥ 75 years) and a nonelderly group (age < 75 years). We compared the characteristics of patients and lesions, curative resection rate and the complications between the two groups. Also we analyzed long term outcomes among elderly group.

**Results:** The elderly group included 108 patients, and the nonelderly group included 737 patients. The average age of the elderly group of patients was 78.2. The incidence of comorbid disease were significantly higher in the elderly group. The curative resection rate in the elderly group was 81.5%. Bleeding and perforation rates were 4.6% and 0%, respectively. The curative resection and the complication rate for the elderly patients were not significantly different from those of nonelderly patients. Among elderly group, 88 patients had a curative resection patients, 14 patients had non-curate resection without surgery and 6 patients had non-curate resection with surgery. During follow-up period, recurrence rate was 7.9%, 14.3%, 0%, respectively and mortality rate was 14.8%, 14.3%, 0% respectively.

**Conclusions:** This study demonstrates the efficacy of ESD in both elderly and nonelderly patients. ESD is a safe and minimally invasive treatment for elderly patients with early gastric cancers.

**Key Words:** Early gastric cancer, Endoscopic submucosal dissection
Therapeutic Effect of Endoscopic Enucleation for Gastric Subepithelial Tumors Originated from Muscularis Propria
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Background and Aim: Most of small gastric subepithelial tumors (SETs) originated from muscularis propria have clinical importance because they have higher malignant potential, especially gastointestinatal stromal tumors (GISTs). Endoscopic enucleation for the resection of SETs may be considered useful treatment option to replace conventional surgery or other treatment modality. The purpose of the present study is to demonstrate the feasibility of endoscopic enucleation for gastric SETs and to evaluate its efficacy and safety.

Patients and Methods: From January 2010 to June 2013, a total thirty eight patients with gastric SETs underwent the endoscopic enucleation for the gastric SETs. Endoscopic enucleation was attempted by using insulted-tip knife or air-driven band ligator. All patients performed endoscopic ultrasound (EUS) to determine the layer of origin and the accurate size of the SETs. The EUS finding, procedure technique and histologic findings were analyzed in this retrospective study.

Results: A total 38 patients (15 men, 23 women; mean age 50.34 years) were eligible for inclusion in the study. All SETs were originated from the muscularis propria layer, detected by preperformed EUS. The mean procedure time was 38.8 minutes (range 3.0- 260) and mean size of the tumors was 15.6mm (range 6-50). The histologic diagnosis was leiomyoma for 24 lesions and gastrointestinal stromal tumor for 14 lesions, which showed ten very low risk, two low risk, one high risk and one intermediate risk. The complete resection rate of leiomyoma was 70.8% (17/24) and complete resection rate of GIST was 42.8% (6/14). Three small perforations occurred but was managed successfully by endoscopic clip application.

Conclusion: The endoscopic enucleation is an safe and effective treatment method for gastric SETs originating in muscularis propria layer.

Key Words: Gastric subepithelial tumor, Enucleation, Muscularis propria tumor, Endoscopic resection, Endoscopic ligation

Clinical Factors That Should Be Considered in Patients with Gastric Hyperplastic Polyps When Treated by Polypectomy
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Background/Aims: Hyperplastic polyps are the most common variety of gastric polyps that constitute 30-93% of all benign epithelial gastric polyps. The overall prevalence of dysplasia in hyperplastic polyps is believed to be <2%, and more frequent in large polyps (>2cm). We aimed to identify the clinical features of hyperplastic polyps that undergoing neoplastic transformation.

Methods: Between June 2011 and June 2013, a total of 298 hyperplastic polyps, which had been removed by endoscopic polypectomy in 207 patients, were analyzed retrospectively.

Results: Neoplastic transformations were found in 12 cases (3.9%) including 7 cases of adenoma (2.3%), 4 cases of adenocarcinoma (1.3%) and 1 case of neuroendocrine tumor (0.3%). Neoplastic transformation was significantly associated with age (hyperplastic polyp group 60.1±11.8 vs. neoplastic transformation group 68.8±10.3, p=0.032) and with sessile shape (n=10 [83.3%] vs. n=148 [51.7%), p=0.038). However, no significant difference was found between these groups in terms of sex, presence of Helicobacter pylori, size, location, number of polyps detected per patient, and endoscopic appearance such as presence of hyperemia, nodular changes and erosions.

Conclusion: Hyperplastic polyps with or without neoplastic transformations were virtually impossible to distinguish by endoscopic findings. However, compared to hyperplastic polyps without neoplastic transformation, those with neoplastic transformation were to be more sessile and the ages of the group were older. Therefore, in case of endoscopic polypectomy in elderly patients with hyperplastic polyps which being sessile form, it is necessary to pay detailed attentions to the possibility of a neoplastic transformation.

Key Words: Stomach, Hyperplastic, Polyps, Neoplastic, Transformation
**UGI-43**

Intermediate Follow Up Results of Endoscopic Resection for Gastric GIST

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**Backgrounds & Aim:** The diagnosis of Gastrointestinal stromal tumor (GIST) must always be investigated since every GIST is potentially malignant. Curative treatment requires a complete gross resection of the tumor. Both open and minimally invasive operations have been shown to reduce recurrence rates and improve long-term survival. Advances in endoscopic technology have allowed some to perform attempted excision of these lesions endoscopically. The oncologic implications of such an approach remain unclear. The aim of our study is to investigate the clinical outcomes of endoscopic resection of GIST in the upper GI tract and evaluate the safety and feasibility.

**Methods:** To assess whether endoscopic resection is feasible approach to cure GIST, the authors performed a retrospective cohort study in single endoscopic center. A total 19 patients with gastric GIST identified by endoscopic ultrasonography were collected from November 2008 to June 2013.

**Results:** Of the 19 GISTS, 4 were located at the cardia, 9 at the fundus, 5 at the body, 1 at the antrum. Endoscopic resection was performed by hybrid natural orifice translumenal endoscopic surgery (NOTES) (n=15), submucosal tunneling endoscopic resection (n=4). Mean tumor size was 23.7 mm (12-42 mm). The 13 cases had low-risk mitosis, 2 cases had intermediate-risk mitosis, and 4 cases had high-risk mitosis. The average of total hospital stay was 9.1 days. The average hospital stay after the procedure was 5.8 days. There were no complications including severe bleeding during the procedure. Complete resection was obtained in 15 cases. All patients were followed up for 27 months (range, 3-54 months). There was no recurrence of tumor.

**Conclusion:** Endoscopic resection of GIST shows promise as a safe and feasible technique. Clinical studies with more subjects and longer follow up are needed.

**Key Words:** GIST, Endoscopic resection, NOTES

**UGI-44**

Pneumonia after Endoscopic Resection for Gastric Neoplasm

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**Background:** Pneumonia following endoscopic procedures may affect the clinical course of the treatment and prolong hospital stay. We therefore investigated the incidence and risk factors for pneumonia after endoscopic resection (ER) for gastric neoplasm.

**Methods:** Subjects who underwent ER for gastric neoplasm at the Asan Medical Center from January 1997 to March 2013 were included. To investigate risk factors, the control group was randomly selected from these subjects.

**Results:** Of the 7,149 subjects who underwent ER for gastric neoplasm, 44 (0.62%) developed pneumonia. The median age was 68 years (range: 31-82), and the male to female ratio was 3:1. Twenty-five patients (56.8%) were smokers and 8 (18.2%) had underlying pulmonary diseases. The median procedure time was 23 minutes (range: 2-126). Compared with the control group, smoking status (current smoker vs. never smoker, Odds ratio [OR] 2.031, \( p = 0.046 \)), total procedure time (OR 1.011, \( p = 0.048 \)), and hemostasis time (OR 1.026, \( p = 0.028 \)) were risk factors for the development of pneumonia. In multivariate analysis, age >65 years (OR 2.073, \( p = 0.031 \)), smoking (OR 2.324, \( p = 0.023 \)), and hemostasis time (OR 1.025, \( p = 0.038 \)) were independent risk factors. All patients recovered from pneumonia, and the duration of hospital stay did not differ between patients with pneumonia and the control group (\( p = 0.077 \)).

**Conclusions:** While old age, smoking, and hemostasis time were risk factors for pneumonia, its incidence after ER was not associated with clinically significant adverse outcomes.

**Key Words:** Pneumonia, Endoscopic resection, Gastric Neoplasm
UGI-45

What Is Tailored Minimally Invasive Treatment of Early Gastric Cancer beyond Endoscopic Submucosal Dissection?

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Background/Aims: The aim of this study was to evaluate the outcomes of combined endoscopic submucosal dissection (ESD) with sentinel node navigation surgery (ESN) or laparoscopic lymph node dissection (LLND) and endoscopic full-thickness resection (EFTGR) with laparoscopic regional lymph node dissection (hybrid natural orifice transluminal endoscopic surgery, hybrid NOTES) for early gastric cancer (EGC).

Methods: This is a retrospective analysis using prospectively collected data at a single tertiary referral center. A total of 80 patients with EGC underwent combined ESD with ESN or LLND and hybrid NOTES between February 2007 and January 2013.

Results: The curative resection rate of all cases was 86.3% (ESN 73.9% vs. ESD with LLND 100% vs. hybrid NOTES 79.2%, respectively). Histologically, 33 cases were mucosal cancers, and 45 were submucosal cancers. There were 50 undifferentiated cancers. The median tumor size was 2.3 cm (range, 0.6-7 cm) in long diameter. Lymphovascular invasion was found in 27 cases with 3 lymph node metastasis. Incomplete resection was found in 11 (8 tumor-positive lateral margins and 3 tumor-positive vertical margins). Eight patients underwent additional gastrectomy because of tumor-positive vertical margins or treatment-related complications. During the median follow-up of 23 months (range, 3-73 months), none showed local recurrence or lymph node metastasis.

Conclusion: ESN, combined ESD with LLND and hybrid NOTES showed favorable pathologic and clinical outcomes. They could be utilized as a bridge between ESD and gastrectomy in selected patients with a risk of lymph node metastasis.

Key Words: Sentinel node navigation surgery, ESD, Hybrid NOTES, Laparoscopic lymph node dissection

UGI-46

Clinical Attention Points Drawn by the Cases with Non-Neoplastic Pathologic Results after ESD for GEDs or EGCs

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Background: Endoscopic submucosal dissection (ESD) has been developed as a standard treatment modality for selected cases of gastric epithelial dysplasias (GEDs) or early gastric cancers (EGCs). However, many endoscopists have faced paradoxical circumstances that ESD specimens revealed non-neoplastic results, with reported rates ranging 3.2-7%. The aims of this study were to find out additional evidences of complete forceps biopsy removal of neoplastic foci, and draw clinical points about performing endoscopic forcep biopsy (EFB) before ESD, and establishing surveillance strategy for the negative pathology group.

Methods: Between February 2005 and December 2011, we retrospectively reviewed the prospectively collected ESD results from the endoscopic database system, and found 46 cases (3.7% of total ESD cases) who were confirmed to have non-neoplastic results on the final specimens.

Results: Mean tumor sizes and sampling ratios were 9.3±2.5 mm (4-16 mm) and 2.98±1.56 mm/fragment, respectively. 4 cases (8.4%) showed notable morphologic changes before and after EFB, and required reclassifications of the initial morphologic diagnosis (2: IIa->IIb, 1: IIa->IIa+IIc, 1: IIa+IIc->IIa+III). 8 cases (16.8%) showed partial non-lifting signs suggestive of severe submucosal fibrosis. We have ever experienced 1 case of wrong localization of ESD site at 3 month after ESD, and 2 metachronous cancerous recurrences at 12, 27 month over the surveillance period (mean 23.8±18.9 months, range 6-75).

Conclusion: Small tumor size, low sampling ratio, and change of morphologic type before and after EFB may be endoscopic evidences of complete biopsy removal of neoplastic foci. The number of biopsy fragment for suspicious dysplastic lesion could be determined in considering reasonable sampling ratio to prevent the adverse submucosal fibrosis. Cautious surveillance for wrong localization of ESD site or metachronous recurrence is needed in the non-neoplastic group.

Key Words: ESD, Non-neoplastic pathology, Biopsy removal, Sampling ratio
Long-Term Clinical Outcomes of Endoscopic Submucosal Dissection for Early Gastric Cancer

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**Background and Aims:** We aimed to evaluate the long-term clinical outcomes for endoscopic submucosal dissection (ESD) for early gastric cancer (EGC).

**Methods:** From 2005 through 2011, 961 EGC patients were treated with ESD. Patients were grouped as standard and expanded indications based on Japanese ESD guideline, while those who did not meet expanded indication were regarded as beyond expanded group. Curative resection rate was compared. Patients who underwent additional surgery due to non-curable resection (n=78) or follow-up loss (n=10) were excluded. Thereafter, 873 patients were enrolled for long-term analysis of local tumor recurrence, development of metachronous cancers, overall and disease-free survival rates.

**Results:** Curative resection rate was significantly higher in the standard group than in expanded and beyond expanded group; 94.9% for standard, 87.1% for expanded, 29.1% for beyond expanded groups. During a median follow-up of 45 months, local tumor recurrence rate was significantly higher in the beyond expanded group than in the standard and expanded group (1.9%, 1.8%, 7.8%, respectively). Metachronous cancer incidence did not differ significantly between the 3 groups (6.5%). Two thirds of recurred or metachronous tumors were treated with ESD. Lymph node metastasis developed in 0.6%. The 5-year overall survival rate was 94.8% (96.6%, 94.2%, 84.4%, p=0.001) and disease-free survival rate was 99.1% (100%, 99.3%, 92.8%, p=0.001).

**Conclusions:** ESD was effective with favorable long-term clinical outcomes for EGC only in patients who met the standard and expanded indications. Conversely, beyond expanded group gave less favorable clinical outcomes. Careful surveillance after ESD should be taken for all patients.

**Key Words:** Gastroscopic surgery, Stomach neoplasm, Therapy, Treatment outcome, Survival

Long-Term Outcomes of Noncurative Resection after Endoscopic Submucosal Dissection for Early Gastric Cancer

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**Aims:** Noncurative resection after endoscopic submucosal dissection (ESD) for early gastric cancer (EGC) can attribute to local recurrence or lymphatic and distant metastasis of tumor. This study aimed to evaluate the long-term outcomes of noncurative resection after ESD for EGC and determine the treatment according to histological result from ESD.

**Methods:** Of 892 EGCs treated with ESD between 2001 and 2012, 152 (17.0%) were determined by histology to show noncurative resection after ESD. Factors of noncurative resection included tumors with margin positivity, lymphovascular invasion, and beyond the absolute and expanded criteria.

**Results:** Among 152 EGCs, 17 were lost to follow up without additional treatment. Of 135 noncurative resections, 45 (33.3%) were interpreted as only lateral margin positivity, 6 (4.4%) as only vertical margin positivity, and 84 (62.3%) did not meet the absolute and expanded criteria by histology after ESD. Additional endoscopic treatment was performed in 14 (29.2%) of 45 with only lateral margin positivity. Among them, local recurrence occurred in 1 incomplete resection by surgery during the follow-up period after additional treatment. The histological results from 44 surgical specimens included 17 (38.6%) residual tumor and 3 (6.8%) lymph node metastasis.

**Conclusions:** The risk of lymph node metastasis based on histological results should be evaluated for decision of additional treatment after ESD for EGC. Additional surgery is necessary for the patients with high risk of lymph node metastasis, and endoscopic treatment can be helpful in those with low risk.

**Key Words:** Early gastric cancer, Endoscopic submucosal dissection, Noncurative resection
**UGI-49**

**Long-Term Outcomes of Noncurative Endoscopic Resection of Early Gastric Cancer**

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**Background and Aims:** We investigated the incidence and patterns of recurrences in patients who underwent noncurative endoscopic resection without additional treatment for differentiated early gastric cancer (EGC).

**Patients and Methods:** We performed a retrospective review of differentiated EGCs undergone noncurative endoscopic resection without additional treatment for EGCs from April 2000 to June 2011.

**Results:** A total of 345 patients underwent noncurative endoscopic resection for 347 differentiated EGCs. They underwent additional surgery in 231 EGCs, additional ER in 12 EGCs, and additional APC in 7 EGCs. Ninety six patients (97 EGCs) didn’t undergo additional treatment. Among 29 EGCs with positive resection margin, six EGCs revealed remained lesion in the follow up endoscopic biopsy and two EGCs showed local recurrence. Extragastric recurrence occurred in three EGC cases, and all of them initially had both lymphovascular invasion (LVI) and deep submucosal (SM) invasion. 9 EGC cases.

**Conclusions:** 14.3% (3/21) of patients with both LVI and deep SM invasion occurred extragastric recurrence. Therefore additional treatment should be considered in patients with both LVI and deep SM invasion among patients undergone noncurative endoscopic resection for EGCs.

**Key Words:** Noncurative endoscopic resection, Early gastric cancer, Recurrence

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**UGI-50**

**Feasibility of Endoscopic Resection for Minute Submucosal Cancer of the Stomach**

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**Background and study aims:** The use of endoscopic submucosal dissection (ESD) for the treatment of minute submucosal (SM) invasive cancer that fulfills the current expanded criteria remains controversial. This study investigated the clinicopathological parameters of patients with sm1 gastric cancers to predict lymph node metastasis (LNM) and evaluate the feasibility of ESD as a curative treatment.

**Patient and Methods:** Data from 278 patients who underwent surgical resection of sm1 gastric cancer were retrospectively collected and their clinicopathological parameters were analyzed to identify predictive factors of LNM.

**Results:** Multivariate analysis identified multiple lesions, lymphovascular invasion (LVI), SM invasion depth > 500 μm, undifferentiated histology, and ulceration as factors significantly associated with LNM in patients with sm1 gastric cancer. Additionally, SM invasion width/superficial tumor size ratio > 0.04 demonstrated a significant association with LNM in patients with sm1 gastric cancer falling within the expanded indications for ESD. The incidence of LNM was 0% (0 of 35 patients) after accounting for the current expanded indications (size ≤ 3 cm, differentiated histology, and no LVI), the absence of ulceration, SM invasion depth ≤ 500 μm, and SM invasion width/superficial tumor size ratio ≤ 0.04.

**Conclusions:** Endoscopic resection can be performed on patients with minute SM invasive, differentiated cancers of ≤ 3 cm without LNM on pretreatment examination. In addition, if histological assessment shows the absence of LVI and ulceration, SM invasion depth ≤ 500 μm, and SM invasion width/superficial tumor size ratio ≤ 0.04, the patient can be carefully observed without additional treatment.

**Key Words:** Early Gastric Cancer, ESD
Factors Associated with Successful Endoscopic Submucosal Dissection in Pyloric Neoplasms: Location and Direction

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Background and Aims: Pyloric neoplasms have been considered as technically difficult lesions for successful endoscopic submucosal dissection (ESD). The anatomical features of pylorus can adversely affect the assessment of tumor margin and ESD procedure, consequently piecemeal resection and complication rates in pyloric neoplasms is higher compared with other sites of gastric neoplasms.

Patients and Methods: A total of 158 pyloric adenomas and early cancers resected by ESD at our hospital from January 2007 to March 2013 were reviewed retrospectively. The location type was defined according to distance from pyloric ring: prepyloric ring (distal margin of the tumor was located <1cm from pyloric ring); pyloric ring (<0.5 cm from pyloric ring); postpyloric ring (any invasion to duodenum side beyond pyloric ring). A clock-face orientation with the endoscope (with the lesser curve of the stomach in contiguity with the 12 o'clock orientation of pylorus) was used to characterize directional distribution.

Results: Complete resection rates differed significantly in relation to location (prepyloric ring vs pyloric ring vs postpyloric ring, 93% vs 74% vs 62%, respectively; p=0.001) and directional distribution (upper hemisphere vs lower hemisphere, 76% vs 92%, respectively; p=0.011) and circumference extent of pyloric mucosal resection (<50% vs >50%, 94% vs 76%, respectively; p=0.001). The rates of delayed bleeding, stricture and perforation were 7.0%, 1.3% and 0.6% after ESD, and there was no surgery related to complications. On multivariate analysis, close distance to pyloric ring and upper hemisphere distribution and large tumor size were significantly relevant for incomplete resection.

Conclusion: ESD of early pyloric neoplasms is effective and feasible, but endoscopists require advanced technique and more experience in the case of neoplasms located in closely to pyloric ring, upper hemisphere and large size because of low complete resection rates and high complications.

Key Words: Pyloric neoplasm, Pylorus, ESD

Preliminary Experience of Endoscopic Submucosal Tunnel Dissection for Exophytically Growing Gastric SMT

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Objective: Although ESD is regarded recently as minimally invasive resection methods for SMTs, it can be associated with the major complication of perforations, especially in the exophatic mass. But ESTD can be closed more easily by endoclips compared with ESD. So, we aim to present the effectiveness and safety of a novel ESTD method for resection of gastric SMTs originating from the muscularis propria (MP).

Methods: In 6 patients who presented with a SMT located in the stomach, we underwent submucosal tunnelling endoscopic resection between August 2011 and February 2012. A submucosal tunnel was endoscopically created by starting approximately 3cm distant to the lesion. After careful submucosal dissection of the tumor from the surrounding submucosal tissue and the unaffected MP layer, the SMTs were completely removed by the technique of endoscopic submucosal dissection. The mucosal entrance of the tunnel was closed using endoclips after the tumor was removed.

Results: SMTs had a mean size of 21.1mm (range 17-25mm); 4 were located in the antrum and 2 in the cardia. SMT resection was successful in all patients with en bloc resection 100% rate (2 lesions affected the deep MP, so complete MP resection was performed; 4 lesions affected the superficial MP for a partial MP resection). The mean procedure time was 64 minutes (50-80 minutes). One patient had lost the full thickness resected sample in the peritoneal space. So the endoscopic procedure was converted into laparoscopic surgery. The other five patients had no any complications. No residual tumor or tumor recurrence were detected during the follow-up period. Pathological diagnoses of these tumors were low risk gastrointestinal stromal tumors (4/6), a schwannoma (1/6), and a ektopic pancreas (1/6).

Conclusion: In this study, endoscopic submucosal tunnel dissection (ESTD) was appeared to be effective and safe endoscopic procedure to remove exophatically growing tumors in the stomach.

Key Words: ESTD, Submucosal tumor, Tunnelling
Oral Presentation - UGI

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Efficacy of Additional CCRT after Non-Curative ESD in Patients with Esophageal Cancer: Single Center Experience

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Backgrounds & Aim: Endoscopic Submucosal Dissection (ESD) has been used conventionally to treat superficial esophageal cancers. But, clinical outcomes with the additional treatment such as concurrent chemoradiation therapy (CCRT) after the non-curative resection are remained unclear. We aimed to evaluate the outcomes of non-curative ESD with additional CCRT in esophageal cancer in a single center experience in Korea.

Methods: A retrograde analysis was performed with 30 patients with superficial esophageal cancer (M and SM1 cancer) who underwent esophageal ESD from Oct 2005 to Sep 2013 in Soonchunhyang University Hospital. Patient characteristics, histologic findings, curative resection rate, additional treatment after the procedure, outcomes after the additional treatment were analyzed. Follow up endoscopy was performed per 6 months, and computed tomography (CT) scan per 12 months.

Results: Of the 30 patients, 7 patients were excluded due to the histologic findings of high grade dysplasia (HGD), 18 patients who were revealed to undergo curative resection were also excluded. A total of 5 patients had non-curative resection; 3 patients had positive resection margins (lateral margin: 2, vertical margin: 1) and 2 patients had lymphatic invasions. All non-curative patients had squamous cell carcinoma, and tumor depth was to the lamina propria (2/5, 40%), to the muscularis mucosa (1/5, 20%), to the SM1 (submucosal invasion <200 mm below the muscularis mucosa) in the remaining 2 patients. All 5 patients underwent additional CCRT after ESD. The mean follow up period after CCRT was 22.2 months (range 12 to 33 months). And no local recurrence was noted in any patient at the last follow up.

Conclusion: In our experience, additional CCRT in non-curative ESD of the esophageal cancer was a useful treatment modality without local recurrence. But, large scale prospective studies with more subjects and longer follow up are needed.

Key Words: Esophageal Cancer, ESD, CCRT

Clinical Outcomes of the Endoscopic Treatments for the Early Esophageal Cancer and Dysplasia

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Backgrounds and Aim: Esophageal cancer and dysplasia are relatively rare disease in Korea, compared with other Far East countries. So, the feasibility and the safety of the endoscopic treatments were not well established in Korea. This study aimed to assess the clinical outcomes of endoscopic treatment for esophageal epithelial lesions.

Methods: Between August 2001 and August 2013, 25 esophageal epithelial lesions of 22 patients were treated with endoscopic submucosal dissection (ESD) or endoscopic mucosal resection (EMR).

Results: Of the 25 lesions, 11 lesions were treated with ESD and 14 lesions with EMR. All of them, 15 (60%) of the lesions were located in lower esophagus, 9 (36%) in mid-esophagus, and 1 (4%) in upper esophagus. ESD group included 7 (64%) squamous cell carcinomas, 3 (27%) high grade dysplasias, and 1 (9%) low grade dysplasia. EMR group included 8 (57%) squamous cell carcinomas, 2 (14%) high grade dysplasias, and 4 (29%) low grade dysplasias. Median procedure time was 74 minutes and 35 minutes in ESD group and EMR group, respectively. Rates of en bloc resection and curative resection were 100% and 100% in ESD group, and 64% and 42% in EMR group. Delayed bleeding occurred in 3 cases (1 in ESD group, 2 in EMR group). They were managed successfully by endoscopic procedures. Non-curative resections were found in 4 patients underwent EMR. Three of them received secondary operation, and other received additional EMR. During follow-up periods (mean, 20.0 months), there was no recurrence in ESD group, but 3 recurrences in EMR group. Among them, two patients received operation, and one patient received photodynamic therapy due to poor comorbidities. No cancer related death occurred in both groups.

Conclusions: Endoscopic treatments for esophageal epithelial lesions are safe and feasible therapeutic modalities. Especially, ESD can provide high rate of en bloc and curative resection for early esophageal cancer and dysplasia.

Key Words: Esophageal cancer, Esophageal dysplasia, Endoscopic submucosal dissection, Endoscopic mucosal resection.
UGI-55

Predictors of Lymph Node Metastasis and Residual Tumor in Non-Curative Endoscopic Resection of Early Gastric Cancer

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Background/Aims: Surgical treatment is recommended after non-curative endoscopic resection (ER) of early gastric cancer (EGC). However, only a part of the patients is found to have lymph node metastasis (LNM) or residual tumor. This study aimed to identify the risk factors of LNM and residual tumor in patients received non-curative ER.

Methods: We retrospectively evaluated surgical outcomes and clinicopathological data of consecutive patients who received additional surgery after non-curative ER of EGC from April 2005 to July 2013 at Seoul National University Hospital. Non-curative ER was defined as positive deep resection margin, lymphovascular invasion, or tumor beyond the expanded indications.

Results: A total of 1783 patients were treated with ER for EGC, and non-curative ER was found in 256 (14.4%) patients. Of these patients, 121 patients underwent additional gastrectomy and lymph node dissection: 15 (12.4%) had LNM, and 23 (19.0%) had residual cancer. In patients without lymphovascular invasion (LVI), LNM was observed only in sm2 cancers. However, in those with LVI, LN metastasis was observed even in mucosal cancer. In multiple logistic regression analysis, venous invasion (odds ratio [OR], 5.40; 95% confidence interval [CI], 1.20-24.32; p=0.028) and lower third location (OR, 10.43; 95% CI, 1.21-90.0; p=0.033) were independent risk factors for LNM, and tumor involvement of lateral resection margin (OR, 18.20; 95% CI, 3.98-83.30; p<0.001) was independent risk factor for residual cancer.

Conclusions: Patients with LVI or sm2 cancer might be considered to receive additional surgery due to the risk of LNM. In particular, patients with venous invasion, lower third location, or lateral resection margin involvement may be strongly recommended to undergo additional surgery for non-curative ER of EGC.

Key Words: Early gastric cancer, Endoscopic resection, Lymph node metastasis, Residual tumor, Risk factors

UGI-56

Long-Term Outcome Comparisons between Endoscopic Resection and Surgery for Expanded Indication of Early Gastric Cancer

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Background/Aims: Endoscopic resection (ER) for early gastric cancer (EGC) lesions has been increasingly performed, but ER for expanded indication is still considered as an investigational treatment. The aim of this study was to evaluate the long-term outcomes after ER for expanded indication in compared with those after surgery.

Methods: We retrospectively reviewed data of gastric cancer patients who underwent ER or surgery for EGC meeting the expanded indication between 2001 and 2009. Multivariate Cox-proportional hazard regression analyses after adjustments by age, sex, and propensity score were performed for overall survival (OS) as primary outcome. Disease-specific survival (DSS), metachronous gastric cancer rates, and complication rates were secondary outcomes.

Result: Among 457 patients included, 165 underwent ER and 292 underwent surgery. During a median follow-up of 58.6 months, OS and DSS rates were not different between both treatment groups (5-year OS rate, 97.5% in ER group and 97.0% in Surgery group, p=0.425 by log-rank test; 5-year DSS rate 100% in ER group and 99.7% in Surgery group, p=0.366 by log-rank test). A multivariate analysis showed that there was no significant difference in OS of ER group (adjusted hazard ratio, 0.55; 95% confidence interval, 0.19 to 1.58; p=0.270) compared with that of Surgery group. Although metachronous gastric cancer developed more frequently in ER group (5.5%) than Surgery group (0.7%) (p=0.002), all metachronous cancers in ER group were successfully treated by repeated ER. Overall complication rates were not different between ER group and Surgery group (5.5% vs. 9.9%, p=0.096), but Surgery group had more late complication than ER group (4.8% vs. 0%, p=0.004).

Conclusions: OS and DSS of ER for EGCs meeting the expanded indication were comparable to those of surgery. Endoscopic resection, Expanded indication, Surgery, Early gastric cancer
UGI-57

Surveillance Strategy after Endoscopic Resection for Early Gastric Cancer Based on the Patterns of Recurrence

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Background and Aims: We investigated the incidence and patterns of local, metachronous, and extragastric recurrence after ER for EGC and tried to suggest the appropriate surveillance strategy after ER based on prospectively and consecutively collected large database.

Patients and Methods: We performed a retrospective review of prospectively and consecutively collected database of 1855 EGCs in 1803 patients (1409 lesions in the AI and 446 lesions in EI) underwent ER for EGCs from April 2000 to June 2011.

Results: During median follow up period of 33.4 months (range, 12-147.4 months), a total of six tumors (3.8%) were locally recurred. The median local recurrence interval was 12.5 months (range 2-36 months). In the AI group, local recurrence was observed in five tumors (0.4%) at 2, 6, 19, 34 and 36 months after first ESD (4 en bloc and 1 piecemeal resection). In the EI group, local recurrence was observed in one tumor (0.3%) at 2 months after piecemeal resection by EMR. Metachronous recurrence occurred in 49 EGC cases (3.1%) meeting AI or EI during follow-up period. The median metachronous recurrence interval was 27.0 months (range, 13-115 months). Extragastric recurrence occurred in two EGC cases (0.13%) meeting each AI and EI. The extragastric recurrence interval was 62 months in the AI group and 46 months in the EI group. At that time, endoscopic examination showed no evidence of local recurrence around ER scar area.

Conclusions: 12.2% (6/49) of metachronous recurrence and 50% (1/2) of extragastric recurrence were detected after 5 years from initial ER for EGC. All of extragastric recurrence were not detected by endoscopic examination. Therefore, more than 5 years of close follow up is needed and CT should be performed together with endoscopy for surveillance of recurrence after ER for EGC in the AI group as well as the EI group.

Key Words: Endoscopic resection, Early gastric cancer, Recurrence, Surveillance

UGI-58

Risk Factors of Bleeding due to Dieulafoy’s Lesion and Prognostic Factors for Rebleeding due to Dieulafoy’s Lesion

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Background/Aims: Dieulafoy’s lesion (DL) is a rare but important cause of upper gastrointestinal bleeding (UGIB). This study was carried out to reveal the risk factors of bleeding due to Dieulafoy’s lesion and identify prognostic factors for recurrent bleeding (RB).

Patients and Methods: One hundred seventy two patients with UGIB due to DL between January 2004 and June 2013 were evaluated, retrospectively. We analyzed the demographic data, endoscopic findings, details of endoscopic therapy and recurrence of bleeding.

Results: The study group consists of 115 male and 57 female patients with a mean age of 68.6 ± 14.2 years. Fifty-seven patients received antiplatelet, anticoagulant and NSAID medication. The most common location was proximal stomach (36.6%) and the most common bleeding type was oozing (60.5%). Endoscopic therapy was successful in stopping the bleeding in 97.7%; single endoscopic treatment in 46.2% and combination treatment in 53.8%. Major risk factors identified among all patients were diabetes (32.0%), hypertension (43.6%), kidney disease (21.5%) and infection (17.4%). Rebleeding occurred in 28 with mean duration of 5.9 days after initial hemostasis. There were significant differences in the distribution of kidney disease (12/28 vs. 25/144, p=0.022, AOR=5.329 95% CI: 1.270-22.370) and infection (9/28 vs. 21/144, p=0.016, AOR = 4.688 95% CI: 1.336-16.455) between two groups. The mean value of APTT (52.1 sec vs. 41.8 sec, p=0.001), creatinine (2.9 vs 1.5 mg/dl, p=0.008), and CRP (3.3 vs 2.3 mg/dl, p=0.021) were significantly higher in the RB. Mortality rate of RB was 39.3% compared to 4.2% of NRB (p=0.001).

Conclusion: Kidney disease and infection were the risk factors of RB of DL. Control of underlying disease is important in the management of DL.

Key Words: Dieulafoy
**Clinical Characteristics and Risk Factors of Rebleeding or Death in Nonvariceal Upper Gastrointestinal Bleeding Patients**

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**Background/Aims:** Prediction of patients at risk of rebleeding or death and following prevention is important for management of nonvariceal upper gastrointestinal bleeding (NVUGIB) patients. We evaluated characteristics and risk factors for major outcome in patients undergoing endoscopic therapy for NVUGIB.

**Method:** Between June 2012 and May 2013, patients who presented with NVUGIB at Asan Medical center and underwent endoscopic therapy were retrospectively enrolled. Patients who had NVUGIB while staying in hospital for another cause or had NVUGIB caused by iatrogenic ulcers (post EMR or post ESD ulcer) were excluded. The clinical and endoscopic characteristics of overall patients were reviewed and compared according to major outcome: rebleeding or mortality. Rebleeding was defined as a new bleeding episode manifested by melena, hematemesis or hematochezia and both of early (≤30days) and late (>30days) rebleeding were included. Mortality was restricted to bleeding-related cause.

**Result:** Total 214 patients underwent endoscopic hemostasis for NVUGIB. The incidence of rebleeding was 10.7% (n=23) and mortality was 0.5% (n=1). Patients who rebleeded or died showed no significant differences in endoscopic findings such as bleeding site, Forrest classification, endoscopic diagnosis and method of endoscopic hemostasis. Factors related to rebleeding or mortality were presence of comorbidities, lower platelet count, number of transfused RBCs, higher GBS score and higher pre- and post-endoscopic Rockall score in univariate analysis. In multivariate analysis, there were not any factors that affected major outcome significantly.

**Conclusion:** Patients with major-outcome events after endoscopic hemostasis for NVUGIB showed no significant differences in endoscopic characteristics. There was not a single predictive factor that could predict major clinical outcomes; thus composite scoring systems that could be used as a decision aid should be designed to accurately predict outcome in NVUGIB patients.

**Key Words:** Gastrointestinal hemorrhage, Endoscopic hemostasis, Risk factor

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**A Comparison of Risk Assessment Tools in Acute Non-Variceal Upper Gastrointestinal Bleeding (ANVUGIB) before Endoscopy**

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**Background:** Several scoring systems have been devised to identify patients with acute nonvariceal UGI bleeding (UGIB) who are at a high risk of poor outcomes. Glasgow-Blatchford score (GBS) is used to estimate patients with UGIB who need clinical intervention before endoscopy. Rockall score (RS) is used to identify patients with UGIB who have adverse outcome. Recently reported AIMS65 is the simple risk scoring system that identified five factors associated with increased risk for in-hospital mortality, length of stay and cost of admission: serum albumin<3.0 g/dL, an international normalized ratio>1.5, altered mental status, systolic blood pressure<90 mmHg and age>65. We retrospectively evaluated the usefulness of these scoring system for assessing the need for clinical intervention, re-bleeding and death in cases of nonvariceal UGIB.

**Method:** In 384 patients who underwent urgent endoscopic examination due to UGIB symptoms such as hematemesis or melena between December 2008 and August 2013 at Pusan national university Yangsan Hospital, 223 patients were satisfied with inclusion criteria. These patients were assessed by GBS, RS and AIMS65. These patients were assessed by GBS, RS and AIMS65, and the score defined as high-risk: GBS of greater than 10, RS of greater than 2 and AIMS65 of greater than 1. The patients who needed the clinical intervention or died in-hospital within 30 days were defined as high-risk patients.

**Result:** Overall in-hospital mortality was 2.2% (5/223). The re-bleeding rate was 9.4% (21/223). In our total 223 patients, 55.1% (123/223) were categorized as those with high-risk for clinical intervention or poor outcome. For high risk patients, RS score was significant (121/123, 98.4%, p<0.001). For in-hospital mortality, AIMS65 score was significant (p=0.039). For need for intervention, Blatchford score and CR score was significant (p<0.001)

**Conclusion:** NVUGIB patients, GBS, RS and AIMS65 scoring system can be used to manage the patients intensively.

**Key Words:** UGI bleeding, Endoscopy, Non-variceal bleeding, Risk assessment tool
UGI-61

Endoscopic Yield and Outcomes of Performing Urgent versus Early Endoscopy in Non-Variceal Upper GI Bleeding

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Background: Emergency endoscopy in patients with acute GI bleeding can determine lesion and control bleeding quickly. Current guidelines recommend early endoscopy (within 24 hours) for suspected acute non-variceal upper GI bleeding. According to several studies to assess the efficacy of emergency endoscopy, it is controversial whether urgent endoscopy must be performed. Aim: The aim of this study is to compare outcomes of urgent (within 8hrs) with those of early Endoscopy (8-24hrs).

Methods: We reviewed medical records of 384 patients who visited to emergency room (ER) with hematemesis, melena, or/and hematochezia with blood or altered blood in the nasogastric aspiration from December 2008 to August 2013. Patients who presented with non-variceal upper GI bleeding and underwent upper endoscopy within 24 hours were analyzed and received intravenous PPI. Patients were classified into 2 groups based on timing of endoscopy: urgent (<8hrs) and early(8-24hrs). We defined positive endoscopic yield as the presence of definite bleeding sites and high-risk stigmata of recent bleeding, such as adherent clots, nonbleeding visible vessels and active bleeding.

Results: A total of 223 patients met the inclusion criteria. There were no significant differences in outcomes between the two groups. The positive endoscopic yield for the urgent and early endoscopy groups were similar at 100/118 (84.7%) and 81/105 (77.1%), respectively (p=0.17). There were no differences of outcomes between urgent and early endoscopy groups with regard to in-hospital mortality (2.5% vs 1.9%, p=0.75), need for repeat endoscopy within 72hrs (6.8% vs 10.5%, p=0.40), median packed red blood cell requirements (1.73 vs 1.78 unit, p=0.84), need for hemostatic therapy (43% vs 31%, p=0.05) and mean length of hospital stay (6.25 ± 6.42 vs 6.43 ± 5.61days, p=0.82).

Conclusions: performance of urgent (≤ 8 hrs) as opposed to early (9-24 hrs)endoscopy showed no differences in the yield of endoscopic findings or clinical outcomes.

Key Words: UGI bleeding, Endoscopy, Non-variceal bleeding

UGI-62

Risk Factors of Iatrogenic Mallory-Weiss Tear Which Needed Bleeding Control during Upper Endoscopy

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Background and Aims: In some cases of iatrogenic Mallory-Weiss tear (MVT) during upper endoscopy, bleeding control is needed due to severe mucosal tear with bleeding. In this study, we tried to know the risk factor of severe iatrogenic MVT and methods of endoscopic bleeding control.

Patients and Methods: Between January 2008 and December 2012, 426,085 cases of upper endoscopy were performed at Asan Medical Center and we experienced 560 cases in 553 patients with iatrogenic MVT. We retrospectively analyzed the risk factors for severe iatrogenic MVT which need to endoscopic procedure and treatment modalities of bleeding control.

Results: Iatrogenic MVT was happened in 560 cases (0.13 %) of upper endoscopy. Median age of 553 patients was 53 years (interquartile range 43-64 years) and men were 333. Bleeding control due to severe bleeding was applied in 73 cases (13.0 %) and rebleeding after initial bleeding control was happened in 1 case (1.4%). In bleeding controlled iatrogenic MVT patients, age was older (p<0.001) and atrophic change in endoscopic finding (p<0.001), existence of hiatal hernia (p<0.001), location of MVT in cardia (p<0.001), and non-sedative procedure (p=0.001) were more than non-bleeding controlled patients. Multivariate analysis showed that atrophic change, herniation, location in cardia, and non-sedative status were associated with severe iatrogenic MVT which need to endoscopic procedure. Among 73 cases of bleeding control, hemoclip was used in 58 cases (79.5%), epinephrine injection was in 9 cases (12.3%), hemoclip with epinephrine injection was in 3 cases (4.1%), band ligation was in 2 cases (2.7%), and hemoclip with fibrin glue injection was in 1 case (1.4%).

Conclusions: During endoscopic examination, procedure should be performed gently when patient is non-sedative status, old age, and atrophic change and hiatal hernia are shown at endoscopic findings.

Key Words: Iatrogenic, Mallory-Weiss tear, Bleeding control
UGI-63

Fibrin Glue Injection for the Patients with Upper Gastrointestinal Bleeding
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Background and Aims: Upper gastrointestinal bleeding (UGIB) is a troublesome and life-threatening emergency. Recently, various endoscopic tools such as clip for hemostasis have been developed and clinically used. However, there are difficult cases of bleeding control due to inaccessible location or intractable lesion. The aim of this study was to determine the usefulness of fibrin glue for UGIB in patients who had difficulties in other hemostatic agents or techniques.

Patients and Methods: We investigated 67 patients who underwent hemostasis with the injection of a fibrin glue to treat UGIB between October 2010 and September 2012 in a tertiary university hospital.

Results: All of 67 patients were treated with endoscopic hemostasis using a local injection of the fibrin glue. The causes of UGIB were gastric ulcer (34 cases, 50.7%), duodenal ulcer (19 cases, 28.4%), cancer bleeding (9 cases, 13.4%) and post-procedural bleeding (5 cases, 7.5%). 16 cases were treated with fibrin glue injection only, 19 cases were treated with combination of other hemostatic agents, and 24 cases were treated additional fibrin glue injection due to unsuccessful other hemostatic methods. However, 8 cases (11.9%) were failed to hemostasis with fibrin glue injections. The failed cases with fibrin glue were followed by hemoclipping with or without repetitive fibrin glue injection, or by embolization. There were no perforations or critical side effects during or after fibrin glue injection.

Conclusions: Fibrin glue injection might be useful hemostatic method for UGIB in patients who had difficult approach technically and fail to other hemostatic procedure such as clipping.

Key Words: Upper gastrointestinal bleeding, Fibrin glue

UGI-64

APC for the Treatment of Lateral Margin Positivity after Endoscopic Resection of Superficial Gastric Neoplasm
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Background and Aims: Endoscopic resection is a useful treatment of superficial gastric neoplasm. However, incomplete removal after endoscopic resection may be associated with the incidence of local recurrence. The aim of this study was to evaluate the usefulness of the argon plasma coagulation (APC) as the treatment of lateral margin positivity after endoscopic resection.

Patients and Methods: Among the patients who received endoscopic resection for the treatment of superficial gastric neoplasm from August 2003 to August 2008, 50 patients were enrolled. All patients had lateral margin positivity after endoscopic resection. We retrospectively reviewed the medical records of the patients.

Results: Endoscopic submucosal dissection was performed in 47 patients and endoscopic mucosal resection (EMR) was performed in 3 patients. Twenty one patients had differentiated adenocarcinoma, 13 had undifferentiated adenocarcinoma, and 16 had adenoma. The overall rate of en bloc resection was 78.0% (39/50). Median follow-up periods was 39.5 months (range : 3-98 months). Additional treatment of lateral margin positivity was performed in 29 patients. Among the 16 patients who received APC, 8 patients were treated once, 4 patients were treated twice, and 4 patients treated three times. Repeat endoscopic resection or surgery were performed in 13 patients. Endoscopic surveillance without additional treatment was performed in 21 patients. One patient who did not receive additional treatment experienced local recurrence, which was successfully treated with EMR. However, there was no local recurrence in the patients who received APC for the treatment of lateral margin positivity.

Conclusions: After endoscopic resection of superficial gastric neoplasm, additional treatment of lateral margin positivity should be considered. APC may be a useful method for the treatment of lateral margin positivity, which is thought to contribute to reduce the incidence of local recurrence.

Key Words: Argon plasma coagulation, Endoscopic resection, Superficial gastric neoplasm
Risk Factors of Residual Lesions after Endoscopic Resection in Gastric Epithelial Neoplasia

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Background/Aims: Endoscopic resection (ER) has become an important curative option for gastric epithelial neoplasia such as early gastric cancer (EGC) and gastric adenoma. Sometimes, residual tumors are found at the follow-up endoscopy in spite of complete resection after ER. Thus, the aim of study was to investigate risk factors of residual tumors in completely resected gastric epithelial neoplasia after ER.

Methods: From October 2007 to March 2013, 3,604 lesions of gastric epithelial neoplasia were performed ER and 42 (1.1%) residual tumors (26 EGC; 16 adenoma) were found at the follow-up endoscopy. The clinicopathological characteristics were evaluated between residual tumor group and control group which were matched according to age and gender in 1 to 2 ratio using propensity score matching method.

Results: Among gastric adenoma, high grade dysplasia and severe intestinal metaplasia (IM) in background mucosa were significantly associated with residual tumor group. Poorly differentiated adenocarcinoma (PD), signet ring cell carcinoma (SRC), lateral safety margin < 3mm and upper third location were significantly associated with residual tumor group among EGC. In multivariate analysis, lateral safety margin < 3mm (OR 13.8; p<0.001), PD (OR 16.3; p=0.001), and SRC (OR 9.8; p=0.009) among EGC and severe IM in background mucosa (OR 19.6; p=0.023) among gastric adenoma were significantly associated with the residual tumors.

Conclusions: Undifferentiated histology (PD, SRC) and lateral safety margin < 3mm among EGC, and severe IM in background mucosa among gastric adenoma were risk factors of residual tumors after ER.

Key Words: Stomach, Epithelial neoplasia, Endoscopic resection

Clinical Outcomes of ESD for Early Gastric Cancer in Elderly Patients: Comparison with Surgery

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Background and Aims: The incidence of gastric cancer has a growing trend with increase of aging as other cancers. Particular situations in elderly patients such as having more co-morbidities may impede gastrectomy for the treatment of gastric cancer. Although endoscopic submucosal dissection (ESD) has been widely applied for early gastric cancer (EGC) with a highly effective, less invasive method, there is no study about comparing ESD with surgery for the ECC in the elderly until now. We aimed to evaluate the efficacy and safety of ESD comparing with surgery for EGC in elderly patients aged 75 years or older.

Methods: We analyzed the data on all patients who were treated with either ESD or gastrectomy for EGC at a single institute from July 2005 to December 2010 retrospectively. In total, 175 lesions in 169 patients with EGC were enrolled.

Results: After excluding 47 lesions which did not meet the expanded ESD criteria, a total of 56 lesions were treated by ESD and 72 lesions were treated by surgical resection. The complete resection rate was 96.4% in ESD group and 100% in surgical group (p=0.189). Although patients who underwent ESD had higher risk of recurrence (including metachronous lesions) (HR 3.13; 95% CI 0.63-15.55), most recurrent lesions after ESD were successfully re-treated without affecting overall survival. There was no significant difference in overall survival and disease free survival during the median follow up period of 49 months (range, 2-95 months), using Kaplan-Meier curves with Log-rank test (p=0.955 and 0.132, respectively). In addition, a similar morbidity rate was observed for ESD compared with surgery (5.4% versus 13.9%, p=0.145). A significantly shorter hospital stay was observed in the ESD group than surgery group (median three days (range, 1-19) vs. median 8 days (range, 1-85), p<0.001).

Conclusion: In elderly patients with EGC, ESD is a promising treatment method even when compared to surgical treatment.

Key Words: Early gastric cancer, Elderly, ESD, Surgery
UGI-67

Clinical Outcomes of Endoscopic Submucosal Dissection for Submucosal Invasive Gastric Cancer

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Background: Endoscopic submucosal dissection (ESD) has been widely conducted for treatment of early gastric cancer (EGC). The aim of this study is to assess the therapeutic outcomes in patients with submucosal invasive gastric cancers (SM-GCs) treated by ESD to determine the feasibility of the procedure across classifications.

Methods: Data for 1,246 patients who underwent ESD for treatment of EGC at six tertiary academic hospitals, between February 2003 and May 2010, were collected. After retrospective analysis of ESD databases, total 121 patients had SM-GCs and these patients were enrolled in the study. The 121 EGC lesions were classified into three groups based on a pathological review-A group of submucosal invasion of less than 500 μm-gastric cancers (SM1-GCs) that met the expanded ESD criteria (n = 43); a SM1-GCs group that did not met the expanded criteria (n = 38); and a group of submucosal invasion beyond 500 μm-gastric cancers (SM2-GC, n = 40).

Results: En bloc and complete resection were achieved in 92.6% and 83.5% of patients, respectively. The curative resection rate was significantly better for SM1-GCs group that met the expanded ESD criteria(67.4%) than for those that did not meet the expanded criteria(0%) or for SM2-GC(0%). The therapeutic outcomes of ESD in relation to indication and ulceration did not differ significantly among SM-GCs subgroups. The overall survival rates were 100%, 86.8%, and 97.5% respectively. But there were no deaths associated with gastric cancer during follow-up.

Conclusions: Our outcome data support the clinical validity of ESD without additional surgical resection for SM1-GCs. Also our data suggest that it might be possible to expand the criteria for curative ESD of SM-GCs.

Key Words: ESD, Early gastric cancer, Submucosal invasion

UGI-68

Immediate and Long-Term Outcome of ESD for Differentiated Intramucosal Gastric Cancer Compared to Surgical Resection

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Background/Aims: Endoscopic submucosal dissection (ESD) is now accepted as an alternative to surgery for the treatment of early gastric cancer (EGC). However, long-term clinical outcome of ESD for EGC compared to surgical resection has not been reported. The aim of this study is to evaluate the immediate and long-term clinical outcome of ESD for differentiated intramucosal gastric adenocarcinoma compared to surgical resection.

Methods: A retrospective analysis was performed in 103 patients who underwent ESD or surgical resection for differentiated intramucosal gastric adenocarcinoma from 2006 and 2008 in Incheon St. Mary’s Hospital and Seoul St. Mary’s Hospital, The Catholic University of Korea. Surveillance endoscopy and stomach CT was performed regularly over 5 years in all patients. Immediate complications, overall survival and recurrence rates were compared between the two groups.

Results: Fifty eight patients received surgical resection and 45 patients received ESD. Patients treated by surgical resection sustained longer operative time compared to ESD (4.2 vs. 1.3 hr, p=0.026), had longer median hospital stay (14.61 vs. 7.20 days, p=0.033), and had more blood loss (drop of hemoglobin level, 1.54 vs. 0.62 g/dl, p=0.001). Metachronous lesion was detected in 6 patients (4 adenocarcinoma, 2 adenoma) among ESD group and none in surgical resection group during the follow up period (p=0.001). Local recurrence was detected in 1 patient among surgical resection group. Distant metastasis was not detected in both groups. The 5-year overall and disease-specific survival rates were 100% in both groups.

Conclusions: ESD has post-operative benefits compared to surgical resection. ESD for differentiated intramucosal gastric adenocarcinoma might be acceptable considering the overall survival. However, meticulous surveillance program should be established because metachronous recurrence is more common after ESD.

Key Words: ESD, Gastric adenocarcinoma, Surgical Resection
How to Predict Delayed Bleeding after Endoscopic Submucosal Dissection for Gastric Neoplasms?

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Background and Aims: Recently, Endoscopic submucosal dissection (ESD) is a useful procedure for the treatment of early gastric neoplasms. Sometimes, it has lead to the complications, one of the major problem is delayed bleeding after ESD for gastric neoplasms. This study aimed to clarify the risk factors for delayed bleeding from ESD.

Patients and Methods: A total of 294 lesions diagnosed with early gastric neoplasms and treated by ESD from October 2004 to March 2013 in Eulji Hospital. Retrospectively, patients with or without these complications were compared on the basis of the patient characteristics and treatment results. Post-ESD bleeding was defined as active bleeding of the ESD ulcer lesion by an emergency endoscopy or a planned follow-up endoscopy. We analyzed associations between bleeding and the characteristics of the patients and the lesions: age, sex, pathology, tumor depth, macroscopic finding, location, size of the lesion, procedure time, resection methods and fibrosis.

Results: Bleeding occurred in 5.3% lesions (16/294) and delayed bleeding in 3.0% lesions (9/294). En bloc resection rate was 92.1% and piecemeal resection was 7.9% and it was risk factor of delayed bleeding (RR 7.70). Univariate analysis revealed larger resected size (0.5 cm) (p<0.001), the depressed macroscopic findings (p=0.04), and delayed procedure time (p<0.001), histologically adenocarcinoma (p=0.008) to be risk factors for delayed bleeding. A third of upper stomach area, the fibrosis lesions and the depth of invasion are increased relative bleeding risk (2.1, 1.1 and 1.07) but they are not significant (p=0.4, p=0.74 and p=0.18).

Conclusions: This study demonstrated risk factors for delayed bleeding associated with ESD. The large resected size, and depressed lesion and adenocarcinoma are the significant risk factors of delayed bleeding. The procedure time and the resection method also increase delayed bleeding risk. From these risk factors, we can predict and prevent from post-ESD bleeding.

Key Words: ESD, Delayed bleeding, Early gastric neoplasm

Clinical Outcomes of Endoscopic Submucosal Dissection for Undifferentiated Early Gastric Cancer: Retrospective Analysis

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Background and Aims: Endoscopic submucosal dissection (ESD) is accepted as a standard treatment for selected patients with early gastric cancer (EGC). However, the application of ESD for undifferentiated EGC was controversial. The aim of this study was to evaluate the clinical outcomes in patients with undifferentiated EGC.

Patients and Methods: Patients who had undifferentiated EGC and received ESD as a primary treatment were collected between June 2005 and June 2013. We retrospectively analyzed the clinical outcomes of these patients after ESD.

Results: 43 lesions from 43 patients were identified [10 poorly differentiated adenocarcinoma (PD), 27 signet ring cell carcinoma (SRC), 6 poorly differentiated adenocarcinoma combined with signet ring cell carcinoma (PD+SRC)]. 31 have met expanded criteria of ESD, which is undifferentiated mucosal cancer without ulceration less than 20 mm. The rates of en-bloc resection and complete resection were 97.7% (42/43) and 76.7% (33/43), respectively. The rates of lymphatic invasion and incomplete resection in the group of patients who did not meet expanded criteria were significantly higher than those in the group of patients who met expanded criteria (p=0.001 and 0.001). In the analysis about relationship between the recurrence after ESD and pathologic types of PD, SRC, and PD+SRC, the rate of recurrence was higher in PD group than other groups (20% vs 0% and 0%, p=0.034). Risk factors associated with incomplete resection were size greater than 2 cm and submucosal invasion (p=0.04 and 0.001, respectively). No local recurrence or metastasis was observed in the group of patients who have met expanded criteria of ESD and were completely resected.

Conclusions: ESD could be considered as a feasible treatment in selected patients with undifferentiated mucosal gastric cancer without ulceration less than 20 mm.

Key Words: Endoscopic submucosal dissection, Early gastric cancer, Undifferentiated carcinoma
Synchronous and Metachronous Multiple Gastric Tumors after Endoscopic Submucosal Dissection

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**Background/Aims:** Endoscopic submucosal dissection (ESD) has been widely accepted as a method of treatment of gastric tumor. The study was aimed to investigate the incidence and characteristics of multiple gastric tumors after ESD.

**Methods:** Patients with gastric tumors treated by ESD from January 2004 through June 2012 and followed up with endoscopic examination periodically for at least 1 year were enrolled. All multiple gastric lesions were treated with subsequent ESD method and their medical records were reviewed retrospectively.

**Results:** A total of 655 patients were included. The mean period of endoscopy follow-up was 32.89 ± 23.28 months (12-107). Overall 126 patients (19.2%) showed multiple gastric tumors during follow up period (synchronous 46 (7.0%) and metachronous 80 (12.2%)). The annual incidence of metachronous gastric tumor was approximately 6.8%. The number of differentiated type cancer was 64 (50.8%), undifferentiated type 6 (4.8%), and adenoma 56 (44.4%). Over half of tumors developed at the same longitudinal location of the stomach, showed the same macroscopic type, and revealed the same histological type as the primary lesions. Old age and long endoscopic follow-up period appeared to be related with the development of metachronous gastric tumors.

**Conclusions:** As synchronous and/or metachronous gastric tumors are not uncommon, a considerable attention should be paid to discover multiple gastric lesions after ESD.

**Key Words:** Stomach, Endoscopic resection, Tumor, Metachronous, Synchronous

The Therapeutic Effect of Irreversible Electroporation according to Tissue Properties in Rat Stomach

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**Background/Aims:** Irreversible electroporation (IRE) is a promising novel technique for the ablation of tumors using short pulses of high-voltage pulse current. IRE has an advantage over other ablation technique in its mechanism to remove undesired cells by affecting the cell membrane without thermally destructing blood vessels, nerves and the surrounding tissues. Recently, we have validated the effectiveness of IRE tissue ablation on stomach. Previous study showed that treatment effect of IRE is susceptible to local environment and tissue properties, but there was no study in gastrointestinal tract. Our purpose was to study effectiveness of IRE according to tissue properties in rat stomach.

**Methods:** The Sprague-Dawley rats were used throughout this study. IRE ablation was applied in upper stomach (squamous cell epithelium) and lower stomach (columnar cell epithelium) with same energy parameters. The energy delivered for each ablation was 100 pulses of 2000V/cm and 3000V/cm. All samples for histologic analysis and tunnel assay were got at 0hours, 10 hours, 24 after IRE.

**Results:** All animals survived for their designated times. H-E staining showed extensive cell death area, which were proved by a pyknotic nucleus and eosinophilic cytoplasm near absence of cell after IRE ablation. We confirmed apoptotic cell death by Tunnel assay. But the degree of apoptosis after IRE ablation in lower stomach tissue (columnar cell epithelium) was higher than upper stomach tissue (squamous cell epithelium) at identical energy condition. Interestingly, squamous cells beneath epithelial keratin in upper stomach were less affected than submucosal and muscle layers comparing columnar cell in lower stomach.

**Conclusions:** This study showed that the degree of apoptosis after IRE ablation was tissue specific in gastrointestinal tract. This suggests strongly that gastrointestinal tissue composition may alter clinical results including different tumor type in IRE therapeutic setting.

**Key Words:** Irreversible Electroporation, Ablation, Tissue property
Therapeutic Outcomes of Endoscopic Resection in Foregut Neuroendocrine Tumors

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Backgrounds and Aim: Endoscopic resection (ER) may benefit to treat the low grade foregut neuroendocrine tumors (NETs). This study aimed to evaluate therapeutic outcomes of ER for foregut NETs.

Methods: From January 2003 to February 2013, a total of 40 patients were confirmed histologically as foregut NETs from the ER (stomach=16, duodenum=13) and surgical resection (SR, stomach=9, duodenum=2). The clinicopathological characteristics and therapeutic outcomes were evaluated retrospectively.

Results: Of 29 patients underwent ER (EMR=23, ESD=6), 28 were diagnosed as NET-G1 and 1 as NEC. Of 11 patients underwent SR, 9 were diagnosed as NET-G1 and 2 as NEC. Tumor size of ER group was significantly smaller than that of SR group (7.4 mm vs. 18.2 mm, p<0.01). Depth of invasion was limited to mucosa and submucosa in 28 NETs of ER group. However, all NETs of SR group invaded the submucosa or proper muscle. Complete resections were achieved in 22 patients (75.9%) of ER group and achieved in 11 patients (100%) of SR group. In ER group, immediate procedure-related complications occurred in 2 cases (bleeding=1, perforation=1), and they were successfully treated by endoscopic procedure. There was no complication in SR group. There was no recurrence in 7 NETs reported as incomplete resection in margin, but all of 3 NEC patients (ER=1, SR=2) had recurrence during follow-up period. They were treated by additional chemotherapy and had no more disease progression. One metachronous recurrence occurred after complete ER, and it was treated by ER.

Conclusion: ER can be used as an effective method in treatment for a small-sized and low grade foregut NETs. However, additional treatment should be performed in the patients who were diagnosed as NEC from histological result after endoscopic treatment because it has high risk of recurrence rate.

Key Words: Endoscopic resection, Foregut neuroendocrine tumor

Effectiveness of Endoscopic Management for Anastomotic Leakage after Gastrectomy in Gastric Cancer

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Background and Aims: Anastomotic leakage after gastrectomy is an important determinant of early and late morbidity and mortality. Various methods for postoperative leakage are used including conservative, endoscopic or surgical treatment. We aimed to evaluate the effectiveness and safety of endoscopic intervention for the management of leakage after gastrectomy.

Patients and Methods: We retrospectively reviewed 40 patients with anastomotic leakage after gastrectomy for gastric cancer that was treated with endoscopic interventions between 2007 and 2013. Clinical aspects of leakages and endoscopic managements, closure rates and treatment related complications were evaluated.

Results: Anastomotic leakages were found at esophagojejunoanostomy (n=22), duodenal stump (n=13), gastroduodenostomy (n=3) or others (n=2). Median size of defect was 8mm (range, 2-25mm). The leakages were treated by endoclips (n=12), endoclips with detachable snare (n=20) or stent (n=8). Simultaneously, abscess around the leak was drained by external drains (n=26). After endoscopic treatment, complete closure was achieved in 27 patients (67.5%) and partial closure in 11 patients (27.5%). In all patients with partial closure, final closure of leak was achieved by continuing conservative treatment. Among remaining two patients, one with failed endoscopic treatment went on to receive surgery and the other died due to septic shock during endoscopic treatment. Treatment related complication (esophageal fistula) occurred in one patient who was treated with stent.

Conclusions: Endoscopic management using clips or stent represents an effective and safe method for anastomotic leakage after gastrectomy in gastric cancer and it can be an easily available minimally-invasive option which may reduce leakage related mortality and morbidity.

Key Words: Gastric cancer, Gastrectomy, Anastomotic leakage, Endoscopy
Stomach Volume Estimation Using 3D Reconstruction for Bariatric Endoluminal Gastroplasty

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Aim: The shape of stomach is variable among individuals and conditions, so bariatric procedures need to be individualized. If stomach is inflated to certain level by endoscopy and internal space is 3D reconstructed, 3D model could be constructed with precision. In this study, we constructed 3D model of stomach by endoscopy.

Methods: We conducted endoscopy for three patients. Stomach was inflated to the predetermined level and internal dimensions were measured using regularly marked endoscopic guide-wire. 3D model was constructed using this information and the volume was estimated. In addition, we planned simulated sleeve operation and endoluminal gastroplasty for 50% volume reduction.

Results: 3D reconstructed stomach of one patient is shown (Fig. 1). The estimated volume of stomach was 3.7 liter. The incision line for individualized sleeve operation is shown (Fig. 2).

Conclusion: Bariatric procedures are conducted increasingly. Personal stomach volume change after intervention is invaluable parameter for predicting treatment response. Also computerized simulation for optimal procedure is very useful for operators. In the absence of techniques for individualized stomach 3D modeling and volume estimation, this study would be important basic research for future bariatric procedures.

Key Words: 3D Reconstruction, Stomach, Endoscopy, Bariatric

Endoscopic Full-Thickness Resection with Laparoscopic Assistance for Gastric Subepithelial Tumors

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Background/Aims: Laparoscopic wedge resection using a linear stapler for gastric subepithelial tumor (SET) has the limitation such as the possibility of impairment of gastroesophageal junction, excessive normal tissue removal or deformity. To overcome this limitation, we attempt endoscopic full-thickness resection with laparoscopic assistance (EFTR with LA).

Methods: Twelve patients with gastric SET were prospectively enrolled. Partial circumferential mucosal precutting around SET was performed using intraluminal endoscopy with IT knife and Fixed flexible snare. The SET were turned outside to peritoneal cavity. Subsequently, the SET was dissected and sutured with a standard laparoscopic stapling device. Follow-up endoscopy was performed 3 months later. Primary outcome of this study was successful resection of gastric SET without complications.

Results: In all patients, gastric SET was successfully resected with EFTR with LA procedures. There were no complications and the postoperative courses were uneventful in all cases. Median port number (range) was 3.5 (1-6). Single port via umbilicus was possible in two patients. The procedure time was 62.5 (35-99) minutes. Estimated blood loss was 15 (5-50) ml. The time until the start of oral intake was 1 (1-4) days. The pathologic diagnosis of SET were gastrointestinal stromal tumor (n=6), leiomyoma (n=4) and Schwannoma (n=2). The size of tumors was 2.5 (2-6) cm. The locations of tumors were upper third (n=11) and mid third (n=1). Six SET was located in gastric cardia. Three month follow-up endoscopy showed no stenosis and intact esophagogastric junction.

Conclusion: The endoscopic full-thickness resection with laparoscopic assistance for the resection of gastric subepithelial tumors may be successfully and safely performed. In addition, preserving the esophagogastric junction and less port number was possible.

Key Words: Subepithelial tumor, Full-thickness resection, NOTES
Accuracy of Confocal Endomicroscopy versus Conventional Biopsies for the Diagnosis of Superficial Gastric Neoplasia

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Background: Probe type confocal laser endomicroscopy (pCLE) allows real-time in vivo histologic evaluation of gastrointestinal mucosal lesions. Although pCLE has been used for various GI disorders, the significance of pCLE for gastric lesions is largely unknown. We compared the accuracy of conventional endoscopic forceps biopsy and pCLE for diagnosis of superficial gastric neoplasia prior to endoscopic resection.

Methods: pCLE was performed prior to endoscopic resection of superficial gastric neoplasia previously diagnosed by endoscopic biopsy. The overall accuracy of endoscopic, in vivo pCLE, and offline pCLE diagnosis was compared with post-endoscopic resection histopathology.

Results: Endoscopic resection was performed on 54 lesions. On final histopathology, there were 3 non-neoplastic lesions, 19 gastric dysplasias, 22 differentiated adenocarcinomas and 10 undifferentiated adenocarcinomas. The overall agreement with final histopathology was substantial for conventional biopsies (κ=0.617 and excellent for in vivo pCLE (κ=0.824) (p<0.001). The overall accuracy for diagnosis of adenocarcinoma was 91.7% for pCLE and 85.2% for conventional biopsies (p=0.065). The combined accuracy of conventional endoscopic biopsies and pCLE was 98.1%.

Key Words: pCLE, Superficial gastric neoplasia, Conventional endoscopic biopsies

ESD Using a Thulium Laser: Preliminary Results of a New Method for Treatment of Gastric Epithelial Neoplasia

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Objective: Endoscopic submucosal dissection (ESD) has been accepted as the optimal treatment in gastric epithelial neoplasia. This study aimed to evaluate the safety and feasibility of a novel laser system when performing ESD of gastric epithelial neoplasia.

Methods: A total of 10 patients were enrolled into this study at a single tertiary referral center. All patients were diagnosed as gastric adenoma (n = 5) or adenocarcinoma (n = 5). They underwent ESD by a single expert endoscopist. A thulium 2-μm wavelength laser system was used for all ESD procedures including marking, mucosal incision and submucosal dissection. Instead of endoscopic knives, a prototype device (530-μm flexible silica fiber attached with metallic sheath) was inserted through the working channel of the endoscope. The main outcome measure was technical success and complication rates.

Results: In all patients, ESD was completed using only thulium laser without the need to change other endoscopic knives. The median time for total procedure was 49 minutes (range, 35-203 minutes). In 80% (n = 8/10) of patients, active bleeding was not observed during ESD. The final pathologic mapping resulted in low-grade dysplasia (n = 4), differentiated adenocarcinoma (n = 5), and signet ring cell carcinoma (n = 1). Curative resection was achieved in 90% (n = 9/10) of patients. There were no significant complications, such as delayed bleeding and perforation, in any patients.

Conclusions: The thulium laser system is safe and feasible in ESD of gastric epithelial neoplasia.

Key Words: Thulium Laser, ESD, Gastric Epithelial Neoplasm
Fluorescein-Enhanced Autofluorescence Imaging for Exact Tumor Margin in Superficial Gastric Neoplasia

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Background/Aims: In spite of advances in image enhanced endoscopy, sometimes we encounter ill-demarcated tumors during endoscopic submucosal dissection (ESD). Autofluorescence imaging (AFI) has been reported to be a clinically promising system to diagnose gastrointestinal neoplasia. However, the use of AFI has been limited. Fluorescence-enhanced AFI is a novel method using additional intravenous injection of fluorescein to AFI. The aim of this study was to investigate the feasibility of fluorescein-enhanced autofluorescence imaging (FAFI) for the exact tumor margin in superficial gastric neoplasia.

Methods: A total of 30 patients with superficial gastric neoplasia was performed ESD between May 2013 and July 2013. Prior to ESD, all of the tumors' size and lateral margin were evaluated with white light endoscopy (WLE), magnifying endoscopy with narrow band image (ME-NBI), chromoendoscopy (CE), AFI and FAFI. We compared the diagnostic efficacy of FAFI for exact lateral margin of the tumors with that of WLE, ME-NBI, CE, and AFI using grading system. We confirmed the tumor size and the margin by comparing endoscopic image and final pathology after ESD.

Results: Among 30 tumors, differentiated and undifferentiated adenocarcinoma was 16 (53.3 %) and 5 (16.7%). Mucosal cancer made up of 43.3% and submucosal cancer 23.3 %. The tumors showed 15 elevated, 5 flat, and 10 depressed types. The median tumor size was 15.5 mm. Complete resection rate was 83.3 %. Compared to WLE, FAFI showed significantly different diagnostic efficacy in case of the middle third location (p=0.029), >2 cm of tumor (p=0.046), and presence of ulceration (p=0.012). The tumor histology, depth of invasion and tumor type did not show a significant difference. Compared with ME-NBI and CE, FAFI did not show a significant difference in diagnostic efficacy.

Conclusion: FAFI seems to be useful system for determination of exact margin in superficial gastric neoplasia.

Key Words: Fluorescein, Autofluorescence image, Neoplasia, gastric

The New Classification of Transnasal Insertion Routes

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Background: Conventionally, upper gastrointestinal endoscopy has been conducted perorally under pharyngeal anesthesia. However, compression of the tongue root by the endoscope can easily cause gag reflex, which makes the endoscopy uncomfortable. In order to relieve any discomfort, an increasing number of facilities sedate the patient using sedatives before the endoscopic procedure; however, sedation of an ambulatory patient is indeed fraught with risk. Under the circumstances, the transnasal endoscopy enabled a less painful, safe procedure without sedation. Because of this, the recent prevalence of transnasal endoscopy is outstanding, and endoscopy became recognized as a routine upper gastrointestinal procedure. However, appropriate preparation and nasal anesthesia are essential to take full advantage of the examination. This time, in order to determine which route is safer and more suitable, Consequently we can classify these two routes into five new routes.

Subjects and Methods: We analysed all data for 328 cases (170 males and 158 females) underwent transnasal endoscopy in our clinic from May 30, 2013 to August 6, 2013. After we inserted rhinoscope through both routes in all patients, we decided their own type of routes. The transnasal endoscope used for this study was EG-530N, whose diameter was 5.9mm produced by FUJINON Corporation and the rhinoscope was ENT unit XU1 by CHAMMED Corporation.

Results and Conclusions: Among 328 cases performed in our clinic, the numbers of right side insertion were 188(59.3%), left side insertion were 129(40.7%), 11 cases were Type 0 route mean was none of the route can be inserted the endoscopy. By the new classification from Japan, type 1 route accounted for 297, type 2 route accounted for 11, type 3 route accounted for 9, type 0 route accounted for 11. According to these results, type 1 route should have been recommended in general.

Key Words: Transnasal endoscopy, Transnasal insertion routes, Five new routes
**UGI-81**

**Endoscopic Characteristics of Gastric Cytomegalovirus Infection in Patients with Renal Transplantation**

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**Background and Aims:** Endoscopic characteristics of gastric cytomegalovirus (CMV) infection are various and mimic other gastric diseases. The aim of this study was to figure out endoscopic features associated with gastric CMV infection.

**Patients and Methods:** Data of 301 renal transplant patients (RTPs) who underwent endoscopic examination with mucosal biopsies for CMV infection between March 2005 and July 2013 were reviewed retrospectively. Gastric CMV infection was confirmed by immunohistochemical staining and CMV PCR. Endoscopic characteristics of ulcers and erosions such as number, size, morphology, location, and exudates were evaluated for the potential risk factors of CMV infection. Result: Overall, 209 patients who showed ulcers (60, 28.7%) or erosions (185, 88.5%) confirmed by endoscopy were enrolled in the study. CMV infection was confirmed in 118 patients (56.5%). For ulcer lesions, round shape and antral location were significantly associated with CMV infection. For erosions, exudates attachment, raised type, and antral location were significantly more observed in CMV infection group. When patients had 2 ulcer risk factors (round shape and antral location) or 3 erosion risk factors (exudates, raised type, and antral location), CMV positive rate was 92.3% and 86.4%, respectively. In addition, patients with all 5 risk factors showed 100% CMV positive rate.

**Conclusions:** These endoscopic characteristics of ulcers and erosions might be helpful to predict gastric CMV infection in patients with renal transplantation. Further study is needed to validate the results of this study.

**Key Words:** Cytomegalovirus, Stomach, Renal transplantation

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**UGI-82**

**Effects of Time to Endoscopic Removal for Foreign Bodies according to the Intention to Ingestion**

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**Introduction:** There were few studies about the time effect on endoscopic removal for ingestion of foreign bodies or impaction of food bolus. We aimed to analyze the factors of foreign body ingestion and food material impaction in upper gastrointestinal tract with endoscopic management.

**Methods:** We retrospectively collected 141 patients with a diagnosis of foreign body ingestion or food bolus impaction in upper gastrointestinal tract confirmed by endoscopy at Dongguk University Ilsan hospital, Goyang, Korea from October 2005 to May 2013. Patient's demographic data included age, sex, past medical history, intention to ingestion, symptoms at admission, and comorbidities. Clinical features of foreign bodies were analyzed including type, size, shape, number, and location. Collected endoscopic data were duration of foreign body impaction, time to endoscopic removal, duration of endoscopy performance, endoscopic devices, the days of hospitalization, the complication rate, the mortality rate, and the number of operation related to foreign body removal.

**Results:** Overall complication rate was 67.2%, including erosions (40.5%), lacerations with minor bleeding (12.1%), ulcers (8.6%), petechiae (4.3%), and perforation (1.7%). Hospitalization was required in 45 cases (38.8%). In univariate analysis, accidental ingestion (\(p<0.001\)) and sharpness (\(p=0.001\)) were associated with higher complication rates. In multivariate analysis, accidental ingestion developed more complications (\(p<0.001\)). Cox regression analysis revealed that prolonged accidental ingestion and delayed endoscopic removal had a higher probability of complications than voluntary ingestion (Hazard ratio 2.25, 95% Confidence interval 1.15 to 4.40, \(p=0.018\)). There was no death associated with the procedure.

**Conclusions:** In case of accidental ingestion of foreign material, more urgent endoscopic treatment could be required to prevent the complications. Further prospective study would be needed.

**Key Words:** Foreign body, Endoscopy, Upper gastrointestinal tract
Endoscopic Hemostasis for Early Postoperative Anastomotic Bleeding after Gastrectomy
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Background/Aims: Postoperative anastomotic bleeding (PAB) is a relatively rare complication, however, it is lethal if not treated immediately. The aim of our study is to investigate the efficacy of the endoscopic hemostasis (EH) for early PAB.

Methods: Of 16,598 patients who underwent gastrectomy between January 2004 and May 2013 at Asan Medical Center, Seoul, Korea, EH for early (within 2 months) PAB was performed in 26 patients. The clinical outcomes, the methods of endoscopic bleeding control, and the factors for influencing the success of EH among these 26 patients were analyzed retrospectively.

Results: Of the 16,598 patients, early PAB developed in 110 patients (0.66%). Among them, EH for early PAB was performed in 26 patients. Median age (range) of 26 patients was 64.5 years (26.0-81.0 years) and men were 20 (76.9%). All the 26 patients underwent R0 gastrectomy with D2 lymph node dissection for gastric cancer and the median operation time (range) was 107.5 min (52-181). The technical and clinical success of EH were revealed as 69.2% (18/26) and 69.2% (18/26), respectively. For the methods of endoscopic bleeding control, hemoclips (14/26 [53.8%]), epinephrine injection (10/26 [38.5%]), and/or fibrin glue (6/26 [23.1%]) were used in EH, individually (19/26 [73.1%]) and compositively (7/26 [26.9%]). Among EH fail group (8/26 [30.8%]), reoperation and angioembolization were performed in 7 patients and 1 patient, respectively. PAB related death was observed only in 2 patients of EH fail group. There were no differences between endoscopic hemostasis success and fail groups, and no factors in influencing on success of EH.

Conclusions: PAB is an infrequent but potentially life-threatening complication. Endoscopy appears to be useful for both the confirmation of bleeding and therapeutic intervention.

Key Words: Anastomosis, Bleeding, Endoscopy, Gastrectomy, Hemostasis

Diagnosis and Treatment of Esophageal Tuberculosis: A Single Center Experience
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Background: The diagnosis of esophageal tuberculosis (ET) is challenging, because its clinical and pathological features are similar to other esophageal ulcerative lesions.

Methods: From the clinical and pathological database, we found 9 cases of esophageal tuberculosis between 1998 and 2013. Clinical, pathological, radiologic findings and treatment outcomes were reviewed.

Results: The presenting symptoms were dysphagia (n=6), and epigastric pain (n=3). The location of esophageal mucosal lesion was mostly mid-esophagus (n=8). The most common endoscopic shape was an ulcerative lesion with healed-up margin (n=6), followed by a perforating hole (n=1), an esophageal stenosis (n=1) and a submucosal tumor-like morphology (n=1). Endoscopic impression was mostly esophageal cancer (n=5), followed by esophageal laceration (n=1), pilled induced esophagitis (n=1) and esophageal submucosal tumor (n=1), and esophageal tuberculosis (n=1). In the esophageal endoscopic forcep biopsy (n=7) and the endobronchial ultrasound fine-needle aspiration (EBUS-FNA) of the subcarinal lymph node (n=1), the pathology was chronic granulomatous inflammation with or without necrosis. There was no definite histological evidence of tuberculosis. In the chest X-rays, 33% (3/8) had pulmonary tuberculous lesion(s). In the chest CT, 88% (7/8) had enlarged lymph node(s) at subcarinal or paraeophageal area. In the sputum AFB smear and culture, M. tuberculosis was detected in 25% (2/8). In the AFB smear and culture of aspirated fluid from enlargement lymph nodes, M. tuberculosis was detected in all tested patients (3/3). Anti-tuberculosis medications were given at least 6 months. The mucosal lesions were improved in the follow-up endoscopies at 2 to 6 months.

Conclusion: High index of suspicion is necessary for esophageal tuberculosis in patients with symptomatic esophageal ulcer and enlarged mediastinal lymph node(s).

Key Words: Esophageal tuberculosis, Esophageal ulcer, Mediastinal lymph node
Comparison of 4 Scoring Systems for Predicting Clinical Outcomes in Non-Variceal Upper Gastrointestinal Bleeding Patient

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Aim: This study aimed to validate four scoring system (pre-Rockall, full Rockall, Blatchford, AIMS 65) in Korean population and compare them for the prediction of re-bleeding and death in patients with acute non-variceal upper gastrointestinal bleeding (UGIB).

Materials and Methods: Between 2008 and 2013, data on 161 patients who had undergone endoscopy due to non-variceal UGIB were collected and reviewed retrospectively in Incheon St. Mary’s Hospital, The Catholic University of Korea. Admission history, clinical and laboratory data, endoscopic findings, treatment and clinical follow-up were recorded and investigated on the basis of three scoring systems. In subgroup analysis, we investigated patients presented with peptic ulcer bleeding with three scoring system and Forrest classification. Using ROC curves, we compared the three scores in the prediction of death, re-bleeding, endoscopic or surgical intervention and transfusion.

Results: Of the 161 study patients, eight patients died within 30 day, twelve patients experienced re-bleeding (7.5%), 34 patients needed additional endoscopic management (21.1%) and 97 patients required transfusion (60.2%). Comparison of the three scoring systems showed that the full Rockall score was superior to the others in predicting re-bleeding (AUROC, 0.80 ; p <0.0001), death (AUROC, 0.97; p <0.0001) and endoscopic intervention (AUROC,0.68; p=0.001). The Blatchford score was superior in predicting blood transfusions (AUROC, 0.86 ; p <0.0001). AIMS 65 score predicted 30-day mortality (AUROC, 0.75 ; p <0 .26). In 47 patients with peptic ulcer bleeding, the pre-Rockall, full Rockall score and Forrest classification were similar in predicting mortality and re-bleeding. Forrest classification was superior in predicting endoscopic intervention (AUROC,0.96; p <0.0001).

Conclusions: Full Rockall score was the most useful scoring system for the prediction of rebleeding and death in patients with nonvariceal UGIB.

Key Words: Upper gastrointestinal bleeding, Rockall score, Blatchford score, AIMS 65