The 14th JGES-ESGE Joint Symposium

Current Status and Future Vision
- Endoscopic Diagnosis and Therapy for Pancreato-Biliary Diseases -

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IS2-1 Endoscopic treatment for bile duct stones

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The treatment of common bile duct stones could be divided into several categories in terms of the various factors about difficulty of the procedure (e.g. stone related factor, bile duct related factor, anatomical factor, activity of cholangitis, etc.). We need to take those factors into consideration and evaluate the difficulty when planning treatment strategy. Recently, some new endoscopic technologies and techniques to overcome the so called “difficult stones” (e.g. large stones, altered anatomy, difficult cannulation cases, etc.) have been developed and spotlighted. On the other hand, in our daily clinical practice, more than 70% of cases are not difficult stones but “average stones” which are smaller than 10mm in normal anatomy. Even in those cases with average stones, there still remain some issues such as post endoscopic sphincterotomy bleeding, handling of antithrombotic agents, stone recurrence, etc.

Therefore, I would talk mainly about our treatment strategy of those average stones when using endoscopy. We found papillary balloon dilatation for 5 minutes with 10mm diameter balloon. In addition, I would like to touch on our experience of treatment options for the difficult stones using cholangioscopy, endoscopic ultrasonography and balloon assisted enteroscopy.

IS2-2 New techniques of cannulation of the papilla (double guide-wire, enteroscopy for altered anatomy...)

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Cannulation of the papilla on Water is the most challenging aspect of endoscopic procedures. (1)

Two “basic” techniques have been described: guidewire and control.

Guidewire cannulation is the most diffuse technique due to the reduced risk of pancreatitis, compared to contrast injection (1). A single guidewire is used to achieve the correct axis for the papillary orifice (2). The straight tip is frequently used but angled tip results in a faster cannulation according to a small trial from Finland (2). Nevertheless in case of failed bilo-pancreatic cannulation by guidewire, other techniques are part of the armamentarium, and need to be considered in a sequential order:

- Double guide-wire cannulation placement of a guidewire into the pancreatic duct to stabilize the papilla and find the correct axis for biliary cannulation with a second guidewire (in this case prophylactic pancreatic stenting is recommended).
- Transpapillary retrograde cholangiography
- Transpapillary biliary sphincterotomy
- Antegrade biliary cannulation by PTC or EUS
- Repeat the ERCP after 48-72 hours

IS2-3 Current Status and Future Vision of EUS-guided biliary drainage

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In patients with inoperable malignant biliary strictures, endoscopic retrograde cholangiopancreatography (ERCP)-guided biliary stenting fails in 10% of patients due to difficult cannulation, difficult access, or altered anatomy. In successful ERCP cases, percutaneous transhepatic biliary drainage (PTBD) was well established as alternatives in these conditions. Moreover, hospital stay, higher patient discomfort and frequent reinterventions were reported. Surgical bypass was a well-established method in high success rate too, but aggressive for advanced stage patients. Endoscopic ultrasound-guided biliary drainage (EUS-BD) has recently emerged as an effective alternative biliary drainage method after unsuccessful ERCP. EUS-BD can be essentially divided into 3 different techniques (1) (2) (3) (4): (1) EUS-guided transmural biliary drainage including choledochoduodenostomy (EUS-CDs) and hepatoduodenostomy (EUS-HDS); (2) EUS-rendezvous technique; and (3) EUS-guided approach. All of these procedures are very useful and we can select the procedures depend on the patient’s conditions.

Today, we focus on the current status and future vision of EUS-BD, especially in EUS-guided transmural biliary drainage. Both EUS-CDs and EUS-HDS were already well-established as alternatives to percutaneous transhepatic biliary drainage (PTBD). These procedures have high success rates and clinical success rates (more than 90%) in high-volume centers. Complications for both procedures remain high at about 10% by well-experienced physician. But, not severe complications at all. So, for inoperable malignant biliary obstruction, EUS-BD can be a first-line drainage procedure after unsuccessful ERCP. EUS-BD is much higher successful rate than balloon-assisted ERCP. If both EUS-CDs and EUS-HDS are available, we should select EUS-CDs, as published data. After special devices for EUS-BD are advanced, EUS-BD will potentially become first-line biliary drainage procedure for inoperable malignant lower bile duct obstruction in the near future. We can decrease the complications and we can increase the success rate after special devices are available.

IS2-4 Prevention and management of ERCP related complications

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Endoscopic retrograde cholangiopancreatography (ERCP) plays a crucial in the therapeutic management of biliary-pancreatic diseases. However, it is an invasive technique that can involve certain risk for the patient, even when it is performed by experienced operators. In the overall patient population, EUS-CDs and EUS-HDS were already well-established as alternatives to percutaneous transhepatic biliary drainage (PTBD). These procedures have high success rates and clinical success rates (more than 90%) in high-volume centers. Complications for both procedures remain high at about 10% by well-experienced physician. But, not severe complications at all. So, for inoperable malignant biliary obstruction, EUS-BD is much higher successful rate than balloon-assisted ERCP. If both EUS-CDs and EUS-HDS are available, we should select EUS-CDs, as published data. After special devices for EUS-BD are advanced, EUS-BD will potentially become first-line biliary drainage procedure for inoperable malignant lower bile duct obstruction in the near future. We can decrease the complications and we can increase the success rate after special devices are available.

Table 1: Risk factors related to post-ERCP AP

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<th>Risk factors</th>
<th>Post-ERCP AP</th>
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<td>Patient-related: young age, female, previous AP, recurrent AP, normal bili, duodenal wall, type I ampulla, and type III distal bile duct.</td>
<td>Increase the risk for the patient, even when it is performed by experienced operators.</td>
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<tr>
<td>Operator-related: less experience</td>
<td>Increase the risk for the patient, even when it is performed by experienced operators.</td>
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<tr>
<td>Procedure-related: difficult cannulation, high number of cannulation attempts, pancreatic injection or cannulation</td>
<td>Increase the risk for the patient, even when it is performed by experienced operators.</td>
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Prevention strategies for avoiding post-ERCP AP include careful patient selection, avoiding pancreatic injection, administration of intra-arterial neusudin and inflammatory drugs, and insertion of a temporary small caliber pancreatic stent. Per-procedural IV fluid administration has also been described as beneficial.

The incidence of ERCP-related perforations is estimated at 0.3-6% and is classified according to location: type I involving the lateral duodenal wall, type II the ampulla and type III the distal bile duct. Type I requires endoscopic clip closure or surgery whereas type II can be managed conservatively with antibiotics, biliary and/or pancreatic drainage.

Hemorrhage (0.3%) can occur in patients with coagulopathy undergoing sphincterotomy. It can be avoided by correcting clotting deficiencies, using blended current for biliary sphincterotomy and prophylactic saphenoprosthetic or splinting patients. Infection (cholangitis, described in 0.3% of cases, can be avoided by administering antibiotics in case the biliary drainage is not complete, such as hilar strictures.

Like in all endoscopic procedures, all possible means should be utilized to prevent complications. Nevertheless, it is important to recognize and correctly diagnose a procedure-related complication, if it occurs, and handle it accordingly.
IS2-5  Optimization of pancreatic mass diagnosis: fine needle aspiration, real-time elastography, contrast-enhanced endoscopic ultrasound (EUS) imaging. Although EUS-guided fine needle aspiration improved the introduction of new needles, the sensitivity and specificity are still not perfect. False-negative results are encountered during the initial diagnostic approach of the patients with focal pancreatic masses. However, the possibility of combining cytology with microchameter and the usage of histological needle improved considerably the spectrum of EUS-guided FNA biopsy procedures. Real-time sono-elastography also allows estimation of tissue strain during tissue compression induced by vessel pulsations and movements. Published data supports the added value of EUS elastography for the differential diagnosis of benign and malignant focal pancreatic masses, despite the high sensitivity but quite low specificity of the technique.

Contrast-enhanced EUS seems to be more promising, being an established indication for differentiation of focal pancreatic masses (especially hypoenhancing pancreatic adenocarcinoma compared to iso- or hyper-enhancing mass-forming chronic pancreatitis or neuroendocrine tumors). Usage of contrast-enhanced EUS was also suggested for targeting of enhanced viable areas as opposed to non-enhanced necrotic areas. Other techniques like tridimensional (3D) EUS or fusion imaging (EUS fused with computed tomography or magnetic resonance imaging) are not used in the daily clinical practice algorithm, although several studies highlighted their possible role for the management of difficult cases.

Improvement of EUS technique indicate that this is the method of choice for detection and differentiation of focal pancreatic masses, especially in the context of newly developed molecular targeted therapies for pancreatic malignancy, either adenocarcinoma, neuroendocrine or other rare tumors.

IS2-6  Endoscopic treatment for pancreatic duct stricture

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In these days the development of endoscopic technology is remarkable, and various endoscopic treatments can be performed for pancreatic diseases. As a recent topic, a new digital pancreatoscopy has been released with marked improvements in terms of the image quality and system setup and contributes to pancreatic masses diagnosis and treatment. In the diagnostic procedure, biopsies from the target lesion were attempted under peroral pancreatoscopy guidance using the dedicated biopsy forceps. In the therapeutic procedure, peroral pancreatoscopy guided lithotripsy using electrohydraulic lithotripsy (EHL) / laser lithotripsy (LL) and guidewire manipulation for structures or a migrated stent were performed. The development of interventional EUS has suggested an alternative for difficult ERCP procedures. Several EUS-guided pancreatic interventions have been reported. Patients with recurrent acute pancreatitis and epigastric pain as a result of pancreatic duct (PD) stricture or stenotic pancreaticodigestive anastomosis require treatment for ductal decompression. However, conventional ERCP is sometimes technically unsuccessful as a result of difficult cannulation or strong PD stricture, or because there is no possible approach to the major papilla, for example, structure of the duodenum. Furthermore, among patients who undergo pancreaticoduodenectomy, approach to the pancreatic duct from the digestive tract side is technically difficult and sometimes impossible. EUS-guided PD drainage (EUS-PD) has been described as a rescue technique for the management of patients in whom ERCP is unsuccessful. EUS-guided transmural stenting using plastic stents was performed in cases in which advancing a guidewire across the anatomosis site was impossible, when the major papilla was under complete pancreatic obstruction, or when the PD had a tortuous configuration. However, rates of complications, including bleeding, perforation are typically higher for transmural stenting than for simple rendezvous placement. Recently, EUS-guided pancreatic duct drainage using a PCSEMS was reported that it may be technically feasible and relatively safe without adverse events related to PCSEMSs, including stent migration, clogging, and stent-induced ductal stricture. Herein, we report the usefulness of ERCP procedure with the new digital pancreatoscopy and EUS-guided pancreatic interventions including our experiments.

IS2-7  Endoscopic diagnosis and treatment for pancreatic cystic lesions

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We increasingly encounter pancreatic cystic lesions in clinical practice and the differential diagnoses vary widely from benign inflammatory process to malignant neoplasms. For pancreatic cystic neoplasms (PCN), radiological evaluation such as CT and MRI can be inconclusive and EUS, and sometimes ERCP, play an important role. While ERCP can precisely evaluate pancreatic ductal change, EUS can image parenchymal, ductal and cystic change of the pancreas. While EUS-guided fine-needle aspiration (EUS-FNA) of PCN is performed for both cytological evaluation and cyst fluid analysis, the diagnostic yield is unsatisfactory and has a potential risk of tumor dissemination. Recently, novel through-the-needle procedures under EUS-FNA such as confocal laserendomicroscopy (CLE) and mini-forceps biopsy are expected to attribute to a better diagnostic yield. Needle-based CLE (nCLE) for PCN has been investigated to overcome the limitation of EUS-FNA and specific findings for various PCN are developed. In addition to EUS-guided diagnostic approach, the evidence of EUS-guided cyst ablation has been also accumulating. A recent Korean study shows promising long term outcomes after EUS-guided cyst ablation for PCN. For benign inflammatory process, pancreatic pseudocyst (PC) and walled-off necrosis (WON) are two major entities which need endoscopic interventions. In cases with symptomatic PC and WON refractory to conservative management, a step-up approach is recommended and EUS-guided drainage is the current standard of care, followed by endoscopic necrosectomy and surgical necrosectomy. Recently, lumen apposing metal stents are utilized for better drainage of PC and WON and might be associated with better clinical success and less procedures. In cases refractory to EUS-guided drainage, endoscopic necrosectomy can be performed through the fistula, which may avoid invasive surgical necrosectomy but has a potential risk of severe adverse events such as bleeding and air embolism. In summary, EUS is essential both for diagnosis and treatment of pancreatic cystic lesions and its role is still expanding.