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Review Article

For Biliary Stones, Eus And Ercp In The Same Session: From Risk Assessment To Treatment Approach In Various Clinical Situations.

Pitro Fusarol and Andra Lisoti.

Nanjing Medical University, Nanjing, PR China.

Abstract

The preferred treatment for choledocholithiasis is endoscopic retrograde cholangiopancreatography (ERCP) with sphincterotomy and stone extraction, which can successfully clear the common bile duct (CBD) in as many as 90% of cases. The best diagnostic accuracy for CBD stones is provided by endoscopic ultrasound (EUS), which has a sensitivity and specificity range of 89–94% and 94–95%, respectively. The fields of EUS and ERCP, which were once thought to be distinct entities, have lately united under the new field of bilio-pancreatic endoscopy.However, due to the intricacy of both EUS and ERCP, the European Society of Gastrointestinal endoscopic recently recommended that endoscopic quality be given high priority in its curricular requirements. There are a number of clinical advantages to performing EUS and ERCP in the same session, including the use of real-time information from EUS, the use of a single sedation for both biliary stone diagnosis and treatment, a decreased risk of cholangitis or acute pancreatitis during the waiting period for ERCP following EUS diagnosis, and, in the end, a reduction in hospital stay and expenses while maintaining patient outcomes. Pregnant women, those who are not surgically fit, patients with symptoms following a cholecystectomy, and people at high risk for CBD stones are all possible candidates for the same session method. The primary technical features and supporting data from the literature on EUS and ERCP in the treatment of choledocholithiasis are included in this narrative review.

Keywords : *endosonography; EUS; ERCP; choledocholithiasis; biliary stones; same session.*

INTRODUCTION

The preferred treatment for choledocholithiasis is endoscopic retrograde cholangiopancreatography (ERCP) with sphincterotomy and stone extraction, which can successfully clear the common bile duct (CBD) in up to 90% of cases with comparatively minimal morbidity (about 5%) [1]. The biliary tree anatomy (i.e., biliary structures, surgical changes), the experience of the surgeons, the comorbidities of the patients, and the stone characteristics (number, size, form, and position within the biliary tree) all affect the success rate of ERCP.

With sensitivity and specificity ranging from 89 to 94% and 94 to 95%, respectively, endoscopic ultrasonography (EUS) offers the highest diagnostic accuracy for CBD stones when used with both radial and linear echoendoscopes [2]. Additionally, EUS offers comprehensive details on the anatomy of the biliary tree and related pancreaticobiliary disorders. EUS was first developed as a diagnostic test to get beyond the current obstacles to pancreatic inspection, but it has since changed as a result of relentless scientific and technical progress [3]. Electronic scanning with color Doppler [4, 5], fine needle aspiration/biopsy (FNA/B), which permits tissue sampling [6, 7], and image enhancement techniques using ultrasound contrast agents and elastography, which enable improved identification and characterization of the lesions of interest [8,9], have been the technique's main advancements.

The fields of EUS and ERCP, which were once thought to be distinct entities, have lately united under the new field of bilio-pancreatic endoscopy. In order to achieve the greatest results, modern endoscopists frequently possess both skills and employ them either in tandem or separately.

Highlighting and discussing the key technical features and supporting data from the literature about EUS and ERCP in the treatment of choledocholithiasis is the aim of this narrative review.

EUS AND ERCP CURRICULUM

The European Society of Gastrointestinal endoscopic (ESGE) has made endoscopic quality a primary goal because to the complexity of both EUS and ERCP [10]. Unfortunately, defined guidelines for excellent training in the art of bilio-pancreatic

***Corresponding Author:** Pitro Fusarol, Nanjing Medical University, Nanjing, PR China.
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endoscopy are still lacking in many countries [11].

Among all endoscopic procedures, the ESGE specifically asserts that interventional EUS and ERCP carry the highest risk of fatalities and major complications [12]. Because of this, before beginning training in ERCP or EUS, endoscopists should have become proficient in conventional upper endoscopy.

The ESGE's primary training requirements include participation in formal courses and self-directed study for a minimum of 12 months, as well as organized supervised ERCP/EUS simulator-based learning prior to hands-on training. To become competent in advanced ERCP and therapeutic EUS, one must complete at least one more year of focused training in a high-volume facility. Physicians are thought to need to have performed at least 250 EUS and 300 ERCP in order to demonstrate proficiency, even though the number of procedures completed is not the best way to measure operators' experience.

Based on these tenets, it is important to first evaluate the availability of competent physicians before implementing a combination of EUS and ERCP in the same session, since proper training in both is far from simple and quick.

But what exactly does the ESGE describe as competence? It is the capacity to autonomously determine the necessity of and execute safe, effective procedures with high patient satisfaction in a variety of clinical settings and case types. To evaluate the development of competence, formal assessment instruments must to be employed on a regular basis throughout training.

Finally, before starting autonomous practice in ERCP and EUS, a trainee should go through a thorough summative assessment process. Endoscopists should be encouraged to continue a period of mentored practice with an experienced colleague after they have gained proficiency in ERCP and EUS. Once more, it is clear that implementing EUS/ERCP combined sessions necessitates ongoing communication with other expert centers to sustain competency in addition to an initial positive operator experience.

MANAGEMENT OF CHOLEDOCHOLITHIAS

Prior to recently, patients with gallbladder stones who were at low risk for CBD stones (<10%) should have direct laparoscopic cholecystectomy, while those who were at high risk (>50%) for CBD stones should have direct ERCP, according to the American Society for Gastrointestinal Endoscopy (ASGE) guidelines [13]. Between the two groups, there was a sizable population of patients who were at intermediate risk for CBD stones; for these patients, a number of tests, such as EUS or magnetic resonance cholangiopan-creatography, were advised in order to identify CBD stones and determine whether ERCP was necessary.

The panel of ASGE experts updated the 2010 criterion to reduce the likelihood of diagnostic ERCP, which carries a high risk but little benefit, after examining the entire body of recent data [14]. The following high-risk criteria were determined to indicate direct ERCP for suspected choledocholithiasis in order to reduce the risk of diagnostic ERCP: ascending cholangitis, dilated CBD on imaging (>6 mm with gallbladder in situ, >8 mm in status post-cholecystectomy), or CBD stone on ultrasound or cross-sectional imaging or total bilirubin >4 mg/dL. EUS or other imaging was still recommended for patients with less risk factors.

In patients with ongoing clinical suspicion but insufficient abdominal ultrasonography evidence of stones, the ESGE recommendations on the same subject suggested using EUS (or magnetic resonance cholangiopancreatography) to identify CBD stones [15]. Furthermore, the 2018 revision of the Tokyo guidelines [16] categorized the timing of biliary drainage in patients with acute cholangitis into three categories: (a) as soon as possible and within 12 hours for patients with septic shock, (b) within 48–72 hours for moderate cases, and (c) elective for mild cases.

As we can see, both the ASGE and the ESGE guidelines restrict the use of EUS in evaluating patients with suspected choledocholithiasis to intermediate-risk categories. Furthermore, not much is spoken regarding EUS and ERCP in the same session.

Nonetheless, we hypothesize that EUS is recommended in most instances prior to ERCP since it provides valuable information (beyond the simple diagnosis of CBD stones) that may help with the technical results of ERCP [17]. Additionally, while this policy cannot be saved for all situations, it may be advantageous to combine EUS and ERCP in the same session.

EUS BEFORE ERCP

EUS must always be performed first in intermediate-risk phases of choledocholithiasis in order to ascertain whether ERCP is later recommended. These patients typically have cholestasis-related biliary illness symptoms, whether or not they have CBD dilatation. Scheduling EUS and ERCP in the same session for these individuals does not seem warranted because resources may not be properly utilized when ERCP is not required. Indeed, by ruling out choledocholithiasis, preliminary EUS prevented ERCP in 67% of patients, according to a comprehensive review [18].

EUS can still be very informative when the pretest chance of choledocholithiasis is higher, as is the case with the high-risk cases detected by the ASGE (see above) [19]. A preliminary EUS may ultimately result in improved patient outcomes, despite the fact that some support the performance of ERCP.

First, a lower incidence of post-ERCP pancreatitis was the primary cause of the notable overall decrease in adverse events observed in patients with prior EUS as opposed to

those who proceeded straight to ERCP.

Second, the appropriate treatment plan can frequently be planned with the help of EUS's good diagnostic accuracy for CBD stones and its findings on stone size and number [20]. Figure 1. Specifically, anticipating the anticipated level of complexity of the ERCP technique is made possible by doing EUS prior to ERCP [21]. To increase success rates while minimizing adverse events, doctors may therefore pre-plan the use of ancillary procedures like cholangioscopy, electrohydraulic or laser lithotripsy, large balloon dilation, and even referral to other facilities [22].

EUS AND ERCP IN THE SAME SESSION

Performing EUS and ERCP in the same session has several clinical benefits, including the ability to use real-time information from EUS, a single sedation for both biliary stone diagnosis and treatment, a decreased risk of cholangitis or acute pancreatitis while awaiting ERCP following EUS diagnosis, and ultimately a reduction in hospital stay and expenses while maintaining patient outcomes (Table 1). Pregnant women, those who are not surgically fit, patients with symptoms following a cholecystectomy, and patients at high risk developing CBD stones are all possible candidates for the same session method.

Since biliary stones can either travel inside the biliary tree or migrate into the duodenum, information from EUS tends to become outdated quickly. Patients who had EUS and ERCP in the same session (n = 33, 28.4%), within a week (n = 42, 36.2%), or after more than a week (n = 41, 35.3%) were the subjects of our report [20]. As anticipated, the concordance between the two endoscopic procedures was impacted by the time between EUS and ERCP. Specifically, compared to all other cases, EUS results were substantially more accurate in patients who had ERCP in the same session.

In terms of procedure duration, length of stay, expenses, and less problems, these findings are consistent with the literature that reports improved clinical outcomes for the same session method [23]. For the treatment of CBD stones, there is therefore strong evidence to support the idea that the time between EUS and ERCP should be as brief as feasible, in addition to the clinical data that is now available.

When EUS and ERCP are performed in the same session, the risk of complications is lower, and a far lower dosage of propofol is needed for sedation than when the procedures are performed separately. Vila et al. contrasted 46 individuals who had different procedures with 39 patients who had the same session strategy. Interestingly, the dose of propofol varied significantly, being lower with the same session strategy (322 ± 250 vs. 516 ± 289 mg; p = 0.001), even if the total procedural time did not differ significantly between the two groups [24]. Age, sex, anesthesiological risk, diagnostic yield, and treatment interventions did not differ between the two groups.

The total probability of unfavorable occurrences appears to be decreased by using the same session method. According to a 6-year study by Benjaminov et al. at their Israeli facility, 151 patients had CBD stones that were confirmed by EUS and later developed ERCP [25]. Compared to none in the same session group, four (5%) patients in the separate-session group experienced a significant complication—one hemorrhage, one perforation, and two fatal post-ERCP pancreatitis. Both groups showed no signs of sedation-related problems. Furthermore, while waiting for ERCP, 11 out of 80 patients (14%) experienced clinical problems such as cholangitis, biliary discomfort, and acute biliary pancreatitis, while none of the patients in the same session group experienced any of these.

The same session strategy can also have a good impact on organizational and economic elements. Fabbri et al. provided a good example of this by randomly assigning 80 patients to either the same-session or separate-session strategy [26]. Even though 33 cases of needless ERCP were prevented by negative EUS, same session EUS-ERCP resulted in shorter treatment times, shorter hospital stays (an average of 2.5 days shorter than the separate-session method), and cheaper hospital and endoscopic administrative budget expenses.

However, the same session technique also has a few minor disadvantages. Specifically, a negative EUS for CBD stones would eliminate the need for ERCP and, as a result, incorrectly allocate endoscopic time. It may be necessary to slightly overbook in order to offset this risk. In any event, thorough informed consent prior to the procedure is always required, as is precise patient selection. Finally, when patients are ready for the same session approach and ERCP finally proves to be not indicated, needless anticoagulant withdrawals may take place.

OVERCOMING ERCP LIMITATIONS WITH EUS

Along with the benefits of the same session EUS-ERCP linear method (i.e., EUS first, followed by ERCP), there are situations when going back to EUS is required due to ERCP restrictions and failures.

Following a failed biliary cannulation, EUS rendezvous is an option to interventional radiology-guided rendezvous that can be carried out during the same endoscopic session (CP). A recent percentage meta-analysis and comprehensive review with 342 patients showed a pooled technical success rate of 86% [27]. Adverse events happened in 14% of cases, whereas the combined clinical success rate was 81%. As usual, facilities with a high level of skill in bilio-pancreatic therapeutic endoscopy are ideally suited for these sophisticated operations due to the possibility of adverse outcomes.

When cannulation fails because of peri-ampullary diverticulum or post-surgical anatomical alterations, additional ERCP limits may be encountered. 170 cases of salvage EUS-guided ductal access and drainage ERCP failures were documented by Garcia–Alonso et al. [28]. About half of the cases had EUS-guided drainage treatments that were carried out in anticipation of ERCP failures rather than after they occurred (e.g., post-surgical anatomy). With nearly 2000 ERCP surgeries, the overall rate of EUS salvage was 7.7%. It's interesting to note that rather than a lack of ERCP expertise, this high EUS salvage rate was caused by a broad definition of ERCP failure, disease complexity, and limiting percutaneous drainage utilization.

The same group also described a case of EUS-guided choledocho-duodenostomy with an electrocautery-enhanced lumen-apposing metal stent in a patient who had a massive periampullary diverticulum causing benign biliary blockage [29].

Finally, in non-surgical candidates, ERCP can be combined with EUS-guided gallbladder drainage (GBD) [30]. We owe the description of same session ERCP and EUS-GBD as a method to treat gallstone disease in selected patients in a comprehensive manner to the same Spanish group of studies mentioned before [31].

As a total therapy of gallstone disease using just endoscopic methods, the technical and clinical success rates of the combined operations were similar to those of EUS-GBD alone, suggesting that EUS-GBD and ERCP can be used together without increasing adverse effects.

CONCLUSIONS

Bilio-pancreatic endoscopy is a new endoscopic art that combines the very sophisticated procedures of EUS and ERCP. Accurate training planning and competence maintenance are crucial given the abilities needed to carry out these difficult tasks. EUS is always helpful in obtaining all the diagnostic aspects that are relevant to the proper therapy with ERCP in patients who may have suspected CBD stones. EUS and ERCP work together to minimize side effects and treatment failure by achieving the best technical and clinical results, especially in complex instances, when done in the same session.

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