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EDITORIAL

Decompression of Malignant Biliary Obstruction After Failed ERCP: To EUSBD and Not to PTBD?

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Although endoscopic retrograde cholangiopancreatography (ERCP) with biliary drainage is the most common procedure used to palliate patients with malignant biliary obstruction, it is unsuccessful in 3–10 % of cases [1, 2]. Failure occurs due to operator inexperience, anatomic variation, tumor extension, prior surgery, and/or incomplete drainage [3, 4]. Percutaneous transhepatic biliary drainage (PTBD) or surgical bypass is often employed after failed ERCP but is associated with a higher morbidity and mortality [3, 5]. Recently, endoscopic ultrasound-guided biliary drainage (EUSBD) has been used as an alternative for patients with failed ERCP. Since it was first described in 2001 by Giovannini et al. [6], many reports have been published focusing on its indications, technique modifications, and efficacy. There is, however, a paucity of literature regarding comparison of EUSBD and PTBD.

EUSBD may have advantages over PTBD including avoidance of vascular injury, lack of interference by ascites, and internal drainage within a single session [3, 4, 6, 7]. Moreover, EUSBD can be successfully performed even in patients who have undergone total gastrectomy or partial gastrectomy with a Billroth II reconstruction. EUSBD procedures exist in three categories—(1) EUS-guided transluminal biliary drainage including choledochoduodenostomy (EUS-CD) and hepaticogastrostomy (EUS-HG), (2) EUS-rendezvous technique (EUS-RV), and (3) EUS-antegrade approach (EUS-AG) [8]. In EUS-guided transluminal biliary drainage, after visualizing the dilated biliary duct under EUS guidance, a fistula is created between upper intestine and bile duct. The fistula is dilated, and stent is deployed for biliary drainage. This technique is divided further into hepaticogastrostomy (HGS), in which the fistula is made between the stomach and intrahepatic bile duct (IHBD) of the left lobe, and choledochoduodenostomy (CDS), in which the fistula is created between the duodenal bulb and extrahepatic bile duct (EHBD). Covered metal stents (CMS) are preferred over plastic stents to minimize biliary leak and pneumoperitoneum. Yet, stent migration is a serious complication that can occur shortly after stent deployment. In the EUS-rendezvous technique, the biliary duct is accessed under EUS and fluoroscopic guidance and a fistula is created followed by guidewire placement via the biliary duct and ampulla into the duodenum. With the help of the rendezvous technique, biliary cannulation is achieved. EUS-RV should be attempted for patients with an endoscopically accessible ampulla after failed ERCP. EUS-RV can be divided into IHBD and EHBD approaches. Kahaleh et al. [4] reported a lower risk of biliary leak with the IHBD approach, as compared to the EHBD approach. Theoretically, the IHBD approach may reduce the risk of bile leakage because the liver parenchyma around the bile duct can tamponade the fistula. Nevertheless, the success rate is the most important factor, as proper biliary drainage can reduce bile leakage and treat bile peritonitis. With EUS-guided antegrade drainage, the IHBD is accessed from the upper intestine with creation of a temporary fistula between the intestine and IHBD. After dilation of the fistula, a self-expanding metal stent (SEMS) is deployed across biliary obstruction in an antegrade fashion. Although this technique is suitable for biliary obstruction in patients with surgically altered anatomy or with upper intestinal obstruction where endoscopic access to the ampulla is not possible, the selection of EUS-BD techniques is more complex: EUS-RV can be a first-line EUS-BD technique in patients with an endoscopically

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accessible ampulla. If endoscopic access to the ampulla is impossible, EUS-AG is a suitable option. EUS-CDS and HGS can be used for either an accessible or inaccessible ampulla.

Artifon et al. [7] compared EUS-CD and PTBD in 25 patients with distal biliary malignant obstruction. Baseline characteristics of the two groups, including the size of the bile ducts and degree of hyperbilirubinemia, were similar. The technical success and outcomes, including the degree of improvement in serum bilirubin levels, length of hospital stay, quality-of-life, and complication rate in both groups, were similar. The overall complication rate in the EUS-CD group was 15 % with only one bile leak. A trend toward lower cost of EUS-CD compared with PTBD was not statistically significant. No migration was reported for the partially covered SEMS that was used. Although the authors concluded that EUS-CD can be an effective and safe alternative to PTBD, the study was underpowered.

In the current issue of *Digestive Diseases and Sciences*, Khashab et al. [9] report a retrospective comparative cohort study of 73 patients with distal malignant biliary obstruction who failed ERCP and subsequently underwent PTBD or EUSBD. For the initial enrollees, EUSBD was attempted by EUS-RV followed by EUS-CD if the former failed. Although the technical success in PTBD group was significantly higher (100 vs. 86 %), outcomes and length of hospital stay were not statistically different between patients treated with the two techniques. In the PTBD group, the degree of improvement in serum bilirubin levels was lower, and adverse events, number of re-interventions and total cost were higher than in the EUSBD group. Although the main adverse event of EUSBD is bile leakage, especially if stent insertion is unsuccessful [3], none of the EUSBD patients in the current study experienced bile leak, whereas a leak occurred in 20 % of those treated with PTBD. The absence of any bile leaks in the EUSBD group may be related to the use of electrocautery in only a single patient. Park et al. [10] have reported a higher risk of post-procedure adverse events in patients undergoing EUSBD when a needle-knife is used. Stent migration occurred in one patient in the EUSBD group and two in the PTBD group. The lower rate of stent migration in EUSBD may be due to the use of partially covered SEMS; however, the precise type and model of metal stent used were not specified.

There are few potential limitations of the Khashab study, including the retrospective design, which may have introduced selection bias, and a study design in which the later enrolled subjects who underwent PTBD only after ERCP and then EUSBD were unsuccessful. Some of the complications attributed to PTBD might hence have indeed been due to failed EUSBD. Finally, since a plastic stent was inserted during PTBD as opposed to a metal stent during EUSBD, the plastic stent may have been responsible for the higher number of re-interventions and ultimately the higher total cost in the PTBD group.

EUSBD is a novel and promising modality for biliary decompression in patients in whom ERCP was unsuccessful. As highlighted in the current study, it is feasible, highly successful, and safe. It provides some advantages over PTBD and, in experienced centers, has become the procedure of choice in patients with obstructive jaundice who have failed decompression via ERCP. Although the study by Khashab et al. [9] is a significant contribution to the literature, well-designed, prospective, direct comparative studies are needed to confirm whether EUSBD is indeed superior to PTBD.

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