Algorithm for EUS-BD: Choice of Access Route, Direction of Stent Insertion and Drainage Route

Do Hyun Park, M.D., Ph.D.
Department of Internal Medicine, Division of Gastroenterology, University of Ulsan College of Medicine, Asan Medical Center, Seoul, Korea

Introduction

Despite high technical success of endoscopic retrograde cholangiopancreatography (ERCP), about 5-7% of ERCP cases could be unsuccessful in patients with biliary obstruction due to accompanying duodenal obstruction, periampullary tumor infiltration, or surgically altered anatomy. After failed ERCP, percutaneous transhepatic biliary drainage (PTBD) is the standard management for biliary decompression. However, PTBD may be uncomfortable for patients owing to external drainage tube. Furthermore, adverse events related to external drainage including tube malposition, hemobilia, or cholangitis are not uncommon. This may be related to unscheduled reintervention and longer hospital stay. 20 years ago, EUS-BD has been introduced as an alternative to PTBD in patients with failed ERCP. This procedure can be performed in same endoscopic room when ERCP was unsuccessful. In this lecture, algorithm for EUS-BD regarding choice of access route, direction of stent insertion, and drainage route will be discussed.

Algorithm for EUS-BD

1. Choice of access route

For successful EUS-BD, the choice of best access point may be a most important step. In EUS-guided hepaticocholedochostomy (EUS-HGS), B2 (the bile duct of segment 2) may be a better position for EUS-guided antegrade stenting or rendezvous than B3 (the bile duct of segment 3) approach. The approach of B2 may be a straight direction to hilum rather than B3 and this direction may be useful for guidewire manipulation. In terms of transmural stenting, B2 or B3 can be equally considered. Based on our study, over 5 cm dilatation of intrahepatic duct and less than 3cm distance between mural wall and punctured intrahepatic duct may be a predictor of successful EUS-HGS with transmural stenting.

In EUS-guided choledochojejunoanastomosis (EUS-CDS), duodenal bulb is the best access point. For EUS-guided CD with transmural stenting, the axis of EUS FNA needle could be positioned towards the hilum. While, the axis of EUS FNA needle could be positioned alongside the the axis of distal bile duct for EUS-guided rendezvous technique. For this, echoendoscope can be firstly placed in the second duodenum. This approach may be more ideal for guidewire manipulation for passing the guidewire to the duodenum.
Fig. 1. (A) Echoendoscope could be placed alongside the longitudinal axis of common bile duct in EUS-guided cholecystocholedochoduodenostomy (EUS-CDS) with transmural stenting as “tram-track sign”. (B, C) EUS-CDS with transmural stenting, the axis of guidewire and stent introducer could be positioned towards the hilum. The position of echoendoscope could be maintained the visualization of longitudinal axis of common bile duct during stent insertion.

2. Direction of stent insertion

After successful placement of guidewire in bile duct, fistula dilation may be required for transmural stenting. Recently, one-step device EUS-BD without additional fistula dilation has been developed. In EUS-HGS, B2 as the straight-line between the line of a guidewire in bile duct and tip of echoendoscope may be more ideal for transmural stenting with this push type device. In B3 position, this angulated scope position may require the additional fistula dilation. In EUS-CDS, the scope position can be placed with elongated common bile duct as tram-track sign (Fig. 1). In this scope and direction of stent position could be positioned towards the hilum. This direction of stent may be ideal for good pushability of stent introducer.

3. Drainage of route

In patients with surgically altered anatomy, gastric outlet obstruction (GOO), EUS-HGS can be considered in patients with malignant biliary obstruction. EUS-HGS can be considered in patients with stent revision of hilar metal stenting in left-sided hilar biliary obstruction or high-grade hilar biliary obstruction. In distal biliary obstruction with inaccessible papillae and D2 (second duodenum including the ampulla) or D3 (third portion duodenum) invasion, EUS-CDS can be initially considered. In previous studies, technical and clinical success of EUS-HGS and CDS in biliary obstruction are similar. In patients with accessible papilla and failed precutting, EUS-guided rendezvous may be preferred to EUS-guided biliary drainage with transmural stenting. Therefore, the choice of route can be determined by inaccessible papillae such as surgically altered anatomy, GOO, or D2-D3 invasion.

Conclusions

EUS-BD can be safely performed by experienced endosonographers with logical algorithm with best access point and direction of stent. EUS-BD can be considered a first-line alternative to failed ERCP rather than PTBD.

References


