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Expanding indication: EUS-guided hepaticoduodenostomy for isolated right intrahepatic duct obstruction (with video)

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Drainage of an obstructed bile duct can be approached in several ways, and EUS-guided biliary drainage (EUS-BD) has been proposed as an effective alternative for percutaneous transhepatic biliary drainage (PTBD) after failed ERCP. EUS-guided transgastric imaging of the dilated left intrahepatic duct (IHD) makes it possible to drain the left biliary system.[1-4] However, patients with isolated right IHD obstruction are not considered as candidates for EUS-BD.[5] We evaluated the technical feasibility and safety of EUS-guided hepaticoduodenostomy (EUS-HD) in cases of isolated right IHD obstruction.

Abbreviations: EUS-BD, EUS-guided biliary drainage; EUS-HD, EUS-guided hepaticoduodenostomy; IHD, intrahepatic duct; IQR, interquartile range; PTBD, percutaneous transhepatic biliary drainage.

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PATIENTS AND METHODS

ERCP and EUS-BD were performed by a single experienced endoscopist (D.H.P.). Trainees were not involved in ERCP. EUS-BD was performed at the time of failed ERCP as a same session. Our inclusion criteria were as follows: (1) patients with failure of biliary decompression of right IHD obstruction through ERCP because of surgically altered anatomy, or missing right IHD on balloon occlusion retrograde cholangiography with a hilar biliary stricture, or failed selective guidewire cannulation because of a high-grade hilar biliary stricture and (2) patients who refused PTBD and wanted EUS-BD performed during the same session as the failed ERCP. Our exclusion criteria were (1) refusal to participate in the study protocol, (2) left intrahepatic or distal biliary obstruction for ordinary EUS-BD including hepaticogastrostomy and choledochoduodenostomy, (3) pregnancy, and (4) patients younger than 18 years. All enrolled patients were given antibiotics before and after the procedure.

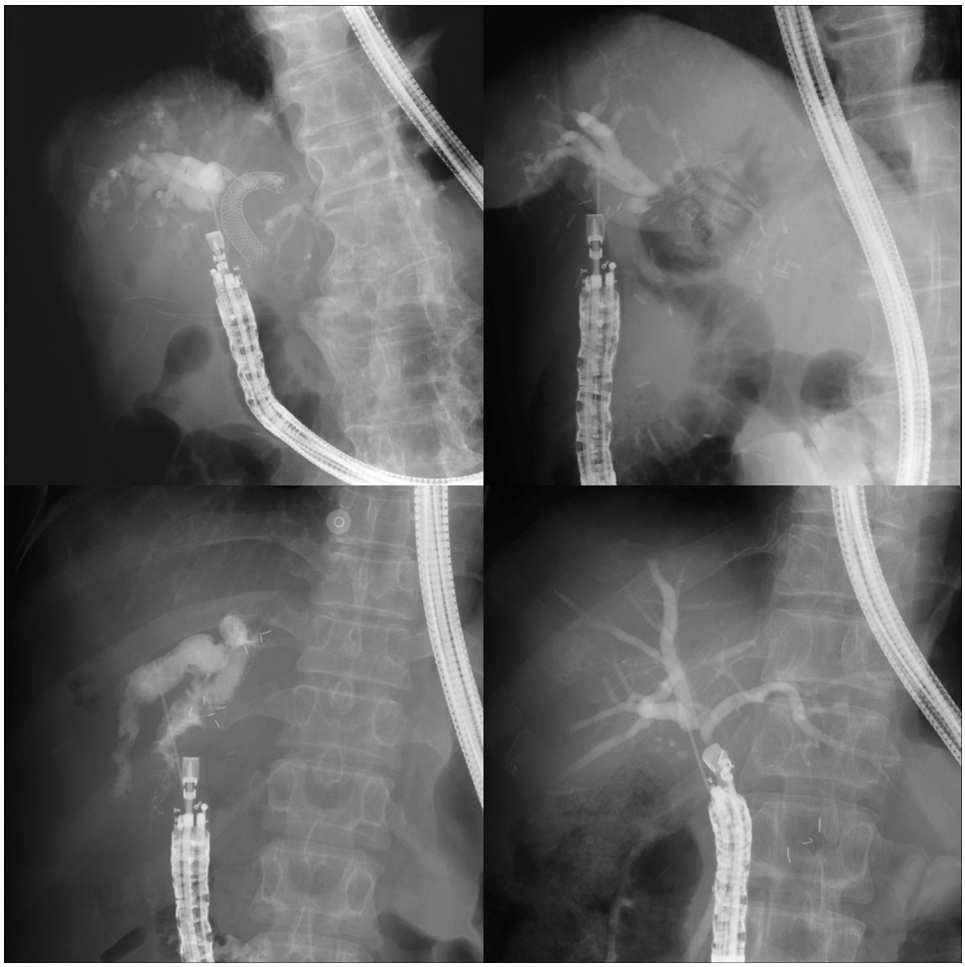

Figure 1. Fluoroscopic view of the typical U-shaped position of the echoendoscope when approaching the right intrahepatic duct from the duodenum.

The initial ERCP was mostly performed by using a therapeutic duodenoscope (TJF-240; Olympus Optical Co, Tokyo, Japan) with accessible papilla or deep enteroscopy with pediatric colonoscope or double-balloon enteroscope in patients with surgically altered anatomy. When the ERCP was unsuccessful, EUS-HD was performed in the same session using a linear-array echoendoscope (GF-UCT 240-AL 10; Olympus) (Figs. 1-3). In this study, we introduced a refined technique with an enhanced protocol for guidewire manipulation in EUS-guided antegrade biliary stenting/balloon dilation as a first-line therapy before EUS-BD with transluminal stenting.[6] With this protocol, if a guidewire could advance through the right main duct or anastomosis site, an antegrade transanastomotic balloon or stenting was considered. When a guidewire could not traverse the right main duct or anastomosis site, antegrade bypass stenting was considered. If these approaches were not feasible, a cholangiogram with retained contrast as a "roadmap" to assist retrograde cannulation was considered (Fig. 2).

In brief, EUS-guided puncture of the right IHD was performed as follows (Figs. 1-3, Video 1, available online at www.giejournal.org). A linear-array echoendoscope was placed in the duodenal bulb with a long endoscope position. The tip of the endoscope was rotated counterclockwise. Then, a U-shaped endoscope position was made in the duodenal bulb under fluoroscopic guidance (Fig. 1). A 22- or 19-gauge EUS needle was loaded in the echoendoscope. A 22-gauge EUS needle was considered for the roadmap technique. For antegrade transanastomotic stenting/balloon dilation or antegrade bypass stenting, a 19-gauge EUS needle was considered for the manipulation of a 0.035 or 0.025-inch guidewire.[6]

The dilated right IHD was punctured by an EUS needle. After bile was aspirated, contrast was injected. Minimal fistula dilation with a 4F cannula (Glo-tip; Cook Endoscopy, Winston-Salem, NC) and a 4-mm Hurricane balloon dilator (Boston Scientific, Natick, MA) was performed after the guidewire was placed in the right IHD. If there was resistance to the advancement of the 4F cannula/4-mm balloon dilator, a triple-lumen needle-knife (Microtome; Boston Scientific) with a 7F shaft diameter was minimally used to dilate the tract by using a brief burst of pure cutting current. Then, an uncovered self-expandable metal stent