Endoscopic ultrasound-guided antegrade bile duct stone treatment followed by direct peroral transhepatic cholangioscopy in a patient with Roux-en-Y reconstruction

Endoscopic ultrasound (EUS)-guided antegrade treatment for biliary disorders was developed for patients with an altered anatomy [1–5]. This report describes a case of successful EUS-guided bile duct stone (BDS) treatment followed by direct peroral transjejunal-hepatic cholangioscopy in a patient with Roux-en-Y reconstruction.

An 80-year-old woman with a BDS and a history of total gastrectomy with Roux-en-Y reconstruction was admitted to the Hokkaido University Hospital. The papilla could not be reached even with balloon enteroscopy. Therefore, transhepatic EUS-guided antegrade BDS treatment was attempted.

A B3 branch duct was punctured using a 19-gauge needle (SonoTip Pro Control; Medi-Globe GmbH, Rosenheim, Germany), and a 0.025-inch guidewire (VisiGlide 2; Olympus Medical Systems, Tokyo, Japan) was placed (Video 1). A 6-Fr wire-guided diathermic dilator (Cysto-Gastro-Set; Endo-Flex GmbH, Voerde, Germany) was used to dilate the tract. Papillary balloon dilation (Hurricane RX Biliary Balloon Dilatation Catheter; Boston Scientific Japan, Tokyo, Japan) was also performed under fluoroscopic guidance according to the size of the distal bile duct (Fig. 1a, Video 1). The retrieval balloon (Extractor Pro RX retrieval balloon catheter, 15–18 mm; Boston) and mechanical lithotripter (Litho Crush V, BML-V437QR-30; Olympus) both failed to extract the stone (Video 1). A 6-Fr nasobiliary drainage catheter (NBDC; Flexima ENBD Catheter; Boston Scientific Japan) was placed across the papilla for drainage into the duodenum and to facilitate a rendezvous procedure using balloon enteroscopy (Fig. 1b).

The next day, the patient developed acute cholangitis. Re-intervention through the fistula tract was attempted. After advancing the guidewire into the bile duct, the BDS was captured by a standard basket catheter (FG-V435P; Olympus) (Fig. 1c, Video 1). However, the basket catheter could not pass the papilla and was impacted instead (Video 1). Emergency, di-

Fig. 1 Endoscopic ultrasound (EUS)-guided bile duct stone (BDS) treatment and direct, peroral, transjejunal-hepatic cholangioscopy in a patient with Roux-en-Y reconstruction. a Radiograph showing endoscopic ultrasound-guided standard papillary balloon dilation under fluoroscopic guidance. b Radiograph showing an endoscopic ultrasound-guided nasobiliary drainage catheter placed across the papilla. Inset: endoscopic image. c Radiograph showing a basket catheter that failed to advance across the papilla. d Radiograph showing an impacted bile duct stone crushed using peroral direct lithotripsy. e Radiograph showing direct, peroral, transhepatic cholangioscopy after endoscopic ultrasound-guided biliary drainage.
rect, peroral lithotripsy (BML-110A-1; Olympus) was performed (Fig. 1d, Video 1). After the BDS had been crushed, the NBDC was inserted into the bile duct without complications. At follow-up 6 days later, direct, peroral transhepatic cholangioscopy (CHF-B260, working channel 1.2 mm; Olympus) was performed under therapeutic duodenoscope (TJF-260V; Olympus) guidance, and complete BDS clearance was confirmed (Fig. 1e, Video 1).

An EUS-guided rendezvous procedure is generally performed when EUS-guided antegrade BDS treatment fails. However, endoscopic re-intervention through the fistula tract should be considered in patients with altered gastrointestinal anatomy. To our knowledge, this is the first report of a troubleshooting technique for BDS impaction using direct, peroral, mechanical lithotripsy and confirmation of BDS clearance by direct antegrade cholangioscopy following EUS-guided biliary drainage. Although challenging, this stone extraction technique combined with EUS-guided antegrade cholangiography and cholangioscopy (EUS-guided ACC) should be recognized as a treatment for BDS in patients with altered gastrointestinal anatomy.

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**References**


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**Bibliography**

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