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Endoscopic ultrasound-guided biliary recanalization with a novel rendezvous inflated balloon-assisted technique for isolated bile leakage

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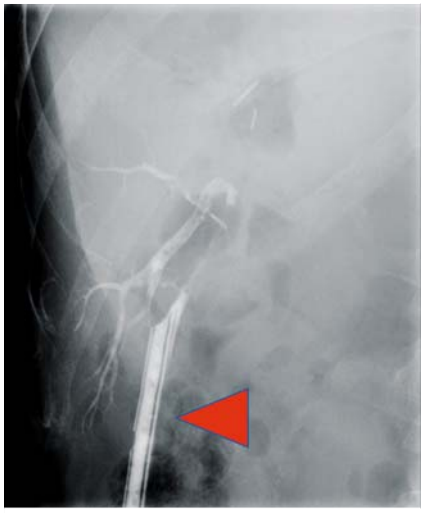
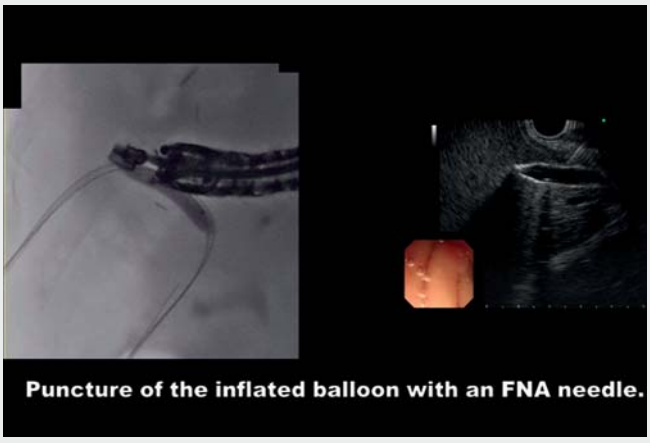
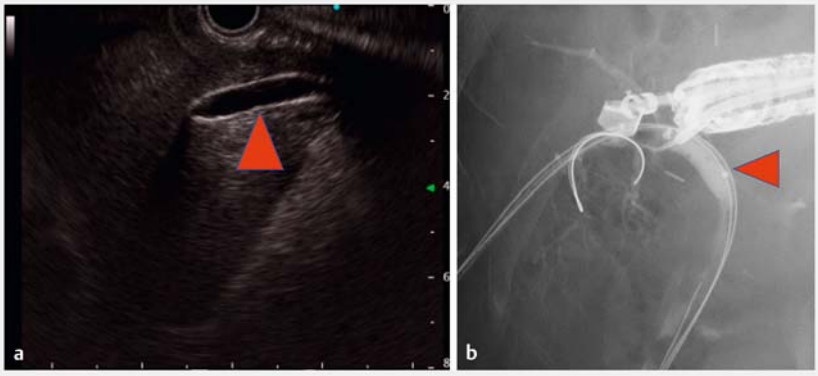


▶ **Fig. 1** Cholangiography performed after surgery through the inserted intra-abdominal drainage tube (red triangle) outlined only the right posterior branch (RPB) and indicated isolated bile leakage at the RPB.



Video 1 Successful endoscopic ultrasound-guided biliary recanalization with rendezvous balloon-inflation assistance and cholangioscopy to manage isolated bile leakage.



▶ **Fig. 2** A guidewire was successfully inserted into the right posterior branch by: **a** inserting a dilation balloon catheter via the percutaneous transhepatic biliary drainage (PTBD) route, with the inflated balloon (red triangle) scanned using endoscopic ultrasound (EUS), then; **b** puncturing the inflated balloon with an EUS-guided needle, to enable insertion of the guidewire.

Bile leakage after hepatectomy has been reported to occur in 5%–8% of cases [1, 2]. In particular, isolated bile leakage is intractable and may require surgical re-anastomosis. In general, endoscopic treatment for isolated bile leakage by transpapillary biliary drainage for recanalization is challenging [3]; the procedure is often unsuccessful because of surgically altered anatomy and disconnection of the bile duct. Here, we report a case of successful endoscopic ultrasound (EUS)-guided biliary recanalization for isolated bile leakage that employed a novel approach assisted by rendezvous balloon inflation.

A 74-year-old man with gallbladder cancer underwent cholecystectomy with partial hepatectomy and bile duct resection. Following the surgery, isolated bile leakage occurred at the right posterior branch (RPB) (▶ **Fig. 1**). Initially, percutaneous transhepatic biliary drainage (PTBD) of the RPB was attempted; however, percutaneous guidewire negotiation across the obstructed duct failed because of the complete disconnection. We then performed EUS-guided biliary drainage (EUS-BD) to create internal drainage (▶ **Video 1**). Investigation of the RPB by EUS failed because of nondilation of the RPB. We introduced a 6-mm dilation balloon catheter via the PTBD route and inflated the balloon, which served as a target for EUS-guided needle puncture (▶ **Fig. 2 a, b**). The inflated balloon was successfully punctured, and a guidewire was inserted under EUS guid-

▶ **Fig. 3** Duodenography via the percutaneous transhepatic biliary drainage (PTBD) route showing internal drainage successfully achieved via the rendezvous approach after insertion of a cholangioscope from the PTBD route allowed the guidewire coming from the endoscopic ultrasound-guided biliary drainage route to be grasped with biopsy forceps, so that a plastic stent could be deployed via the percutaneous route into the duodenum along the guidewire.

ance and grasped with biopsy forceps (SpyBite; Boston Scientific, Natick, Massachusetts, USA) under direct cholangioscopic visualization (SpyGlass DS; Boston Scientific) via the percutaneous rendezvous approach. Finally, we were able to advance a 10.2-Fr catheter into the duodenum along the guidewire and achieve successful internal drainage (▶ **Fig. 3**).

Rendezvous cholangioscopic assistance has been reported to be a useful technique for successful recanalization of postoperative biliary disconnection [4]. In addition, EUS-guided drainage of an open pancreaticocutaneous fistula using the balloon as a target has been reported [5]. Rendezvous balloon-inflation assistance is also a useful option for EUS-BD in the treatment of refractory isolated bile leakage.

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Competing interests

The authors declare that they have no conflict of interest.

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