Placement of multiple metal stents by endoscopic retrograde cholangiopancreatography for malignant hilar biliary obstruction (MHBO) contributes to longer stent patency [1, 2]. However, endoscopic reintervention is technically difficult when stents are occluded [3]. Endoscopic ultrasonography-guided hepaticogastrostomy (EUS-HGS) is performed for the drainage of the left hepatic bile duct in MHBO. A bridging technique during EUS-HGS can be a promising method for treating isolated right hepatic bile duct obstruction [4, 5]. However, the bridging procedure has yet to be performed as a reintervention for obstructed metal stents in MHBO.

> Fig. 1 Fluoroscopic images of endoscopic ultrasound-guided hepaticogastrostomy with bridging. a Biliary stents on admission. Over three separate sessions of endoscopic treatment by endoscopic retrograde cholangiopancreatography, three metal stents had been placed in the anterior and posterior bile duct by a partial stent-in-stent technique (arrows), followed by placement of one plastic stent into the anterior bile duct and another plastic stent into the B3 intrahepatic bile duct (arrowheads). b After puncture of the B2 intrahepatic bile duct from the stomach under endoscopic ultrasound guidance, a guidewire was inserted into the bile duct and the duodenum (arrowhead). Then, a 0.025-inch hydrophilic guidewire was advanced into the right posterior bile duct through the mesh of the previously placed metal stent (arrow) using a double-lumen cannula. c Balloon dilation was performed to dilate the mesh of the previously placed metal stents using a thin-tipped balloon catheter to facilitate subsequent placement of a self-expandable metal stent (arrowhead). d An uncovered self-expandable metal stent was inserted through the mesh of the previously placed metal stents, between the right posterior bile duct and the left hepatic bile duct (arrowheads). e A partially covered self-expandable metal stent was placed from the left hepatic bile duct to the stomach (arrowhead).
A 58-year-old woman with gallbladder carcinoma and a history of multiple endoscopic treatments for MHBO, including placement of five stents, was admitted with cholangitis (▶Fig. 1a). Computed tomography revealed dilatation of the B2 intrahepatic bile duct and right posterior bile duct (RPD). We failed to insert a stent into the RPD using the endoscopic transpapillary approach. Moreover, EUS-guided RPD drainage from the duodenum was impossible because tumor obstruction prevented the puncture of the RPD. Therefore, EUS-HGS was performed using the bridging method (▶Video 1).

Following the puncture of B2 under EUS guidance, a guidewire was advanced beyond the MHBO and into the duodenum (Uneven double-lumen cannula; Piolax Medical Devices, Inc., Tokyo, Japan) (▶Fig. 1b). After dilating the mesh of the previously placed metal stent (Niti-S biliary; Tae-Woong Medical, Seoul, Korea) was inserted between the RPD and left hepatic bile duct (▶Fig. 1d). Finally, we placed a partially covered, self-expandable metal stent from the left hepatic bile duct to the stomach (▶Fig. 1e).

Recovery was uneventful, and cholangitis subsided within a few days. Although this patient had multiple metal stents placed, EUS-HGS with the bridging method was a feasible treatment option.

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Competing interest

The authors declare that they have no conflict of interest.

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