Recently, bilateral biliary drainage has been considered as the recommended approach for malignant hilar biliary obstruction (MHBO). Patients with surgically altered anatomy (SAA) usually represent a challenge for enteroscopy-assisted ERCP (E-ERCP), with its demanding procedure and dedicated technique. This challenge is greatly increased if SAA is combined with MHBO, especially with the limited availability of suitable metal stents for E-ERCP. EUS-guided hepaticogastrostomy (EUS-HGS) has become a feasible alternative approach for this group of patients, allowing bilateral drainage through the bridging technique using an uncovered self-expandable metal stent (SEMS) across the hilar malignant stricture joining the right and left hepatic ducts (RHDs and LHDs, respectively). Furthermore, combined EUS-HGS with antegrade common bile duct (CBD) stent placement was reported to prolong stent patency, mostly related to securing the natural antegrade bile flow. Herein, we present a successful transmural combined bridging and antegrade stent placement for MHBO in a patient with SAA (Video 1, available online at www.giejournal.org).

CASE

A 69-year-old woman was referred to our hospital with a diagnosis of malignant obstructive jaundice for biliary drainage. Her medical history was significant for gastric cancer 2 years earlier, with subsequent distal gastrectomy combined with Roux-en-Y reconstruction. Postoperative chemotherapy protocol was achieved. On initial assessment, the patient had deep jaundice with an elevated serum bilirubin level.

Abdominal CT revealed liver metastasis encroaching into the hilum (Fig. 1). E-ERCP was attempted for biliary access but failed to reach the papilla. After counseling the patient about further management strategies, EUS-HGS was preferred, targeting palliative biliary drainage.

Under EUS guidance, the dilated left intrahepatic duct (liver segment II) was punctured using a 19-gauge FNA needle (SonoTip Pro Control; Medi-Globe GmbH, Rosenheim, Germany), through which a 0.025-inch guidewire (VisiGlide 2; Olympus Medical Systems, Tokyo, Japan) was selectively inserted through the
CBD into the duodenum. Subsequently, a standard ERCP cannula (MTW catheter, MTW-Endoskopie, Wesel, Germany) was inserted easily over the guidewire through the needle tract, without need for a preliminary dilatation procedure, with subsequent contrast opacification revealing a 2-cm hilar biliary stricture with separately dilated right and left hepatic ducts (Fig. 2). Another guidewire was inserted into the RHD, assisted by uneven double-lumen cannula (UDLC)\(^4\) (Piolax Medical Devices, Inc, Tokyo, Japan), followed by deployment of an uncovered 10-mm × 6-cm SEMS (Bile Rush; Piolax Medical Devices, Inc), bridging from the LHD to the RHD (Fig. 3). Afterward, UDLC directed another guidewire through the mesh of the bridging stent into the CBD, followed by mesh expansion using a 6-mm biliary dilatation balloon (ZARA; Century Medical, Tokyo, Japan). An uncovered 10-mm × 8-cm SEMS was then placed in antegrade fashion across the mesh into the CBD (Fig. 4). Aside from the beneficial role of using double guidewires for stent-in-stent deployment, this technique maintains greater stability of the endoscope during the exchange of devices and allows recovery access in case of technical failure.\(^4\) Finally, an 8F dedicated HGS plastic stent (TYPE-IT; Gadelius Medical Co, Ltd, Tokyo, Japan) was placed across the needle tract, maintaining the fistula (Fig. 5).

The patient improved clinically, with a dramatic decrease in serum bilirubin level from 9.2 mg/dL into 1.9 mg/dL, within 1 week. No procedure-related adverse events were encountered, and the patient was referred to chemotherapy. During subsequent follow-up (more than 10 months) until the patient died, no troubles were faced regarding stent patency.

In conclusion, although MHBO in patients with SAA usually represents a challenge for endoscopic therapeutic modalities, this transmural procedure appears to be a

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**Figure 3.** An uncovered 10-mm × 6-cm self-expandable metal stent (Bile Rush; Piolax, Tokyo, Japan) was deployed by bridging from left to right hepatic ducts.

**Figure 4.** After mesh dilation by 6-mm balloon dilator, an uncovered 10-mm × 8-cm self-expandable metal stent was deployed through the mesh in antegrade fashion into the common bile duct.

**Figure 5.** An 8F dedicated hepaticogastrostomy plastic stent (TYPE-IT; Gadelius Medical Tokyo, Japan) was placed across the needle tract to maintain the fistula.
feasible, potentially safe, and effective treatment option for MHBO in this category of patients.

DISCLOSURE

All authors disclosed no financial relationships.

Abbreviations: CBD, common bile duct; E-ERCP, enteroscopy-assisted ERCP; EUS-HGS, EUS-guided hepaticogastrostomy; LHD, left hepatic duct; MHBO, malignant hilar biliary obstruction; RHD, right hepatic duct; SAA, surgically altered anatomy; SEMS, self-expandable metal stent; UDLC, uneven double-lumen cannula.

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