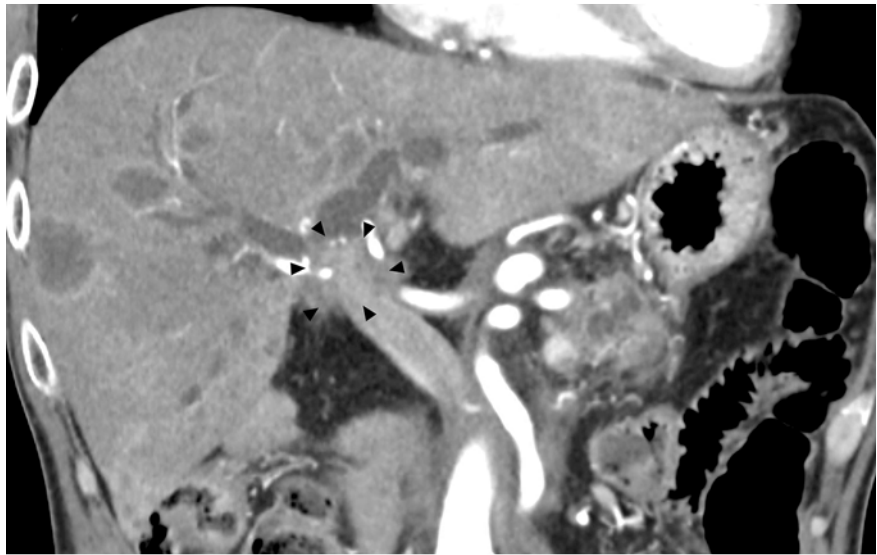


Endoscopic ultrasonography-guided bilateral drainage with antegrade stenting in patient with malignant hilar biliary obstruction after bowel reconstruction

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Endoscopic ultrasonography-guided hepaticogastrostomy (EUS-HGS) and uncovered self-expandable metal stent (SEMS) placement between the right and left intrahepatic bile ducts, called the bridging method, is useful for bilateral drainage in patients with malignant hilar biliary obstruction [1]. Combined EUS-HGS and EUS antegrade stenting is reported to reduce the rate of bile leakage and to prolong stent patency [2]. Access from B2 makes it easier to operate the guidewire downstream of the bile duct than from B3, and the use of a forward-viewing echoendoscope reduces the risk of transesophageal puncture [3].

A 50-year-old man who received chemotherapy for recurrent pancreatic cancer presented with jaundice. Subtotal stomach-preserving pancreaticoduodenectomy was performed with Child's reconstruction. Contrast-enhanced computed tomography showed multiple liver metastases; one metastatic lesion obstructed the hilar part of the bile duct (► Fig. 1). The bridging method and antegrade stenting using a stent-in-stent technique under EUS guidance were selected. Considering guidewire manipulability, we selected the B2 route; however, use of a curved linear array echoendoscope was associated with a risk of transesophageal puncture. Use of a forward-viewing echoendoscope (TGF-UC260J; Olympus Medical, Tokyo, Japan) enabled us to puncture B2 with a 19-gauge fine-needle aspiration needle (EZ Shot 3 Plus; Olympus Medical). Assisted by an uneven double-lumen cannula (UDC; Piolax Medical, Kanagawa, Japan), we placed two 0.025-inch guidewires (VisiGlide 2; Olympus Medical) into the jejunum and B8 bile duct (► Fig. 2). First, we placed the initial uncovered SEMS (8×60 mm, ZEOSTENT V; ZEONMEDICAL, Tokyo, Japan) using the bridging method (► Fig. 3). Subsequently, the



► Fig. 1 Contrast-enhanced computed tomography showed that multiple liver metastases invaded the hilar part of bile duct (arrowheads).



► Fig. 2 Assisted by the double-lumen cannula, two 0.025-inch guidewires were inserted into the jejunum from the tip lumen and into the B8 bile duct from the side lumen.



► Fig. 3 An uncovered self-expandable metal stent (SEMS) was placed bridging from the right to left intrahepatic bile ducts.

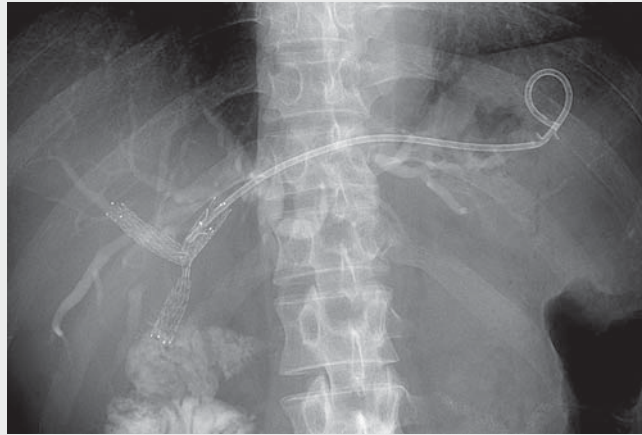
guidewire was inserted into the jejunum through the mesh of the initial SEMS, then the second uncovered SEMS (8×40 mm, ZEOSTENT V) was placed as antegrade stenting using the stent-in-stent technique (► Fig. 4). Finally, a 7-Fr plastic stent (TYPE-IT; Gadelius Medical, Tokyo, Japan) was placed across the

EUS-HGS fistula (► Video 1). There were no adverse events and jaundice improved immediately.

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► **Fig. 4** A second uncovered self-expandable metal stent (SEMS) was placed through the mesh of the first uncovered SEMS into the jejunum to provide antegrade stenting.





► **Video 1** Endoscopic ultrasonography-guided bilateral drainage with antegrade stenting using the stent-in-stent technique in a patient with malignant hilar biliary obstruction after bowel reconstruction.

Competing interests

The authors declare that they have no conflict of interest.

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