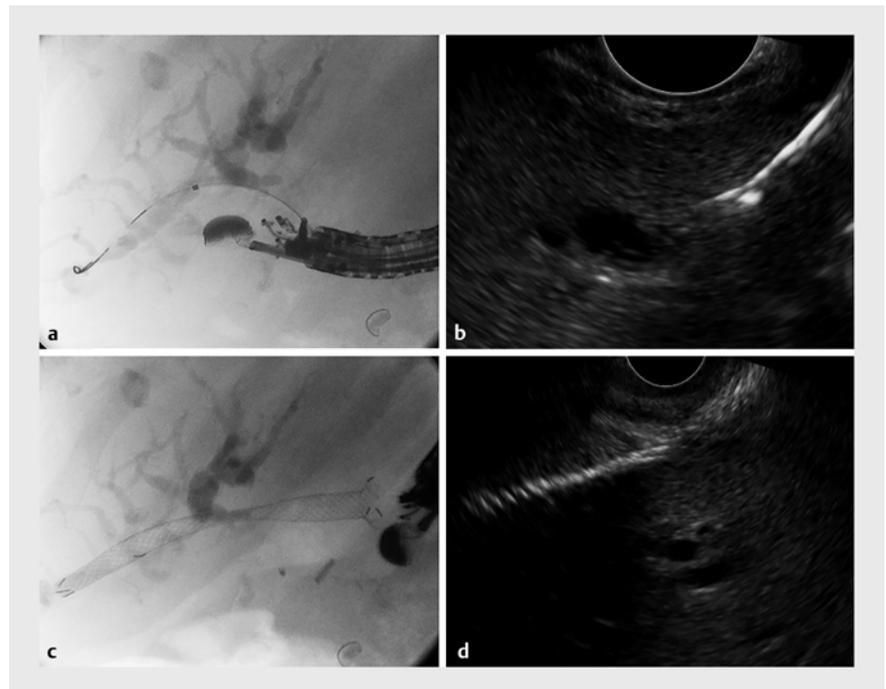


Conversion of endoscopic ultrasound-guided hepaticogastrostomy to transpapillary drainage by anterograde intervention via dedicated biliary metal stent for benign biliary stenosis

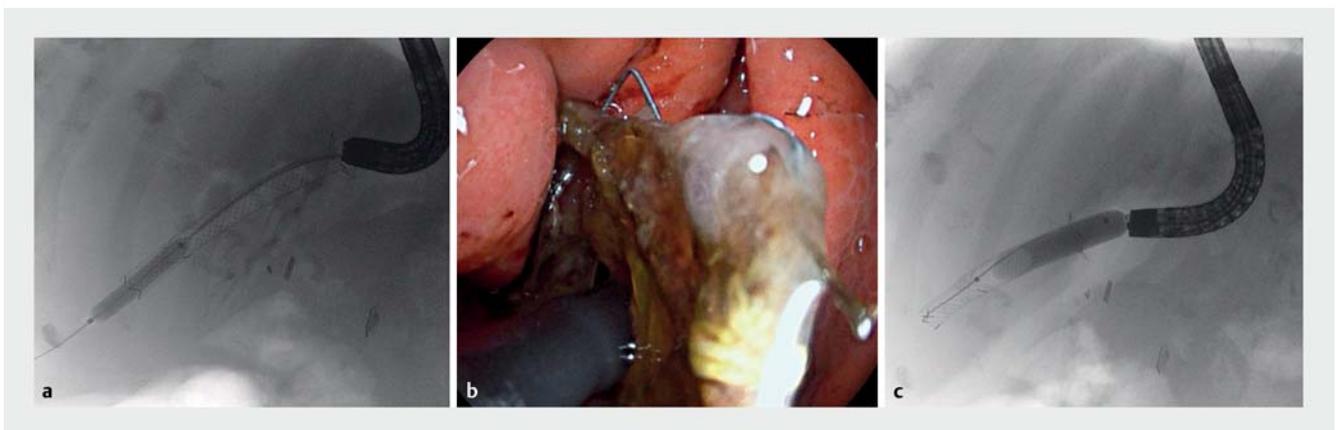
An 80-year-old woman with obstructive jaundice caused by distal biliary stenosis secondary to chronic pancreatitis was referred for biliary drainage. After failed endoscopic retrograde cholangiopancreatography, endoscopic ultrasound (EUS)-guided biliary drainage was proposed. Portal cavernomatosis prevented an extrahepatic route and EUS-hepaticogastrostomy (HGS) was considered.

Using a linear echoendoscope, the left biliary duct was accessed with a 19-gauge needle. The tract diameter was increased using a 6-Fr cystotome and 4-mm balloon catheter. A partially covered biliary self-expandable metal stent (SEMS; 8 × 80 mm Niti-S Giobor stent; Taewoong Medical, Goyang-si, South Korea) was placed (► Fig. 1).

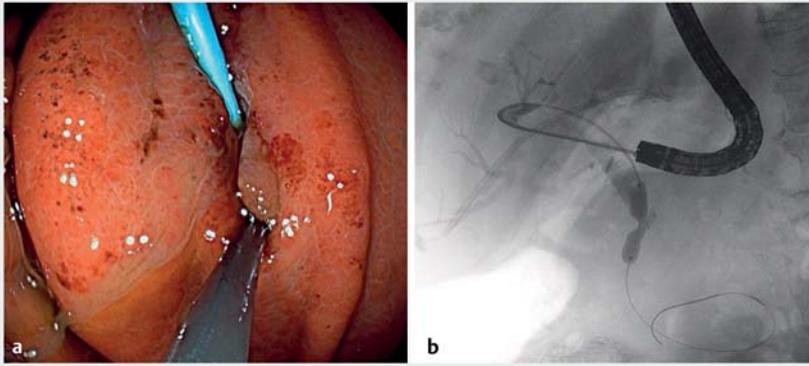
Endoscopic anterograde transhepatic intervention was attempted 6 weeks later through the mature EUS-HGS fistula. Anterograde cholangioscopy using a pediatric scope through the transhepatic SEMS showed tissue ingrowth at the uncovered end (2.4 cm), occluding the distal stent lumen. The Giobor stent was



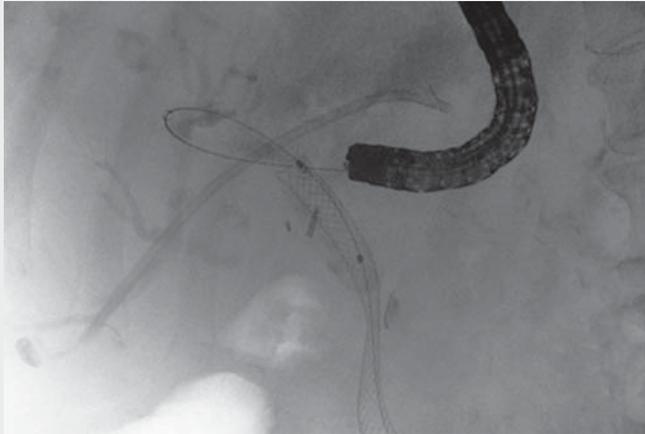
► **Fig. 1** Endoscopic ultrasound (EUS)-guided hepaticogastrostomy. **a** Dilation of the transmural fistula under fluoroscopic guidance. **b** Endosonography image of intrahepatic duct and guidewire. **c, d** Placement of dedicated biliary metal stent (8 × 80 mm; 70% covered, 30% bare; Niti-S Giobor Biliary stent; Taewoong Medical, Goyang-si, South Korea) by fluoroscopic (**c**) and EUS (**d**) guidance.



► **Fig. 2** Maximal intrastent dilation up to 8 and 10 mm of the distal bare portion (Giobor stent) by fluoroscopic guidance. **a, c** Fluoroscopic images; **b** endoscopic image.



► **Fig. 3** Endoscopic transhepatic anterograde intervention. **a** Balloon catheter and plastic stent within the mature hepaticogastrostomy fistula. **b** Anterograde dilation of extrahepatic distal biliary stenosis up to 8 mm, guided by fluoroscopy.



► **Video 1** Conversion of endoscopic ultrasound-guided hepaticogastrostomy to transpapillary drainage by anterograde intervention using a dedicated biliary metal stent in a benign distal biliary stenosis.

removed using a grasping forceps after maximal intrastent balloon dilation (► **Fig. 2**). The fistula tract was explored by anterograde cholangioscopy, identifying intrahepatic ducts close to the gastric wall. Scope exchange to a therapeutic scope allowed cholangiography using an impacted balloon extractor, and a biliary roadmap was captured. Next, a plastic stent (8.5 Fr×9 cm) was placed across the HGS fistula to secure guidewire passage in the desired anterograde transpa-

pillary direction. The extrahepatic duct was then successfully cannulated using the wire-guided fluoroscopy technique, and a sphincterotome was advanced across the distal stenosis to the duodenal lumen. Finally, biliary dilation up to 8 mm and anterograde stenting (fully covered SEMS; 10×80 mm Wallflex; Boston Scientific Corp., Marlborough, Massachusetts, USA) guided by fluoroscopy was performed (► **Fig. 3**, ► **Video 1**).

The Giobor stent is a dedicated biliary stent for HGS and has been reported for use in malignant diseases but not as a temporary stent [1–5]. The recent change in covered design (70%:30%) enables its use in a biliary benign scenario as a temporary stent to create a transhepatic mature fistula, allowing subsequent anterograde stenting.

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Competing interests

JBG is a consultant for Boston Scientific.

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