

Endoscopic ultrasound-guided biliary drainage in high grade biliary hilar obstruction

Endoscopic ultrasound-guided biliary drainage (EUS-BD) is an effective and evolving modality. Biliary hilar strictures, however, cannot be optimally drained with EUS-BD while both endoscopic retrograde cholangiopancreatography (ERCP) and percutaneous drainage also have their limitations [1–3]. We describe a novel approach to EUS-BD in collaboration with interventional radiology, where hepaticogastrostomy (HPG) is performed with a bridging hilar stent to achieve optimal drainage in a Bismuth-Corlette type IV (BC-IV) obstruction (► **Video 1**).

A 62-year-old woman who had undergone radical cholecystectomy with duodenal resection and gastrojejunostomy for gallbladder cancer presented with symptoms suggestive of biliary obstruction. Computed tomography (CT) scan revealed a BC-IV hilar stricture due to tumor recurrence. Despite insertion of bilateral metal stents via the percutaneous route, the patient continued to have recurrent cholangitis due to rapid tumor stent ingrowth, leading to interruptions in chemotherapy treatment. Following informed consent by the patient, a decision was made to undertake EUS-BD in collaboration with interventional radiology. Cholangiography via the percutaneous tube (PTBD) showed complete obstruction of both metal stents at the hilum due to tumor tissue ingrowth. A 0.035-inch guidewire was inserted, traversing the hilum through the stent indices and into segment III of the left intrahepatic biliary tree (► **Fig. 1**). A transgastric puncture of this biliary segment was then performed with a 19-gauge needle under EUS guidance followed by the advancement of a 0.035-inch guidewire antegradely. The wire was then captured via a snare inserted via the PTBD route and pulled through the percutaneous access. With optimal tension at both



► **Video 1** Successful hepaticogastrostomy using endoscopic ultrasonography and interventional radiology for management of high grade hilar obstruction using a bridging stent technique. Sources for stents and scope pictures: Boston scientific and Pentax



► **Fig. 1** Endoscopic ultrasonography (EUS) view of dilated segment III of the left intrahepatic biliary tree with a guidewire within (inserted via percutaneous access). This is prior to the transgastric needle puncture.

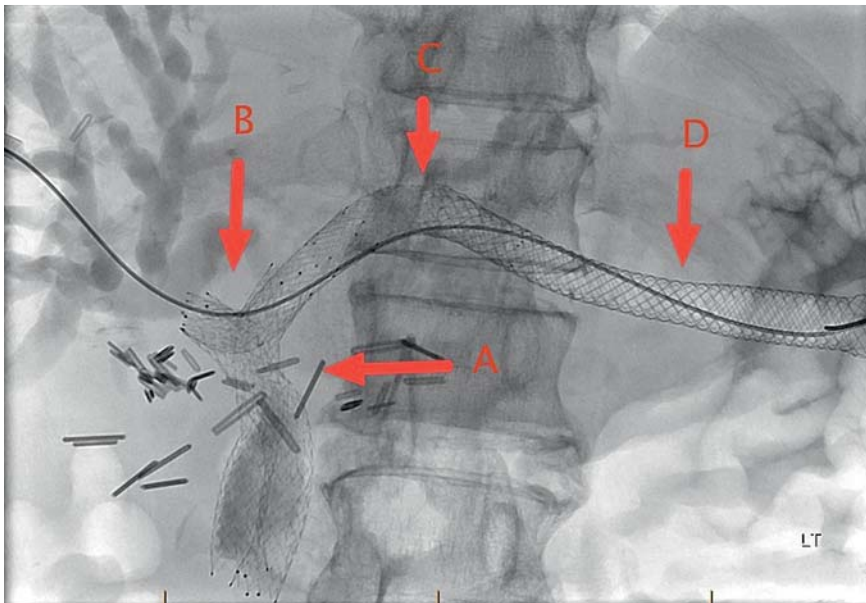


► **Fig. 2** Fluoroscopic view of an endoscopic ultrasonography (EUS)-guided hepaticogastrostomy stent insertion.



► **Fig. 3** Endoscopic view of an hepaticogastrostomy (HPG) stent.

ends of the wire, the HPG tract was dilated to 4 mm with a dilating balloon inserted from the PTBD. A 10-mm × 80-mm partially covered metal stent (WallFlex, Boston Scientific, Marlborough, Massachusetts, USA) was then deployed simul-



► **Fig. 4** Fluoroscopic view of hepaticogastrostomy (HPG) stent and bridging stents. A, occluded previously placed hilar stents; B, 8-mm × 40-mm balloon-expandable stent across the biliary bifurcation and hilar stricture; C, 8-mm × 40-mm self-expandable stent placed between the HPG stent and biliary bifurcation stent; D, HPG stent.

taneously with deflation and pulling back of the dilating balloon, limiting the time between dilation and stent insertion and therefore the risk of bile leak (► **Fig. 2** and ► **Fig. 3**). Over the same guidewire, a bridging stent (8-mm × 40-mm balloon-expandable; Cordis) was then successfully deployed across the biliary bifurcation and hilar stricture. A second bridging stent (8 mm × 40 mm self-expandable; Cordis) was then placed between the HPG stent and biliary bifurcation stent (► **Fig. 4**). A post-procedural cholangiogram confirmed complete drainage of the biliary system.

The patient did well after the procedure and at 4-month follow-up she showed no signs of biliary obstruction or cholangitis. In conclusion, a collaborative approach with interventional radiology can further extend the therapeutic indications for EUS-BD and allow successful establishment of stable biliary stents with optimal drainage in high grade hilar obstruction. Further studies are needed to assess safety.

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Competing interests

Yen-I Chen is a consultant for Boston Scientific. David Valenti has been a speaker for Boston Scientific and Cook Medical. Alan Barkun has served as consultant for Cook, Pendopharm, and Olympus (also providing research support and serving on advisory committee) and received funds from Cook, Pendopharm, and Olympus. All other authors have no relevant conflicts of interest.

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