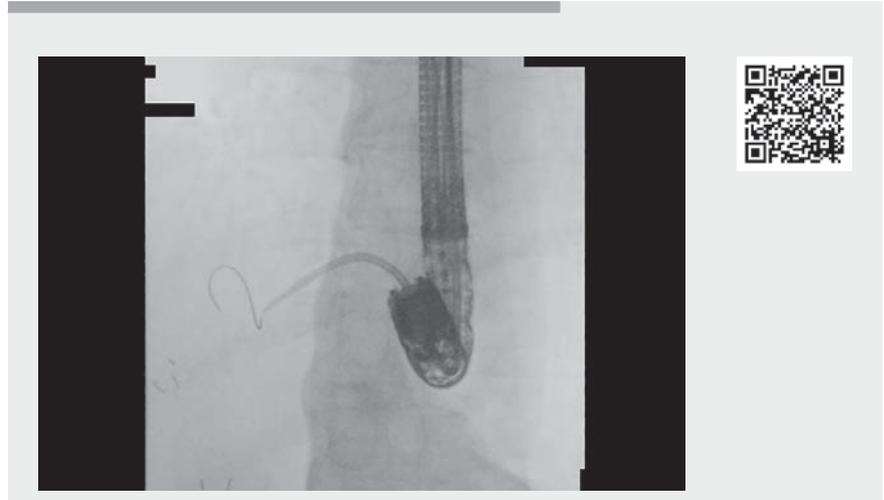


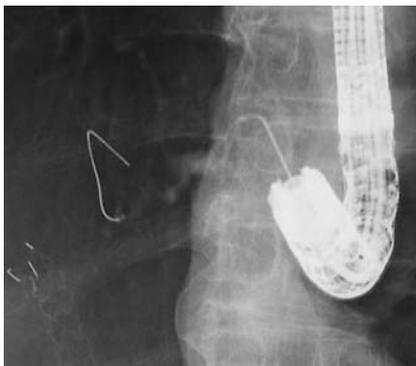
Endoscopic ultrasound-guided hepaticogastrostomy using a novel drill dilator




► **Fig. 1** Tip and handle of the novel Tornus ES drill dilator.



► **Video 1** Endoscopic ultrasound-guided hepaticogastrostomy using the novel Tornus ES drill dilator.



► **Fig. 2** A 0.018-inch guidewire was inserted, but the guidewire was very curved.

Endoscopic ultrasound-guided hepaticogastrostomy (EUS-HGS) is an alternative to endoscopic retrograde cholangiopancreatography when the latter has failed [1–3]. Using a 22-gauge needle, 0.018-inch guidewire, and forward-viewing EUS, EUS-HGS is easier and safer to perform [4]. However, in some cases fistula dilation is difficult, because a 0.018-inch guidewire is relatively soft. Recently, we used a novel drill dilator

(Tornus ES, Asahi Intecc) for EUS-HGS in a difficult case of this kind (► **Fig. 1**). Here, we describe technical tips for fistula dilation using this tool.

A 64-year-old man underwent endoscopic metallic stenting and percutaneous transhepatic biliary drainage for malignant hepatic hilar obstruction due to hepatocellular carcinoma. However, left intrahepatic bile duct drainage failed, and he was referred to our hospital for EUS-HGS. The intrahepatic bile duct was visualized from the stomach under forward-viewing EUS guidance (GF-UC260, Olympus). The intrahepatic bile duct was punctured using a 22-gauge needle [Expect Slimline (SL), Boston Scientific], and a 0.018-inch guidewire (Fielder, Asahi Intecc) was inserted. A contrast medium was injected, allowing the intrahepatic bile duct to be observed. The guidewire was curved, because the angle between the puncture route and the intrahepatic bile duct was relatively sharp due to the atrophy of the left hepatic parenchyma (► **Fig. 2**). Therefore, the Tornus was selected for fistula dilation (► **Video 1**). To

dilate the fistula, the Tornus was turned clockwise and easily advanced (► **Fig. 3**). After dilation, it was easily removed by counterclockwise turning. A double-lumen cannula (Uneven Double Lumen Cannula, Piolax Medical Devices) was inserted, and a contrast medium was injected. Hemobilia due to the hepatocellular carcinoma was observed (► **Fig. 4**). Finally, deployment of an 8-mm, fully covered metallic stent (Covered BileRush Advance, Piolax Medical Devices) was successfully carried out (► **Fig. 5**). The present case demonstrates that Tornus is useful for fistula dilation in difficult cases of EUS-HGS.

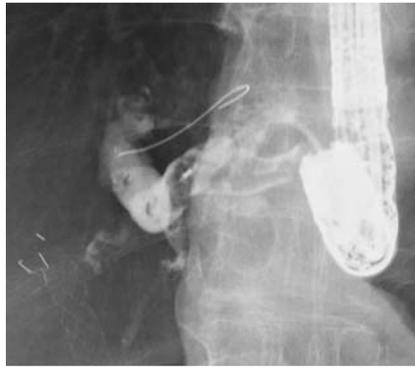
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Competing interests

The authors declare that they have no conflict of interest.



► **Fig. 3** The fistula was dilated using the Tornus ES.



► **Fig. 4** Hemobilia due to hepatocellular carcinoma was observed.



► **Fig. 5** Deployment of a fully covered metallic stent was successfully carried out.

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