

## A safe technique using clips for covered self-expandable metal stent placement during endoscopic ultrasound-guided hepaticogastrostomy

Endoscopic ultrasound-guided hepaticogastrostomy (EUS-HGS) is a new biliary drainage procedure, which uses a curved linear-array echoendoscope. Recently, the efficacy and safety of covered self-expandable metal stent (CSEMS) placement have been reported [1–5]. However, it is difficult to confirm correct release of the CSEMS endoscopically and stents can easily migrate into the abdominal cavity or intrahepatic bile duct. We report here on an innovation using clips that facilitates confirmation of the correct release point under fluoroscopic guidance.

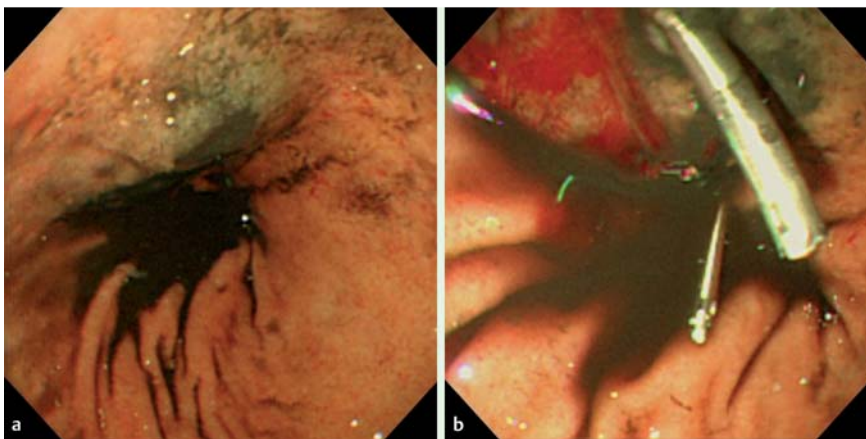
An 85-year-old woman with lymph node metastases from gastric cancer presented with lymphadenopathy that was causing bile duct and duodenal strictures. Because of the duodenal strictures, endoscopic retrograde cholangiography (ERC) could not be performed. EUS-HGS was chosen instead to relieve her obstructive jaundice.

The puncture site was determined using the echoendoscope, and India ink was locally injected using a 25-gauge sclerotherapy needle (Olympus Medical Systems, Tokyo Japan; **Fig. 1 a**; **Video 1**). With the India ink serving as an indicator,

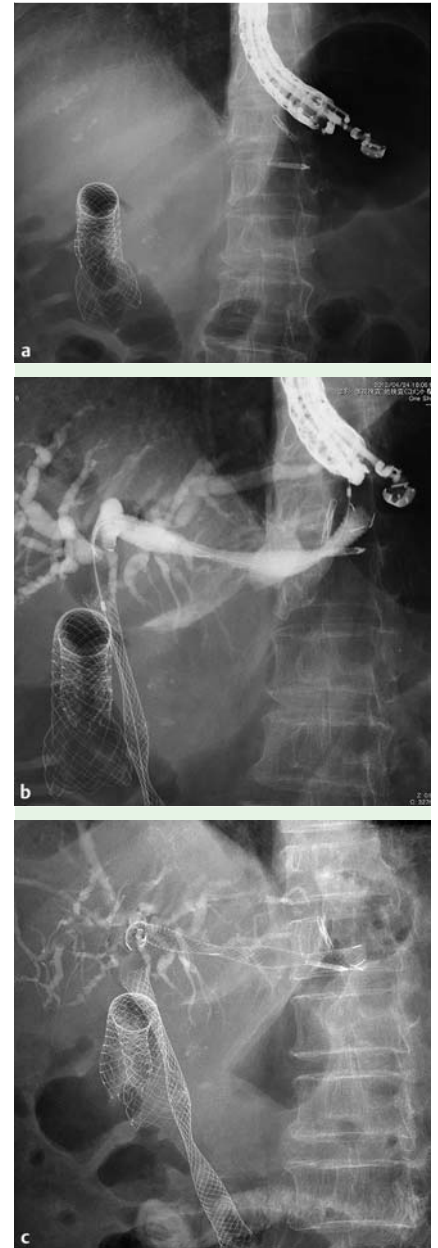
clips (Resolution Clip Device; Boston Scientific, Natick, Massachusetts, USA) were applied to both the proximal and distal points of the injection sites (**Fig. 1 b** and **Fig. 2 a**). The echoendoscope was again guided to the marked site for the puncture and a 19-gauge needle (Expect; Boston Scientific) was used to puncture the intrahepatic bile duct. The hole through the gastric and bile duct walls was dilated using dilation catheters and a Niti-S (end bare; 100 mm × 8 mm) stent (TaeWoong Medical, Gimpo, Korea) was placed for EUS-HGS (**Fig. 2 b**). During stent deployment, the puncture site was easily identified with the two gastric mucosal markers, and the correct proximal position of

### Video 1

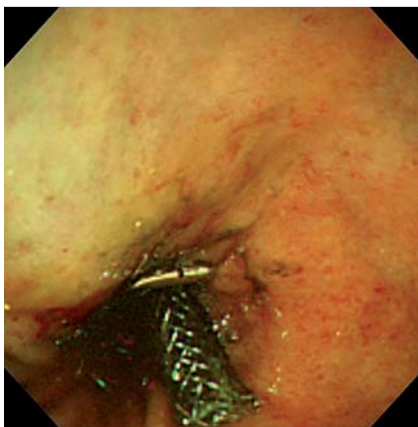
The endoscopic ultrasound-guided hepaticogastrostomy (EUS-HGS) technique that was used. The correct location of the proximal end of the stent is easily determined fluoroscopically following local injection of India ink and the placement of clips at the puncture site. In combination with endoscopic confirmation, this technique is useful in preventing stent migration at the time of placement.



**Fig. 1** Endoscopic views during endoscopic ultrasound-guided hepaticogastrostomy (EUS-HGS) in a woman with metastatic gastric cancer and obstructive jaundice showing: **a** the chosen puncture site marked by local injection of India ink; **b** clips applied to the proximal and distal sides of the marked area.



**Fig. 2** Fluoroscopic images showing: **a** the clips in position indicating the point for stent delivery; **b** how fluoroscopy is useful for accurate identification of the correct release point for the stent as the scope is slightly distant; **c** the correctly positioned covered self-expandable metal stent (CSEMS).



**Fig. 3** Endoscopic view showing the correctly positioned covered self-expandable metal stent (CSEMS).

the stent could be determined both fluoroscopically and endoscopically. Therefore, the stent was placed safely and without migration (● Fig. 2c and ● Fig. 3). With this technique, once the puncture site had been determined, local India ink injection allowed the clips to be accurately placed. The presence of the clips then allowed the correct release point of the

CSEMS to be determined not only endoscopically but also fluoroscopically. The process of local injection and clipping was completed within 5 minutes without changing endoscopes. The presence of the clips did not interfere with the puncture process or with stent placement.

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**Competing interests:** None

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