First report of endoscopic ultrasound-guided cholecystogastrostomy with a Nagi covered metal stent for palliation of jaundice in extrahepatic biliary obstruction

Fig. 1 Endoscopic ultrasound (EUS) image showing the unsuccessful attempt to puncture the bile duct with a 19G fine needle aspiration (FNA) needle.

Fig. 2 The Nagi stent, a silicone-covered nitinol stent with bilateral anchor flanges.

Endoscopic ultrasound (EUS)-guided drainage procedures, such as pancreatic pseudocyst drainage, biliary drainage, and gallbladder drainage, are being increasingly performed in specialist centers [1–4]. A 30-year-old man with unresectable periampullary cancer, who had undergone biliary plastic stenting 1 year previously, presented with recurrent jaundice and gastric outlet obstruction for 2

weeks. Blood test results showed his bilirubin was 15 mg/dL with an alkaline phosphatase of 800 u/L. An ultrasound of his abdomen showed dilated intrahepatic biliary radicals and a dilated bile duct with a periampullary mass. Side-viewing endoscopy was unsuccessful despite dilation of the gastric outlet. EUS-guided choledochoduodenostomy failed because the bile duct, which was thick-

ened due to the plastic stent, could not be punctured with a 19G fine needle aspiration (FNA) needle (● Fig. 1). EUS-guided cholecystogastrostomy was therefore performed using a silicone-covered nitinol stent (14 mm in diameter, 20-mm long) with bilateral 24-mm diameter anchor flanges (Nagi; Taewoong Medical Co. Ltd., Seoul, Korea) (● Fig. 2). This stent provides stability and minimizes migration. The diameter of the delivery system is 10 Fr.

The gallbladder was visualized using a linear echoendoscope (GF-UCT 180; Olympus) at the level of the antrum and was punctured with a 19G needle (Cook Endoscopy, Winston-Salem, North Carolina, USA) (● Fig. 3). After removal of the stylet, bile was aspirated, and contrast was injected into the gallbladder, revealing a patent cystic duct. A 0.035-inch guidewire (Jagwire; Boston Scientific, Natick, Massachusetts, USA) was inserted into the gallbladder under fluoroscopic guidance. The needle was removed and the puncture site was dilated using 6-Fr and 7-Fr dilators (Soehendra biliary catheters; Cook Endoscopy) and then with a 4-mm balloon (Hurricane; Boston Scientific, Tokyo, Japan) (● Fig. 4a). Finally, a Nagi stent (Taewoong Medical Co. Ltd.) was deployed across the cholecystogastrostomy tract (● Fig. 4b).

The procedure resulted in biliary decompression with resolution of the patient's jaundice. The biliary plastic stent was removed using an upper gastrointestinal endoscope. A 9-cm metal stent was placed across the duodenal stricture (● Fig. 5; ● Video 1). The patient remains asymptomatic after 4 weeks of follow up.

Video 1

Endoscopic ultrasound (EUS)-guided cholecystogastrostomy using a Nagi covered metal stent, followed by removal of a plastic biliary stent and deployment of a duodenal metal stent.

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Competing interests: None

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Fig. 3 Endoscopic ultrasound (EUS) image showing the gallbladder being punctured with a 19G fine needle aspiration (FNA) needle.

Fig. 5 Radiographic image showing the stent positioned in the gallbladder and the metal stent placed across the duodenal stricture.

Fig. 4 Endoscopic views showing: **a** dilation of the cholecystogastrostomy tract with a 4-mm balloon; **b** the metal stent in position after its successful deployment.

Bibliography

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