Novel technique for placement of overlapping self-expandable metal stents to close a massive pancreatitis-induced duodenal fistula

Fig. 1 Endoscopic images showing the massive fistula on the right. The arrow denotes the narrowed duodenal lumen. **a** The endoscope is situated just across the fistula passing into the remaining necrotic cavity with an indwelling catheter. **b** Endoscopic view from the duodenal bulb.

Fig. 2 Radiographic image immediately after deployment of initial partially covered esophageal stent through the transgastric sheath. Contrast injection shows continued leakage through the fistula communicating with a percutaneous pigtail catheter.

A 67-year-old man with infected pancreatic necrosis underwent serial endoscopic necrosectomies through a spontaneously formed massive duodenal fistula (Fig. 1). He also required percutaneous drainage of a communicating paracolic gutter collection.

Despite resolution of necrosis, the fistula remained open with high-volume output through the percutaneous drain. The patient's severe coronary disease precluded

surgical repair. Transoral placement of a fully covered esophageal self-expandable metal stent (SEMS) was attempted but failed due to looping of the delivery system within the stomach. To overcome this obstacle, a fluoroscopically guided percutaneous gastrostomy puncture was performed by an interventional radiologist; the tract was balloon dilated to 10 mm, and a 26-Fr Amplatz Renal Introducer Sheath (Cook Urological Inc., Spencer, Indiana, USA) was inserted into the gastric

lumen. Through the sheath, a guide wire was positioned into the distal duodenum, and a 12-cm long, 23-mm diameter, partially covered esophageal SEMS (Ultraflex; Boston Scientific, Natick, Massachusetts, USA) was deployed across the fistula under fluoroscopy.

Contrast injection showed continued leakage through the fistula (Fig. 2). Therefore, a 7-cm long, 18-mm diameter, fully covered esophageal SEMS (Alimaxx; Merit Medical Endotek, South Jordan, Utah, USA) was passed through the gastrostomy sheath and fluoroscopically deployed within the first stent in an overlapping fashion. Contrast injection confirmed luminal patency without further leakage (Fig. 3).

After 2 months, an upper gastrointestinal series revealed persistent absence of contrast extravasation. Fistula closure was endoscopically confirmed, and stent removal was performed by forceps extraction. The patient remains well 2 years later.

Gastroduodenal SEMS are typically utilized for palliation of malignant obstruction, but have also been used to close fistulas after gastric surgery [1–4] as well as to close iatrogenic duodenal perforations [5]. However, their use in the small intestine is limited by difficult placement due to imperfect delivery systems. Our case illustrates an innovative approach for SEMS deployment through a gastrostomy site to treat a massive pancreatitis-induced duodenal fistula.

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Competing interests: None

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Fig. 3 Radiographic image immediately after deployment of second distally placed fully covered esophageal stent in overlapping fashion through the transgastric sheath. Contrast injection shows no residual extravasation through the fistulous tract.

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