Duodenal endoscopic submucosal dissection and sutured defect closure across a lumen-apposing metal stent

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Patients with gastric bypass anatomy face unique challenges and limited options with respect to endoscopy in the bypassed portion of the stomach and duodenum.1 Here we introduce a novel technique for EUS-guided creation of a temporary access tract and demonstrate various therapeutic interventions that can be safely and effectively performed across the access tract in the bypassed duodenum (Video 1, available online at www.VideoGIE.org).

A 58-year-old woman with a history of Roux-en-Y gastric bypass presented for evaluation of abdominal pain. Magnetic resonance imaging revealed an enhancing polypoid mass in the duodenal bulb. The patient underwent a novel 3-stage therapeutic approach involving EUS-guided creation of a temporary access tract (gastric access temporary for endoscopy [GATE]) to facilitate EUS and endoscopic submucosal dissection (ESD) of the duodenal mass (Figs. 1 and 2). In the first stage, a suitable target for accessing the remnant stomach was identified in the Roux limb. The GATE was then created between the Roux limb and the remnant antrum by use of a 15–10 mm electrocautery-enhanced lumen-apposing metal stent (LAMS) (AXIOS; Boston Scientific, Marlborough, Mass, USA). The stent was dilated to 10 mm, and the access tract was allowed to mature for 2 weeks.

In the second stage, across the LAMS, EUS of the duodenal lesion was performed, and the findings were consistent with carcinoid. Given the difficult nature of endoscopic surveillance after resection, it was decided to proceed with ESD to maximize the likelihood of complete resection and to minimize the risk of recurrence.2 Submucosal lifting was performed, and a circumferential incision was made with a needle-type ESD knife (Dual Knife; Olympus America, Center Valley, Penn, USA). The lesion was then meticulously resected in an en bloc fashion. At the conclusion of the submucosal dissection, a small tag of submucosa was left behind to prevent lesion migration during specimen retrieval. After successful resection and retrieval of the duodenal lesion, a sutured defect closure was performed to reduce the risk of delayed perforation.3 A double-channel endoscope with an endoscopic suturing device (Overstitch; Apollo Endosurgery, Austin, Tex, USA) was advanced across the LAMS, and the resection defect was closed with a single 2-0 polypropylene suture in a running pattern. In the third stage, temporary access was reversed, with exchange of the LAMS for a smaller 10F × 3-cm double-pigtail plastic stent (Solus; Cook Medical, Bloomington, Ind, USA). Injections of contrast material showed no extravasation from the duodenal resection site or the temporary access tract. At a follow-up visit after 2 additional weeks, the plastic stent had spontaneously passed, and the temporary access tract had fully closed. Injection of contrast material showed no evidence of fistulae or leaks.

EUS-guided creation of a temporary access tract between either the jejunum or the gastric pouch and the remnant stomach was initially developed to facilitate ERCP (EUS-directed transgastric ERCP [EDGE]).4,5 Although the technique has been described through either a gastrogastric or a jejunogastric approach,6 each has its respective advantages and disadvantages. When the procedure is performed for elective indications, we prefer a jejunogastric access tract because it is more amenable to surgical revision if persistent fistulae develop. However, to optimize stability, any jejunogastric access tract should be allowed to mature for several weeks before the desired endoscopic intervention is performed. In the present case, the stability provided by this step allowed the passage of a double-channel endoscope with a suturing device without LAMS dislodgement. The recent introduction of the 20–10 mm LAMS may permit safer passage of large instruments in future cases.7 Future studies will seek to compare the gastrogastric and jejunogastric approaches and further evaluate the 20–10 mm LAMS.

In the present case, the GATE procedure was used as a strategy for complex endoscopic resection in an otherwise highly challenging location. Although device-assisted enteroscopy can be considered, a recent meta-analysis of single-balloon enteroscopy for ERCP in surgically altered anatomy demonstrated procedural success in only 61.7% of cases.8 In addition to facilitating access to the lesion, the creation of a temporary access tract allows the use of standard endoscopes, with the full assortment of endoscopic instruments and accessories, to maximize the...
potential for a complete and curative resection and minimize the potential for an incomplete resection with risk of recurrence.

After completion of the desired endoscopic intervention, the access tract is partially reversed with exchange of the LAMS for a double-pigtail plastic stent, which is subsequently removed after several additional weeks. The purpose of the double-pigtail stent is to maintain tract integrity in case repeated access is necessary for the management of adverse events such as bleeding; however, from our anecdotal experience, the double-pigtail stent may also facilitate closure of the access tract. Additional injections of contrast material or formal radiographic imaging are obtained at follow-up to rule out any persistent fistulae.

In conclusion, the GATE procedure facilitates advanced therapeutic endoscopy in patients with gastric bypass anatomy. This case demonstrates the feasibility of performing successful EUS, ESD, and endoscopic suturing across a temporary LAMS and highlights multiple technical challenges and the keys to success.

Figure 1. Creation and reversal of gastric access temporary for endoscopy (GATE). A, EUS-guided puncture of the remnant stomach from Roux limb. B, Injection of contrast material into the remnant stomach. C, Creation of jejunogastric GATE with deployment of lumen-apposing metal stent (LAMS). D, Removal of LAMS after successful trans-GATE endoscopic procedure. E, Prior access site 2 weeks after GATE reversal. F, Injection of contrast material showing no persistent jejunogastric fistula.
DISCLOSURE

Dr Aihara is a consultant for Boston Scientific and Olympus. Dr Thompson is a consultant for Boston Scientific, Medtronic, and GI Dynamics; is a consultant for, advisory board member of, and recipient of research support from USGI Medical; is a consultant for and recipient of research support from Olympus and Apollo Endosurgery; has an ownership interest in GI Windows; is a recipient of research support from Aspire Bariatrics; is a consultant for and advisory board member of Fractyl; receives research support from Spatz; and has an ownership interest in EndoTAGSS. Dr Ryou is a consultant for Medtronic. The other author disclosed no financial relationships relevant to this publication.

Abbreviations: ESD, endoscopic submucosal dissection; GATE, gastric access temporary for endoscopy; LAMS, lumen-apposing metal stent.
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