Mitigating lumen-apposing metal stent dislodgment and allowing safe, single-stage EUS-directed transgastric ERCP

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Until recently, patients with Roux-en-Y gastric bypass had the options of enteroscopy-assisted or surgery-assisted ERCP.[1] However, the use of a lumen-apposing metal stent (LAMS) with EUS to create a transgastric fistula allows for ERCP with a duodenoscope (EUS-directed transgastric ERCP [EDGE]).[2] However, dislodgement of the LAMS with advancement of the endoscope can result in a perforation, leading some providers to do this in 2 stages: LAMS placement followed by fistula maturation (7-14 days) and subsequent ERCP. To avoid this more expensive 2-step approach, and in cases in which waiting is not an option, we describe 5 cases in which an over-the-scope clip (OTSC) or endostitch was used to secure the LAMS, allowing a single-stage EDGE (Video 1, available online at www.VideoGIE.org).

CASES AND ENDOSCOPIC METHODS

Patient 1

A 41-year-old man with a 200-cm combined Roux-en-Y bypass and afferent limb length presented with gallstone pancreatitis and a retained common bile duct stone (Fig. 1). A 15-mm cautery-enhanced LAMS was used for

Figure 1. CT scan demonstrating pancreatitis and a distal common bile duct stone in Patient 1.

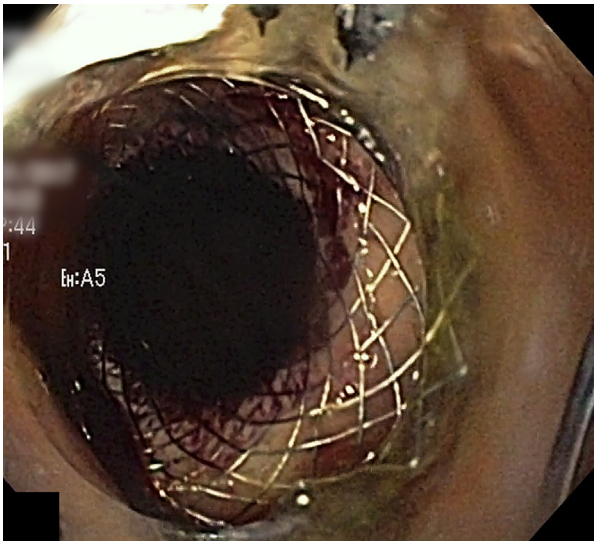

Figure 2. Use of 15-mm cautery-enhanced lumen-apposing metal stent to create a gastrogastric fistula in Patient 1.

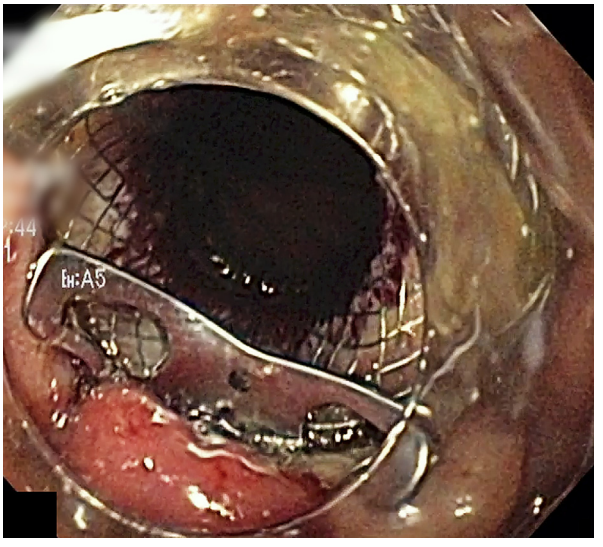

Figure 3. Lumen-apposing metal stent secured to the gastric pouch with an 11/6t over-the-scope clip in Patient 1.

Written transcript of the video audio is available online at www.VideoGIE.org.

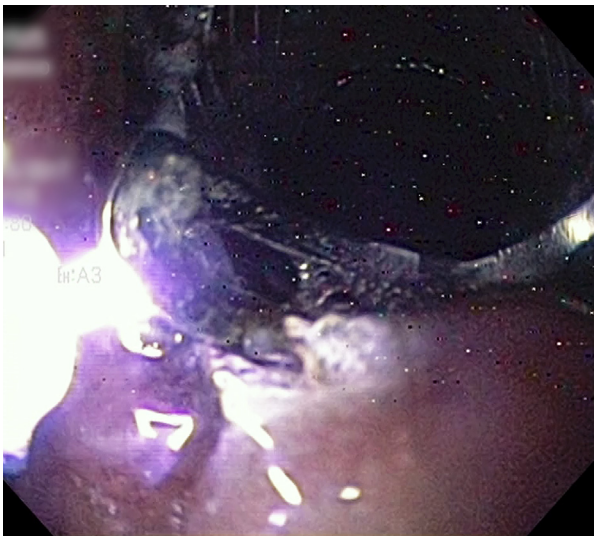

Figure 4. Use of argon plasma coagulation to cut and remove the over-the-scope clip securing the lumen-apposing metal stent in Patient 1.

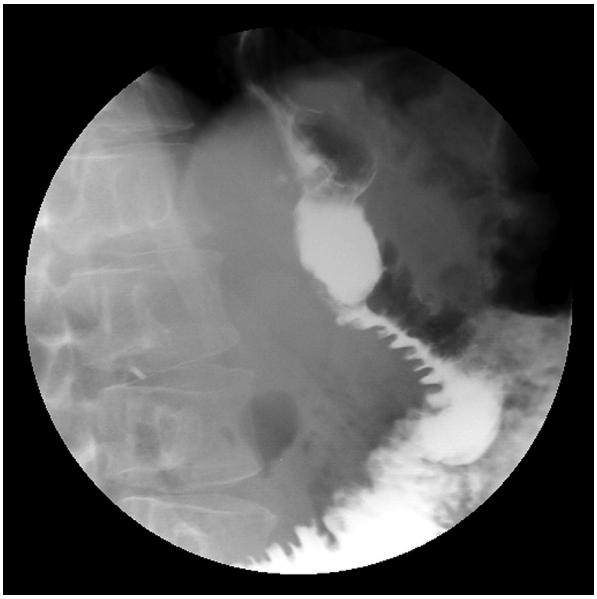

Figure 5. Upper-GI series confirming closure of gastrogastric fistula 4 weeks after removal of lumen-apposing metal stent in Patient 1.

the EDGE (Fig. 2). This was secured to the gastric pouch with a single 11/6t OTSC (Fig. 3). After balloon dilation of the LAMS, ERCP was performed to remove multiple black pigmented stones successfully. The patient returned 2 weeks later to have the LAMS removed using argon plasma coagulation to cut the OTSC (Fig. 4). Spontaneous transgastric fistula closure was allowed and was confirmed by an upper-GI series 4 weeks later (Fig. 5).

Patient 2

A 48-year-old woman with a 180-cm combined Roux-en-Y bypass and afferent limb length was admitted

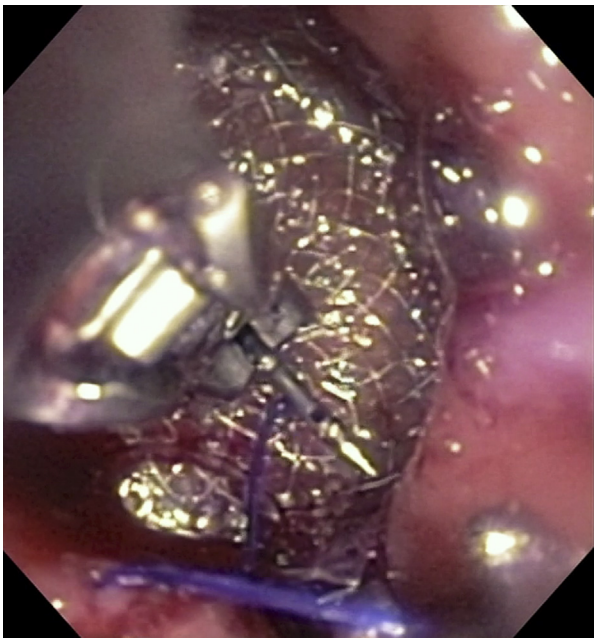

Figure 6. Lumen-apposing metal stent secured with 2 sutures to the gastric pouch in Patient 2.

with pain and suspected choledocholithiasis. She underwent successful EDGE with a 15-mm cautery-enhanced LAMS. This was secured with 2 sutures to the gastric pouch (Fig. 6). A biliary sphincterotomy with removal of sludge was successfully performed. Four weeks later the LAMS was removed, allowing spontaneous fistula closure, which was confirmed by an upper-GI series 6 weeks later.

RESULTS

Five patients (3 women, 2 men) with a mean age of 52 years (range, 32-71 years) underwent single-stage EDGE from June 2015 to August 2017. The indications for ERCP were choledocholithiasis in 3 patients and pancreatitis in 2 patients. EDGE was performed rather than enteroscopy-assisted ERCP in 4 patients because the length of the bypassed limb was very long (>180 cm), and pancreas divisum with relapsing pancreatitis was present in 1 patient. The LAMS was secured with an OTSC in 1 patient and sutured in 4 patients. All 5 patients underwent successful ERCP with a standard duodenoscope without LAMS dislodgement or adverse events (Tables 1 and 2). Although OTSC placement was faster (3 minutes vs 12 minutes to suture), advancement of the scope through the OTSC-secured LAMS and removal of the OTSC was technically more difficult, which is why after the first case of using the OTSC, a switch was made to suturing.

The mean LAMS dwell time was 41 days (range, 14-90 days). All patients were allowed to undergo spontaneous fistula closure, which was confirmed by upper-GI series

TABLE 1. Preprocedural and procedural data on patients undergoing EUS-directed transgastric ERCP with a 15 mm lumen-apposing metal stent (n = 5)

Patient number	Age/ gender	Indication	Reason for antegrade approach	Size and type of LAMS	Type of fistula	LAMS secured with	ERCP successful without LAMS dislodgement
1	71/F	Choledocholithiasis	Very long bypassed limb	15 mm, cold	GG	Stitch	Yes
2	41/M	Gallstone pancreatitis	Very long bypassed limb	15 mm, hot	GG	OTSC	Yes
3	48/F	Choledocholithiasis	Very long bypassed limb	15 mm, hot	GG	Stitch	Yes
4	32/F	Relapsing pancreatitis	Pancreas divisum and failed DBE ERCP	15 mm, hot	GG	Stitch	Yes
5	69/M	Choledocholithiasis	Very long bypassed limb	15 mm, hot	GG	Stitch	Yes

DBE, Double-balloon enteroscopy; *GG,* gastrogastric fistula; *LAMS,* lumen-apposing metal stent; *OTSC,* over-the-scope clip.

TABLE 2. Postprocedural data on patients undergoing EUS-directed transgastric ERCP with a 15-mm lumen-apposing metal stent (n = 5)

Patient number	Hospital stay after procedure (days)	Adverse events	LAMS dwell time in TG fistula (days)	Confirmation of spontaneous TG fistula closure	Follow-up since placement (days)
1	1	No	42	UGI 49 days	502
2	1	No	14	UGI 30 days	286
3	1	No	28	UGI 40 days	282
4	1	No	30	UGI 38 days	245
5	1	No	90	NA	90*
Mean	1		41		281

NA, Not applicable; *LAMS,* lumen-apposing metal stent; *TG,* transgastric, *UGI,* upper-GI series.
*Died of unrelated causes before being able to return for LAMS removal.

in 30 to 50 days, with a mean follow-up time of 281 days (range, 90-502 days).

CONCLUSIONS

A safe, single-stage EDGE can be performed in Roux-en-Y gastric bypass patients without LAMS dislodgement by securing the stent to the gastric pouch with an OTSC or endoscopic stitch. Other options include the use of a pediatric duodenoscope through a 15-mm LAMS or a standard duodenoscope through a 20-mm LAMS. Comparative studies would be useful.

DISCLOSURE

Dr Irani is a consultant for Boston Scientific and Gore Medical. Dr Khashab is a consultant for Boston Scientific, Olympus, and Medtronic and is on the medical advisory boards of Boston Scientific and Olympus. The other author disclosed no financial relationships relevant to this publication.

Abbreviations: EDGE, EUS-directed transgastric ERCP; LAMS, lumen-apposing metal stent

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