



Two clues make a proof: EUS-directed transgastric ERCP in twice-surgically altered anatomy—Roux-en-Y gastric bypass conversion of a sleeve gastrectomy

Giuseppe Vanella, MD,¹ Giuseppe Dell'Anna, MD,¹ Francesco di Capua, MD,² Giovanni Carlo Cesana, MD,² Stefano Olmi, MD,² Paolo Giorgio Arcidiacono, MD, FASGE¹

BACKGROUND AND INTRODUCTION

Roux-en-Y gastric bypass (RYGB) is one of the most frequent bariatric surgeries, especially in cases of insufficient weight loss or gastroesophageal reflux following sleeve gastrectomy (SG).¹

Postbariatric patients carry a higher risk of pancreatobiliary events because of lithogenicity after weight loss.

EUS-directed transgastric ERCP (EDGE) is gaining popularity to restore endoscopic access to the ampullary region by creating a reversible endoscopic anastomosis between the gastric pouch and the excluded stomach through a lumen-apposing metal stent (LAMS).²

Despite being technically challenging, this approach seems less invasive than surgically driven alternatives (laparoscopy-assisted ERCP [LA-ERCP]) and more efficacious than enteroscopy-assisted ones.

As demonstrated in a recent meta-analysis, enteroscopy-assisted ERCP has a lower technical and clinical success rate compared to LA-ERCP and EDGE because of the intrinsic characteristics of the procedure: the longer length navigated by the device causing instability, the forward-viewing nature of the scope, the absence of an elevator mechanism, and the challenge of using suitable accessories because of the narrow diameter and extended length of the working channel.³⁻⁵

LA-ERCP might be the technique of choice in patients who need to undergo simultaneous cholecystectomy or in urgent settings, but it is a time-consuming procedure (eg,

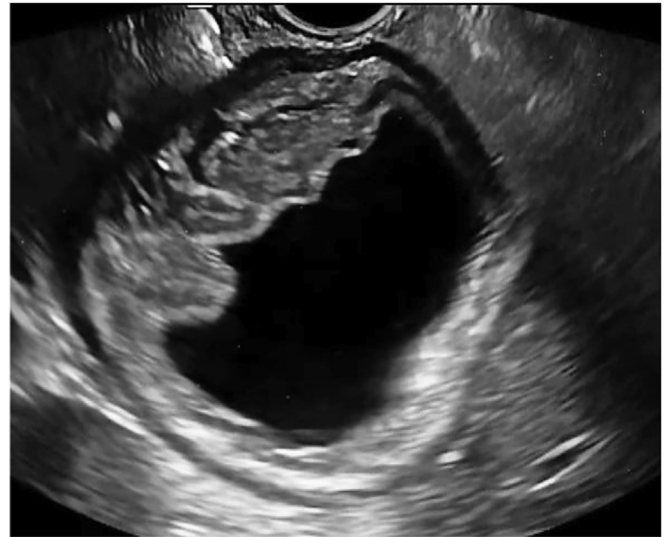


Figure 1. The gastric remnant with a “sand dollar” sign was identified by the postanastomotic jejunum under EUS guidance and punctured with a 19-gauge needle. Subsequently, it was dilated using a mixture of saline and contrast medium to create the operative space for freehand placement of an electrocautery-enhanced lumen-apposing metal stent.

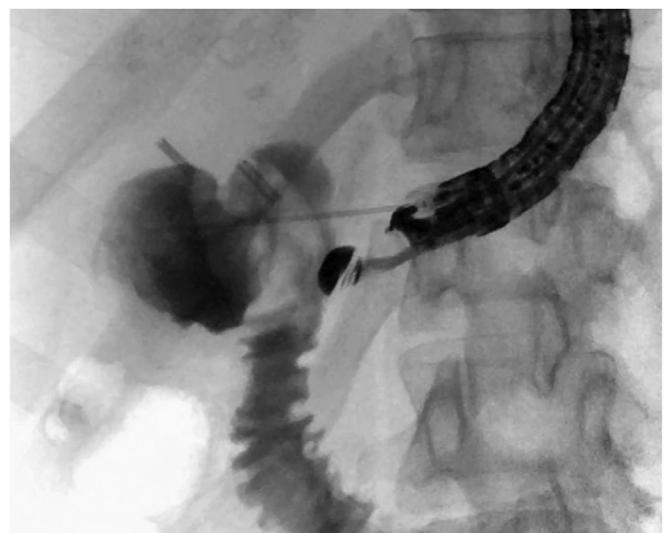


Figure 2. Gastric remnant ad duodenum. The injection of contrast depicted a small gastric remnant and, following its flow, the duodenum downstream of the pylorus.

Abbreviations: EDGE, EUS-directed transgastric ERCP; LA-ERCP, laparoscopy-assisted ERCP; LAMS, lumen-apposing metal stent; RYGB, Roux-en-Y gastric bypass; SG, sleeve gastrectomy.

Copyright © 2024 American Society for Gastrointestinal Endoscopy. Published by Elsevier Inc. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

2468-4481

<https://doi.org/10.1016/j.vgie.2023.09.011>

Pancreatobiliary Endoscopy and Endosonography Division, Pancreas Translational & Clinical Research Center, IRCC San Raffaele Scientific Institute and University, Milan, Italy (1), General and Oncologic Surgery Department, Centre of Advanced Laparoscopic Surgery, Centre of Bariatric Surgery, San Marco Hospital GSD, Osio Sotto, Italy (2).

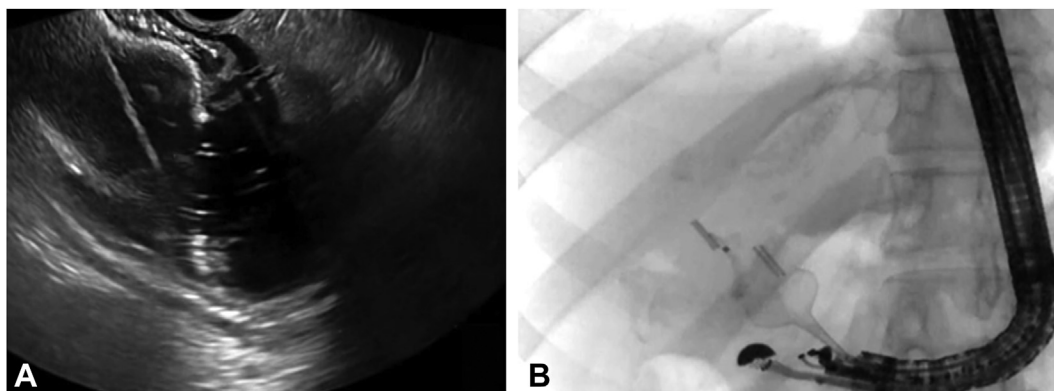


Figure 3. Release of the electrocautery-enhanced lumen-apposing metal stent. After adequate distension of the gastric remnant, a jejunogastrostomy was created by advancing a 20- × 10-mm electrocautery enhanced lumen-apposing metal stent (Hot Axios; Boston Scientific, Marlborough, Mass, USA) by freehand technique. The release of the distal flange occurred under EUS (**A**) and fluoroscopic (**B**) control, while the release of the proximal flange was performed under endoscopic visualization.

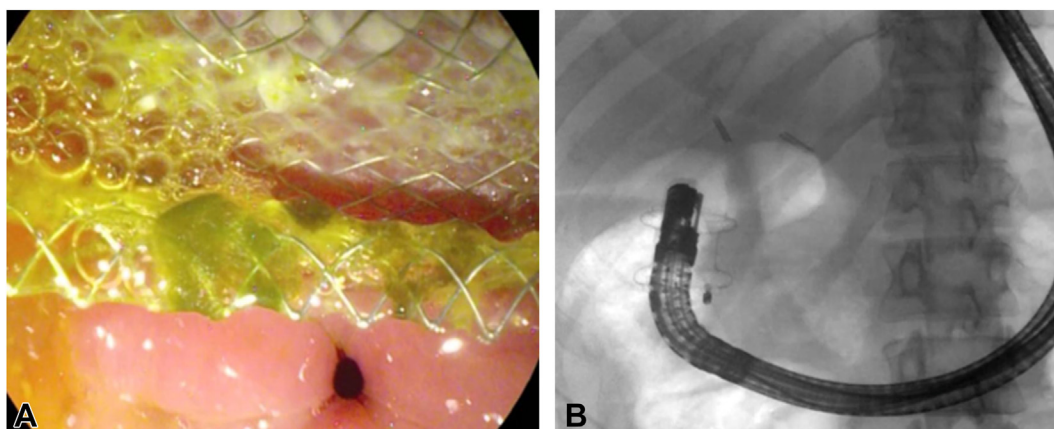


Figure 4. Through-the-LAMS ERCP. The patient was readmitted after 2 weeks to undergo elective through-the-LAMS ERCP. The LAMS was anchored via 2 endoclips. The jejunal loop was intubated with a standard duodenoscope, and the LAMS was traversed under endoscopic visualization (**A**) and fluoroscopic control (**B**). The pylorus was located just downstream of the LAMS (**A**). LAMS, Lumen-apposing metal stent.

adhesions from previous surgeries) that necessitates a complex logistical process (synchronization between surgical and endoscopic teams). Furthermore, it is burdened by other drawbacks: surgical site infections, longer hospital stay, higher cost, and the challenging execution of a consecutive ERCP if required.⁶

However, EDGE gets more complicated when SG has been converted into RYGB because the gastric remnant is much smaller and dislocated toward the liver.⁷ Recently, Ghandour et al⁸ reported the first EDGE and successful same-session ERCP on such a scenario.

CASE REPORT

We recently managed a similar case of a 30-year-old patient with symptomatic choledocholithiasis who had previously undergone RYGB conversion after SG.

After discussing all alternatives, EDGE was proposed for several reasons: local expertise in therapeutic EUS proced-

ures and unavailability of the enteroscope, risk of adhesions in a patient with multiple prior surgeries, and the absence of a need for cholecystectomy.

Similar to Ghandour et al,⁸ EUS trans-pouch exploration did not depict the gastric remnant. Therefore, we searched for the duodenum and papillary region from the postanastomotic jejunum and followed it backward toward the pylorus and the small antrum where the "sand dollar" sign was visible (Video 1, available online at www.videogie.org). We proceeded to 19-gauge needle puncture, remnant distension (Figs. 1 and 2), and free-hand 20-mm LAMS (Hot Axios; Boston Scientific, Marlborough, Mass, USA) release (Fig. 3).⁹

After 2 weeks, ERCP was successfully and easily performed with complete duct clearance (Figs. 4 and 5). Furthermore, 2 months later, a through-the-LAMS diagnostic EUS was performed to confirm stone clearance before LAMS removal (Fig. 6).

The jejunogastric fistula was treated by argon plasma coagulation to favor spontaneous closure (Fig. 7).

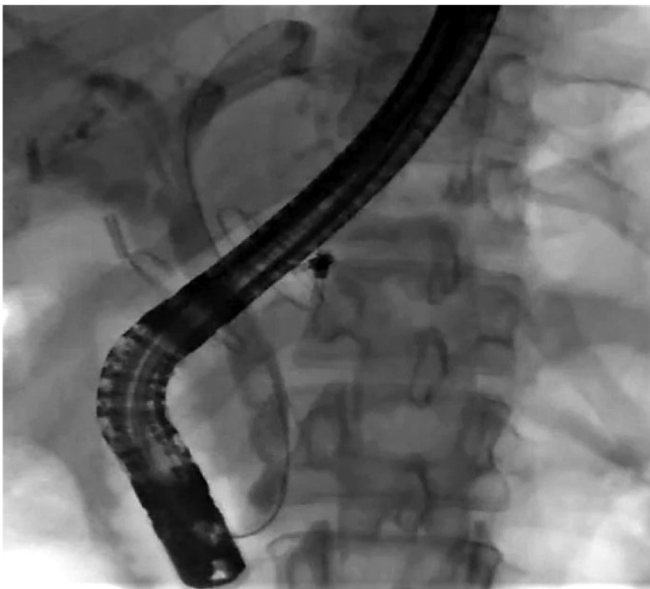


Figure 5. Through-the-LAMS ERCP. After easily passing through the pylorus, the endoscope was pulled into a “short” position in the duodenum. A standard ERCP (cannulation, sphincterotomy, and balloon swipes) was performed. Cholangiography shows the duodenoscope transversing the LAMS and confirmed the presence of a 5-mm stone in the common bile duct. *LAMS*, Lumen-apposing metal stent.

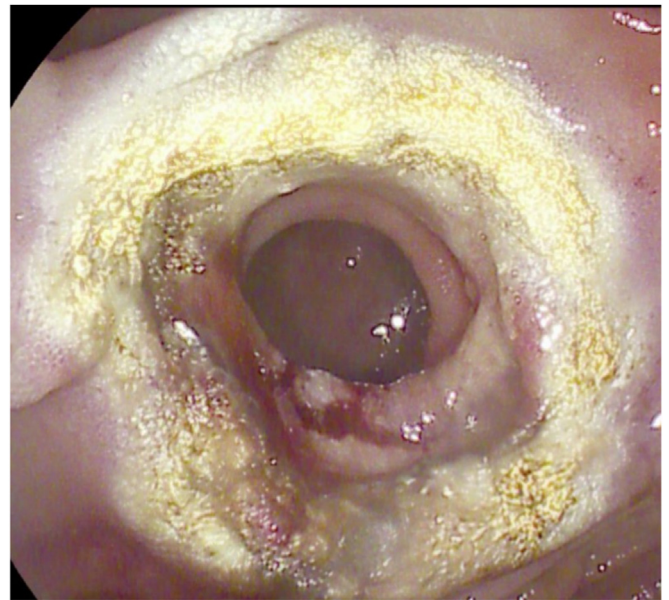


Figure 7. Argon plasma coagulation of the jejunogastric fistula. After the removal of the lumen-apposing metal stent, the jejunogastric fistula was treated with argon plasma coagulation to promote spontaneous closure.

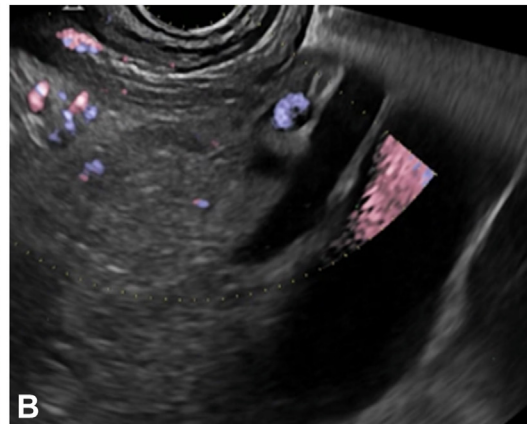


Figure 6. Through-the-LAMS EUS. **A**, Two months after the ERCP, the patient underwent a through-the-LAMS EUS using a linear echoendoscope. **B**, Scanning from the bulb as well as the second duodenal portion revealed no direct or indirect signs of choledocholithiasis. Therefore, the LAMS was removed. *LAMS*, Lumen-apposing metal stent.

No adverse events were recorded after all endoscopic procedures. The patient undergoes regular follow-up within a prospective registry of therapeutic EUS (PROTECT registry, NCT04813055).

After almost 1 year of follow-up, no short- or long-term adverse events were recorded, as well as no weight gain or onset of metabolic changes, so we decided not to expose this young woman of childbearing age to further diagnostic procedures to ascertain fistula closure.

CONCLUSIONS

Experience with EDGE in complex postsurgical anatomies is limited. These 2 cases demonstrate that an accurate endosonographic study makes EDGE feasible even in challenging situations when performed by expert hands in tertiary referral centers, confirming its prominent role in the management of pancreatobiliary events after bariatric surgery.

DISCLOSURE

The authors did not disclose any financial relationships.

REFERENCES

1. Franken RJ, Sluiter NR, Franken J, et al. Treatment options for weight regain or insufficient weight loss after sleeve gastrectomy: a systematic review and meta-analysis. *Obes Surg* 2022;32:2035-46.
2. Ghandour B, Shinn B, Dawod QM, et al. EUS-directed transgastric interventions in Roux-en-Y gastric bypass anatomy: a multicenter experience. *Gastrointest Endosc* 2022;96:630-8.
3. van der Merwe SW, van Wanrooij RLJ, Bronswijk M, et al. Therapeutic endoscopic ultrasound: European Society of Gastrointestinal Endoscopy (ESGE) guideline. *Endoscopy* 2022;54:185-205.
4. Khara HS, Parvataneni S, Park S, et al. Review of ERCP techniques in Roux-en-Y gastric bypass patients: highlight on the novel EUS-directed transgastric ERCP (EGDE) technique. *Curr Gastroenterol Rep* 2021;23:10.
5. Gkolfakis P, Papaefthymiou A, Facciorusso A, et al. Comparison between enteroscopy-, laparoscopy- and endoscopic ultrasound-assisted endoscopic retrograde cholangio-pancreatography in patients with surgically altered anatomy: a systematic review and meta-analysis. *Life (Basel)* 2022;12:1646.
6. de Oliveira VL, de Moura DTH, do Monte Júnior ES, et al. Laparoscopic-assisted endoscopic retrograde cholangiopancreatography (ERCP) versus endoscopic ultrasound-directed transgastric ERCP in patients with Roux-en-Y gastric bypass: a systematic review and meta-analysis. *Cureus* 2022;14:e30196.
7. D'Urso A, Vix M, Perretta S, et al. Indications and long-term outcomes of conversion of sleeve gastrectomy to Roux-en-Y gastric bypass. *Obes Surg* 2021;31:3410-8.
8. Ghandour B, Bejjani M, Zhang L, et al. EUS-directed transgastric ERCP in Roux-en-Y gastric bypass revision of sleeve gastrectomy. *VideoGIE* 2022;7:247-9.
9. van Wanrooij RLJ, Bronswijk M, Kunda R, et al. Therapeutic endoscopic ultrasound: European Society of Gastrointestinal Endoscopy (ESGE) technical review. *Endoscopy* 2022;54:310-32.

Read Articles in Press Online Today!
Visit www.videogie.org

VideoGIE posts in-press articles online in advance of their appearance in a monthly edition of the journal. These articles are available on the *VideoGIE* website by clicking on the “Articles in Press” tab. Articles in Press represent the final edited text of articles that are accepted for publication but not yet scheduled to appear in a specific issue. They are considered officially published as of the date of Web publication, which means readers can access the information and authors can cite the research months prior to its availability in an issue. To cite Articles in Press, include the journal title, year, and the article’s Digital Object Identifier (DOI), located in the article footnote. Visit the website today to stay current on the latest research in the field of gastrointestinal endoscopy.