

A Novel Application of a Through the Scope Fully Covered Esophageal Stent for an Endoscopic Ultrasound-Directed Transgastric Endoscopic Retrograde Cholangiopancreatography Procedure

Kareena S. Garg, BS¹, and Saad A. Haque, MD²

¹Georgetown University School of Medicine, Washington, DC

²Department of Gastroenterology, Virginia Hospital Center, Arlington, VA

ABSTRACT

Performing traditional endoscopic retrograde cholangiopancreatography (ERCP) in patients with Roux-en-Y gastric bypass anatomy is challenging. The endoscopic ultrasound-directed transgastric ERCP (EDGE) procedure offers a minimally invasive solution. This case describes a 53-year-old woman with a history of Roux-en-Y gastric bypass presenting with cholelithiasis, abnormal liver function tests, and cholecystitis. After initial conservative treatment, a staged EDGE procedure was performed. A lumen-apposing metal stent (LAMS) was placed in the jejunum, but subsequent attempts to cannulate it with the ERCP scope were unsuccessful due to “bowing” of the efferent loop. A fully covered esophageal stent was placed through the LAMS creating a “ramp” allowing passage of the duodenoscope, enabling successful ERCP and stone removal. This case highlights an effective technique to overcome often encountered challenges accessing LAMS during an EDGE procedure.

KEYWORDS: endoscopic retrograde cholangiopancreatography; endoscopic ultrasound-directed transgastric ERCP; EDGE; cholecystitis; endoscopy

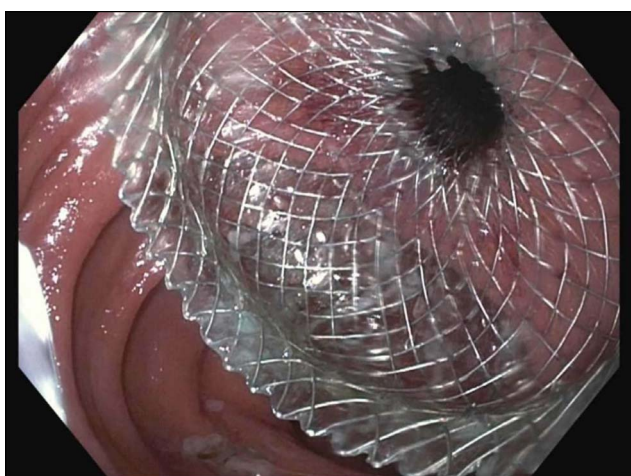


Figure 1. AXIOS stent (Boston Scientific, Natick, MA) seen in the jejunal efferent loop during the first procedure (1× magnification).

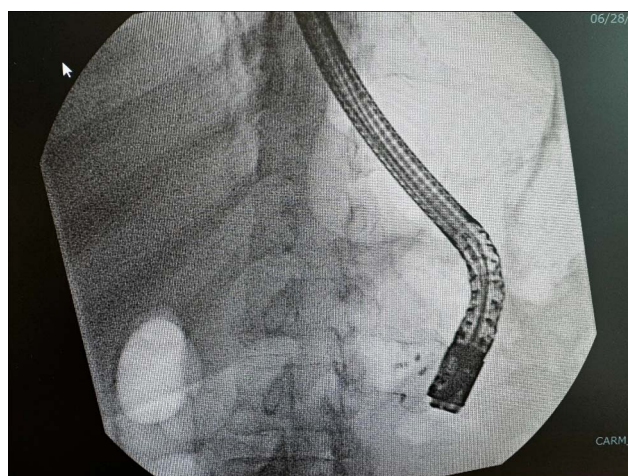


Figure 2. Endoscopic retrograde cholangiopancreatography scope unable to engage with the AXIOS stent in a patient with Roux-en-Y gastric bypass anatomy (1× magnification).

INTRODUCTION

In patients with Roux-en-Y gastric bypass anatomy, performing traditional endoscopic retrograde cholangiopancreatography (ERCP) can be challenging for cases with choledocholithiasis.^{1,2} Endoscopic ultrasound-directed transgastric ERCP (EDGE) procedure is a minimally invasive, completely endoscopic technique for patients with Roux-en-Y gastric bypass anatomy that has demonstrated high clinical success rates and gained recent popularity.¹⁻³ The procedure involves placing a lumen-apposing metal stent (LAMS) to connect the gastric pouch or proximal jejunum to the excluded stomach. The access window into the excluded stomach is ideally done to avoid the antrum or distal stomach, as this makes subsequent cannulation of the pylorus technically challenging. A standard duodenoscope can then be passed through the LAMS to allow for the performance of a standard ERCP. Complications of the procedure include dislodging the LAMS with the passage of the scope through it, as well as difficulty accessing the LAMS in a jejuno gastric approach. Following the procedure, the fistula tract can either be allowed to close spontaneously or closed endoscopically. EDGE is a time-efficient single-session or dual-session procedure that can be performed in an outpatient setting or endoscopy unit and is shown to have high rates of clinical success with low adverse event rates.^{1,3}

CASE REPORT

We present the case of a 53-year-old woman with a medical history of Roux-en-Y gastric bypass surgery, diabetes mellitus, chronic migraines, and hypertension who presented to the emergency department with fever, total bilirubin of 4.5, alkaline phosphatase of 286, and sharp right upper quadrant pain, with

an magnetic resonance cholangiopancreatography showing choledocholithiasis in the main duct with 2 stones approximately 4 mm in size each, and with evidence of cholecystitis. The patient was initially treated conservatively with bowel rest and antibiotics and responded well clinically with normalizing liver function tests leading to subsequent discharge, with a planned EDGE procedure to be done as an outpatient due to the noted choledocholithiasis.

The patient's first procedure was performed in the outpatient setting 17 days after diagnosis of cholecystitis. The patient was asymptomatic at this time with normal liver function tests. A 19 gauge needle was used to initially access the remnant stomach through the gastric pouch, and dye was injected to inflate the stomach, under fluoroscopic and endoscopic ultrasound guidance. A 20 × 10 mm electrocautery-enhanced LAMS was then placed in the remnant stomach, 7 cm into the jejunum in the efferent loop (Figure 1). A jejuno gastric approach was used as it would allow the duodenoscope to access the remnant stomach in the midbody, allowing easy passage into the duodenum. It was subsequently sutured in place with a through the scope suturing device. The patient was discharged home later that day on a normal diet. Three weeks later, the patient presented for her ERCP procedure. Multiple attempts were made to cannulate the LAMS with the duodenoscope unsuccessfully due to the bowing of the efferent limb, despite application of abdominal pressure and position changes of the patient to change the angle of access into the LAMS (Figures 2 and 3). There was concern that continuing such efforts could dislodge the LAMS or cause jejunal injury. At this time, the endoscopist chose a different approach. A 23 mm × 150 mm through the scope fully covered esophageal stent was placed across the LAMS from the remnant stomach by a double channel esophagogastroduodenoscopy

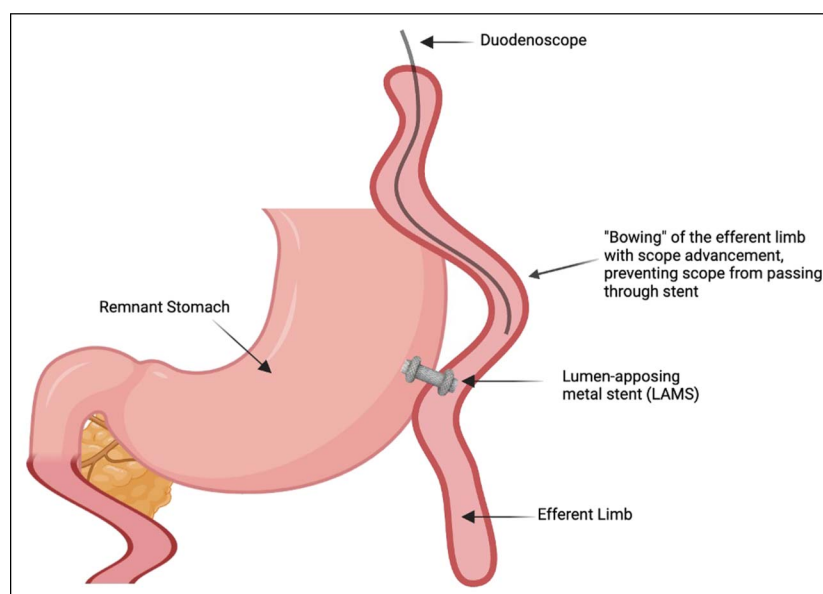


Figure 3. Drawing that demonstrates endoscopic retrograde cholangiopancreatography in a patient with Roux-en-Y gastric bypass anatomy; the duodenoscope is unable to pass through the AXIOS due to “bowing” of the efferent limb.



Figure 4. Through the scope fully covered esophageal stent being placed from the excluded stomach, across the AXIOS, into the efferent jejunal limb by esophagogastroduodenoscopy scope (1× magnification).

scope (Figure 4). It was done in a free hand manner with the initial deployment of 3–4 cm under endoscopic visualization in the remnant stomach with simultaneous slow withdrawal of the scope into the efferent limb. The majority of the stent was left in the efferent limb in this fashion and was not sutured. This created a ramp for the duodenoscope scope to access the remnant stomach subsequently (Figures 4–6). The ERCP was subsequently done with the successful removal of common bile duct stones. The esophageal stent was removed after completing the ERCP.

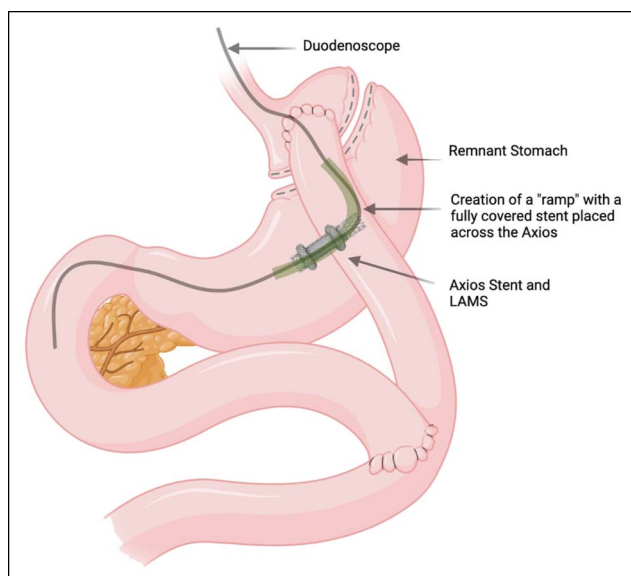


Figure 5. Drawing that demonstrates endoscopic ultrasound-directed transgastric procedure; creation of a “ramp” with a fully covered esophageal stent placed across the AXIOS allows for easy passage of the duodenoscope into the excluded stomach. LAMS, lumen-apposing metal stent.

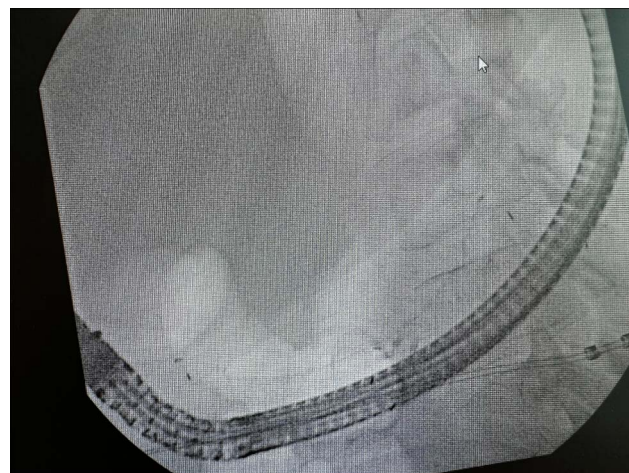


Figure 6. Endoscopic retrograde cholangiopancreatography scope passing easily through the through the scope esophageal and AXIOS stent (1× magnification).

The patient presented 1 month later for a final procedure and for removal of the esophageal stent and LAMS. She was discharged the same day on normal diet and has had no post-operative complications to date.

DISCUSSION

This case demonstrates a safe and effective method to aid endoscopists when faced with a difficult LAMS orientation during EDGE. Often times, the LAMS is at further length into the jejunum, which decreases the mechanical advantage to torque the duodenoscope through the LAMS. Endoscopists often use application of abdominal pressure, increased pushing of the scope, or patient position changes to access the LAMS, which can increase procedure length and risks LAMS dislodgment.^{4,5} Creation of a ramp with a fully covered esophageal stent, in an off-label fashion, placed across the LAMS, allows for easy access into the excluded anatomy. This prevents the efferent jejunal loop from bowing away from the scope due the mechanical stiffness offered by the esophageal stent. The esophageal stent is removed at the end of the procedure and, therefore, adds minimal risks to the procedure.

DISCLOSURES

Author contributions: SA Haque made substantial contributions to the conception or design of the work, methodology, investigation, resources, data curation, supervision, drafting the work and reviewing it critically for important intellectual content, final approval of the version to be published, and agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. KS Garg made substantial contributions to the acquisition, analysis, and interpretation of data for the work, drafting the manuscript and reviewing it critically for important intellectual content, final

approval of the version to be published, and agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. SA Haque is the article guarantor.

Financial disclosure: None to report.

Informed consent was obtained for this case report.

Received November 25, 2024; Accepted February 18, 2025

REFERENCES

1. Prakash S, Elmunzer BJ, Forster EM, Cote GA, Moran RA. Endoscopic ultrasound-directed transgastric ERCP (EDGE): A systematic review describing the outcomes, adverse events, and knowledge gaps. *Endoscopy*. 2022;54(1):52–61.
2. James TW, Baron TH. Endoscopic ultrasound-directed transgastric ERCP (EDGE): A single-center US experience with follow-up data on fistula closure. *Obes Surg*. 2019;29(2):451–6.
3. Kedia P, Shah-Khan S, Tyberg A, et al. Endoscopic ultrasound-directed transgastric ERCP (EDGE): A multicenter US study on long-term follow-up and fistula closure. *Endosc Int Open*. 2023;11(5):E529–37.
4. Baron TH. Approaches to ERCP in patients with Roux-en-Y gastric bypass anatomy. *Gastroenterol Hepatol (N Y)*. 2019;15(11):622–4.
5. Khara HS, Parvataneni S, Park S, Choi J, Kothari TH, Kothari ST. 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(7):10.

Copyright: © 2025 The Author(s). Published by Wolters Kluwer Health, Inc. on behalf of The American College of Gastroenterology. This is an open access article distributed under the terms of the Creative Commons Attribution-Non Commercial-No Derivatives License 4.0 (CCBY-NC-ND), where it is permissible to download and share the work provided it is properly cited. The work cannot be changed in any way or used commercially without permission from the journal.