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CASE REPORT | ENDOSCOPY

A Unique Case of a Successful Endoscopic Retrograde Cholangiopancreatography Through a Previously Placed Gastro-Jejunostomy Lumen Apposing Metal Stent

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ABSTRACT

Originally used for minimally invasive drainage of pancreatic fluid collections, the uses of lumen-apposing metal stents (LAMS) have expanded to encompass several other pathologies including gastric outlet obstruction, strictures, and cases with surgically altered anatomy. We describe a rare case of an endoscopic retrograde cholangiopancreatography that was successfully completed through a previously placed LAMS between the stomach and the jejunum, in a patient with challenging anatomy due to progressing malignancy resulting in gastric outlet obstruction. This case highlights the technical complexity of performing endoscopic retrograde cholangiopancreatography through a previously placed LAMS and underscores the importance of patient-centered care with readiness for adaptability in complex cases.

KEYWORDS: lumen-apposing stent; gastric outlet obstruction; surgically altered anatomy; endoscopic retrograde cholangiopancreatography; double-wire technique; challenging cannulation

INTRODUCTION

The lumen-apposing metal stent (LAMS) is a revolutionary device in gastrointestinal endoscopy, initially designed in 2011 to create stable conduits between nonadherent lumens. Originally used for minimally invasive drainage of pancreatic fluid collections, the uses of LAMSs have expanded to encompass several pathologies including gastric outlet obstruction (GOO), strictures, and cases with surgically altered anatomy. We describe a rare case of an endoscopic retrograde cholangiopancreatography (ERCP) that was successfully completed through a previously placed LAMS between the stomach and the jejunum, in a patient with challenging anatomy due to progressing malignancy resulting in GOO. This procedure requires very technical maneuvers and could be very challenging to complete.

CASE REPORT

A 68-year-old female patient with a medical history of stage IV gastric signet ring cell adenocarcinoma diagnosed 8 months before presentation was brought to the emergency department for evaluation of abdominal pain, nausea, and vomiting of 4 days duration.

Oncologic history: History goes back to 8 months before current presentation, when the patient was evaluated for similar symptoms and computed tomography imaging of the abdomen at the time revealed evidence of GOO. At that time, an upper endoscopy with endoscopic ultrasound (EUS) was performed and revealed a 30 × 25-mm antral gastric mass extending to the pylorus and causing stricturing with GOO (Figure 1). An endoluminal metal stent was successfully placed across the stricture, and an Over the Scope clip was used to fix the stent (Figure 2). Histopathology confirmed stage IV gastric signet ring cell adenocarcinoma.

One month later, the patient presented with worsening abdominal distention, repeat imaging was concerning for GOO due to stent malfunction. Repeat upper endoscopy with EUS was performed. The previously placed stent was found to be stable in position; however, the stricture had worsened, and the stenosis could not be traversed with the endoscope. Consequently, the previously placed

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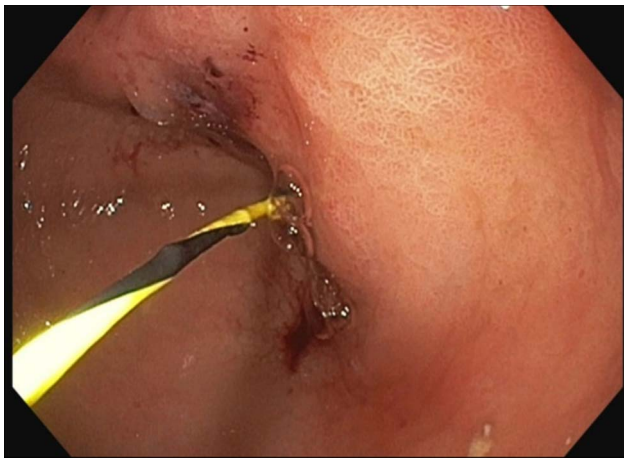

Figure 1. Stricture extending to the pylorus.

stent was removed, and a gastro-jejunostomy was successfully placed using a 15 × 10-mm LAMS (Figure 3). The patient was then started on chemotherapy.

Current presentation: On current presentation, the patient was febrile (102.9 F), tachycardic (heart rate 107), with a blood pressure of 95/53. On laboratory testing, white blood cell count was 11,000, and lactate was 2.4. Liver enzymes were elevated with a predominantly cholestatic pattern and direct hyperbilirubinemia: alkaline phosphatase 581, aspartate aminotransferase 177, alanine aminotransferase 103, total bilirubin 4.9, direct bilirubin 4.2, and a normal indirect bilirubin. Blood cultures had no growth of microbiologic organisms. Computed tomography imaging of the chest, abdomen, and pelvis with intravenous contrast revealed a moderately distended gallbladder with moderate wall thickening and new biliary ductal dilatation as well as mild peripancreatic stranding. A right upper quadrant ultrasound showed biliary dilation to 9 mm and minimal intrahepatic biliary ductal dilation. The constellation of findings was suspicious for obstruction at the ampulla of Vater, possibly secondary to tumor progression or scarring vs inflammation from the previously placed stent.

The patient underwent ERCP. During the procedure, the forward scope could not traverse the antrum due to the large tumor burden. The duodenoscope was switched to the GIF-1TH190 scope. The therapeutic gastroscope was advanced through the previously placed LAMS and traversed backward through the jejunum until the second part of the duodenum was reached (Figure 4). Double wire–guided technique was used after failure of selective biliary cannulation. Using a swing tip sphincterotome, a 0.025-inch wire was used in the pancreatic duct (PD) and a second wire (NovaGold 0.018inch) was used to achieve successful common bile duct (CBD) canulation. Using a pulsed cut setting, a needle knife (toward the 5 o'clock direction away from the PD direction) was performed without complications. Using the previously placed biliary access wire, a 10 mm × 6 cm fully covered metal biliary stent was placed into the CBD, and a 4 cm × 5 Fr stent was placed in the PD. An excellent drainage of bile and contrast was noted at the conclusion of the successful double wire ERCP with sphincterotomy and placement of CBD and PD stents (Figure 5).

The procedure was uncomplicated, and the patient had marked improvement in her symptoms after the procedure. She was able to tolerate enteral feeds, and her diet was advanced as tolerated.

DISCUSSION

In the world of constantly evolving gastrointestinal endoscopy, the LAMS is a revolutionary device that has served multiple purposes. It was designed by Binmoeller and Shah in 2011 to enable the creation of a robust and reliable conduit between nonadherent lumens around the gastrointestinal tract.[1] The device has a "barbell" shape, a large lumen, and flanged ends that give it a theoretically very low risk of migration.[2] Several different types of LAMS devices are available with different lengths and diameters, and the diameter and length measurements vary between 6 × 8 mm and 16 × 30 mm.

Initially, LAMS was mainly designed to enable minimally invasive transluminal drainages, such as the drainage of transmural pancreatic fluid collections.[2] They have also been used in other challenging procedures, such as direct necrosectomies and endoscopic gallbladder drainage, with stent placement from the duodenum into the gallbladder.[3,4]

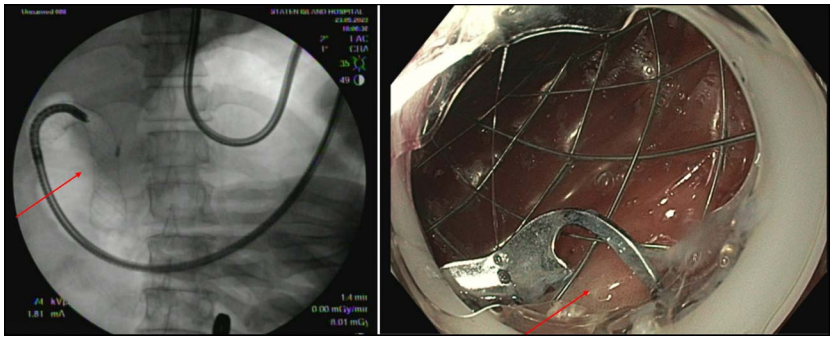

Figure 2. (A) Endoluminal stent during deployment. (B) Endoluminal metal stent with an Over the Scope clip for fixation.

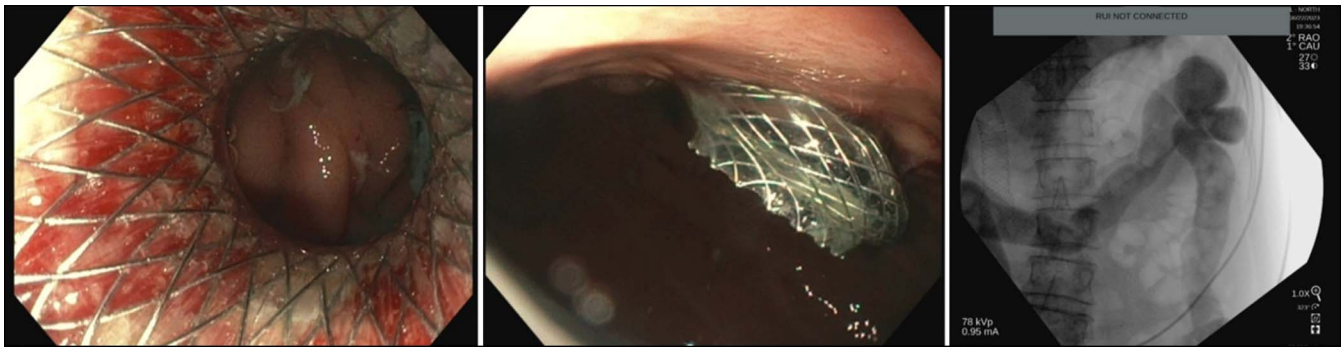

Figure 3. Gastro-jejunostomy placed with a 15 × 10-mm lumen apposing metal stent.

Interestingly, multiple in- and off-label indications for the use of LAMSs were proposed over time. For instance, LAMSs have been recently used for benign strictures throughout the gastrointestinal tract, such as strictures related to radiation therapy, caustic injury, and perianastomotic stricutres.[5] In addition, they have also recently emerged as nonoperative alternatives in the management of GOO, especially in high-risk surgical patients with malignant obstructions, such as our patient. By using LAMSs in EUS-guided gastrojejunostomy, they allow for the creation of a lumen from the stomach into the jejunum, hence, bypassing the mechanical obstruction.[6] Moreover, this can serve as a conduit to facilitate therapeutic procedures in patients with surgically altered anatomy. For instance, Roux-en-Y gastric bypass surgery significantly alters the anatomy of the upper gastrointestinal tract, restricting endoscopic access to the distal stomach, duodenum, biliary tree, and pancreas. Goldman et al describe a case similar to ours, where a LAMS was placed specifically to facilitate endoscopic access for repeat ERCP every 3 months in a patient with a Whipple anatomy and refractory biliary strictures causing recurrent cholangitis.[4] Similarly, a multicenter study was done by Ngamruengphong et al using LAMS to facilitate for peroral ERCP in patients who received Roux-en-Y gastric bypass surgery.[5] Thirteen patients were enrolled in this study, among all of which ERCP through LAMS was successful.

Potential complications that could arise are important to keep in mind. These could be intraprocedural or late complications such as bleeding, buried LAMS syndrome, and LAMS dislodgement especially when performing ERCP through the stent.[6] Ichkhanian et al report adverse events during endoscopic ultrasound directed transgastric ERCP: LAMS migration and embedding into the stomach mucosa, marginal ulcers at the site of the LAMS, and bleeding during stent dilation for scope passage.[7]

The literature is very scarce about endoscopic access for ERCP through LAMS. The case we present is unique given the challenging anatomy in the setting of a progressing malignancy causing GOO. The therapeutic maneuvers utilized during the procedure are very technical and require experienced advanced endoscopists and preprocedural planning.

This case highlights the use of a previously placed LAMS between the stomach and the jejunum as a conduit for the endoscope to bypass the GOO and travel backward from the jejunum to the second part of the duodenum, to successfully perform an ERCP in the setting of a progressing gastric malignancy. The procedure demonstrates the utility of LAMS in facilitating access to the biliary tree in challenging scenarios, highlighting its versatility beyond its initial indications. This is an effective and safe method that provides opportunities to avoid invasive surgical procedures.

Overall, our case highlights the technical complexity of performing ERCP through a previously placed LAMS. It also underscores the

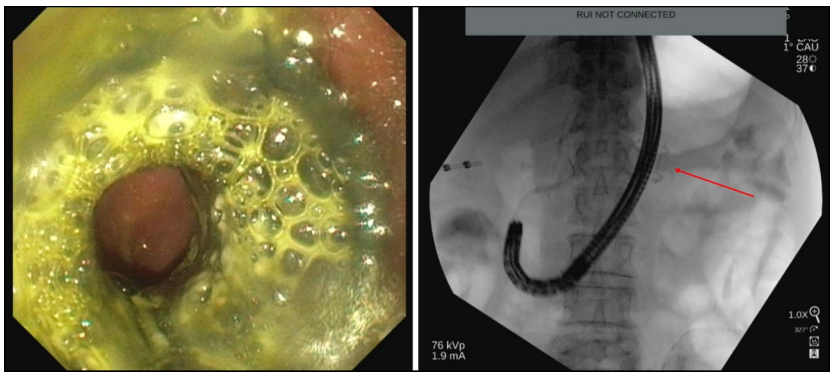

Figure 4. (A) Previously placed LAMS. (B) Endoscope through previously placed LAMS (red arrow) and traversed backward through the jejunum into the duodenum. LAMS, lumen-apposing metal stent.

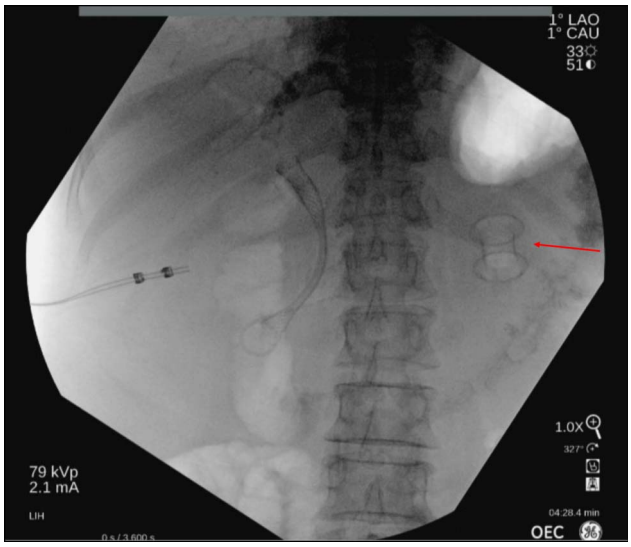

Figure 5. Concluding film after placement of a common bile duct stent, a pancreatic duct stent, and lumen-apposing metal stent in place (arrow).

importance of patient-centered care with readiness for adaptability in complex cases and of innovative endoscopic approaches and expertise in managing high-risk patients with complex gastrointestinal conditions. Given the complexity of the procedure and the potential adverse events, more research efforts are required to expand LAMS applicability.

DISCLOSURES

Author contributions: C. Lahoud and M. Kreidieh: literature review, manuscript writing and editing. M. Abureesh: manuscript editing. Y. El Douaihy: supervision and manuscript review. All the authors have read and agreed to the published version of the manuscript. C. Lahoud is the article guarantor.

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