



Simultaneous double gastrojejunostomy for afferent and efferent limb syndromes

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Afferent and efferent limb syndromes are potential adverse events after partial gastrectomy with a gastrojejunostomy (GJ) reconstruction. Mechanical obstruction of the reconstructed small-bowel loops is often the underlying etiology, and it occurs because of anastomotic narrowing, postsurgical adhesions, and recurrence of the primary disease.¹ Afferent limb syndrome usually presents with abdominal pain, bilious vomiting, and cholestasis and may require urgent surgical intervention in the acute setting to prevent bowel necrosis.² Efferent limb syndrome has a similar, overlapping presentation, with more pronounced postprandial symptoms. Surgical intervention is also often required for symptomatic relief.¹

METHODS

EUS-guided gastroenterostomy, a technique first described *in vivo* by Itoi et al in 2013,³ uses lumen-apposing metal stents (LAMSs) to create a *de novo* GJ under EUS and fluoroscopic guidance. It is usually performed to manage gastric outlet obstruction and to access the hepatobiliary region in patients with surgically altered anatomy. We herein describe a case of double EUS-GJ for the management of afferent and efferent limb syndromes in the setting of partial gastrectomy with Roux-en-Y GJ.

DESCRIPTION

Video 1 (available online at www.VideoGIE.org) is a case report of a 50-year-old woman who had undergone partial gastrectomy with Roux-en-Y GJ for the management of poorly differentiated gastric adenocarcinoma with signet ring features. Four years after surgery, the patient was found to have cancer recurrence with peritoneal carcinomatosis and metastases involving part of the colon and gallbladder, requiring omentectomy, partial colectomy, and cholecystectomy. After surgical recovery, the patient was readmitted to the hospital with progressively worsening abdominal pain and decreased oral intake, indicating symptoms of efferent limb syndrome. Laboratory findings (aspartate aminotransferase 199, alanine aminotransferase 437, alkaline phosphatase 1343, and total bilirubin of 1.1) along with imaging findings (moderate intra- and extrahepatic biliary dilatation

and dilated afferent limb) were diagnostic of afferent limb syndrome. On initial endoscopy, visible narrowing of the efferent limb was noted, and the endoscope failed to traverse the limb. The patient was diagnosed with both afferent and efferent limb syndromes.

Because the endoscope could not be advanced beyond the stomach, both endosonography and fluoroscopy were used to localize the afferent and efferent loops. A bowel loop near the stomach was identified by EUS and was accessed with a 19-gauge needle. A total volume of 300 mL of contrast and saline solution was injected to opacify the loop, and the trajectory indicated that it was the afferent loop. A 0.025 wire was advanced and coiled within the limb. A 10- × 10-mm cautery-enhanced LAMS was advanced over the wire and deployed into the afferent limb, creating the first endoscopic GJ. Another dilated bowel loop in the right upper quadrant was localized and similarly accessed, and enterography confirmed this was the efferent loop. A 0.025 wire was then coiled within the efferent limb. The 19-gauge FNA needle was then exchanged with a 15- × 10-mm cautery-enhanced LAMS. Initially, the distal flange was deployed into the efferent limb lumen under sonographic and fluoroscopic visualization, followed by the proximal flange, creating the second endoscopic GJ (**Fig. 1**).

After the late onset of biliary reflux, the previously deployed LAMS connecting the remnant stomach to the afferent limb was exchanged with a 7F × 7 cm double-pigtail stent, and the patient was started on cholestyramine therapy. The last endoscopy follow-up was performed 1 year after the initial procedure and revealed patent and *in situ* stents. The patient denied currently experiencing the previously noted symptoms.

Evidence in the literature on optimal LAMS size corresponding with its different indications is scarce; however, the decision was made to use a 10-mm diameter LAMS for managing the afferent limb syndrome because a larger diameter might result in greater risk of bile reflux. In addition, the purpose of the stent is drainage of the afferent limb and pancreaticobiliary juices. A 15-mm LAMS is needed to provide relief of gastric outlet obstruction symptoms and allow oral intake of a low-residue diet. In our long experience with 100 cases of EUS-GJ, we have noticed adequate palliation of gastric outlet obstruction symptoms

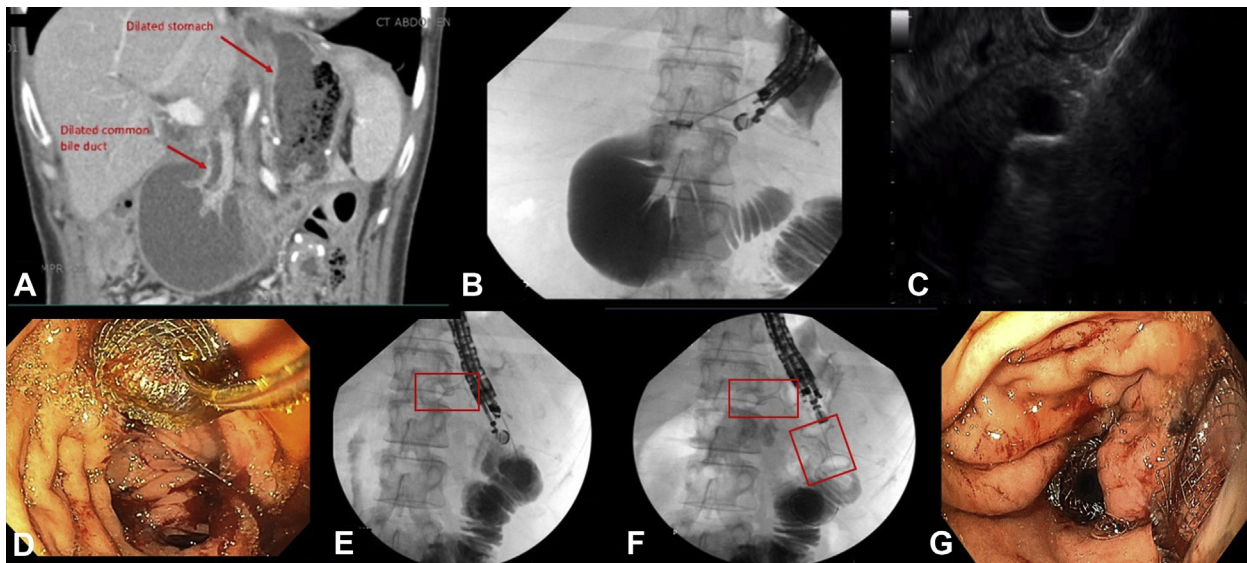


Figure 1. Double EUS-guided gastrojejunostomy for the management of afferent and efferent limb syndromes. **A**, Preprocedural CT scan of the abdomen. **B**, Fluoroscopic image showing the afferent limb punctured with a 19-gauge needle and distended with a total of 300 mL of contrast/saline solution mixture. **C**, Sonographic image of 10- × 10-mm cautery-enhanced lumen-apposing metal stent (LAMS) advanced over the wire with the distal flange deployed in the afferent limb. **D**, Endoscopic view of the deployed LAMS from the proximal end of the de novo created gastrojejunostomy connecting the stomach to the afferent limb. **E, F**, Fluoroscopic images revealing the deployment of the second gastrojejunostomy connecting the stomach to the efferent limb. The efferent limb was initially punctured with 19-gauge needle and distended with a mixture of contrast/saline solution, followed by the advancement of 15- × 10-mm cautery-enhanced LAMS. **G**, Endoscopic view of the 2 deployed LAMSs from the proximal end of the 2 de novo created gastrojejunostomies.

with the 15-mm LAMS. A comparative study is needed to determine whether a 20-mm LAMS provides any additional benefit while maintaining the safety of the procedure.

CONCLUSION

Same-session double EUS-guided gastrojejunostomy for the management of afferent and efferent limb syndromes was performed with both technical and clinical success. Bile reflux is a potential adverse event in the case of EUS-GJ for the management afferent limb syndrome. Reflux can be controlled by downsizing the stent and using cholestyramine therapy.

DISCLOSURE

Dr Khashab is a consultant for Boston Scientific, Olympus, and Medtronic. All other authors disclose no financial relationships.

Abbreviations: GJ, gastrojejunostomy; LAMS, lumen-apposing metal stent.

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