

## Double edged: a dual EUS-guided approach to pancreatobiliary intervention in altered anatomy



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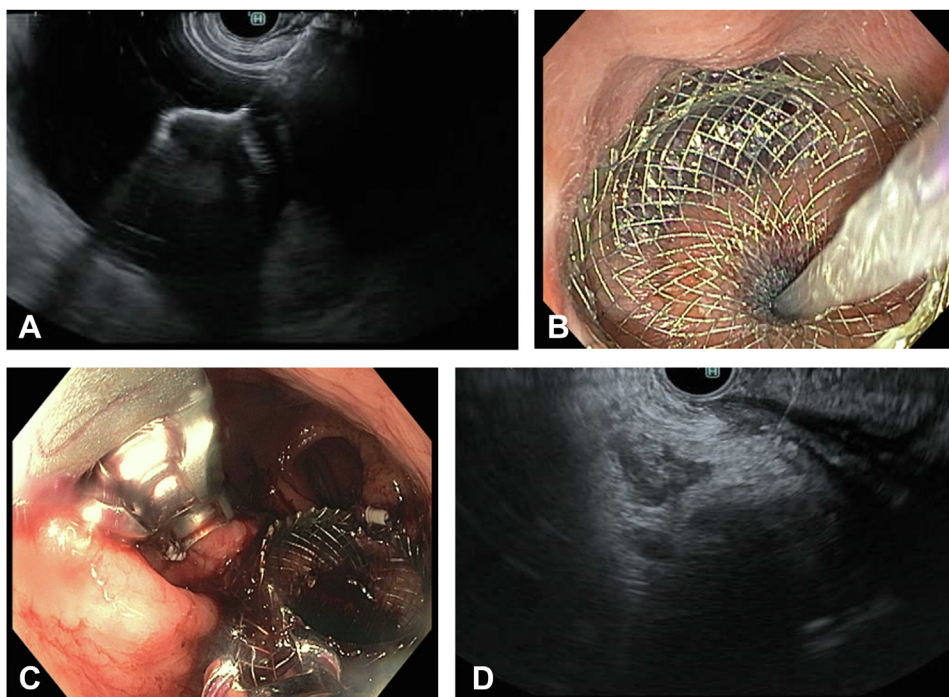
### BACKGROUND

Following the success of EUS-directed transgastric ERCP,<sup>1,2</sup> a similar transgastric approach can be adopted for treatment of other pathology in Roux-en-Y gastric bypass (RYGB) patients, collectively termed EUS-directed transgastric intervention (EDGI).<sup>3</sup> Herein, we report a case of an RYGB patient requiring multiple EDGI (Video 1, available online at [www.giejournal.org](http://www.giejournal.org)).

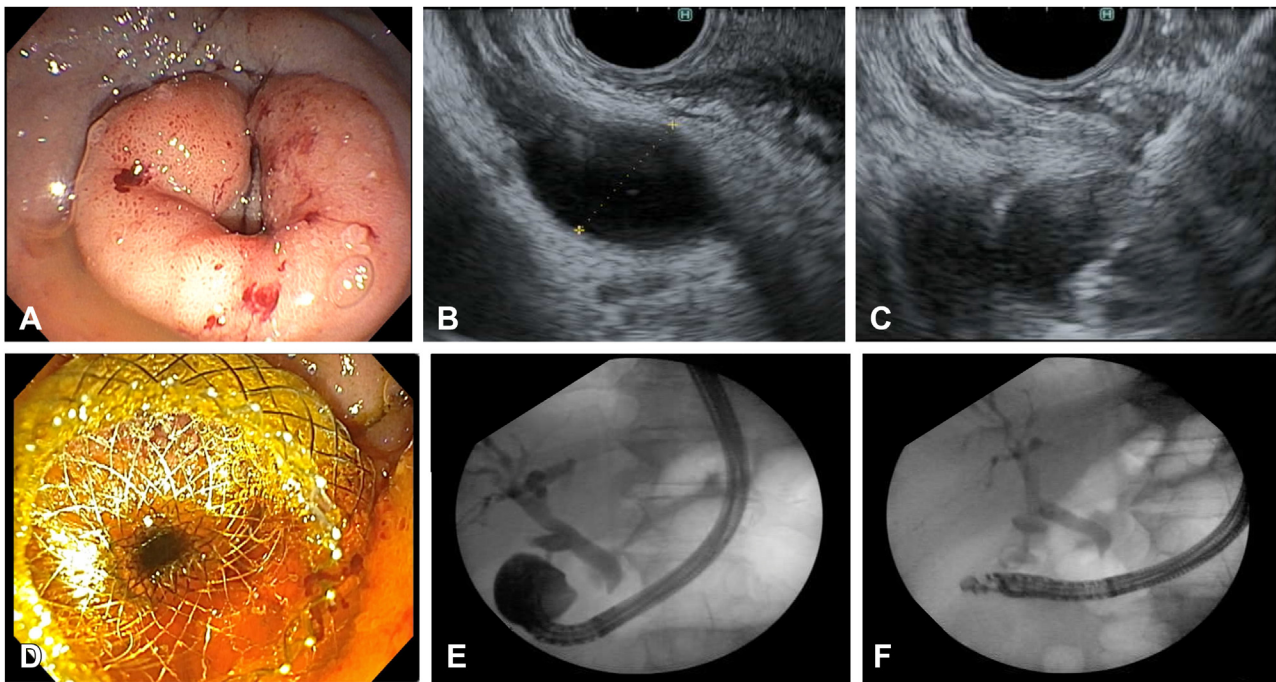
### CASE PRESENTATION

A 47-year-old man with prior RYGB and recurrent alcoholic pancreatitis presented with painless jaundice. He had elevation of his liver enzymes and total bilirubin, and CT/MRI scans demonstrated a new pancreas head mass with upstream dilation of the bile duct and pancreatic

duct. The excluded stomach was also noted to be distended. Given his altered anatomy, the patient was referred for EDGI. Using a linear echoendoscope, we identified the dilated excluded stomach from the gastric pouch (Fig. 1). A gastrogastrostomy was created with the freehand technique using a 20- × 10-mm cautery-enhanced lumen-apposing metal stent (LAMS). The LAMS was dilated to 20 mm, and the proximal flange was secured to the gastric pouch with 2 interrupted endoscopic sutures. The linear echoendoscope was then carefully advanced through the LAMS. There was a severe, nontraversable stenosis at the duodenal bulb. Given the stricture severity and presumed malignant etiology, we deferred attempts to access the second portion of the duodenum. A 29-mm ill-defined hypoechoic head-of-pancreas lesion was identified from the duodenal bulb. Fine-needle aspiration with a 22-gauge needle yielded adequate cellularity, deemed atypical by on-site cytological evaluation. Given



**Figure 1.** EUS-directed transgastric intervention. **A**, Excluded stomach is endosonographically visualized from the gastric pouch and a 20- × 10-mm cautery-enhanced LAMS is placed creating a gastrogastrostomy. **B**, The LAMS is visualized from the gastric pouch and dilated to 18 mm to allow subsequent passage of endoscopes. **C**, Endoscopic suturing was performed to secure the proximal flange of the LAMS. **D**, Linear echoendoscope is then able to pass through the LAMS to the excluded duodenal bulb for sampling of a hypoechoic head of pancreas mass. LAMS, Lumen-apposing metal stent.



**Figure 2.** EUS-directed choledochoduodenostomy. **A**, The duodenoscope is advanced through the LAMS to the excluded duodenum but unable to reach the major papilla because of a nontraversable duodenal stenosis. **B**, A linear echoendoscope is used to evaluate the common bile duct, which is dilated at 12 mm. **C**, A 10- × 10-mm cautery-enhanced LAMS is placed from the duodenal bulb to the common bile duct, creating a choledochoduodenostomy. **D**, Endoscopic visualization of the choledochoduodenostomy, with visible passage of bile. **E**, Contrast injection via the LAMS results in a cholangiogram, which confirms the distal bile duct stricture. **F**, A double-pigtail plastic stent is placed through the LAMS for anchoring. LAMS, Lumen-apposing metal stent.

the inability to access the major papilla, the common bile duct was assessed for EUS-guided drainage (Fig. 2). The distal bile duct was dilated to 12 mm and located 6 mm from the duodenal wall. A choledochoduodenostomy was created using a 10- × 10-mm cautery enhanced-LAMS using the freehand technique. A 7F 5-cm double-pigtail plastic stent was placed through the LAMS for anchoring. The total procedure time was 53 minutes.

There were no periprocedural adverse events. Despite the on-site findings, formal EUS cytology and a subsequent CT-guided biopsy were negative for malignancy. However, tumor board review deemed the case highly suspicious for locally advanced pancreatic adenocarcinoma. Thus, the patient underwent neoadjuvant chemotherapy. Progress imaging at 2 months demonstrated decreased peripancreatic inflammatory change without obvious mass lesion. Given the excellent response, the patient proceeded to Whipple pancreaticoduodenectomy. Surprisingly, histologic analysis of the resected specimen showed chronic pancreatitis and dense fibrosis, without malignancy. The choledochoduodenostomy LAMS was contained within the resected specimen.

As access to the excluded stomach was no longer required, the patient returned for gastrostomy reversal at 7 months post-insertion. Following LAMS removal, particularly given the long LAMS dwell time, the tract was closed by a combination of argon plasma coagu-

lation, through-the-scope sutures, and over-the-scope clip. Contrast injection demonstrated no residual fistula.

## CONCLUSION

Here, we present a patient with post-bypass anatomy presenting with a suspected pancreatic mass and resultant bile duct obstruction. EUS-directed gastrostomy creation allowed passage of the echoendoscope into the excluded stomach, facilitating lesion sampling. Because of a nontraversable duodenal stenosis, ERCP was not feasible and EUS-directed choledochoduodenostomy was performed. This case demonstrates the versatility of EUS-directed access to the excluded stomach and duodenum in facilitating treatment of a broad spectrum of luminal and extraluminal conditions in patients with RYGB. As demonstrated in this case, same-session EUS and/or ERCP can be safely undertaken provided the stent is adequately secured, thus minimizing the risk of intraprocedural LAMS dislodgment before the tract matures.<sup>4,5</sup> Although our case was ultimately found to have benign pathology, EUS-directed choledochoduodenostomy remains within Whipple resection margins and thus is a valid option for treatment of malignant distal biliary obstruction even in surgically resectable patients.<sup>6</sup> Finally, EUS-guided gastrointestinal anastomoses can be effectively closed

endoscopically, and the risk of persistent fistula formation is low.<sup>7</sup>

## DISCLOSURE

*Dr Khasbab is a consultant for Boston Scientific, Olympus America, Medtronic, Apollo Endosurgery, Pentax, and GI Supply. He receives royalties from UpToDate and Elsevier. All other authors disclosed no financial relationships.*

*Abbreviations: EDGI, EUS-directed transgastric intervention; LAMS, lumen-apposing metal stent; RYGB, Roux-en-Y gastric bypass.*

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