ORIGINAL ARTICLE

A challenging case of pancreaticogastric anastomotic stricture in a patient with surgically altered anatomy

Yervant Ichkhanian, MD,[1] Faisal Nimri, MD,[2] Mohammad Faisal Salman, MD,[2] Kevin Harris, MD,[2] Ashraf Taha, MD,[2] Hamna Fahad, MD,[2] Tobias Zuchelli, MD[2]

INTRODUCTION

A 64-year-old woman presented with the chief complaint of chronic, persistent, and worsening abdominal pain, unintentional weight loss of around 25 lb, and steatorrhea. The patient had undergone multiple abdominal surgeries in an outside hospital, which included hernia repair, *Roux-en-Y gastric bypass* for weight loss, and a recent (less than a year from presentation) Whipple reconstruction with pancreatico-gastrostomy (PG) for "double duct sign" with concern for malignancy, which was later deemed to be nonmalignant (pancreatic intraepithelial neoplasia) on post-surgical pathology. MRI was performed, which showed persistent, tortuous, and dilated remnant main pancreatic duct (PD) measuring up to 7 mm without evidence of an obstructing mass, but there was a cutoff sign at the expected area of the surgical anastomosis site and inadequate response to secretin (Fig. 1). Based on the clinical presentation and findings on cross-sectional imaging, PG anastomotic stricture with pancreatic exocrine insufficiency was suspected.

Pancreatico-enteric anastomotic stricture post–pancreatoduodenectomy is a late, rare postsurgical adverse event that could result in pancreatitis, abdominal pain, and pancreatic insufficiency. There are multiple available endoscopic management modalities for pancreatico-enteric anastomotic stricture; however, anatomic alterations deem such techniques challenging, and patients might require surgical or percutaneous managements. After a multidisciplinary discussion, the patient opted to avoid percutaneous or surgical interventions. Given the anticipated multisession intervention, the decision was made to create de novo EUS-guided anastomosis to access the PG anastomosis site.

Abbreviations: LAMS, lumen-apposing metal stent; OTSC, over-the-scope clip; PD, pancreatic duct; PG, pancreatico-gastrostomy.

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2468-4481
https://doi.org/10.1016/j.vgie.2023.06.004

Department of Internal Medicine, Henry Ford Hospital, Detroit, Michigan (1), Division of Gastroenterology and Hepatology, Henry Ford Hospital, Detroit, Michigan (2).

INDEX PROCEDURES

Procedure 1

Under EUS and fluoroscopic guidance, a 19-gauge FNA needle was used to puncture the remnant stomach, and a 0.025-inch guidewire was advanced. This was followed by the advancement of a 20- × 10-mm lumen-apposing metal stent (LAMS) from the Roux limb into the distal gastric remnant, thus creating a de novo gastrojejunostomy. Technical failure was initially encountered during the attempt of creating a gastro-gastrostomy. This was due to contrast being readily drained from the remnant stomach across the remnant's gastrojejunostomy site. Therefore, the pouch puncture site was closed with an over-the-scope clip. Two plastic stents were placed in the gastric remnant through the LAMS, ending in the Roux limb, to ensure adequate drainage and protect the LAMS from rubbing against the jejunal and gastric walls (Fig. 2). The patient was admitted for overnight monitoring with the plan to repeat ERCP in 3 weeks (Video 1, available online at www.videogie.org).

Procedure 2

The previously placed LAMS had traversed into the distal part of the excluded stomach. Two sutures were noted in the stomach with a location correlating with the proposed PG. The opening was not clearly visualized and was thought to be significantly stenosed. The sutures were cut using endoscopic scissors and partially removed. Multiple attempts to cannulate the PG using a 0.025-inch guidewire and sphincterotome were not successful; therefore, the procedure was aborted and the patient was scheduled to return in 4 weeks so we could attempt EUS-guided rendezvous drainage of the PD (Fig. 3; Video 1).

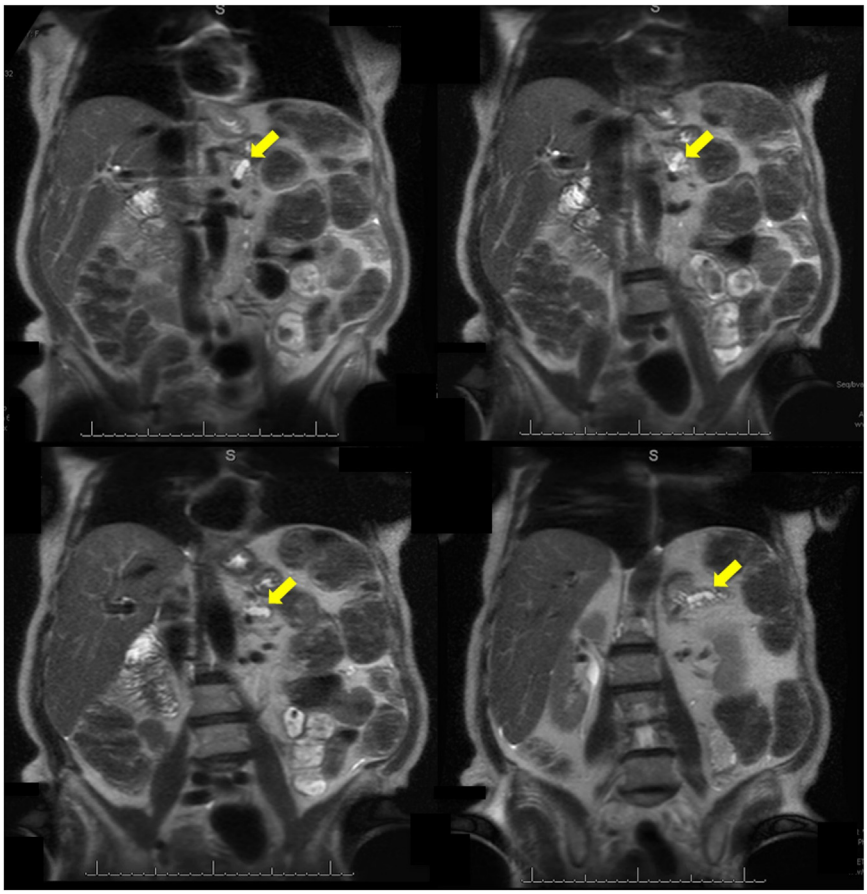

Figure 1. MRCP, indicating (*yellow arrow*) persistent tortuous and dilated remnant main pancreatic duct measuring up to 7 mm without evidence of obstructing mass.

Procedure 3

Under EUS and Doppler guidance, the PD was punctured with a 19-gauge FNA needle through a transgastric approach followed by injecting half-strength contrast, and a pancreatogram was obtained under fluoroscopy, revealing a dilated and ectatic PD without contrast extravasation into the excluded stomach. Multiple attempts were made to pass an ultra-stiff long 0.035-inch angled-tipped guidewire across the PG anastomosis without success; therefore, the guidewire was redirected toward the tail of the pancreas, where a safety loop was formed to avoid losing the access to the PD, and the decision was made to create a de novo PG under EUS-guidance. A 6-mm × 4-cm balloon dilator was passed over the guidewire, and dilation was performed by inflating the balloon to 8 atmospheres. Then a 5F × 9-cm plastic PD stent was placed in the PD over the wire. The upstream end rested in the duct, and contrast was seen draining through the stent (Fig. 4; Video 1).

FOLLOW-UPS

After the EUS-guided drainage of the PD, the patient reported gradual improvement in her abdominal pain, decreased steatorrhea, and weight gain. The patient returned 5 weeks later for a follow-up procedure. A guidewire was used to cannulate alongside the previously placed plastic stent, and a pancreatogram was performed. The de novo created PG site was further dilated by performing balloon dilation to 6 mm, and two 7F plastic PD stents were placed side by side to ensure adequate drainage and promote patency of the fistula site. During a second follow-up 3 months later, the PD was noted to be further decompressed and straighter compared to before. To maintain the patency of the de novo created PG, a 9-mm balloon was used to sweep the duct. A small amount of white particulate matter was removed, and 2 new upsized 7F and 8.5F PD plastic stents were placed

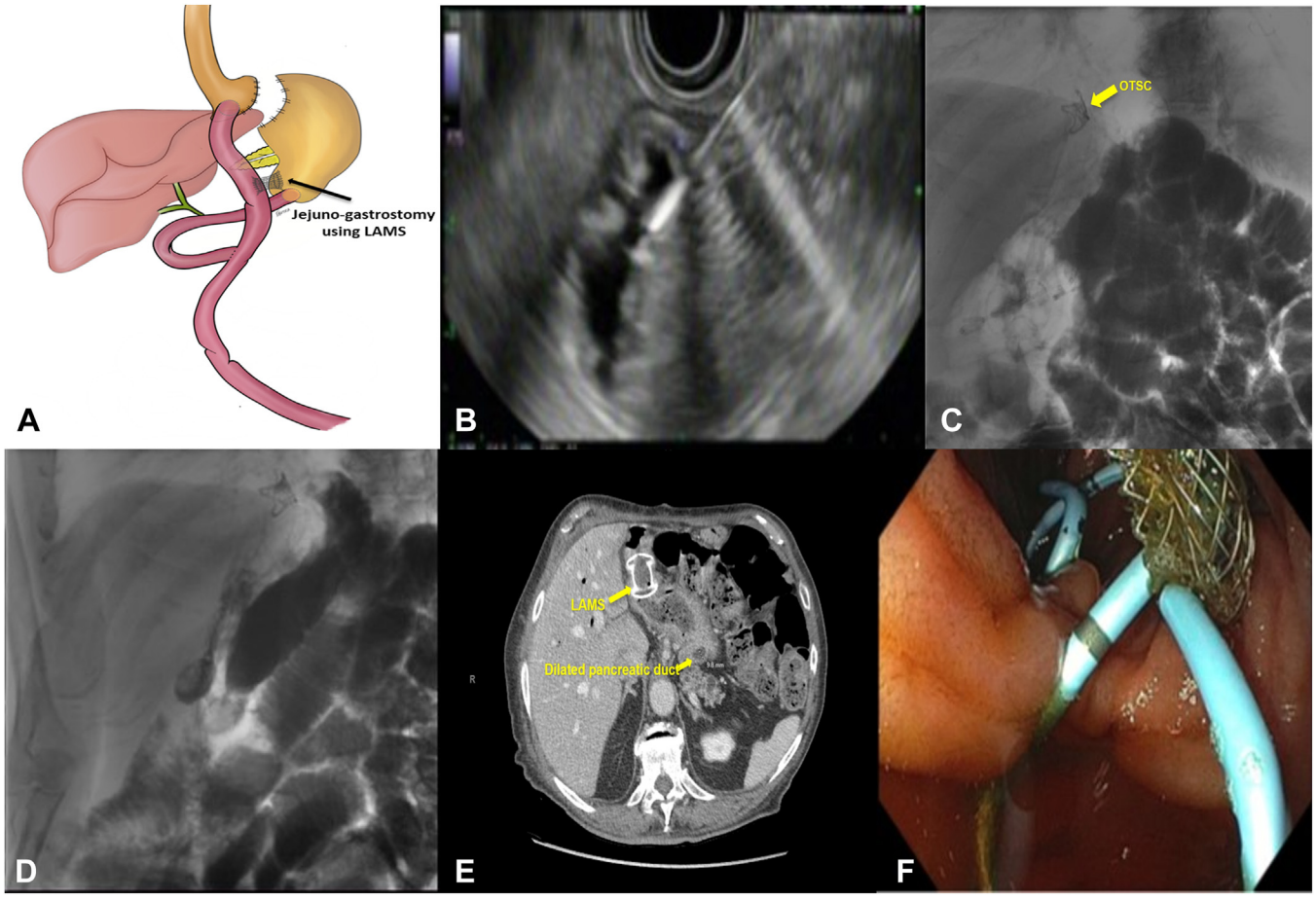

Figure 2. EUS-guided gastrojejunostomy using a LAMS. **A,** An illustration showing the patient's surgically altered anatomy and the site of the de novo created gastrojejunostomy. **B,** EUS image showing a 19-gauge FNA needle that was used to puncture the remnant stomach. **C,** A fluoroscopic image indicating an OTSC that was used to close the pouch puncture site after the technical failure in creating the gastro-gastrostomy. **D,** A fluoroscopic image indicating the de novo created gastrojejunostomy. **E,** A cross-sectional CT image indicating the de novo created gastrojejunostomy and the dilated pancreatic duct. **F,** Endoscopic image showing 2 plastic stents were placed into the gastric remnant through the LAMS, ending in the Roux limb. *LAMS*, Lumen-apposing metal stent; *OTSC*, over-the-scope clip.

(Fig. 5). The indwelling LAMS demonstrated stent changes suggestive of possible covered coating breakdown. To avoid tissue in-growth into the stent, the existing LAMS was removed with a rat tooth and replaced with a new 20- × 10-mm LAMS (Video 1).

The patient had an additional 3 procedures (4 months apart) after her first follow-up procedure post–EUS-guided drainage of the PD, during which the 2 PD plastic stents were replaced to maintain the patency of the de novo created PG along with the periodic (twice yearly) replacement of the LAMS to limit tissue in-growth and/or mucosal erosion. Clinically, the patient continued to gain weight and reported decreased diarrhea and steatorrhea. Although the de novo created PG resulted in PD decompression, it is anticipated that cannulation of the surgical PG will be reattempted in an anterograde or retrograde fashion to establish more durable drainage of the PD.

CONCLUSION

We present a case of a challenging PG anastomotic stricture that was managed endoscopically by creating a de novo EUS-guided PG. The EUS-guided transluminal deployment of an LAMS, creating the gastrojejunostomy, allowed the multisession access to the anastomosis site in the excluded stomach, facilitating a wider range of

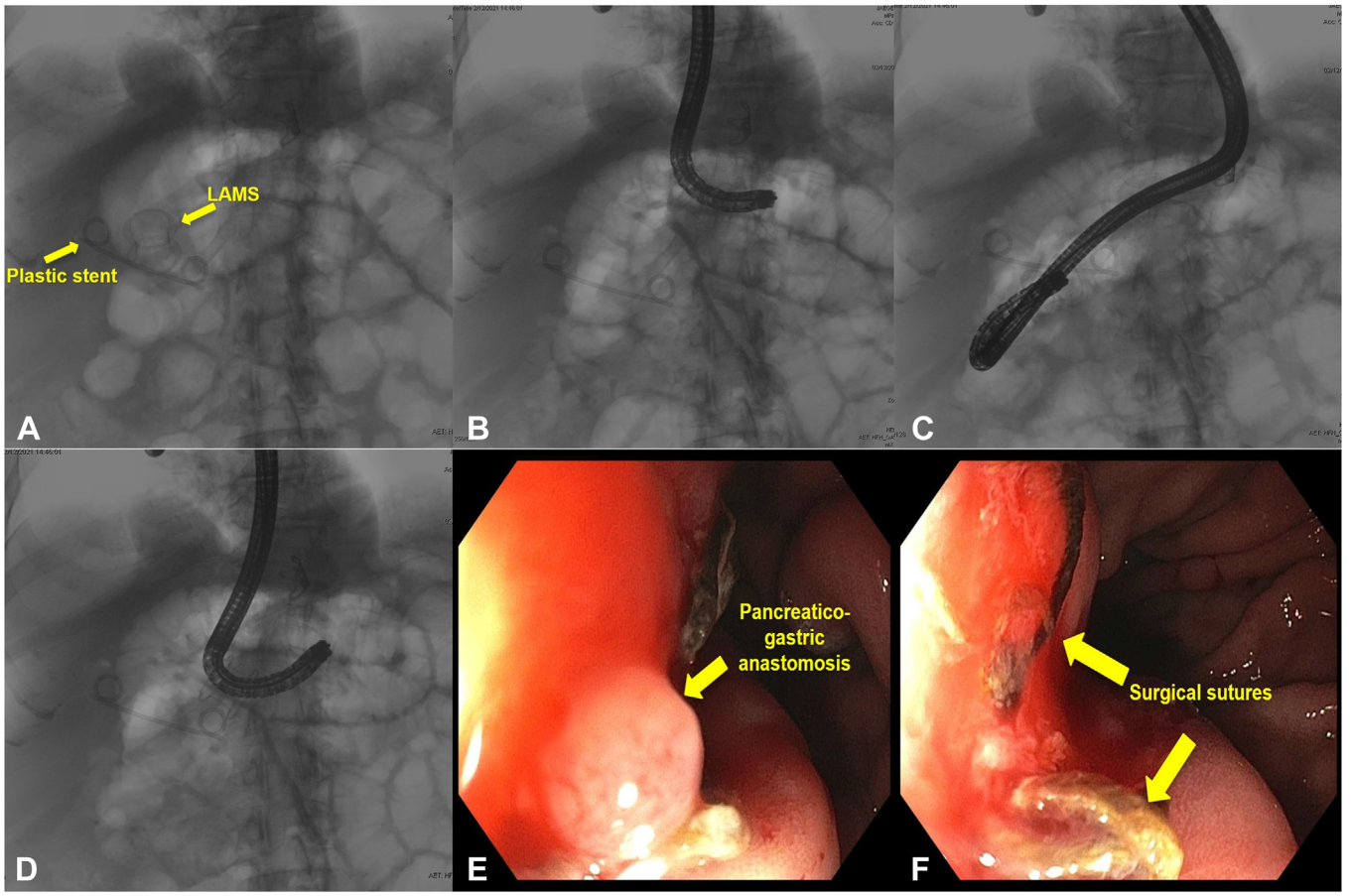

Figure 3. First attempt to cannulate the pancreaticogastric anastomosis site. **A-D,** Fluoroscopic images indicating the passage of the therapeutic duodenoscope through the gastrojejunostomy to access the remnant stomach. **E and F,** Endoscopic images indicating the stenosed pancreatico-gastrostomy and the sutures correlating with the surgical anastomosis site.

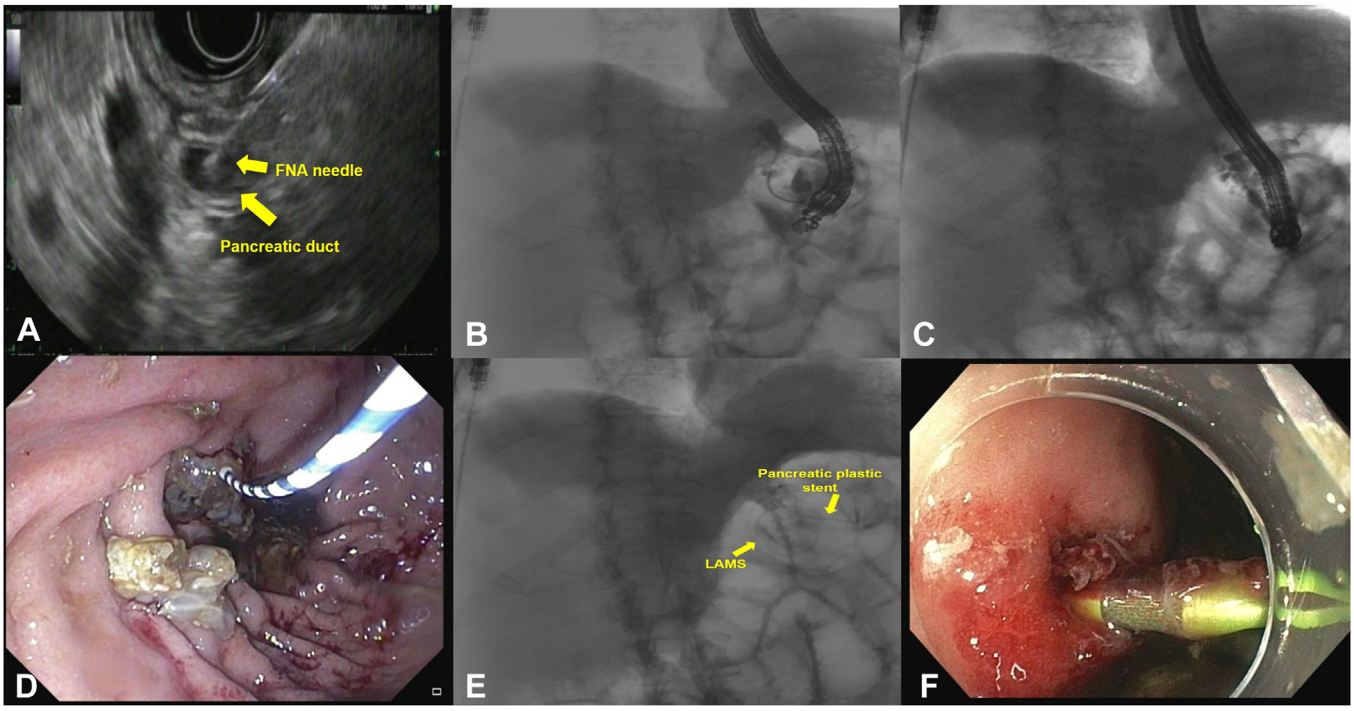

Figure 4. EUS-guided de novo pancreatico-gastrostomy for the management of severe pancreaticogastric anastomotic stricture. **A,** EUS image showing a 19-gauge FNA needle that was used to puncture the pancreatic duct. **B,** A pancreatogram performed under fluoroscopy revealing dilated and ectatic pancreatic duct without contrast extravasation into the excluded stomach. **C,** Fluoroscopic image indicating a 6-mm × 4-cm balloon dilator passed over the guidewire for dilation of the de novo pancreatico-gastrostomy tract. **D,** Endoscopic view of the guidewire exiting the de novo pancreatico-gastrostomy tract. **E and F,** Fluoroscopic and endoscopic image indicating the deployed transgastric 5F × 9-cm plastic pancreatic duct stent.

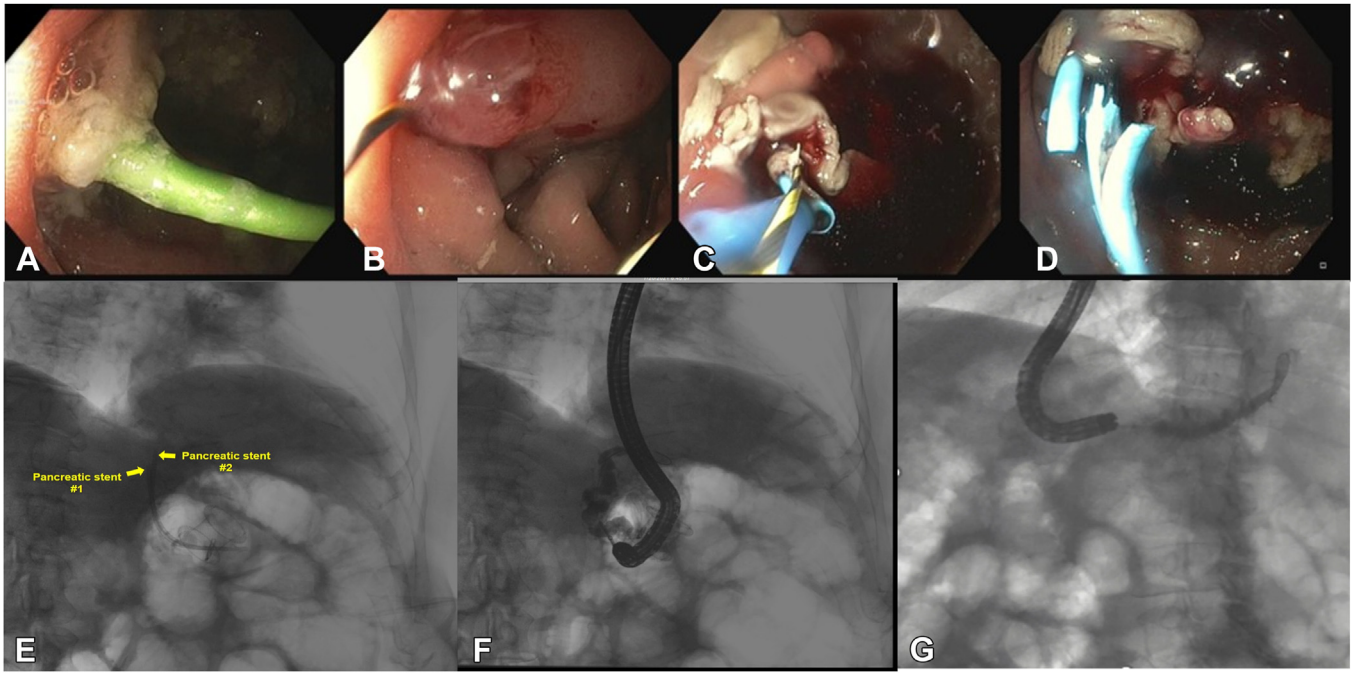

Figure 5. Follow-up procedures. **A-D,** Endoscopic images indicating a guidewire that was used to cannulate alongside the previously placed plastic pancreatic duct stent followed by the placement of another 7F plastic pancreatic duct stent side by side to ensure adequate drainage and promote patency of the fistula site. **E,** Fluoroscopic image indicating the 2 plastic pancreatic duct stents across the de novo created pancreatico-gastrostomy. **F and G,** A pancreatogram performed under fluoroscopy revealing the change of the pancreatic duct before and after drainage. The pancreatic duct was noted to be further decompressed and straighter compared to before.

therapeutic interventions. Early treatment of pancreaticoenteric anastomotic stricture could reverse the clinical consequences of pancreatic exocrine insufficiency and prevent chronic pancreatitis.

DISCLOSURE

Dr Zuchelli is a consultant with Boston Scientific. All other authors disclosed no financial relationships.

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