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Management of a gastric pouch staple-line leak and its adverse events with multimodal endoscopic techniques including endoscopic vacuum therapy

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A 48-year-old woman with history of a mini-gastric bypass developed intractable vomiting and was converted to Roux-en-Y gastric bypass with placement of multiple surgical drains and a wound vacuum to close the surgical incision. She was then found to have a gastric pouch staple-line (GPSL) leak because of dehiscence of the gastric pouch, and esophageal stent placement was attempted (Figs. 1 and 2). After placing a 23- × 155-mm fully covered self-expandable metal esophageal stent (FCSEMES) (WallFlex; Boston Scientific, Marlborough, Mass, USA) (Fig. 2), imaging demonstrated a persistent leak with 5 cm distal migration of the stent. A second 23- × 100-mm FCSEMES (WallFlex) was placed overlapping the previous stent to fully cover the defect. It was secured with an 11-mm/6-Gc over-the-scope clip device (Ovesco, Tübingen, Germany) (Fig. 2). However, the GPSL leak persisted. For this reason, endoscopic vacuum therapy (EVT) was pursued (Video 1, available online at www.videogie.org; Fig. 3).

The patient underwent EVT with 3 sponge-system exchanges, with each exchange showing decreased size of the defect and wound healing. The previously noted 1.8-cm GSPL leak reduced to 2 mm 3 weeks later (Fig. 4). However, a wire was advanced through the defect, and contrast administration demonstrated the presence of a gastrogastric (GG) fistula, which was about 3 to 4 mm in diameter, originating from the GPSL leak in the gastric pouch and connecting to the remnant stomach (Figs. 1 and 5). Extravasation of contrast from within the fistula and into the peritoneum suggested the presence of additional fistulous tracts originating from within the GG fistula. The GG fistula likely formed because of continued leakage of gastric contents into surrounding tissue from the extravasation tracts, causing inflammation.

Presence of a GG fistula with extravasation tracts prevents the formation of adequate negative pressure from EVT because of its connection to the remnant stomach and peritoneum. Considering the high failure rate of the closure of enteral fistulas,[1] a 15- × 15-mm lumen-apposing metal stent (LAMS) (AXIOS; Boston Scientific) was deployed across the fistula to occlude any present leaks and allow the fistula to mature and remain patent (Fig. 6). After 2 months, a CT scan demonstrated passage of contrast directly through the GG tract without signs of extraluminal extravasation (Fig. 6).

Two months later, an enterocutaneous fistula was found about 4 cm distal to the original GPSL leak in the area where 3 things previously overlapped: prior esophageal stents, a surgical drain, and an external wound vacuum (Fig. 1). The overlap likely caused significant friction and inflammation, resulting in fistula formation. A tandem catheter and wire were advanced into the fistula and confirmed a 2-mm-wide and 2-cm-long tract. Therefore, a 4-mm ventricular septal defect cardiac septal occluder (Amplatzer; AGA Medical Group, Plymouth, Minn, USA) was advanced into the fistula tract. The occluder was deployed with successful spanning of the jejunum (Fig. 7). Six months later, the enterocutaneous fistula was closed with scar tissue (Fig. 8), and the LAMS was removed from the matured gastrogastric tract, which was left patent (Fig. 9). At the most recent follow-up, 1 year and 3 months after initial EVT, the patient was tolerating a regular diet and at her nadir weight of 180 pounds with a body mass index of 34, improved from her maximum weight of 307 pounds with a body mass index of 58.

In our patient, EVT resulted in significant reduction in the size of the GPSL leak, but subsequent GG fistula formation required further intervention. When discussing safety, it is important to consider that GI anastomotic leakages are high risk at baseline.[1-9] For this reason, most available interventions are also high risk.[2-5] According to retrospective analyses, the mortality rate with surgical management is as high as 64%[2] and with stent placement as high as 83%.[3] Compared to these treatment options, retrospective studies reported much lower mortality rates for EVT ranging from

Abbreviations: EVT, endoscopic vacuum therapy; FCSEMES, fully covered self-expandable metal esophageal stent; GG, gastrogastric; GPSL, gastric pouch staple line; LAMS, lumen-apposing metal stent.

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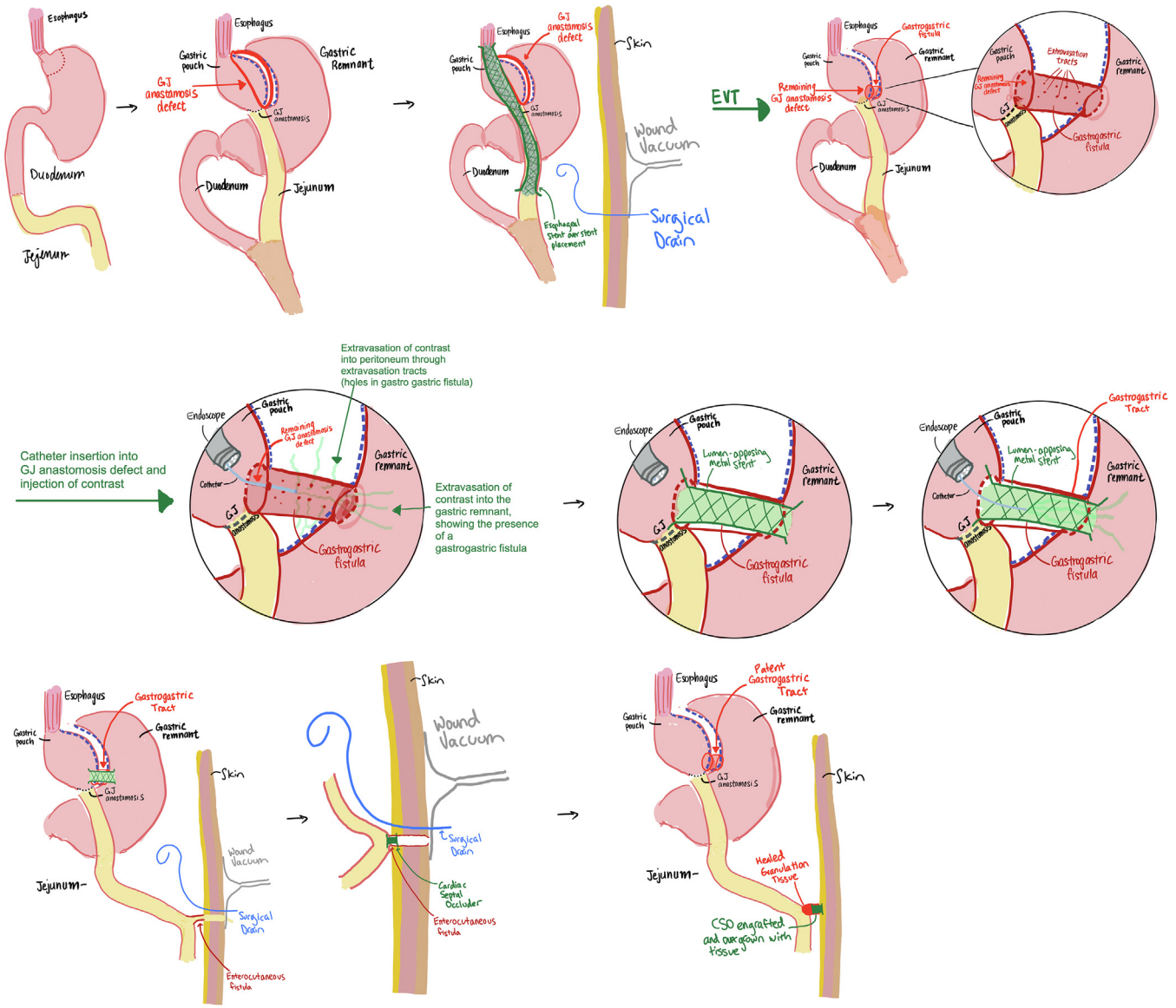

Figure 1. Diagrams demonstrating the anatomy and interventions done through the clinical course of this case. The patient started with Roux-en-Y gastric bypass anatomy with a 1.8-cm gastric pouch staple-line (GPSL) leak. After unsuccessful esophageal stent-over-stent placement, endoscopic vacuum therapy was performed with significant shrinkage of the GPSL defect to 2 mm. After insertion of a catheter into the GPSL defect along with contrast administration, it was found to have become a gastrogastric (GG) fistula with extravasation tracts. A lumen-apposing metal stent was placed in the GG fistula to close off the extravasation tracts. Later, an enterocutaneous fistula was discovered about 4 cm distal to the GG fistula where the prior esophageal stent, a surgical drain, and a wound vac previously overlapped, and a cardiac septal occluder was placed for closure. The patient subsequently underwent removal of the lumen-apposing metal stent, which left a patent and matured GG fistula and an occluded enterocutaneous fistula with a cardiac septal occluder that was overgrown with scar tissue.

12% to 15%,[3,4] with a prospective trial suggesting rates as low as 3.8%.[5]

In conclusion, EVT is a new, effective therapy for closure of transmural GI defects with proven effectiveness not only in cases refractory to other closure techniques, but also as first-line, primary therapy. However, it is important to assess for contraindications, such as a fistula connected to a large cavity or open air, before implementation, as EVT may not be suitable for every patient. Although the morbidity and mortality rates of patients with endoluminal leaks are high, when compared to other options for management, EVT has demonstrated decreased risk of morbidity and mortality.

DISCLOSURER

Dr Skinner is a consultant for Boston Scientific. The other authors did not disclose any financial relationships.

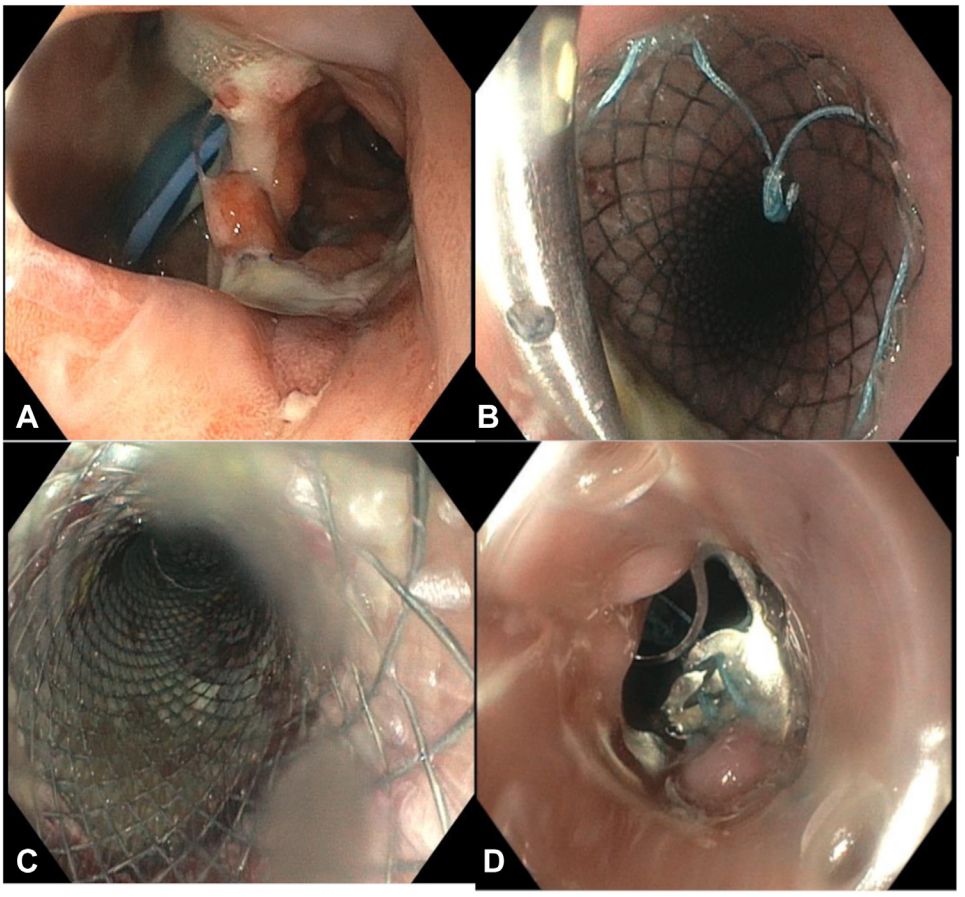

Figure 2. A, The original 1.8-cm gastric pouch staple-line leak. The lumen on the right is the gastrojejunal anastomosis and the lumen on the left is the anastomotic defect into the peritoneum with 2 blue surgical drains. **B,** First esophageal stent placement with an endoscopic clip for anchoring. **C,** Second esophageal stent placement overlapping the first esophageal stent. **D,** Over-the-scope clip used to anchor the stent over stent placement.

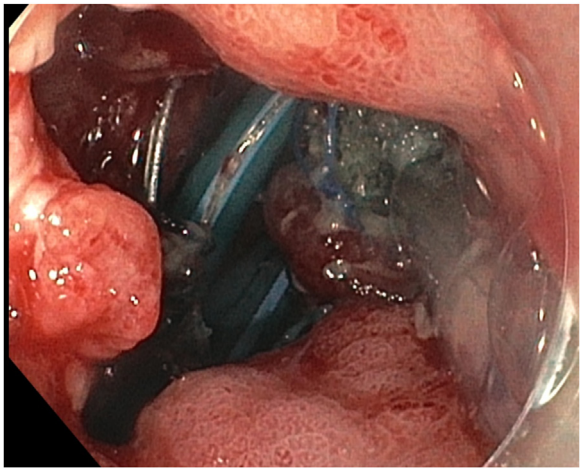

Figure 3. Endoscopic vacuum therapy foam placement adjacent to gastric pouch staple-line defect and blue surgical drains visible within the peritoneum on the left.

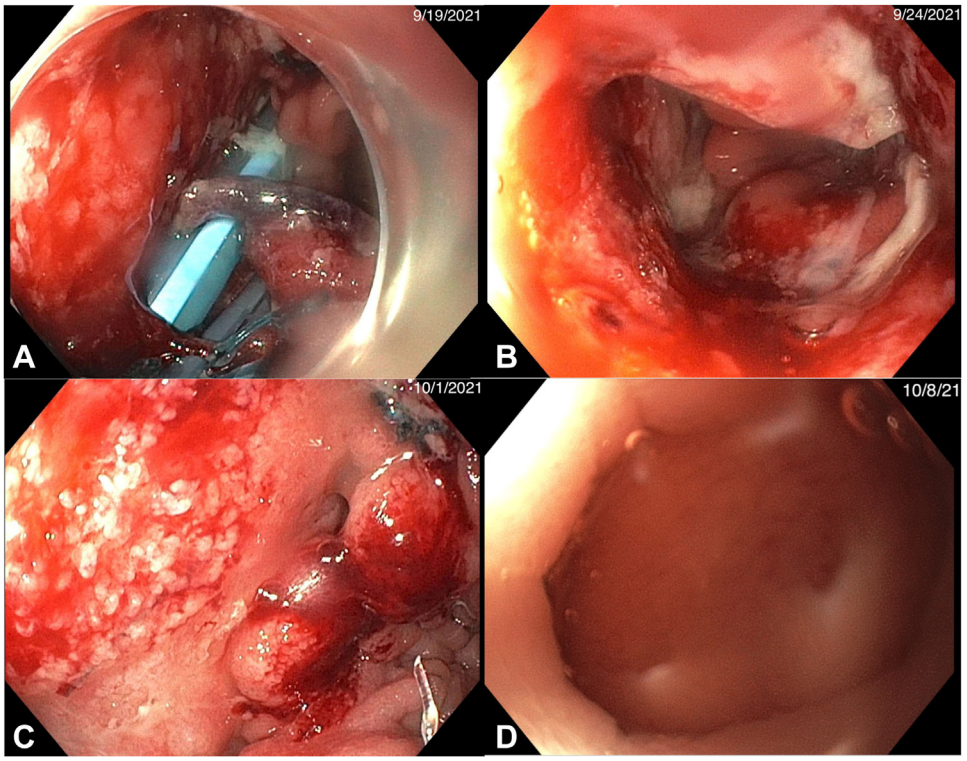

Figure 4. After initial endoscopic vacuum therapy on September 15, 2021, the patient underwent repeat sponge-system exchanges on September 19 **(A)**, September 24 **(B)**, and October 1 **(C)**, with endoscopic vacuum therapy resulting in a decrease in size of the gastric pouch staple-line defect to 2 mm on October 8 **(D)**.

Figure 5. Fluoroscopic view of gastrogastric fistula after endoscopic vacuum therapy with extravasation of contrast.

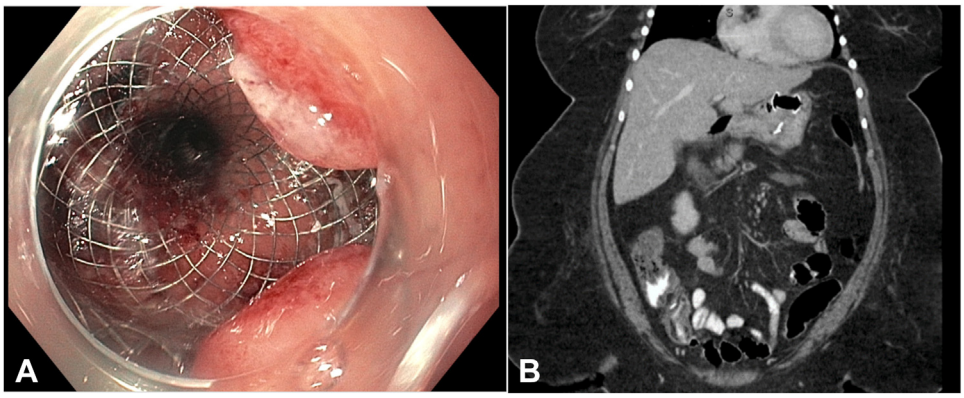

Figure 6. A, Endoscopic view of gastrogastric fistula after lumen-apposing metal stent placement in the gastrogastric fistula. **B,** CT scan 2 months after lumen-apposing metal stent placement showing no extravasation of contrast into the peritoneum.

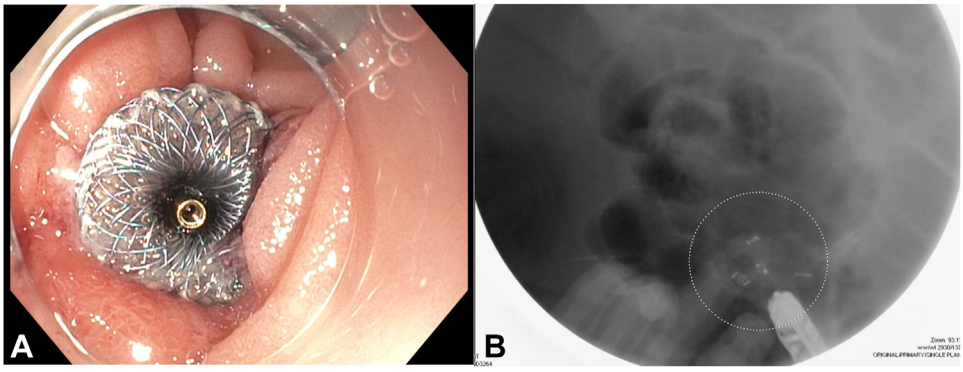

Figure 7. A, Endoscopic view of cardiac septal occluder placement for the enterocutaneous fistula. **B,** Fluoroscopic view of cardiac septal occluder placement (*circled*) for the enterocutaneous fistula.

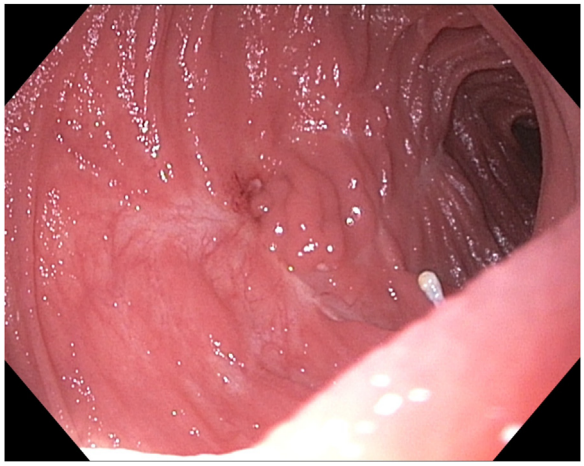

Figure 8. Enterocutaneous fistula completely closed. Cardiac septal occluder is overgrown with scar tissue.

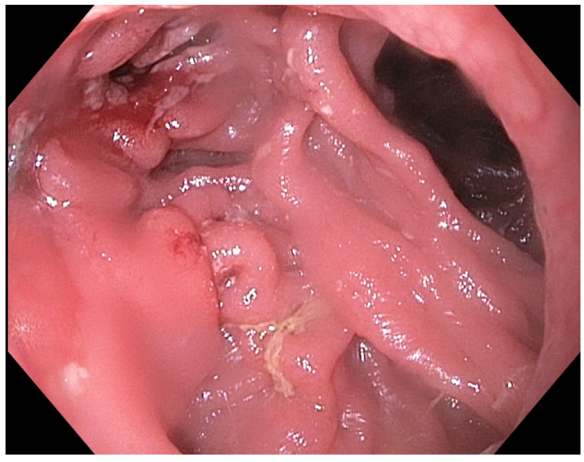

Figure 9. Gastrogastric tract with healthy granulation tissue (top left) as well as healthy-appearing gastric pouch, gastrojejunal anastomosis, and opening to the jejunum (top right) immediately after lumen-apposing metal stent removal.

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