Role of endoscopic vacuum therapy, internal drainage, and stents for postbariatric leaks

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Background and Aims: Therapeutic endoscopy plays a major role in the management of postbariatric anastomotic leaks, offering an effective treatment alternative to repeated surgery. In recent years, management has been moving from bridging and closing the leak's orifice toward an approach that uses vacuum therapy or internal drainage. Our aim was to demonstrate different treatment options for the management of postbariatric leaks.

Methods: We describe 3 different endoscopic techniques for postbariatric leaks in 2 patients who had undergone Roux-en-Y gastric bypass (RYGB) and 1 patient who had undergone sleeve gastrectomy.

Results: The first patient had a 20-mm early post-RYGB leak with an intra-abdominal associated collection treated with 5 sessions of endoscopic vacuum therapy (EVT). The second patient had a 12-mm acute postgastric sleeve leak with an associated collection, in whom therapy with EVT had failed, and who was then treated with endoscopic internal drainage (EID). The last patient had a chronic intra-abdominal collection after RYGB, despite reoperation, in whom therapy with EID and esophageal stent had failed, and who was treated with a diabolo-shaped lumen-apposing metal stent placed between the gastric pouch and the gastric remnant. Weight-loss intention was not compromised in any patient. All patients remain well.

Conclusions: Staple-line or anastomotic leaks are an important cause of morbidity and mortality after surgery. There are myriad endoscopic techniques, with varying reported efficacy. Often, more than one endoscopic approach can be used concomitantly, whereas in other cases, therapies are applied sequentially depending on the initial clinical response. Multiple therapeutic options should be considered before endoscopic failure. (VideoGIE 2019;4:481-5.)

BACKGROUND

Anastomotic and suture leaks are an important cause of morbidity and mortality after bariatric surgery, with an incidence over the past few years on the order of 2% to 5% of patients after Roux-en-Y gastric bypass (RYGB) and in 1% to 2% after sleeve gastrectomy.[1,2] Leaks after RYGB can occur at multiple points along any staple line, including the gastric pouch, the gastrojejunal anastomosis (most common location), the blind portion of the Roux limb, the jejunojejunal anastomosis, and the remnant stomach.[3] Leaks after sleeve gastrectomy are typically found near the angle of His, wherein the staple-line meets the gastroesophageal junction.[4]

The management of anastomotic leaks may involve surgical, radiologic, or endoscopic procedures or a combination. Endoscopy has benefited from the development and improvement of many therapeutic devices, including stents, through-the-scope clips, over-the-scope clips, nasocystic drains, pigtail stents, vacuum therapy, tissue sealants, and suturing systems. All of these technologic advances have placed endoscopy as a first-choice treatment for adverse events of surgery, including bariatric surgery.[5] Traditionally, treatment has been aimed at facilitating drainage (percutaneous or surgical), followed by endoscopic closure of the leak site. However, primary endoscopic closure with tissue-apposition techniques (over-the-scope clips/suturing) or diversion therapy (self-expandable metal stents) may not be the ideal treatment strategy, especially in late or chronic leaks, as it is often not durable.[5,6]

The aim of this series is to demonstrate different treatment options for the management of postbariatric leaks.

METHODS

This single-center report comprises 3 different endoscopic techniques for postbariatric leaks (2 RYGB and 1 sleeve gastrectomy) (Video 1, available online at www.VideoGIE.org). All procedures were performed with the patients under deep sedation.

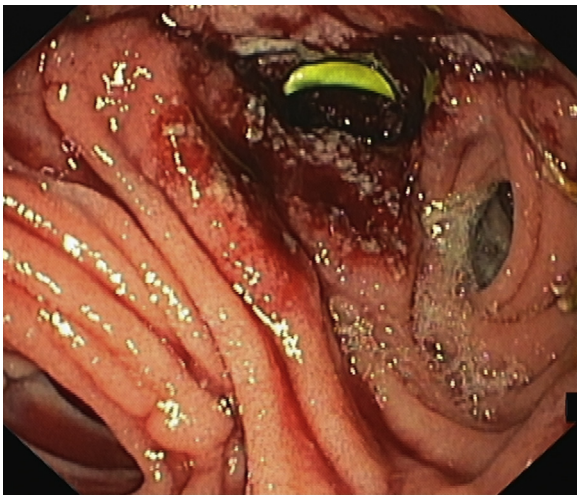

Figure 1. Patient 1 (Roux-en-Y gastric bypass) before therapy with a gastrojejunal leak 44 cm from the incisors.

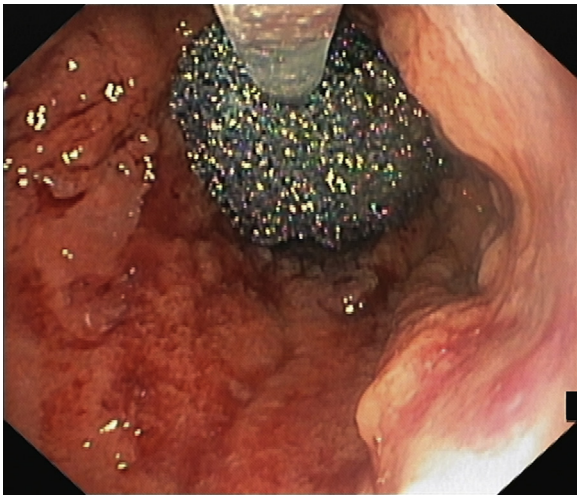

Figure 2. Patient 1 during endoscopic vacuum therapy, with the foam sponge placed partially intracavitary and partially intraluminal.

CASE REPORTS

Patient 1

A 38-year-old man experienced an early RYGB leak at the gastrojejunal anastomosis, with an associated 8-cm intra-abdominal collection. Percutaneous drainage was performed at another institution. Upper endoscopy (GIF-H180; Olympus, Center Valley, Pa, USA) revealed a 20-mm anastomotic leak 44 cm from the incisors (Fig. 1). Intracavitary endoscopic vacuum therapy (EVT) with endo-sponge (B Braun Medical BV, Melsungen, Germany) was first tried; however, we were unable to place the polyurethane foam sponge in the intra-abdominal collection, even after use of the "backpack technique" (additional suture loop placed at the tip of the sponge). The eso-sponge (B Braun Medical BV) was then used, with the longer and thinner overtube assisting in the placement of the sponge intracavitary (Fig. 2). The sponge was replaced every 5 days by use of the previously described technique, with progressive clinical and endoscopic improvement. Leak closure was achieved after percutaneous drain removal and 4 sponge replacements, 22 days after the beginning of endoscopic therapy (Fig. 3). The patient received parenteral nutrition during the entire treatment.

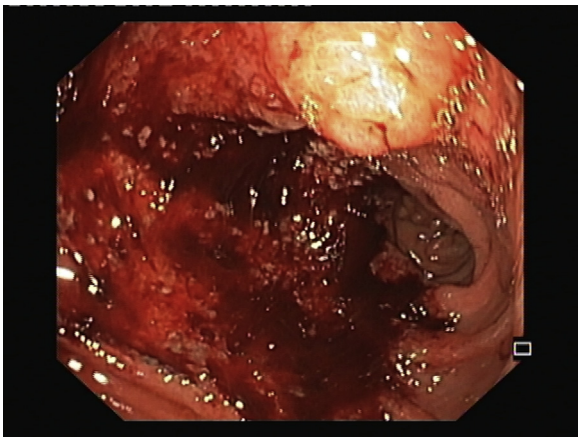

Figure 3. Patient 1 after therapy with leak closure after 4 sponge replacements (22 days after beginning of endoscopic therapy).

Patient 2

A 62-year-old woman experienced an acute postgastric sleeve leak. CT with oral contrast material revealed a 30-mm intra-abdominal collection at the level of the pancreatic body, with communication with the proximal upper-third of the tubular stomach. Upper endoscopy revealed a 12-mm leak near the angle of His (Fig. 4), 40 cm from the incisors. Intracavitary and then intraluminal EVT (endo-sponge) was tried (2 sponge changes); however, owing to a lack of endoscopic improvement, endoscopic internal drainage (EID) was performed. Using a therapeutic gastroscope (GIF-2TH180, Olympus), we placed 2 double-pigtail plastic stents (10F Zimmon Biliary Stent; Cook Medical, Winston-Salem, NC, USA) in the first 2 procedures (Fig. 5), with only 1 double-pigtail plastic stent being placed in the final exchange. Oral feeding was allowed on the day after EID was begun. Leak closure was achieved after 3 stent exchanges (4-week intervals) (Fig. 6).

Patient 3

A 49-year-old woman experienced a chronic intra-abdominal collection after RYGB, despite antibiotic therapy and reoperation. CT did not show extravasation of oral contrast material. Upper endoscopy revealed a 4-mm leak at the vertical pouch suture (Fig. 7), with extravasation of contrast material to the gastric remnant. EID was tried, first under endoscopic control only (it was impossible to place the stent in the

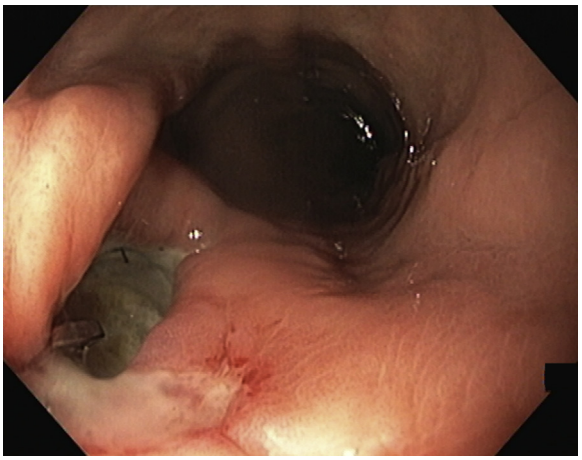

Figure 4. Patient 2 (gastric sleeve) before therapy with a leak near angle of His, 40 cm from the incisors.

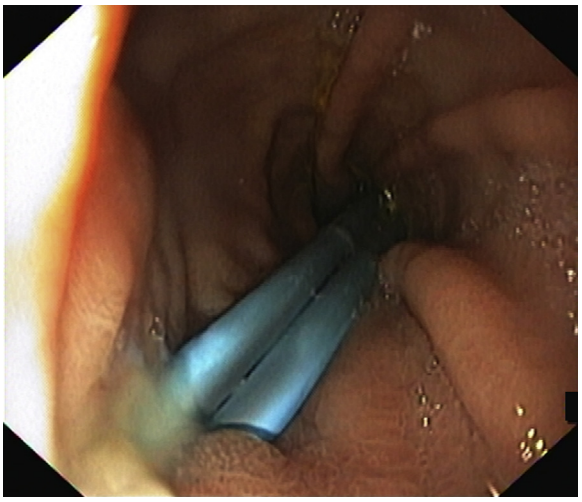

Figure 5. Patient 2 during endoscopic internal drainage with 2 double-pigtail plastic stents crossing the leak.

collection) and guided by EUS (no visualization of associated collection), but failed. Owing to EID failure, a partially covered 125- × 23-mm esophageal self-expandable metal stent (SEMS) (Wallflex; Boston Scientific, Marlborough, Mass, USA) was placed, covering the leak; however, same-day removal was needed because the patient could not tolerate the stent. A 40- × 14-mm diabolo-shaped lumen-apposing metal stent (LAMS) (Hanarostent MITech Co, Inc, Seoul, South Korea) was then placed between the gastric pouch and the gastric remnant, with clinical improvement and resolution of the collection (Fig. 8). Oral feeding was allowed the day after LAMS placement. The LAMS was removed 6 weeks later, with leak closure and maturation of the gastrogastric fistula (GGF) (Fig. 9). The patient was prescribed proton pump inhibitors twice a day. Weight-loss intention was not compromised. All patients remain well.

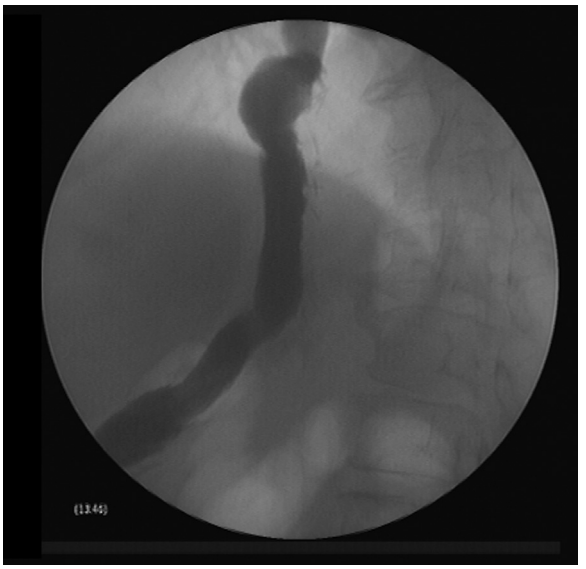

Figure 6. Patient 2 after therapy with no extravasation of contrast material related to leak closure (94 days after beginning of endoscopic therapy).

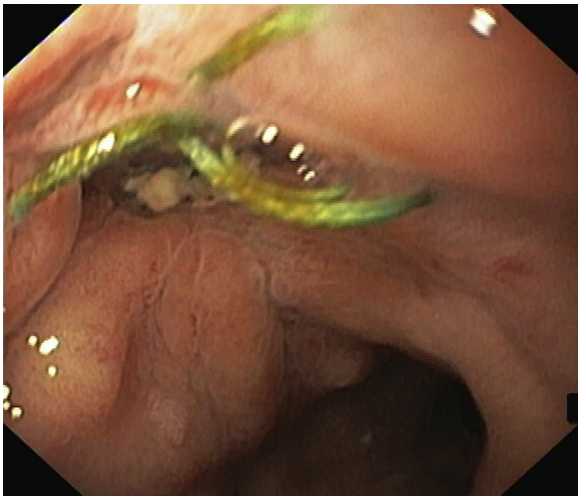

Figure 7. Patient 3 (Roux-en-Y gastric bypass) before therapy with a 4-mm leak at the vertical pouch suture.

DISCUSSION

Endoscopy plays a major role in the management of post-bariatric leaks.[7] The available endoscopic approaches range from primary to secondary closure techniques, with varying degrees of technical and clinical success and adverse events, generating a lack of consensus regarding the most appropriate endoscopic management.[4] However, in recent years, management has been moving from bridging and closing the leak's orifice (with stents, clips, tissue sealants, and sutures) toward an approach that uses vacuum therapy or internal drainage. The reasons for failed closure are mostly related to poor integrity of the tissue

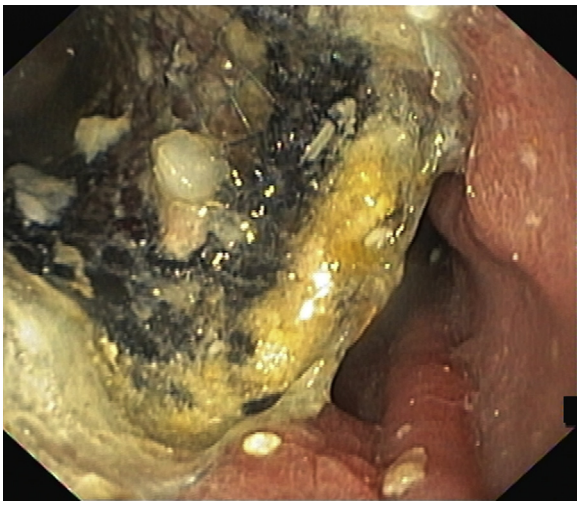

Figure 8. Patient 3 during placement of lumen-apposing metal stent between the gastric pouch and the gastric remnant.

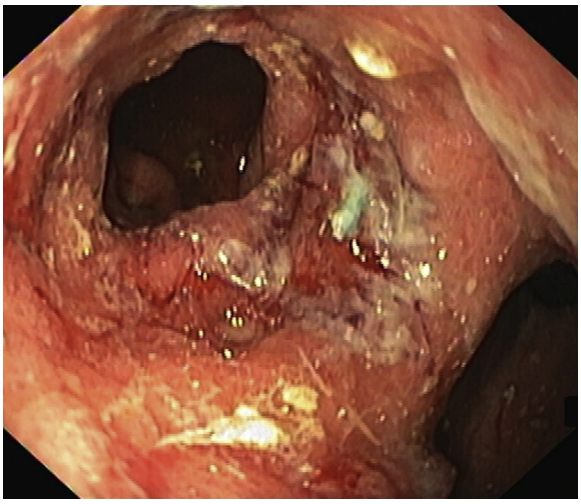

Figure 9. Patient 3 after removal of lumen-apposing metal stent, with leak closure and maturation of the gastrogastric fistula (50 days after beginning of endoscopic therapy).

surrounding the leak as a result of ischemia and inflammation.[6]

There is a wide variation in the treatment of patients with postbariatric leaks because there is no definite consensus on the most appropriate therapeutic approach. EVT allows optimal drainage of the cavity, ensuring granulation, according to the concept of keeping the leak open,[6] whereas EID guides drainage toward the GI tract, obstructs the leak orifice, and enables oral intake while favoring mechanical re-epithelialization. One of the great disadvantages of EVT is the need for repeated endoscopic procedures because the sponge needs to be changed every 3 to 5 days. Depending on the size of the defect, the sponge may be placed intracavitary or in the lumen of the esophagus, covering the leak. Intraluminal EVT might be easier and safer to perform than intracavitary EVT; nevertheless, leak closure might be more difficult to achieve with intraluminal EVT alone. Apposition of the sponge to the leak may be suboptimal with intraluminal placement, especially in a dilated esophagus.[5] EID can be used in acute and chronic leaks with associated collections; better results may be achieved with intra-abdominal leaks and when several pigtail stents can be delivered side-by-side in an attempt to occlude the leak defect. EVT may be a better approach in mediastinal collections because they are more difficult to manage.[5] Regarding stent exchange in EID, although some see no value in routine stent exchange unless necrosectomy is also performed,[6] the performance of multiple procedures may allow the evaluation of treatment progress so as to adapt internal drainage, and also to promote healing by inducing trauma in the pseudocavity with the exchange of the pigtail stents.[8]

In cases when internal drainage cannot be achieved because the collection cannot be reached, as described in the case of patient 3 with an associated GGF, sealing the leak with a stent may allow maturation of the GGF and closure of the leak. Even though surgical or newer peroral approaches can be considered for closure of GGF, it is usually indicated only if persistent symptoms are clearly attributable to it, despite treatment with proton pump inhibitor therapy and dietary counseling.[3] The reason patient 3 did not regain weight after endoscopic treatment may be related to a progressive reduction of the GGF diameter or preferential progression of food through the sleeve instead of the GGF.

During treatment of postbariatric leaks, often more than one endoscopic approach is used concomitantly, whereas in other cases, therapies are applied sequentially depending on the initial clinical response. In a prospective study that evaluated the entirely endoscopic approach for management of leaks after bariatric surgery, the first procedure was successful in 41% of patients, and all the patients eventually achieved resolution after a mean 4.4 endoscopies at a mean of 86 days.[9] Multiple therapeutic options should be considered before endoscopic failure.

DISCLOSURE

All authors disclosed no financial relationships relevant to this publication.

Abbreviations: EID, endoscopic internal drainage; EVT, endoscopic vacuum therapy; GGF, gastrogastric fistula; LAMS, lumen-apposing metal stent; RYGB, Roux-en-Y gastric bypass.

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