VIDEO CASE REPORT

Endoscopic revision of gastric bypass using plication technique: an adjustable approach

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BACKGROUND AND AIMS

Roux-en-Y gastric bypass (RYGB) is one of the most commonly performed bariatric surgeries worldwide.[1] Despite successful weight loss after RYGB, weight regain in subsequent years is common, with nearly one-third of patients returning to their prebypass weight.[2,3] Although the cause of weight regain is often

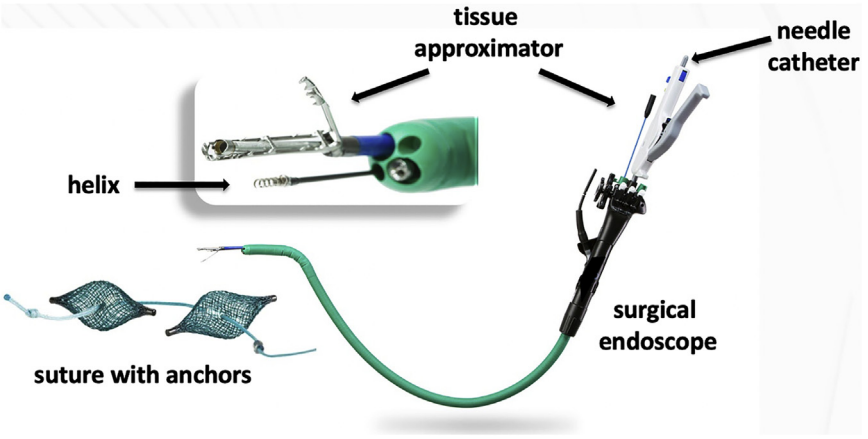

Figure 1. Plication device used for restorative endoluminal obesity surgery. A surgical endoscope is used to deliver instruments to a working area in a controlled fashion. These instruments include the tissue approximator, which serves to grasp and oppose tissue, the helix to capture tissue to bring into the approximator, and needle catheters, which deliver a suture with 2 anchors for permanent tissue plication. Permission for reuse provided by USGI Medical (San Clemente, Calif, USA).

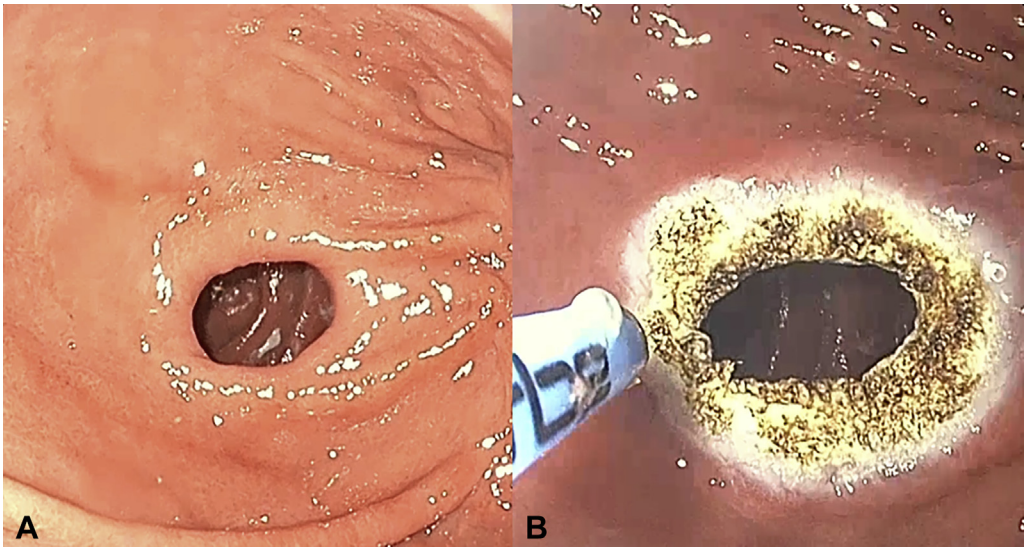

Figure 2. Dilated and incompetent gastrojejunal anastomosis. Evidence of a dilated and incompetent gastrojejunal anastomosis before **(A)** and after **(B)** argon plasma coagulation treatment. Argon plasma coagulation is performed to increase tissue strength and integrity, to serve as a foundation for plication placement, and to reduce risk for bleeding after plications.

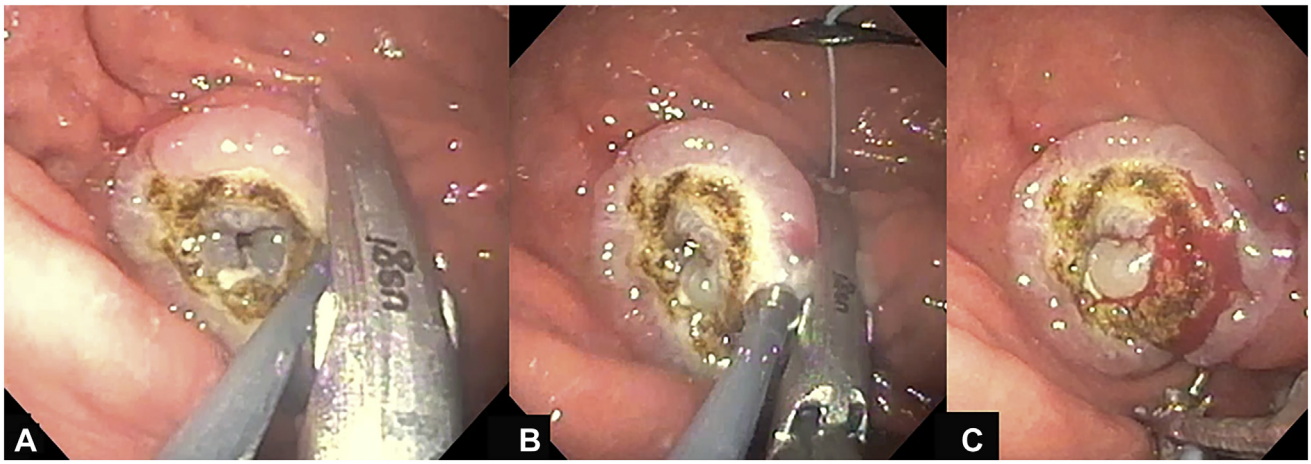

Figure 3. Plication of gastrojejunal anastomosis. Demonstration of the initial gastrojejunal anastomosis plication using a helix to position the tissue graspers **(A)**, full-thickness advancement of the needle and release of a tissue anchor **(B)**, and cinching for tissue approximation **(C).**

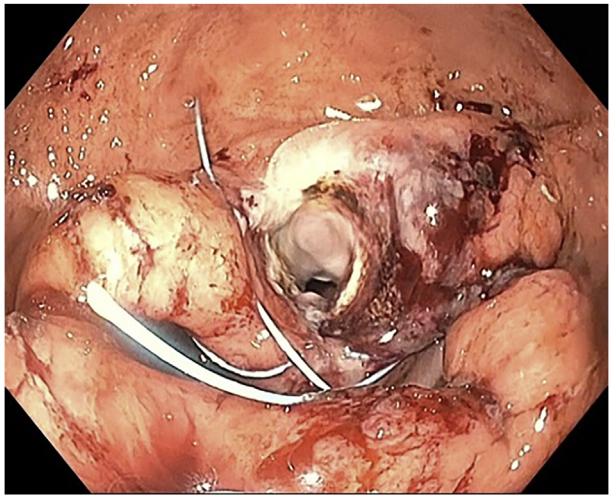

Figure 4. Gastrojejunal anastomosis after plication. Final appearance of the gastrojejunal anastomosis after placement of 2 plications.

multifactorial, one of the anatomic causes is dilation and increased tissue compliance of the gastrojejunal anastomosis (GJA),[4] which is likely a larger contributor to weight loss than anastomosis size alone.[5] Endoscopic therapies have evolved to treat weight regain due to a dilated or incompetent GJA, most commonly involving a suturing technique.[6,7] However, a plication technique can serve as a more durable alternative with lower risk for suture breakage. This video case presentation highlights a 65-year-old woman with a history of obstructive sleep apnea and class 3 obesity, for which she underwent an RYGB in 2017 (Video 1, available online at www.VideoGIE.org). Although her weight decreased from a preoperative weight of 241 pounds to nadir of 177 pounds, she later regained nearly half of her lost weight after bypass, reaching 202 pounds. Diagnostic endoscopy revealed an incompetent or dilated GJA to 12 mm, and she presented for endoscopic revision of her gastric bypass, which involved a plication technique.

METHODS

The Incisionless Operating Platform (USGI Medical, San Clemente, Calif, USA) contains a surgical endoscope, tissue approximator, helix, and needle catheter components to deliver full-thickness tissue plications (Fig. 1). Argon plasma coagulation treatment (forced setting, flow 0.8 L/min at 70 W) was applied surrounding the dilated and incompetent GJA to reduce tissue compliance and encourage tissue healing and to reduce bleeding (Fig. 2). To minimize the risk of stenosis, a narrow margin with reduced tissue exposure was pursued when using argon plasma coagulation. A total of 2 full-thickness plications were placed around the GJA to reduce the gastric outlet diameter and reduce compliance (Figs. 3 and 4), followed by an additional 6 plications to the gastric pouch for volume reduction during the same procedure. The case was successfully performed without periprocedural adverse events.

RESULTS

Despite initial weight loss, the patient developed nausea, vomiting, and intolerance to oral intake. Repeat endoscopy demonstrated GJA stenosis (Fig. 5), requiring balloon dilation to 7 mm. However, given persistent symptoms, she later underwent placement of a 10- ×10-mm lumen-apposing metal stent (LAMS) (Fig. 6). This decision was pursued to ensure gradual outlet expansion to a reliable stent diameter of 10 mm, while reducing risk for injury during repeat balloon dilation or recurrent weight regain due to excessive dilation. LAMS placement resulted in resolution of symptoms while the patient

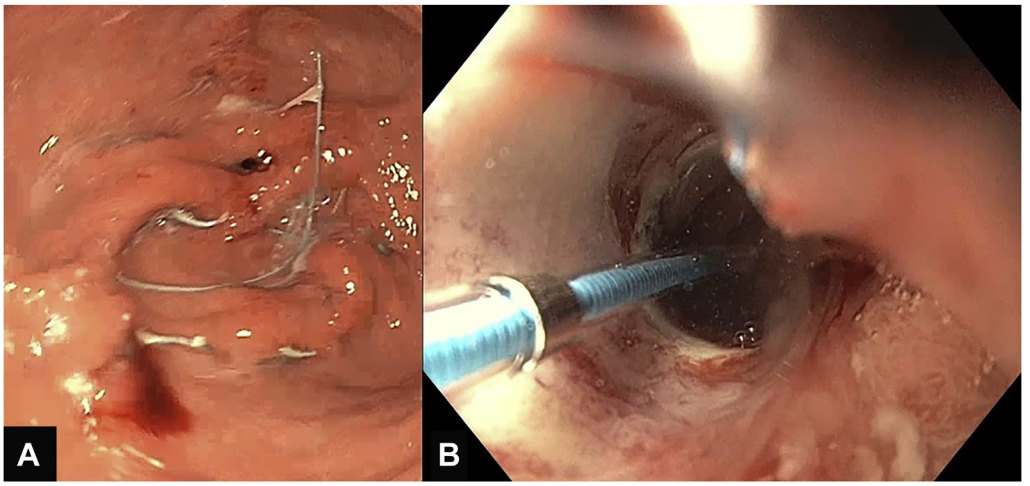

Figure 5. Gastrojejunal anastomosis stenosis requiring balloon dilation. Stenotic gastrojejunal anastomosis after revision using the plication technique **(A)** requiring through-the-scope balloon dilation to 7 mm (**B**).

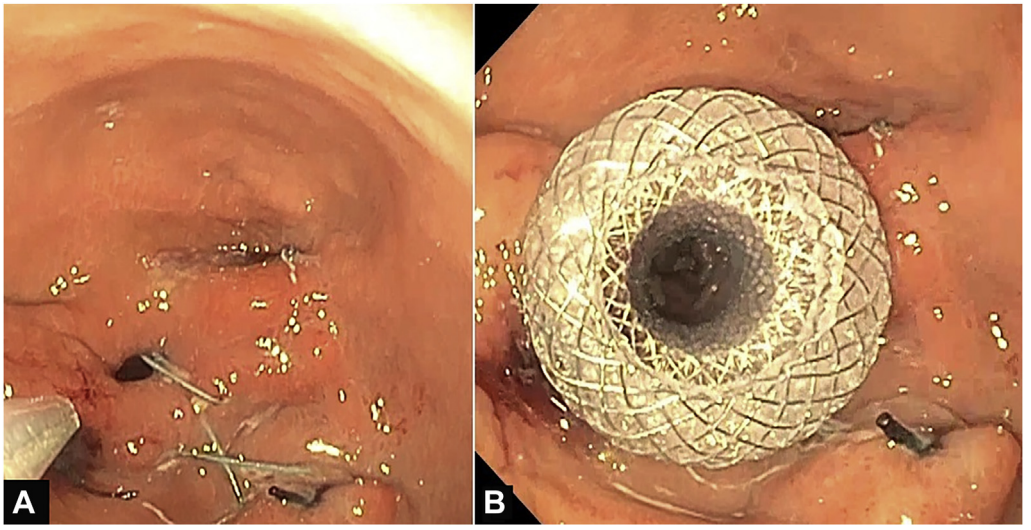

Figure 6. Persistent gastrojejunal anastomosis stenosis requiring lumen-apposing metal stent. Given the persistence of gastrojejunal anastomosis stenosis despite balloon dilation **(A)**, a lumen-apposing metal stent was subsequently placed **(B)**.

maintained a liquid-to-soft-solid diet. Repeat upper endoscopy 6 weeks later allowed for successful LAMS removal and dilation of the anastomosis using a 10-11-12 mm balloon, after which a narrowly patent GJA was seen (Fig. 7). This resulted in durable symptom resolution while maintaining effective weight loss. Over 6 months, she achieved a 25-pound weight loss, reducing her body mass index from 35.7 kg/m^2 to 29.6 kg/m^2, correlating with a 16% total weight loss (Fig. 8).

CONCLUSIONS

Weight regain after RYGB is common and may be due to an incompetent or dilated GJA. The goal of the endoscopic approach should be to maximize weight loss while incrementally addressing symptoms until completely resolved. Although outlet reduction with argon plasma coagulation can be effective, recurrent dilation can occur and weight loss is mitigated when the gastric pouch is plicated as well. Endoscopic gastric bypass revision using a plication device serves as an effective, minimally invasive modality for inducing weight loss that serves to reduce both outlet compliance and size, as well as pouch size. Although uncommon, GJA stenosis may occur and is responsive to incremental balloon dilation and lumen-apposing metal stent placement.

DISCLOSURE

This work was funded in part by NIH grants P30 DK034854 and T32 DK007533. Dr Jirapinyo is a consultant for Endogastric Solutions and does research support

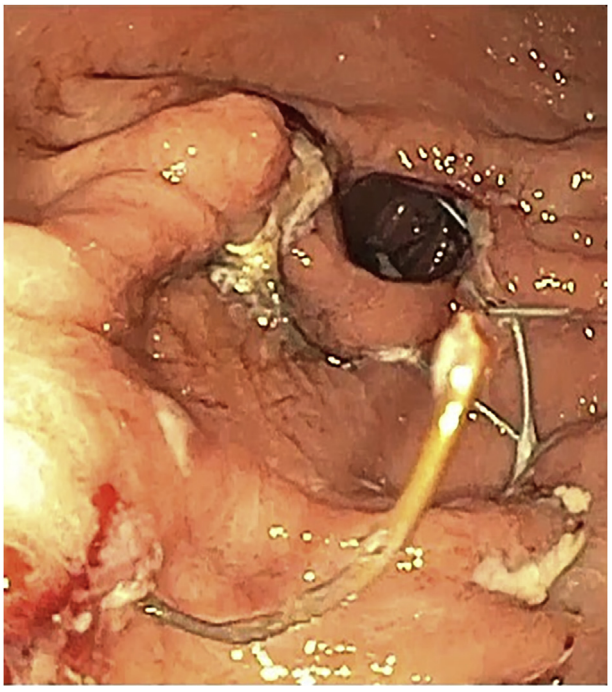

Figure 7. Gastrojejunal anastomosis after lumen-apposing metal stent removal. Demonstration of a 10-mm gastrojejunal anastomosis after removal of a 10- × 10-mm lumen-apposing metal stent.

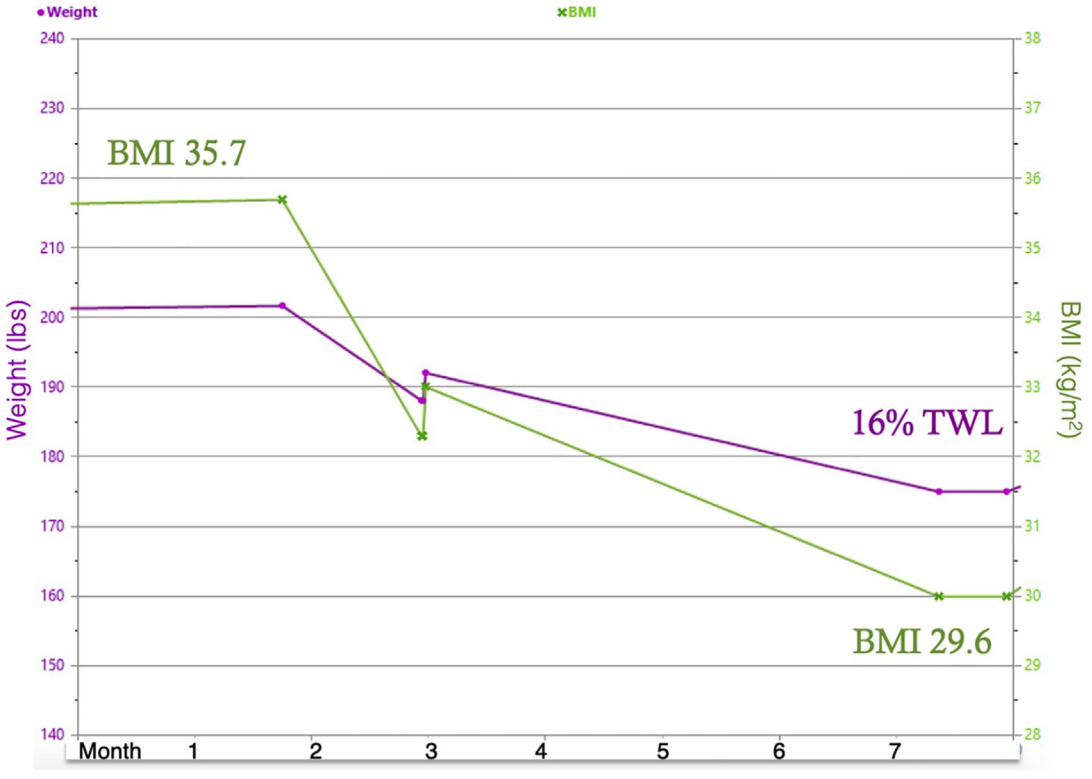

Figure 8. Patient weight trajectory after endoscopic revision of gastric bypass.

for Apollo Endosurgery, Fractyl, and GI Dynamics. Dr Thompson has ownership interest in GI Windows; is a general partner with BlueFlame Healthcare Venture; is an advisory board member for Fractyl and USGI Medical; is a consultant for Apollo Endosurgery, Boston Scientific, Covidien/Medtronic, EnVision Endoscopy, Fractyl, GI Dynamics, Olympus/Spiration, and USGI Medical; and does research support for Apollo Endosurgery, Aspire Bariatrics, Boston Scientific, GI Dynamics, Olympus/Spiration, USGI Medical, and Fujifilm. All other authors disclosed no financial relationships.

Abbreviations: GJA, gastrojejunal anastomosis; LAMS, lumen-apposing metal stent; RYGB, Roux-en-Y gastric bypass.

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