Gastrojejunal anastomotic stricture after Roux-en-Y gastric bypass: ambulatory management with the Savary–Gilliard dilator

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Abstract

Background: Roux-en-Y gastric bypass (RYGBP) is currently one of the most frequently performed procedures for the surgical treatment of morbid obesity. The success of this procedure's restrictive component requires a small gastrojejunostomy (GJ), which occasionally results in stenosis. The treatment of choice for this complication is balloon dilation. This study aimed to evaluate the feasibility and safety of ambulatory management for stenosis of the GJ using endoscopically guided Savary–Gilliard dilators.
Methods: Between January 1998 and October 2003, 769 patients underwent RYGBP. The mean age of these patients was 38 ± 12 years, and their mean body mass index (BMI) was 43 ± 6 kg/m^2. Of these 769 patients, 520 (68%) underwent open surgery and 249 (32%) underwent laparoscopic RYGBP. Patients suspected of GJ stenosis were referred for upper gastrointestinal endoscopy. Those who presented with stenosis were managed endoscopically with Savary–Gilliard dilators.
Results: Stenosis at the GJ was confirmed in 53 patients (6.9%). A total of 71 dilations were performed for these patients, resulting in a mean of 1.3 dilations per patient. One dilation was needed for 41 patients (75.5%), two dilations for 9 patients (16.9%), three dilations for 3 patients (5.7%), and four dilations 1 patient (1.9%). The patients subjected to open RYGBP required a mean of 1.57 dilations, and those who had laparoscopic RYGBP required mean of 1.08 dilations. The mean time for the first dilation was 51 ± 28 days after surgery (range, 20–178 days). All the dilations were performed in ambulatory settings. One patient (1.9%) was admitted after GJ dilation for pain. He was discharged without symptoms after 2 days with no need for invasive procedures.

Conclusions: The management and treatment of GJ stenosis after RYGBP can be effectively accomplished in ambulatory settings using endoscopically guided Savary–Gilliard dilators, with good and safe results.

Key words: Balloon dilation — Endoscopy — Gastric bypass — Gastroenterostomy — Morbid obesity — Stenosis

Roux-en-Y gastric bypass (RYGBP) currently is one of the most common surgical procedures for the treatment of morbid obesity [18]. The success of this procedure's restrictive component requires the construction of a small gastric pouch and a small gastrojejunostomy (GJ) [6]. Stenosis of the GJ can develop in up to 27% of the patients who undergo RYGBP [14, 16]. The presenting symptoms include dysphagia (initially with solids and subsequently with liquids) and daily vomiting, with little or no associated abdominal pain [9, 11, 15, 17].

The treatment of choice for GJ stenosis is guided balloon dilation. This procedure can be guided by either fluoroscopy or upper gastrointestinal endoscopy, with a reported effectiveness of 50% to 100% [1, 2, 10, 15, 19].

Since its first description, the Savary–Gilliard dilator (Wilson-Cook Medical, Inc., Winston-Salem, NC) has been used mainly for the treatment of benign and malignant esophageal stenosis [5, 17], although it also has been used for the dilation of gastric, duodenal, and colonic strictures [20]. This study aimed to evaluate the feasibility and safety of ambulatory management for GJ stenosis after RYGBP using endoscopically guided Savary–Gilliard dilators.

Materials and methods

Between January 1998 and October 2003, 769 patients underwent RYGBP. Of this group, 520 patients (68%) underwent open surgery and 249 (32%) underwent laparoscopic RYGBP. The mean age of these patients was 38 ± 12 years, and 562 patients (73%) were women. Their mean body mass index (BMI) was 43 ± 6 kg/m^2.
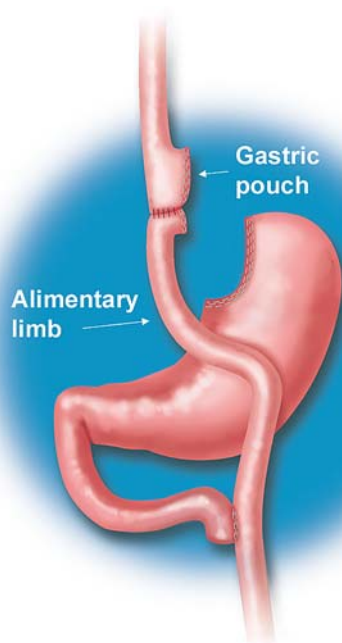
Fig. 1. Roux-en-Y gastric bypass.

Fig. 2. Endoscopic view of gastrojejunostomy stricture.

Fig. 3. Insertion of a soft guide through the strictured gastrojejunostomy.

Surgical technique

All the patients had surgery involving construction of a 10- to 15-ml gastric pouch, with complete stomach section and a 150- to 200-cm alimentary limb (Fig. 1). A hand-sewn 11-mm GJ was performed using running absorbable suture (Vicryl 3–0; Johnson & Johnson, São José dos Campos, Brazil). This anastomosis was performed with one layer in open surgery and two layers in laparoscopic surgery. For the patients who underwent laparoscopic RYGBP, the GJ was performed over a 34-Fr tube placed through the anastomosis.For the patients who had open RYGBP, the alimentary limb was constructed and mobilized following a transmesocholic route to be located retrogastrically. In those who underwent laparoscopic RYGBP, the location of the alimentary limb was transmesocholic and antegastric.

Endoscopic procedure

Patients with symptoms suspicious of GJ stenosis were referred for upper gastrointestinal (GI) endoscopy. The presence of GJ stenosis was defined as an incapacity for advancement of a 9.2-mm endoscope (GIF Type V 9.2 mm; Olympus Corp., Tokyo, Japan) through the gastrojejunal anastomosis.

If stenosis was confirmed (Fig. 2), patients underwent dilation with a Savary–Gilliard dilator. This was performed by placing a soft guide through the endoscope working channel and advancing the dilator through the GJ (Fig. 3). The endoscope then was removed, with the guide kept in place while Savary–Gilliard dilators of increasing size up to #11 were placed and removed. A second GI endoscopy was finally performed for advancement though the dilated gastrojejunal anastomosis (Fig. 4). A second or third procedure was performed if necessary depending on the symptoms. The period between the RYGBP and dilation procedures as well as the number of dilations required and the presence of complications were registered.

Statistical analysis

Student's t-test and Fisher's exact test were used for data analysis. Results are reported as mean ± standard deviation. A p value less than 0.05 determined statistical significance.

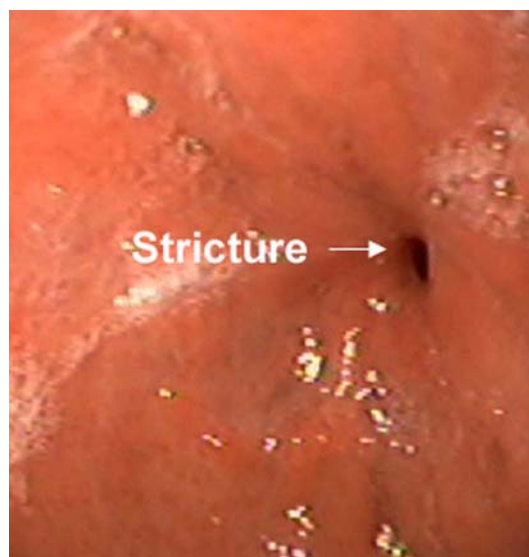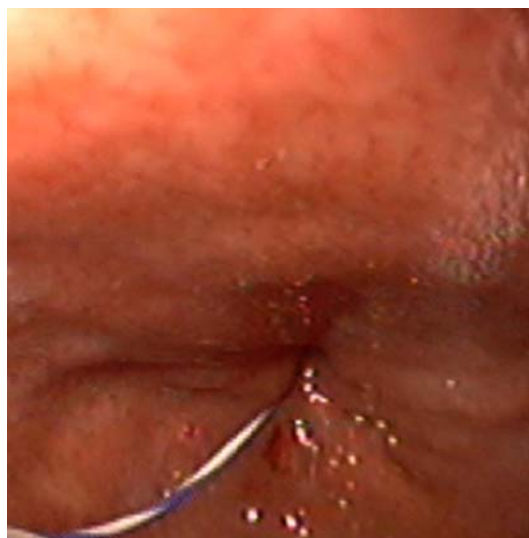## Results

Stenosis of the GJ was observed in 53 (6.9%) of the 769 patients. Of these 53 patients, 27 (5.1%) underwent open RYGBP and 26 (10.4%) underwent the laparoscopic procedure ($p = 0.02$). The mean time to stricture development after surgery was 51 ± 29 days (range, 20–178 days).

A total of 71 dilations were performed, resulting in a mean of 1.3 dilations per patient. One dilation was needed for 40 patients (75.5%), two dilations for 9 patients (16.9%), three dilations for 3 patients (5.7%), and four dilations for 1 patient (1.8%). Neither balloon dilation nor surgery was needed. The patients who underwent open RYGBP needed a mean number of 1.57 dilations per patient, as compared with 1.08 dila-
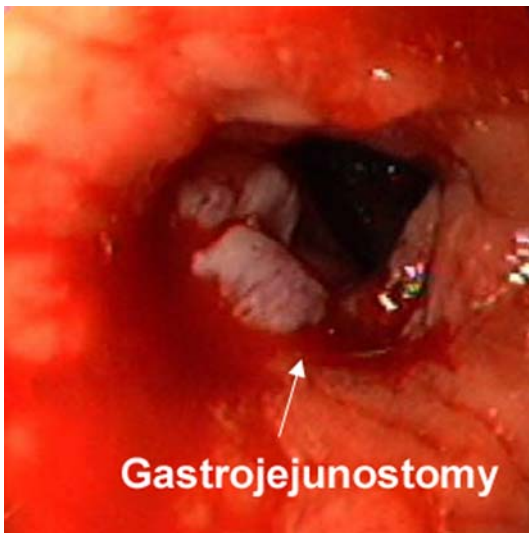
Fig. 4. Endoscopic view of gastrojejunostomy after dilation with the Savary–Gilliard dilator.

tions required among those subjected to laparoscopic RYGBP ($p = 0.008$).

All the dilations were performed in ambulatory settings. One patient (1.9%) experienced pain after GJ dilation. A computed tomography (CT) scan showed bubbles of pneumoperitoneum in relation to the anastomosis. He was admitted for observation and discharged without symptoms after 2 days, with no need of invasive procedures. No other morbidities were observed.

Discussion

Stricture of the gastrojejunal anastomosis, a common complication related to RYGBP, causes substantial morbidity and patient dissatisfaction. Depending on their severity, anastomotic strictures may cause dehydration and exaggerated caloric deprivation to the point that fluid and nutritional support are necessary.

Among the various procedures, guided balloon dilation is commonly used as the treatment of choice [1, 4]. Balloon dilation for gastrojejunal stricture can be guided by endoscopy or fluoroscopy. The endoscopically guided balloon dilation is the most frequently performed. Although a high success rate has been described by various groups, a variety of complications also have been described with this procedure. Repeated dilations, sometimes more than five, have been necessary in some cases. Perforation has been described for 12% of dilated patients, and emergency surgery for 6% of these patients [17]. Dilation failure with subsequent surgery also has been described for 25% of dilated patients [17].

Since their first description, Savary–Gilliard dilators have been used primarily as a method for dilation of benign and malignant esophageal stenosis [5]. Nevertheless, they also have been used for dilation of stenosis of the distal stomach or duodenal bulb, as well as stenosis after large bowel anterior resection [13, 20].

A number of recent reports describe these dilators as used for treatment for stenosis of the GJ after RYGBP [3, 7].

The experience presented in the current series of Savary–Gilliard dilators used for the management of gastrojejunal strictures after RYGBP shows a success rate of 100%. The number of procedures required for each patient was comparable with the number used in balloon dilation, with fewer used in some cases [7]. The majority of dilated patients in this series (75%) required only one dilation, with a few (7.6%) needing more than two. The complication rate was as low as 1.88%, with no need of surgery because of dilation failure or other major complications.

The development of stenosis at the gastrojejunal anastomosis has several presumed causes. Gastrojejunostomy ischemia and tissue damage during the construction of the anastomosis are described among the most important factors. Several studies show that this complication is more common after laparoscopic RYGBP than after open RYGBP [12]. There is evidence that linear staplers and especially hand-sewn anastomosis have lower rates of GJ stenosis than circular stapled anastomosis, which is associated with an 11% to 14% stricture rate [8].

Among the 769 patients reported in this study, those subjected to laparoscopic RYGBP showed a higher incidence of GJ stenosis. Although this incidence rate was significantly higher, the mean number of dilations required for each patient subjected to laparoscopic RYGBP was significantly lower than for open RYGBP. Both surgical techniques, open RYGBP and laparoscopic RYGBP, were performed with completely hand-sewn GJ anastomosis (i.e., the levels of tissue damage and subsequent scarring should be comparable). The technical difference is related to the fact that the GJ anastomosis in open RYGBP is performed with a single running suture layer, whereas in laparoscopic RYGBP it is performed with double running suture layers.

The fact that all dilations were effectively accomplished in ambulatory settings with no need of a hospital stay for 98% of the patients and with a low rate of repeated dilations means reduced surgical costs for patients. The possibility of reusing the Savary–Gilliard dilator also allows for a lower cost than for balloon dilation.

Conclusion

Stricture of the GJ commonly develops after RYGBP, and its incidence appears to be closely associated with technical factors, especially those that lead to tissue damage and ischemia of the anastomotic junction. Among the different treatment procedures described for this complication, dilation with Savary–Gilliard bougies proves to be an effective and safe method with lower complication rates and fewer failed procedures than found with other dilation procedures such as the guided balloon dilation. The reported results allow this procedure to be considered as standard treatment GJ

stenosis. Savary–Gilliard dilation can be performed in ambulatory settings, with subsequent lower costs for patients.

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