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Gastrojejunal stricture after Roux-en-Y Gastric Bypass: a 13-year single-center analysis

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Abstract

Gastrojejunal anastomotic stricture is a possible complication following RYGB. This study aimed to determine its incidence after RYGB at our center, characterize the affected population to identify potential risk factors, and assess treatment effectiveness. We performed a retrospective single-center study including patients with gastrojejunal anastomotic stricture after RYGB between January 2011 and December 2023, defined by clinical and endoscopic criteria. Of the 3,210 patients who underwent RYGB, 1% developed gastrojejunal anastomotic stricture, 68% occurring after four postoperative weeks. Most were female (87%), with a median age of 43 years; 16% were smokers. All anastomosis were performed with a linear stapler, followed by enterotomy closure using hand-sewn sutures - non-absorbable in 77% and absorbable in 23%. Three patients had early postoperative gastrointestinal bleeding and four developed marginal ulcers. Endoscopic balloon dilation was performed in 55% of cases, achieving a 94% success rate. The incidence of gastrojejunal anastomotic stricture was consistent with the literature, with most cases occurring within the first three postoperative months. Endoscopic balloon dilation shows high success and low complication rates, reaffirming its role as the first-line treatment for this complication.

Keywords:

- Gastrojejunal anastomotic stricture
- Roux-en-Y gastric bypass
- Endoscopic balloon dilation

Introduction

Gastrojejunal anastomotic stricture is a well-recognized complication of Roux-en-Y gastric bypass (RYGB), with a global incidence reported between 3% to 27%. It is endoscopically defined as a reduction in the anastomotic lumen diameter to less than 10 mm. [1, 2, 3]

Clinically, it most often presents with progressively worsening upper gastrointestinal obstructive symptoms, such as nausea, vomiting and dysphagia to both solids and liquids. [1, 4]

The pathogenesis is multifactorial and not yet fully elucidated. Proposed mechanisms include tissue ischemia with subsequent fibrosis, non-ischemic scar formation, recurrent marginal ulcers, and mechanical factors such as anastomotic tension or malposition. Technical aspects of the surgical procedure play a critical role, including stapler type (circular vs. linear), stapler size, use of hand-sewn anastomosis and surgical expertise. Patient-related risk factors such as smoking, comorbidities, and the use of nonsteroidal anti-inflammatory drugs (NSAIDs) or corticosteroids have also been implicated, due to impaired mucosal healing and increased ulcer risk. [1, 4, 5, 6]

Gastrojejunal strictures are classified as early (≤ four weeks postoperatively) or late (> four weeks). Early strictures are typically due to local complications, including ischemia, edema, hematoma or dehiscence. Late strictures, which commonly arise between four and twelve weeks after surgery, are usually related to fibrosis and scar formation at the anastomotic site. [7]

Strictures can be endoscopically classified into four grades: I–II (mild to moderate) which permit passage of a standard 10.5mm or a pediatric 8.5mm endoscope; III (severe) which is traversable only with a guidewire; and IV (complete or near-complete) which is non-traversable. [1] This classification has

important clinical implications, as it correlates with severity of symptoms and guides therapeutic management.

Although high-quality comparative data are lacking, most literature supports conservative treatment—including proton pump inhibitors (PPIs), mucosal protectants and dietary modifications—as a first-line approach in early-onset and mild cases. These measures may contribute to symptom relief and mucosal healing, potentially avoiding the need for immediate invasive intervention in selected patients. [8, 9]

For moderate to severe, or late-presenting strictures, endoscopic balloon dilation (EBD) is considered the gold-standard initial therapy. Published series report clinical success rates range from 95 to 100 %, typically using 10–15 mm balloons with gradual escalation to 20–25 mm when tolerated. Complications are infrequent (~3–5 %), predominantly minor perforations which are generally managed conservatively. Repeat dilation sessions may be required. [3, 7, 10, 11]

In cases refractory to conservative therapy and EBD - including strictures that fail to maintain adequate luminal diameter after multiple dilations - endoluminal stent placement or surgical revision may be required. [11]

The aim of this study was to determine the incidence of gastrojejunal anastomotic stricture after RYGB at our center, characterize the affected patient population to identify potential risk factors and assess treatment effectiveness.

Materials and methods

A retrospective, single-center study was conducted from January 2011 to December 2023 (13 years). During this period, 3,210 patients underwent RYGB for clinically severe obesity.

Patients who underwent elective RYGB - with or without resection of the excluded stomach - and subsequently developed gastrojejunal anastomotic stricture were eligible for inclusion. Stricture was defined by clinical symptoms of gastric outlet obstruction plus endoscopic confirmation of an anastomotic diameter < 10mm.

Data collected included demographic characteristics (comorbidities, lifestyle habits), surgical technique, anastomotic complications, stricture classification and therapeutic interventions.

The standard conservative therapy at our center comprises high-dose PPIs combined with gastric mucosal protectants (e.g., sucralfate).

EDB were performed by gastroenterologists in an outpatient endoscopy suite. Strictures were classified as mild, moderate (endoscope-passable), or severe (non-traversable). At initial presentation, strictures were usually dilated incrementally to a diameter of 12 to 15mm. Further sessions were guided by shared decision-making between patient and surgical team. All procedures were performed under direct endoscopic visualization. Post-dilation assessment confirmed luminal enlargement and verified adequate hemostasis.

Results

Among all patients who underwent RYGB during the study period, 31 developed gastrojejunal anastomotic stricture, corresponding to an incidence of approximately 1%.

Of the included patients, 87% were female (n=27), with a median age of 43 years and a mean preoperative body mass index (BMI) of 39 kg/m^2. Comorbidities included diabetes (6%), dyslipidemia (16%), hypertension (26%) and smoking (16%, n=5).

All gastrojejunal anastomosis were performed using a standardized technique by surgeons with comparable expertise. All anastomosis were calibrated and constructed using a linear stapler, followed by hand-sewn closure of the enterotomy — non-absorbable suture (Ethibond®) was used in 77% of cases and absorbable barbed sutures (V-Loc™) in 23%.

Among the 31 patients with stricture, no cases of anastomotic dehiscence or localized abscess were reported. However, 10% (n=3) experienced anastomotic bleeding, and 13% (n=4) developed marginal ulcer.

All patients presented with symptoms of food intolerance; six (19%) required emergency department admission due to food impaction, prompting urgent endoscopy.

Regarding temporal classification, 32% (n=10) of strictures were classified as early (≤ four weeks). Among late strictures (68%), 29% (n=9) occurred between 1-3 months, 10% (n=3) between 4-6 months, and 29% (n=9) after six months. Of those developing beyond six months, one-third (n=3) were smokers, and two had associated marginal ulcers.

Based on endoscopic findings, 16% (n=5) of strictures were mild and 19% (n=6) moderate (endoscope-passable).

Among these, 82% responded favourably to conservative management. However, most cases (65%) were severe strictures, non-traversable by standard endoscope, requiring endoscopic dilation in 70%.

Readmission due to stricture occurred in 65% (n=20). Regarding treatment, 45% (n=14)—mostly with mild or passable strictures—were successfully managed with pharmacologic therapy. The remaining 55% (n=17) underwent EBD, with an overall success rate of 94%. The majority (71%) required only one session; three patients (18%) required two, and only one patient (6%) required three sessions. Post-dilation complications were minimal, with two cases of self-limited bleeding.

One patient who did not respond to either conservative therapy or EBD underwent endoscopic stent placement, followed by surgical revision with reconstruction of the gastrojejunal anastomosis.

Discussion

In this cohort, the incidence of gastrojejunal anastomotic stricture was lower than typically reported in the literature.

The development of this complication is multifactorial, and although its pathogenesis remains incompletely understood, optimization of specific intraoperative variables may mitigate the risk of occurrence.

Evidence suggests a lower stricture rate when linear staplers are used compared to circular devices, and when procedures are performed by experienced surgeons. [6] At our institution, all anastomosis are constructed using a uniform and standardized technique consistently applied by a dedicated bariatric surgical team. Despite technique standardization, suture material to enterotomy closure varied: 77% of patients with anastomotic stricture received non-absorbable sutures, while 23% received absorbable ones. This observation raises the hypothesis that non-absorbable sutures may impair normal wound healing process and contribute to stricture formation; however, this association remains speculative and requires prospective validation.

All patients undergoing bariatric surgery at our center are systematically screened for *H.pylori* infection. Those testing positive receive eradication therapy with subsequent confirmation of successful treatment. Furthermore, all candidates are enrolled in a structured prehabilitation and preoperative optimization program, including smoking cessation and comorbidity management. This standardized and rigorous approach to risk factor modification may contribute not only to the lower incidence of strictures in our cohort but also to fewer early complications, such as anastomotic leakage or localized abscesses—both recognized contributors to secondary stricture development. Most strictures identified were late-onset, consistent with previously reported data. Among those occurring beyond six months postoperatively, more than half had identifiable predisposing factors, including active smoking or marginal ulcers, supporting their role in delayed stricture pathogenesis.

For severe strictures, EBD served as the primary therapeutic modality, yielding a high success rate and low complication rate, in line with published outcomes. [11]

This study is subject to certain limitations, primarily its retrospective, observational design, which may limit causal inference. Additionally, incomplete documentation of relevant clinical variables—such as detailed smoking history or use of medications known to impair mucosal healing (e.g., NSAIDs or corticosteroids)—may have led to underestimation of their potential contribution to stricture formation. Further prospective studies are needed to clarify these associations and assess the effectiveness of targeted preoperative optimization strategies.

Conclusion

Anastomotic stricture represents a clinically significant complication following RYGB, with substantial impact on patients' quality of life. Nonetheless, through meticulous management of modifiable risk factors combined with a standardized surgical approach, the incidence of this complication can be substantially minimized to negligible levels. EBD has proven to be highly effective and exhibits a favourable safety profile, thereby establishing itself as the first-line treatment for this complication, particularly in cases involving non-traversable strictures.

Disclosures

The authors have no conflicts of interest relevant to the content of this article.

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