Revision of Bariatric Surgery for Gastroesophageal Reflux Disease: Characterizing Patient and Procedural Factors and 30-Day Outcomes for a Retrospective Cohort of 4412 Patients

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Research Questions

- Who are the patients requiring revisional surgery for GERD?
- What are the outcomes of their procedures?
- What factors might put them at risk for complications?

Introduction

Gastroesophageal reflux disease (GERD) is among the more common indications for revisional bariatric surgery.(1) However, our understanding of the underlying pathophysiology necessitating such revisional procedures remains limited. This is in part due to conflicting evidence on GERD symptoms after bariatric surgery, with some patients developing worsening or de novo GERD and others experiencing improvement in symptoms.(2, 3) Improving our ability to identify bariatric surgery patients who are at risk of requiring revisional surgery for GERD is imperative to better tailoring our surgical approach for each individual. Understanding the demographics, surgical technique, and post-operative outcomes in this specific patient population is required to improve outcomes for these patients.

Methods

- MBSAQIP data is collected from over 800 accredited bariatric surgery centres across North America and is the largest clinical data registry for bariatric procedures
- Patients who underwent revisional bariatric surgery in 2020 were identified in the database and all patients who had undergone revisional surgery for GERD were included in the retrospective cohort
- Continuous variables were described as means with standard deviations and categorical variables were described as absolute values with corresponding percentages. Multivariable regression models were generated for the outcomes of 30-day major complication rates.

Summary of findings

- 4412 patients (40.5%) in the 2020 revisional surgery cohort underwent revisional surgery for GERD. The majority of patients in this group were female (n=4032, 91.4%) and the average age of patients was 47.4 +/- 10.7. The mean BMI of the study group was 38.0 +/- 7.22 kg/m2 and 94.9% (n=4186) of patients were non-smokers. Many of the patients had existing comorbidities. Over a third of patients had hypertension (n=1509, 34.2%) and the majority had hyperlipidemia (n=3634, 82.4%). Mostly notably, the majority of patients were taking a PPI or H2 antagonist (n=3711, 84.1%).
- Major complications within 30 days occurred in 527 patients (11.9%) undergoing revisional surgery for GERD. These included post-operative anastomotic leak (n=31, 0.7%), post-operative GI bleed (n=38, 0.9%), reoperation within 30 days (n=168, 3.8%), reintervention within 30 days (n=124, 2.8%), or readmission within 30 days (n=377, 8.5%). Ten patients died within 30 days of their revisional procedure, making the 30-day mortality rate 0.2%.
- Multivariable regression modelling examined predictors for major complications. Operative length (OR 1.25; 95% CI 1.17 – 1.34; p<0.001), pre-operative PPI or H2 antagonist use (OR 1.35; 95% CI 1.01 – 1.80; p<0.05), and previously having undergone RYGB (OR 1.81; (95% CI 1.10 - 2.99; p<0.05) were significant predictors for 30-day major complications.



Most patients undergoing revisional surgery underwent sleeve gastrectomy as their primary operation.



Major complications occurred in 527 patients (11.9%) and 10 patients (0.23%) died within 30 days of revisional surgery.



Pre-operative PPI or H2 antagonist use, operative length, and prior RYGB were found to be predictors for major complications in those undergoing revisional surgery due to GERD.

Discussion

- This is **the largest study to date** of patients undergoing revisional surgery for GERD.
- No consensus has been reached with respect to the physiology of GERD in these patients, largely due to the coexistence of paradoxical phenomena whereby bariatric surgery alleviates GERD in some patients (2, 3) while exacerbating it in others. (4, 5, 6)
- Non-operative treatment for GERD also remains an area of contention. Prior studies demonstrated increased use of PPIs in patients after both sleeve gastrectomy and RYGB (37, 38) but there is little basic science research confirming the efficacy of these medications in this population. Our study showed that the majority of patients undergoing revisional surgery for GERD were taking PPIs or H2 antagonists, clearly suggesting that for some patients these treatments do not provide sufficient symptom control. Further, there is some evidence that it is **non-acid reflux that causes reflux symptoms** in patients following sleeve gastrectomy. (7, 8)
- Variables associated with major complications included operative length, pre-operative PPI/H2 antagonist use, and prior RYGB. **Operative length** may be an opportunity for quality improvement as revisional techniques continue to improve.
- The finding that patients who previously underwent RYGB as their primary surgery were at higher risk for major complications is important to highlight. While conversion to RYGB in patients with GERD following sleeve gastrectomy is well established, **solutions to GERD following primary RYGB** are more elusive. It remains to be seen whether novel bariatric procedures such as the single anastomosis-duodeno-ileostomy (SADI-S) will offer additional alternatives for conversion procedures or whether the SADI-S approach may reduce rates of refractory GERD entirely, as suggested by Surve et al (9). There is also some early evidence that endoscopic procedures such as the endoscopic sleeve gastroplasty may also have lower rates of post-operative GERD than sleeve gastrectomy. (10) Endoscopic placement of a magnetic sphincter augmentation device has also been proposed as an alternative to conversion to RYGB for refractory GERD. (11)

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