# The Association of Gastroesophageal Reflux Disease with Thirty-Day Interventions following Sleeve Gastrectomy using the MBSAQIP Database

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## Introduction

Bariatric surgery is currently the most effective treatment for obesity and its comorbidities with the most common procedure being the sleeve gastrectomy (SG). The removal of a large portion of the body of the stomach decreases the number of acid-producing cells in the stomach following a SG. The loss of these cells combined with weight loss is postulated to lead to improvement or resolution of gastroesophageal reflux disease (GERD). However, the remaining stomach is a high-pressure zone, and crural attachments can become disrupted leading to an incompetent lower esophageal sphincter; these two outcomes together can contribute to the development of new onset GERD postoperatively. This may be associated with treatment for dehydration as well as early procedures, such as esophagogastroduodenoscopy.

## Purpose

Currently, there is limited data on the association of preoperative GERD with dehydration and the need for early interventions following SG. The purpose of this study is to clarify the mixed information regarding the association, if any, between a preoperative diagnosis of GERD with early interventions following SG.

## Methods

Adult patients undergoing elective, first-time SG for obesity between 2015-2019 were identified using the American College of Surgeons Metabolic and Bariatric Surgery Quality Improvement Program Database (MBSAQIP). Preoperative, intraoperative, and 30-day morbidity outcomes were compared between patients with a preoperative diagnosis of GERD and those without. The study's primary and secondary outcomes of interest were assessed using Generalized Linear Mixed Models, univariate, and multivariate regression analyses.

## Results

A total of 603,782 patients met inclusion criteria; 168,066 (27.8%) had a preoperative diagnosis of GERD. Patients with a preoperative diagnosis of GERD were more likely to be older, male sex, white race, have a higher BMI, and were more likely to have associated comorbidities.

| Variable | With preoperative GERD (n=137,518) | Without preoperative GERD (n=365,477) | P value |
|---|---|---|---|
| **Age in years, mean (SD)** | 46.7 (11.6) | 42.6 (11.9) | < .0001 |
| **Female sex, n (%)** | 110,781 (80.6) | 287,558 (78.7) | |
| **Race, n ( %)** | | | |
| **White** | 88,163 (64.1) | 197,438 (54.0) | < .0001 |
| **Black** | 20,814 (15.1) | 70,745 (19.4) | |
| **Hispanic** | 10,961 (8.0%) | 39,301 (10.8%) | |
| **Unknown/Not reported** | 16,578 (12.1) | 54,521 (14.9) | |
| **BMI, median (IQR)** | 48.4 (9.0) | 43.9 (9.2) | < .0001 |
| **Current smoker, n (%)** | 12,644 (9.2) | 30,241 (8.3) | < .0001 |
| **Chronic steroid use, n (%)** | 3,747 (2.7) | 5,507 (1.5) | < .0001 |
| **COPD, n (%)** | 3,636 (2.6) | 4,061 (1.1) | < .0001 |
| **ESRD, n (%)** | 1208 (0.9) | 2016 (0.6) | < .0001 |
| **History of VTE, n (%)** | 4279 (3.1) | 7285 (2.0) | < .0001 |
| **Therapeutic anticoagulation, n (%)** | 5338 (3.9) | 8607 (2.4) | < .0001 |
| **Diabetes requiring insulin** | 12220 (8.9) | 20460 (5.6) | < .0001 |
| **Staple line reinforcement/Oversew** | 103204 (75.1) | 273295 (74.8) | 0.0494 |
| **Bougie size group** | | | < .0001 |
| **<36** | 30,128 (21.9) | 81690 (22.4) | |
| **≥36** | 101,046 (73.5) | 267788 (73.3) | |
| **Unknown** | 6,344 (4.6) | 15999 (4.4) | |
| **Pylorus distance, median (IQR)** | 5 (2.0) | 5 (2.0) | < .0001 |
| **Pylorus distance group** | | | < .0001 |
| **<4** | 16381 (11.9) | 36208 (9.9) | |
| **≥4** | 114788 (83.5) | 311030 (85.1) | |
| **Unknown** | 6348 (4.6) | 18239 (5.0) | |

The primary outcomes of interest within 30 days postoperatively were statistically significant dependent on GERD status for all variables except ED visits for nausea, vomiting, or diarrhea, hospital readmission for nausea, vomiting, or diarrhea, and conversion to RYGB.

| Variable | With preoperative GERD | Without preoperative GERD | p-value |
|---|---|---|---|
| **ED visits for N/V/D** | 84 (0.06) | 163 (0.04) | 0.0221 |
| **ED visits** | 8182 (7.2) | 18254 (6.0) | < .0001 |
| **Outpatient treatment for N/V/D** | 5300 (4.7) | 10805 (3.5) | < .0001 |
| **Hospital readmission for N/V/D** | 216 (0.16) | 371 (0.10) | 0.0445 |
| **Hospital readmission related to BAR** | 3767 (2.7) | 7477 (2.1) | < .0001 |
| **Unplanned Emergency Intervention** | 239 (0.17) | 493 (0.13) | < .0001 |
| **Diagnostic EGD Intervention** | 458 (0.33) | 842 (0.23) | < .0001 |
| **Therapeutic EGD Intervention** | 441 (0.32) | 808 (0.22) | < .0001 |
| **Unplanned Reoperation** | 1416 (1.03) | 2805 (0.77) | < .0001 |
| **Conversion (n=345) to Roux-en-Y Bypass** | 18 (17.1) | 43 (17.9) | 1.0000 |

## Conclusion

SG is a common procedure performed for the treatment of obesity, but the association between SG and GERD has not been well studied. We found that a preoperative diagnosis of GERD is associated with a higher rate of postoperative interventions following an SG procedure. The long-term effects of these interventions and the success of the SG procedure require further investigation to elucidate the continuing relationship between these two variables.

## References

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