Adding gastropexy is safe and improves outcomes following sleeve gastrectomy.

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Introduction

Sleeve gastrectomy (SG) represented 71% of primary bariatric surgery procedures in the United States as of 2020 according to MBSAQIP data [1]. One potential downside of SG is the development of new onset or worsening GERD. There are several proposed mechanisms for post SG GERD such as intrathoracic sleeve migration or hiatal hernia, partial outflow obstruction from sleeve rotation, physiologic or true strictures, as well as sleeve morphology with possible contribution of excess upper or lower pouch, or both [2].

Addition of gastropexy to SG may be a low risk intervention that reduces intrathoracic sleeve migration and malrotation of the remnant stomach. Several studies have shown a reduction in post SG GERD and upper gastrointestinal symptoms with the addition of gastropexy or omentopexy, while others have not. We evaluated early and longer term outcomes of 223 patients before and 224 patients after adoption of routine gastropexy in conjunction with SG.

Methods

This is a retrospective cohort study of 447 patients who underwent laparoscopic SG from December 2018 through July 2021. All operations were conducted by the same surgeon. Two groups were distinct chronologically: operations completed between December 2018 and March 2020 without standard gastropexy (SG-Pre), and between May 2020 and July 2021 with standard gastropexy (SG-Post). No SGs were conducted between 3/21/20 and 5/5/20 due to the State of Florida Executive Order barring elective procedures due to the COVID 19 pandemic. Twenty-one patients in SG-Pre received gastropexy, 11 patients in SG-Post did not have gastropexy due to anatomic factors such as extreme torque on trocars.

Our SG technique includes use of a 36 French bougie, powered Echelon stapler with Seamguard reinforcement, starting 3 cm from pylorus. Gastropexy includes suturing the sleeve staple line to the gastrosplenic and gastrocolic omentum, or the retroperitoneal fascia, with continuous absorbable barbed suture from the proximal sleeve down approximately 10 cm to above the angularis incisura, with additional interrupted sutures added as needed.

We evaluated operative time, postoperative complications and interventions, short and longer term GERD, upper GI related symptoms, and weight loss. Only patients with data available at each follow-up time point were used for statistical evaluation. GERD was considered present depending on the use of anti-reflux medications. Statistical analysis was completed on an intention-to-treat (SG-Pre, SG-Post) and intervention specific (No gastropexy, SG-NP versus Gastropexy, SG-P) basis with IBM SPSS using Independent Sample T-tests for continuous variables, and chi squared analysis as well as Fisher Exact Test for categorical variables.

Results

	No Gastropexy (n=213)	Gastropexy (n=234)	P Value
Mean Age	45.3 (11.8)	46.3 (12.8)	0.43
Mean BMI (kg/m^2)	47.59 (8.2)	45.86 (6.9)	0.016
Female	166 (77.9%)	181 (77.4%)	0.88
Male	47 (22.1%)	53 (22.6%)	0.88
Preop GERD	39 (18.3%)	45 (19.2%)	0.80
Surgery Duration (min)	57.8 (22.3)	66.7 (24.8)	<0.001
Length of Stay (days)	1.12 (0.47)	1.06 (0.27)	0.211
Bleed	3 (1.4%)	1 (0.4%)	0.27
Leak	1 (0.5%)	1 (0.4%)	0.95
DVT/ PE	2 (0.9%)	0	0.95
Major complications	6 (2.8%)	2 (0.8%)	0.16
Early Interventions (< 1mo)	7 (3.3%)	10 (4.3%)	0.59
ER visits and readmissions	36 (21.6%)	36 (23.1%)	0.71
Early GI Symptoms (< 1 mo)	42 (19.7%)	38 (16.2%)	0.34
GERD at 3 mos (all)	32 (21.5%, n=149)	21 (13%, n=161)	0.049
GERD new onset at 3 mos	15/120 (12.5%)	12/127 (9.4%)	0.44
GERD persistent at 3 mos	17/29 (58.6%)	8/33 (24.2%)	0.006
GERD at 6 mos	23 (17.8%, n=129)	20 (14%, n=143)	0.39
GERD at 12+ mos	22 (22.4%, n=98)	14 (14.3% n=98)	0.14
Nausea (any > 3 mos)	9 (5.2%, n=173)	6 (3.2%, n=190)	0.43
Vomiting (any > 3 mos)	8 (4.6%, n=173)	1 (0.5%, n=190)	0.02
Dysphagia (any > 3 mos)	2 (1.2%, n =173)	3 (1.6%, n=190)	1.0
Revisions	2 (1.2%, n=173)	1 (0.5%, n=190)	0.61

Table: Demographics, operative details and outcomes with standard deviation or percent.

Operative times include all ancillary procedures such as hiatal repair, cholecystectomy, gastric band removal (n= 11), and adhesiolysis. All operations with anterior cruroplasty (n =15) and formal hiatal or paraesophageal hernia repairs (n=16) were done in conjunction with a gastropexy. Excluding operations with hiatal repairs from SG-P results in a reduction of mean operative time from 66.7 to 62.8 minutes.

All 447 patients came for their 2-week visit, but follow up diminished with time, with 310 patients returning for the 3-month visit (69.4%), 272 at 6-months (60.9%), with 196 (43.8%) returning at 12 or more months.

For females 3 months out, GERD was significantly higher with SG-NP, present in 22.7% and 9.5% in SG-P (P=0.014), while this was not significant in males with SG-NP 16.7% and SG-P 20.6%.

Patients with preop GERD had persistent symptoms at 12 or more months in 47.4% of SG-NP, and 28.6% of SG-P, while new onset GERD at 12+ months occurred in 16.5% of SG-NP and 8.0% SG-P and both of these were not significant. A CMH test was completed to compare GERD rates at 12+ months between groups while controlling for the presence of preoperative GERD. After adjusting for preoperative GERD, the odds of GERD occurrence at 12+ months was 55.7% lower in SG-P (adjusted OR=0.443, p=0.046).

Discussion

As the most effective intervention for morbid obesity, type 2 diabetes, and other expressions of metabolic syndrome, bariatric surgery will continue to play a critical role in addressing the obesity epidemic, and SG is the most common operation. GERD is a potential downside of SG and different techniques to reduce postop GERD have been evaluated.

The addition of gastropexy to SG appears to be safe, but there's been disparate results in the literature regarding efficacy and gastropexy is not the standard of care for SG. Mahawar, et al. reported the outcome of a Delphi consensus evaluation of SG with a multinational committee of experts that met in early 2020. Of 97 proposed statements just 4 statements achieved 100% agreement. Only 22.6% of committee members at that time agreed that gastropexy should be routinely performed with SG [3].

In this study adding gastropexy to sleeve gastrectomy reduced major complications, early postop GI symptoms, long term vomiting and GERD at 3 months with a trend toward decreased GERD at 6 and 12 or more months. The average duration of procedure, less patients who underwent intraoperative hiatal repair, was only 5 minutes longer in SG-P. While statistically significant, the addition of 5 minutes is a negligible increase in exchange for the clinical gain of reduced major complications and reduced long term GERD.

This is a retrospective study and as such has limitations. Additionally, the two groups were not controlled as the SG-NP group had a higher BMI (47.6 vs 45.9 kg/m^2) and there were minor modifications in ERAS protocol over the almost three year window of the study. Patient compliance and follow up were acceptable but approximately 20% of patients only had a 2 week postop visit and then no return visits. There was less data at 12 or more months postop to evaluate for significance of GERD reduction. A larger sample size and longer term follow up are necessary to assess the impact of gastropexy on any subsequent revisional or conversion operations. Patients were classified as having GERD by the use of daily acid reducing medication. While patient reported symptoms are valuable metrics, we did not have routine, objective testing evaluating GERD pre- or postop.

A controlled, randomized trial with a larger sample size and longer follow up may be needed before gastropexy should be a recommended, standard of care addition to SG to reduce long term GERD and revisional procedures.

References

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