



## Standard Anterior Repair of Hiatus Hernia During Laparoscopic Sleeve Gastrectomy Causes a Significant Reduction in Symptoms of GERD

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### ABSTRACT

*Bariatric surgery is the most effective treatment for gastro-esophageal reflux disease (GERD) in obese patients. Published data reporting the results of laparoscopic sleeve gastrectomy (LSG) and hiatus hernia repair in patients with GERD are contradictory. In this study, we evaluate the effects of standardization of our LSG and Hiatus hernia repair technique on the incidence of postoperative symptoms of GERD. This was a retrospective study. Patients who underwent Laparoscopic sleeve gastrectomy at our centre between Jan 2012 and Dec 2013 were followed up retrospectively with a questionnaire. All patients had been evaluated for hiatus hernia (HH) intraoperatively using a 15ml Balloon pull back technique and all hiatus hernias were repaired with anterior crural approximation. A total of 246 patients underwent surgery. All 246 patients who completed 3–24 months of postoperative follow-up were evaluated. In the study group, 79 patients (32.1%) were diagnosed with GERD preoperatively, and Hiatus Hernia was detected in 77 patients (30.8%) intraoperatively. Hiatus Hernia was treated by anterior repair in all pts. There is a significant remission of GERD symptoms post op in patients with hiatus hernia ( $p=0.003$ ). Most patients with a hiatus hernia repair are asymptomatic post op ( $p=0.001$ ). Our study confirms a substantial prevalence of GERD symptoms and HH in obese patients. Our results show that standardization of intraoperative hiatus hernia detection and repair can cause a significant reduction in symptoms of GERD patients up to 24 months after surgery and also prevent denovo GERD symptom development after LSG.*

**Keywords:** GERD, Hiatus hernia, Laparoscopic Sleeve Gastrectomy.

### INTRODUCTION

GERD and obesity go hand in hand which is obvious when we see that almost 50% of morbidly obese patients suffer from GERD. The main cause of GERD in obese patients is transient relaxation of the lower esophageal sphincter combined with increased intra-abdominal pressure<sup>[1]</sup>. Symptomatic hiatus hernia (HH) occurs in 15 % of patients with a

body mass index (BMI) of  $>35 \text{ kg/m}^2$ <sup>[2]</sup> and is also one of the causal factors for GERD in obese patients<sup>[3]</sup>. Bariatric surgery is the most effective treatment for GERD in obese patients, with the Roux-en-Y gastric bypass being the most preferred.<sup>[4]-[6]</sup>. Published data regarding the results of sleeve gastrectomy in patients with GERD are contradictory, and comparison between studies is

difficult. Symptomatic GERD has been reported to occur in 7.8–20 % of patients at 12–24 months after LSG in selected series of more than 100 patients [7]-[9]. At the second and the third international consensus summits for sleeve gastrectomy, reflux disease was reported to occur in 6.5 % and 17 % of patients, respectively, after sleeve gastrectomy [10]-[11]. A recent review of the literature found that four studies reported an increase in reflux symptoms after sleeve gastrectomy, and seven studies reported a reduction in symptoms [12]. Most studies reported an increase in reflux symptoms during the first year following sleeve gastrectomy, followed by a gradual decrease in symptoms up to the third postoperative year [13]. Tai et al found postoperative GERD and erosive gastritis to be related to the presence of a hiatus hernia [14]. However Santonicola et al did not find any benefit of hiatus hernia repair on GERD post LSG [15]. Also preoperative detection techniques for Hiatus hernia vary among studies and so do techniques of repair. From just reduction of hiatal hernia to anterior and posterior repairs and use of mesh vary among surgeons and centres. Daes et al. [16], a prospective single centre study, utilized hiatal hernia repair concurrently with SG and had a resultant 47.5% decrease in GERD prevalence postoperatively at 6 and 12 months. Soricelli et al [17] demonstrated no de novo cases of GERD in any of the 97 patients undergoing SG and hiatal hernia repair. This study retrospectively evaluated the effects of techniques of standardization of the intraoperative detection and anterior repair of hiatus hernia on the incidence of postoperative symptoms of GERD.

## MATERIALS AND METHODS

We retrospectively followed all patients who underwent bariatric surgery from January 2012 to December 2013. All these patients underwent LSG. All patients completed a questionnaire as regards pre and post operative GERD symptoms and their severity and usage of antireflux medications. Preoperative GERD was diagnosed if patients experienced symptoms of heartburn or acid reflux more than twice a week and if they required antacid treatment for more than 2 weeks. All patients were checked intraoperatively for presence of hiatus hernia using 15ml balloon pullback technique. All those found positive were treated with anterior crural closure at the same setting.

## RESULTS

A total of 246 patients underwent surgery during Jan 2012 and Dec 2013. They were evaluated using the following questionnaire.

**Table no 1.** Questionnaire for GERD symptoms

NAME OF PT: Age:                      Sex: DT OF LGS: HIATUS HERNIA : Y/N		
	Before surgery	After surgery present day
Burning chest pain frequency and duration		
Reflux frequency and duration		
Antireflux medication usage		

A Microsoft Access database (Office 2000) was used for data collection. A two-sided  $p$  value of  $<0.05$  was considered significant. Bivariate analyses using the  $\chi^2$  test was done.

A total of 77 patients were intraoperatively detected with hiatus hernia and the hernia was repaired with anterior crural closure at the same setting. Out of the 79 pts with pre operative GERD symptoms 29 had presence of hiatus hernia which was statistically significant ( $p=0.039$ ).

There was a significant decrease in post op symptoms in pts who were symptomatic preoperatively and underwent a hiatus hernia repair ( $p=0.003$ ). Even those with a clinically silent hiatus hernia were asymptomatic postoperatively ( $p=0.001$ ). Of the 50 pts who were preoperatively symptomatic but without a hiatus hernia 39 ie 78% had remission of symptoms postoperatively ( $p=0.001$ ).

However only 8 out of 246 pts were found to have significant GERD symptoms post op requiring regular PPI therapy.

## DISCUSSION

The results of this study show a 32.1% incidence of preoperative GERD in the study population . These results are even more significant because this was an unselected cohort of patients, with no exclusions. The incidence of postoperative GERD in this series is 17.47% which is similar to that reported in the literature. There were no cases of death, fistula, or conversion to open surgery. The morbidity was very low.

The preferred bariatric surgery procedure has changed from the adjustable gastric band and the

Roux-en-Y gastric bypass to the LSG. Both Soricelli et al<sup>[17]</sup> and Daes et al<sup>[16]</sup> found that searching for and repairing a hiatus hernia at the LSG operation decreases GER significantly. Our study also has similar findings. 79.3% patients in whom hiatus hernia was repaired were asymptomatic postoperatively. A significant no of previously symptomatic patients had remission following hiatus hernia repair ( $p=0.003$ ).

Some postoperative factors tend to reduce reflux after sleeve gastrectomy, such as reduced intra-abdominal pressure due to decreased body weight, reduced acid production, and accelerated gastric emptying. We found remission of GERD symptoms postoperatively in 78% of previously symptomatic patients ( $p=0.001$ ). Decrease in gastric compliance, increased intraluminal pressure with an intact pylorus and low esophageal sphincter pressure all predispose to increased possibility of GERD after LSG[14]. Only 16 patients in our series had denovo development of GERD symptoms post LSG ( $p=0.001$ ).

In selected series involving more than 100 LSG patients, symptomatic GERD was reported to occur in 7.8–20 % of patients at 12– 24 months postoperatively. Cottan et al.<sup>[7]</sup> reported a series of 126 patients who underwent LSG and found a 20 % incidence of GERD at 12 months postoperatively. Hamoui et al.<sup>[8]</sup> reported 131 LSG patients with a 12.7 % incidence of GERD at 13 months, Nocca et al.<sup>[9]</sup> reported 163 LSG patients with an 11.8 % incidence of GERD at 24 months, and Sorelly et al<sup>[2]</sup> reported 264 LSG patients with a 7.8 % incidence of GERD at 24 months. In our series 43 (17 %) had postoperative GERD symptoms on follow up.

However only 8 patients require regular PPI therapy. Our study has several limitations. Firstly, it is a retrospective study. Secondly, postoperative endoscopy or contrast study was not performed on any patients. However all patients had a standard approach to hiatus hernia detection and repair. As such, the results of this study may be used as a basis for a prospective study to investigate the same. Finally, we also need to evaluate longer term outcomes (more than 24 months postoperatively).

## CONCLUSIONS

Our study confirms a substantial prevalence of GERD symptoms and HH in obese patients. Our results show that standardization of intraoperative hiatus hernia detection and repair can cause a significant reduction in symptoms of GERD patients up to 24 months after surgery and also prevent denovo GERD symptom development after LSG.

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