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Role of Simple Cruroplasty in Non-GERD Morbid Obese Patients Submitted to Laparoscopic Sleeve Gastrectomy

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Abstract

Background: Surgical treatment for extreme obesity (body mass index [BMI] more than 50 kg/m²) is on the rise as the prevalence of morbid obesity increases. This has led to the development of surgical techniques that help people lose enough weight while causing as little harm as possible.

Objective: The purpose of the research was to determine if doing simple cruroplasty at the same time as laparoscopic sleeve gastrectomy (LSG) is safe and effective, and if so, to what degree.

Patients and methods: This study was done on 60 people who were split into two groups. Group A had 30 people who had a laparoscopic sleeve gastrectomy and a cruroplasty at the same time. The thirty patients in Group B all underwent laparoscopic sleeve gastrectomy without the addition of a cruroplasty. Differences in outcomes and complication rates were examined between the two groups.

Results: This study found that SG with simple cruroplasty is possible and safe, and it's a good way to treat denovo GERD in obese people who don't have symptoms of reflux. During a preoperative endoscopy and/or upper GI contrast study, small hiatal defects could be missed. So, it is always best to carefully look at the crura during surgery.

Conclusion: The results of simple cruroplasty with laparoscopic sleeve gastrectomies to prevent GERD after SG are the same as those of laparoscopic sleeve gastrectomies without cruroplasty, and there are no major side effects.

Keywords: Denovo GERD, Morbid obesity, Simple cruroplasty, Sleeve gastrectomy

1. Introduction

Surgical treatment for extreme obesity (body mass index [BMI] >50 kg/m²) is on the rise as the prevalence of morbid obesity increases. A result of this is the evolution of minimally invasive surgical procedures to aid in weight loss. Weight loss has been linked to increased longevity in a new study.¹ The two most common weight loss surgeries are laparoscopic gastric bypass (LGB) and laparoscopic adjustable gastric band (LAGB) (LGB). The restricted operation known as laparoscopic sleeve gastrectomy (LSG) consists of a vertical gastrectomy, in which the entire greater

curvature of the stomach is removed. Even though LSG has a higher morbidity rate than LAGB, it doesn't have some of the problems that LGB does, like dumping syndrome, marginal ulceration, and too little food.²

Hiatal hernia (HH) and gastroesophageal reflux disease (GERD) are prevalent and difficult-to-treat disorders in the morbidly obese. Studies have shown that a higher body mass index (BMI) makes GERD more common by making it more likely that HH will happen.³

50–70% of morbidly obese people who want bariatric surgery say they have upper GI symptoms.⁴

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Repair of hiatal abnormalities (without indication of a typical surgical approach) after bariatric surgeries was advised in recommendations from the Society for American Gastrointestinal and Endoscopic Surgeons (SAGES) to decrease the prevalence of postoperative symptomatic GERD.⁵ Laparoscopic sleeve gastrectomy (LSG) has recently shown increased acceptance as a common final surgery. However, there is no agreement about its indication in obese individuals with symptomatic GERD, esophagitis, and/or HH, and the available evidence on its efficacy on GERD is still debatable. It is thus unclear what treatment would be most effective in mending the crural defect.⁶ As most of the ghrelin-secreting portion of the stomach is eliminated during this treatment, it also has the potential to reduce hunger, which is a major selling point.⁷ There are a number of factors that have been hypothesised to contribute to the development or worsening of GERD in patients who have undergone SG, including the removal of the gastric fundus and angle of His, an increase in intraluminal pressure, the division of sling fibres and/or the phreno-esophageal ligament, which reduces pressure on the lower esophageal sphincter (LES), the loss of the antral pump because of the radical.⁸

This study's objective is to examine the differences between patients who underwent simple cruroplasty at the time of their laparoscopic sleeve gastrectomy (LSG) and those who did not.

2. Patients and methods

Al-Azhar University Hospitals in Cairo, Egypt treated 60 patients for morbid obesity between September 2020 and August 2022 using either simple cruroplasty during laparoscopic sleeve gastrectomy (LSG) or LSG without simple cruroplasty, with clearance from the local ethics committee. Consent forms were completed by all patients who were about to be admitted to the surgical ward. They were split into two groups by close-envelope randomization: **Group I:** Thirty patients had simultaneous laparoscopic sleeve gastrectomy and cruroplasty. **Group II:** In a study including 30 patients, laparoscopic sleeve gastrectomy was performed without cruroplasty.

2.1. Inclusion criteria

Those included ranged in age from 14 to 65, and those with a body mass index (BMI) of 40 or higher were considered to be patients. Patients with a BMI

between 35 and 40 who also have obesity-related comorbidities and no endocrine or mental diseases present and non-surgical treatments have failed.

2.2. Exclusion criteria

Patients who are in poor enough health that doctors deem them unsafe candidates for elective anaesthesia. Patients with H.H diagnosed through preoperative upper GI endoscopy, with or without GERD symptoms, and who had sleeve gastrectomy with or without cruroplasty before the trial constituted the study population. Those who suffer from acid reflux disease. Stricture, twisting, and other anatomical abnormalities are common in these patients.

2.3. Surgical techniques

Patients were randomly assigned to have either a laparoscopic sleeve gastrectomy with simultaneous cruroplasty or a laparoscopic sleeve gastrectomy without simultaneous cruroplasty using sealed envelopes unsealed just before to surgery. The procedures were performed while the patients were unconscious under general anaesthesia.

2.3.1. Group A: laparoscopic sleeve gastrectomy with cruroplasty in the same operation

We used a five-port laparoscopic technique for each SG operation. In our series, there was no outward evidence of character development. Beginning 4–6 cm (cm) distal to the pylorus, the gastro-splenic ligament was severed using an energy device (Harmonic Ace, Ethicon Endosurgery, Cincinnati, OH, USA). After severing the short gastric arteries, the fundus was repositioned to expose the left crus. The anesthesiologist dissected the stomach and severed the gastrosplenic ligament in order to insert a 36 Fr bougie. The greater curvature of the stomach could be transected without the bougie moving. An Echelon stapler was utilised to make the incision through the broader stomach curve (Ethicon Endosurgery, Cincinnati, OH, USA). Each transection begins with the insertion of a new green or black cartridge (staple open height 4.1 and 4.2 mm, respectively). Dissecting the angle of Hiss, separating the phreno-esophageal ligament, and shifting the fat pad are common surgical techniques for diagnosing and measuring a hiatal hernia. Having located the right and left crura, we utilise our atraumatic grasper to measure the hernia (open jaws length of our grasper is 3 cm) (open jaws length

of our grasper is 3 cm). To move the GE junction into the abdomen, both crura were cut apart and skeletonized behind where they met. The two cranial bones were then joined together with non-absorbable sutures. After a cruroplasty, a 36 Fr bougie was always left in place to keep the hiatus from getting smaller. A methylene blue test was done on each person. On the first day after surgery, patients are sent home if they are clinically stable and can handle a liquid diet. Every patient was told to keep a weight log at home every week and to come back for checkups every month (Fig. 1).

2.3.2. Group B: laparoscopic sleeve gastrectomy without cruroplasty

The same steps as above without cruroplasty.

2.4. Statistical analysis

IBM's statistical programme SPSS, version 20.0, was used to examine the data. Statistics were presented as means and standard deviations. Quantitative and proportional representations of qualitative data were provided. A logistic regression model was used to figure out the odds ratio and the *P* value that goes with it. The level of significance was less than 0.05.

3. Results

As shown in and, obesity mostly affects women in both groups (Table 1).

The longest operation time for a sleeve gastrectomy was 185 min and the shortest was 90 min, with a mean of 152 min. The longest operation time for a cruroplasty was 215 min and the shortest was about 103 min, with a mean of 147 min. It is clear that the

Table 1. Age and other characteristics.

	Total no. = 60
Age	
Mean ± SD	37.55 ± 11.77
Range	20–55
Sex	
Female	45 (75.0%)
Male	15 (25.0%)
Weight	
Mean ± SD	110.35 ± 10.84
Range	88–128
Height	
Mean ± SD	158.10 ± 6.98
Range	145–171
BMI	
Mean ± SD	43.95 ± 2.58
Range	40–49

added simple cruroplasty took about 30–45 min longer in (group A) than in (group B) (Table 2).

The average time to follow up was 18 months. Denovo GERD happened to two patients (6.7%) in group A, which was confirmed by an upper Gastro-Intestinal endoscopy, but it happened to eight patients (26.7%) in group B. In the other 50 patients, anti-reflux drugs were stopped, and their symptoms were completely under control (Table 3).

Table 2. Comparative maximum, minimum & mean values in the operative time & the hospital stay between both groups.

	Type of operation					
	Sleeve			Sleeve with cruroplasty		
	Mean	Min.	Max.	Mean	Min.	Max.
Operative time (min)	152	90	185	147	103	215
Hospital Stay (day)	6	4	14	5	4	5

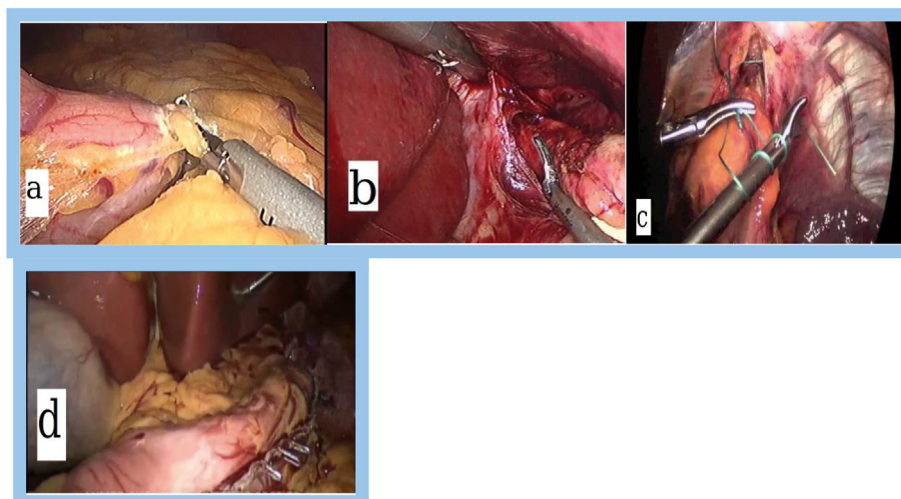


Fig. 1. (a) Dissecting the gastrosplenic ligament. (b) Opening the hiatus. (c) Simple cruroplasty. (d) Good hemostasis of the stapler line.

Table 3. Incidence of *denovo* GERD.

	Denovo GERD incidence
Group A	
Yes	2 (6.7%)
No	28 (93.3%)
Group B	
Yes	8 (26.7%)
No	22 (73.3%)

4. Discussion

This is what Mahawar et al.,⁷ the authors believe this is the first comprehensive look at the outcomes and technical considerations of doing a sleeve gastrectomy (SG) and a hernia repair (HH) on obese individuals at the same time. The optimum bariatric surgery for these individuals is a topic of heated dispute amongst bariatric surgeons.⁹ Although many surgeons, including those in our group 164 OBES SURG, consider gastric bypass to be the best choice for obese patients, even those who adhere to this philosophy sometimes deal with patients who either refuse or are unable to undergo the procedure. This systematic study found that the combined use of SG and cruroplasty is safe, with tolerable rates of postoperative GERD, even in morbidly obese patients. Out of all the studies that were considered for this summary. The analysis indicated that the prevalence of GERD in these patients after surgery was 12.6%, which cannot be denied. However, it is important to note that individuals who have gastric bypass or SG who do not have a hiatus hernia or GERD have also reported experiencing postoperative GERD. According to Gagner et al.⁸ a preoperative diagnosis of GERD and/or HH may indicate a contraindication to SG since some researchers have theorised that this operation might increase the development or aggravation of GERD symptoms.⁸ When comparing bariatric surgery versus antireflux surgery for the treatment of GERD and/or HH in morbidly obese patients, Soricelli et al.,¹⁰ found that bariatric surgery was the most effective option. Its efficacy is attributable not only to the patient's reduced body mass, but also to distinct alterations in the architecture and functional layout of the crural complex. The tiny (15–30 ml) gastric pouch created by RYGB seems to have a highly beneficial impact on GERD symptoms, presumably because of the decreased acid production and increased esophageal refluxate caused by the Roux limb.¹⁰ In a study conducted by Himpens et al.,¹¹ GERD developed 'de novo' in 21.8% of patients at 1 year post-op. However, Himpens et al.¹¹ found that GERD was evident in just 3.1% of patients 3 years after angle of His restoration

Furthermore, seventy-five percent of patients who had reflux symptoms before surgery said that they had stopped experiencing them between the first and third years following the procedure. Patients who had SG alone were twice as likely to develop 'de novo' GERD symptoms as those who had SG with HHR.¹⁰ Patients in our research who were identified with GERD pre-operatively by upper G-I endoscopy did not exhibit any symptoms of GERD at the time of surgery. The average time between visits was 18 months. Two patients (6.7%), both of whom had denovo GERD verified by upper G-I endoscopy, were able to stop using their antireflux drugs without experiencing any worsening of their symptoms. Since preoperative diagnostic techniques eliminating the existence of HH may not be precise, we think the incidence of HH in obese patients having bariatric surgery may be underestimated. In addition, the presence of obvious gastroesophageal fat pads might lead to an underdiagnosis of tiny hiatal abnormalities before to and after surgery. It is possible and safe to treat denovo GERD in obese individuals with AND SG combined with simple cruroplasty.

4.1. Conclusion

For the treatment of denovo GERD in obese individuals without reflux symptoms, we think SG with simple cruroplasty is a viable and safe option.

Conflicts of interest

None declared.

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