ORIGINAL ARTICLE

Prophylactic Gastropexy for Prevention of Post-sleeve Gastric Twist

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Abstract

Background: ***When it comes to treating severe obesity, bariatric surgery is still the gold standard. For the past five years, more than half of all bariatric procedures have been laparoscopic sleeve gastrectomy (LSG).***

Aim and objectives: ***To assess gastropexy as a main method for post-sleeve gastric twist control.***

Patients and methods: ***Using a systematic random sampling technique, 50 patients from the general surgery departments of Al-Azhar University Hospitals participated in this prospective observational study.***

Results: ***When it came to bleeding and leaking, the groups weren't significantly different. However, when it came to nausea, vomiting, reflux symptoms in the first year after surgery, and stomach torsion, there was a substantial difference.***

Conclusion: ***Gastric torsion, reflux symptoms, vomiting, and nausea following sleeve gastrectomy (SG) with or without gastropexy are significantly different. Additionally, there were significant differences in hospital readmissions, antiemetic use, severe GEJ incompetence, hospital/surgeon calls, and excessive clinical visits in the SG with gastropexy group compared to the SG without gastropexy group.***

Keywords: Prophylactic gastropexy; Post-sleeve gastric twist

1. Introduction

There are a number of difficulties that can arise from it, notwithstanding its usefulness. It is possible to die from LSG problems if they are not identified and treated quickly. Staple line leakage(1-3.9%), major organ damage(0-5%), and stenosis(2-5%) are among the problems that might occur, with an incidence ranging from 1% to 29%.[1]

Delayed treatment of gastric stenosis can lead to malnutrition and dehydration. The incisura angularis is more likely to be affected by mechanical or functional stenosis, depending on classification. Fibrosis and stricture produce mechanical stenosis.[1]

On the other hand, functional stenosis occurs when the stomach is unable to empty normally due to the twisting of the gastric tube along its longitudinal axis. Gastric twist's pathophysiology is mostly unclear. The rupture of the stomach's supporting ligaments (gastrosplenic, gastrohepatic, and gastrocolic and posterior attachments) following SG, resulting in a twist or kink in the remaining gastric tube, is one theory.[1]

A further proposed etiology is uneven tension on the stomach's anterior and posterior walls during spiral pattern staple firing. Possible underlying reasons can include acute angulation, adhesion development, edema, and hematomas near the staple line. Upper gastrointestinal endoscopy or computed tomography with three-dimensional reconstruction is used to diagnose gastric twist. With the use of computed tomography with three-dimensional reconstruction, the spiral staple line around the stomach can be better seen, and upper gastrointestinal endoscopy can show that the sphincter is functioning and able to let the endoscope pass.[1]

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Gastropexy is a surgical procedure involving the suturing of the stomach to the abdominal wall or diaphragm. As a therapy for GERD, gastropexies in which the stomach is sutured to the diaphragm are occasionally done to prevent the stomach from rising into the chest. Gastropexy may be effective in avoiding twisting following the sleeve procedure due to suturing.[2]

The research team behind this study set out to see how effective gastropexy is for patients suffering from post-sleeve gastric twist.

2. Patients and methods

The 50 patients who participated in this prospective observational study were randomly chosen among the general surgery patients at Al-Azhar University Hospitals.

Inclusion criteria:

Patients are selective for SG.

Exclusion criteria:

Infection, visceral hemorrhage, organic stricture, endoscope passage failure during preoperative evaluation, and hiatus hernia are all risk factors for this procedure.

Sample Size:

This research is based on work done by Sabry et al.,[3] The sample size was calculated using Epi Info STATCALC, taking into account the following assumptions: Two-sided confidence level of 95%, with 80% power. Plus or minus 5%, the odds ratio comes out to 1.125. Based on the results from Epi-Info, the maximum sample size was 43 in the end. Therefore, in order to account for potential situations of participants dropping out during follow-up, the sample size was raised to 50.

Two categories were used to classify all patients: Two groups were created: one for patients who wanted SG with gastropexy (25 patients total) and another for patients who wanted SG without gastropexy (25 patients total)

Method:

The following questions were asked of every patient: name, age, parity, place of residence, profession, unique habits of medical significance (particularly smoking), complaint, and how long it had lasted, and personal history. Current history: review of the patient's present complaint, past medication sensitivities, medical history, and surgical procedures.

A thorough evaluation is necessary to rule out systemic disorders. This includes taking vital signs such as blood pressure, temperature, heart rate, and respiration rate. Additionally, look for symptoms including pallor, cyanosis, jaundice, and enlarged lymph nodes. There was also a local examination. Patients electing for SG during the same session as their sleeve operation or who developed complications from gastric twist after the operation underwent gastropexy in addition to routine laboratory investigations such as complete blood count (CBC), erythrocyte sedimentation rate (ESR), C-reactive protein, liver and kidney functions, PT, PTT, and INR.

Surgical technique:

Below is an example of one of many possible ways to do an LSG.

Entrance and Set Up:

At palmer point, via the verees needle, the entrance into the abdomen is located in the left upper quadrant. A laparoscope is used to visually examine the abdomen after it has been insufflated to a pressure of 15 mmHg.

Mobilization of the Greater Curvature:

The larger omentum is divided 5 cm proximal to the pylorus, near the incisura angularis, to start the dissection. An energy device is used to separate the gastroepiploic vessels along their greater curvature, which leads to the short gastric vessels. A bipolar cautery instrument is recommended for the division of the short gastric veins. In order to locate the left crus of the diaphragm, it is necessary to mobilize the angle of His and finish dividing the gastrophrenic ligament.

Opinions vary about how far away from the pylorus the first staple load should begin. These days, distances between 2 and 6 cm are common, and the amount of retained antrum dictates its clinical importance. The gastric remnant is considerably smaller, and more antrum is removed at a 2 cm spacing. Theoretically, this will cause more weight loss, but in practice, the rise in distal intragastric pressure can cause further problems.

Posterior Mobilization:

The lesser sac can be accessed now that the omentum has detached from the greater curve. The back wall of the stomach is exposed by grabbing it and lifting it anteriorly. At the lesser curvature, all adhesions to the lesser sac are brought down to the most medial portion of the stomach.

Bougie Placement:

32–40 French-speaking. The bougie is guided to a location distant from the separated omental attachments while being viewed through laparoscopy. Based on two outcomes—percentage anticipated weight loss and proximal staple line leaks—the bougie size to build the SG around is chosen. Historical evidence suggests a correlation between a smaller French bougie and an increase in leak rate, as well as weight reduction. Using a bougie of 40-French or higher reduces leak rates by 66%, according to a 2013 meta-analysis, and it doesn't change the success of weight loss in a statistically meaningful way.

Creation of a Stapled SG:

This is done with an endoscopic stapler that is 60 mm long. The bougie is angled parallel to the lesser curvature, and firing begins around 5 cm

proximal to the pylorus. To prevent the sleeve from "spiraling," make sure the stapler covers the same amount of the front and back of the tummy. Along the bougie, in a sequential fashion, the staple lines are fired until they reach the angle of His. At a distance of 0.5-2cm lateral to the esophagus, they divide the fundus. After that, the 15 mm port is used to remove the severed stomach.

During gastropexy, three stitches were used: one linking the left crus of the diaphragm to the posterior part of the sleeved stomach's fundus, another linking the pancreatic fascia to the midbody of the stomach, and a third stitching the posterior antrum of the stomach to the transverse mesocolon. The suture used in the procedure was Prolene 2-0. The posterior antrum was sometimes secured to the transverse mesocolon with the use of two additional stitches. Methylene blue dye was used to conduct a leakage test during the operation. The 15 mm port site undergoes fascial closure, while the other sites undergo skin closure.

The bougie was reinserted after the gastric sleeve was fixed so that it could be tested for free mobility through the gastric tube. On average, patients spent 12 hours in the hospital following surgery, and the operation itself took about 1 hour.

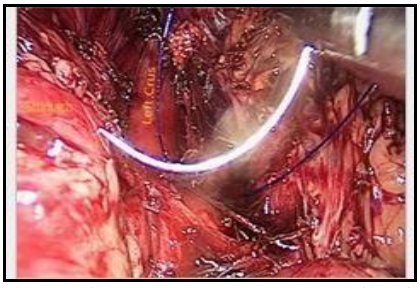

Figure 1. A laparoscopic picture displaying the location of the stitch formed between the stomach fundus and the left diaphragmatic crus.

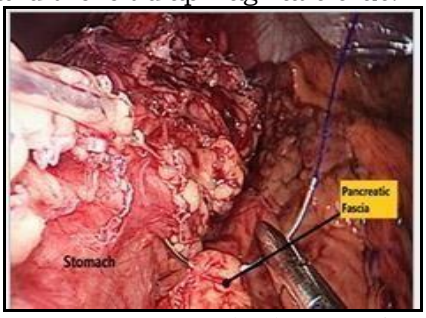

Figure 2. Laparoscopic image showing the second stitch between the midbody of the stomach and the pancreatic fascia.

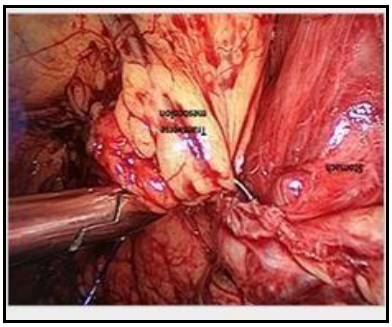

Figure 3. Laparoscopic image showing the third stitch

between the posterior antrum of the stomach and the transverse mesocolon.

Ethical Consideration:

The information collected from participants is private. No report or publication pertaining to this study included the names of the study participants. The goal and nature of the trial, together with the risk-benefit analysis, were presented to the participants prior to their admission. Informed consent was acquired.

Statistical Analysis:

Utilizing the statistical package of the social science software version 21 (SPSS), pre-coded data was statistically examined. The mean, SD, median, and IQR for quantitative variables and the number and percentage for qualitative factors were used to summarize the data.

For quantitative variables between two groups, one-way categories that were often disrupted, an independent T-test was employed, whereas the Chi-square test was utilized to compare qualitative variables. When it came to quantitative measures that were not typically disrupted, nonparametric Kruskal-Wallis and Mann-Whitney tests were employed. Other statistical tests were applied as needed. P-values below 0.05 were regarded as statistically significant.

The sum of squares of the deviations of each observation from the mean is known as the standard deviation (SD). In order to compare two groups with respect to the distribution of various variables, the chi-square (x2) test was employed. P-value: degree of importance. P<0.05 denotes non-significant (NS), P>0.05 denotes significant (S), and P>0.01 is very notable (HS).

3. Results

Table 1. Distribution of demographic information among the groups under study.

	GROUP-A N=25	GROUP-B N=25	P-VALUE
AGE	37.96±7.2	36.6±8.96	0.56
SEX			
MALE	7(28%)	9(36%)	0.54
FEMALE	18(72%)	16(64%)	

A statistically significant P-value is less than 0.05.

Age and sex differences between the groups under study were not statistically significant, (table 1).

Table 2. Distribution of BMI pre and post operative among the groups under study.

	GROUP-A N=25	GROUP-B N=25	P-VALUE
BMI			
PRE OPERATIVE	48.54±9.1	48.72±6.71	0.94
POST OPERATIVE	32.1±6.41	34.2±6.6	0.26

A statistically significant P-value is less than 0.05.

Based on BMI before and after surgery, there was not a statistically significant distinction between the groups under study, (table 2; figure 4).

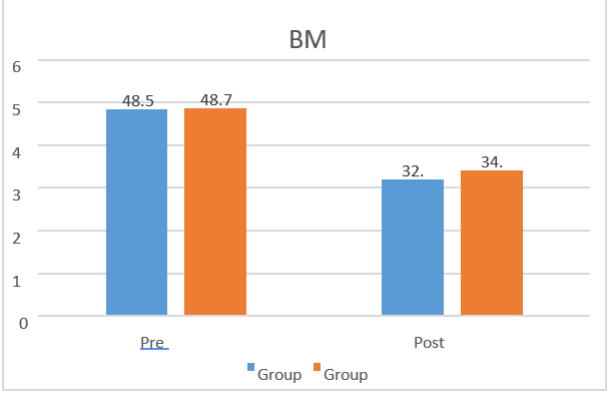

Figure 4. Comparison of BMI pre and post operative among the groups under study.

Table 3. Comparison of operative duration, length of hospital stays and Gastro-pexy sutures among the groups under study.

OPERATIVE DURATION 61.28±8.1 (MIN) MEAN±SD		57.88±8.74	0.16
LENGTH OF HOSPITAL STAY (H) MEAN±SD	27.9±8.4	32.7± 9.01	0.06
GASTRO-PEXY SUTURES MEAN±SD	4.88±0.78	-	<0.001

A statistically significant P-value is less than 0.05

The length of hospital stay (hours) and the duration of the operation (minutes) did not show any statistically significant differences between the groups under study; nevertheless, the gastro-pexy sutures showed a highly significant difference, (table 3; figure 5).

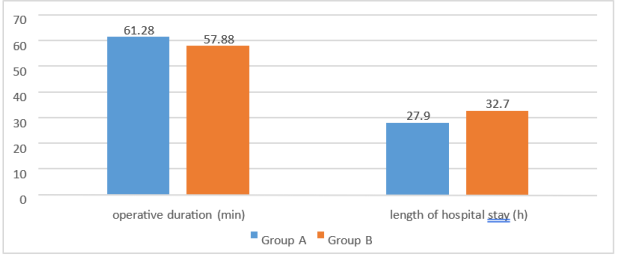

Figure 5. Comparison of operative duration, length of hospital stays among the groups under study.

Table 4. Comparison postoperative complications among the groups under study.

	GROUP-A N=25	GROUP-B N=25	P-VALUE
NAUSEA			
YES	1(4%)	6(24%)	0.04
NO	24(96%)	19(76%)	
VOMITING			
YES	2(8%)	8(32%)	0.03
NO	23(92%)	17(68%)	
BLEEDING			
YES	0	0	1
NO	25(100%)	25(100%)	
REFLUX SYMPTOMS IN THE 1ST YEAR AFTER SURGERY			
YES	1(4%)	6(24%)	0.04
NO	24(96%)	19(76%)	
GASTRIC TORSION			
YES	0	4(16%)	0.03
NO	25(100%)	21(84%)	
LEAKAGE			
YES	0	1(4%)	0.3
NO	25(100%)	24(96%)	

A statistically significant P-value is less than 0.05

The groups under investigation did not differ statistically significantly in terms of bleeding or leakage, but they did differ statistically significantly in terms of nausea, vomiting, reflux symptoms within the first year following surgery, and gastric torsion, (table 4).

Table 5. Follow up among the groups under study.

GROUP-A N=25		GROUP-B N=25	P-VALUE
HOSPITAL READMISSION IN 30-DAYS	0	4(16%)	0.037
REOPERATION FOR COMPLICATIONS	0	1(4%)	0.31
ANTIEMETIC USE	4(16%)	13(52%)	0.007
SEVERE GEJ INCOMPETENCE	0	4(16%)	0.037
CALLS TO HOSPITAL/SURGEON DURING THE 1ST PO WEEK	3(12%)	9(36%)	0.047
EXCESSIVE CLINICAL VISITS>3 IN 1ST MONTH	1(4%)	6(24%)	0.04

A statistically significant P-value is less than 0.05

Reoperation for complications did not show a statistically significant distinction between the groups under study, but hospital readmission within 30 days, antiemetic use, severe GEJ incompetence, hospital/surgeon calls during the first PO week, and excessive clinical visits during the first month did show a statistically significant difference, (table 5; figure 6).

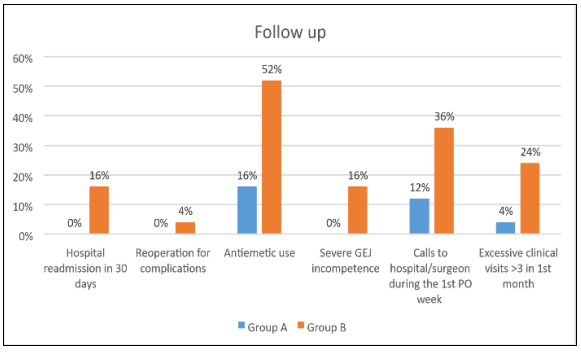

Figure 6. Follow up among the groups under study.

4. Discussion

Obesity surgery is now the only therapeutic option with a high success rate for resolving obesity-related comorbidities, achieving long-lasting weight loss, and reducing mortality rates for patients who have not responded to conservative weight loss treatments.[4]

According to our findings, group A had a mean age of 37.96±7.2 years, and 72% of the patients were female. In group B, the mean age was 36.6±8.96 years, and 64% of the patients were female. We found no statistically significant distinction in age or sex between the two groups that were analyzed.

This study's findings are in line with Abou-Ashour[5] he sought to determine whether gastropexy alleviated unpleasant gastrointestinal symptoms associated with LSG following surgery. According to their report, 200 individuals were randomly involved in the trial. Each group consisted of 100 patients, and the participants were split in the middle. Group A patients had gastropexy, while group B patients had LSG without gastropexy.

The current study found that in group A, the average BMI before surgery was 48.54±9.1, and the average BMI after surgery was 32.1±6.41. This pertains to the distribution of BMI before and after surgery among the groups that were examined. Group B had an average body mass index (BMI) of 48.72±6.71 before surgery and 34.2±6.6 after. We found no statistically significant distinction in body mass index (BMI) between the groups we looked at before and after the operation.

Additionally, we found that Våge et al.,[6] They sought to determine whether the development of gastroesophageal reflux symptoms (GORS) following LSG was affected by the addition of gastropexy. While 76.7% of the gastropexy group's patients were female, the non-gastropexy group's average age was 40.7±11.5 years, and 69.9% of those patients were female. Also, they showed that when it came to age and sex, the two groups were not significantly different from one another (nongastropexy and gastropexy).

Likewise, we found results that are in agreement with Okasha & Soliman,[7] who assessed the benefits of gastropexy during laparoscopic sleeve gastrectomy (LSG) on the pancreatic fascia and its impact on complications during and after surgery. They found no evidence of a gender or age gap between the groups that were part of the study.

We found that when we included Abou-Ashour[5] according to those individuals, group-A had an average preoperative body mass index (BMI) of 44±6kg/m2, whereas group-B had an average preoperative BMI of 45±3kg/m2. When looking at the two groups' pre-operative body mass indexes, they discovered no statistically significant difference.

However, our findings ran counter to those of Wu et al.[8] For postoperative body mass index (BMI), the researchers found a statistically significant difference between the LSG with gastropexy and LSG without gastropexy groups.

The time required for the operation, the amount of time spent in the hospital, and the number of Gastro-pexy sutures used were all compared among the groups. Based on the results of the current study, group A had an average operating duration of 61.28±8.1 minutes, a mean length of hospital stay of 27.9±8.4 hours, and an average number of Gastro-pexy sutures of 4.88±0.78. The average time during surgery in group B was 57.88±8.74 minutes, and the average amount of time spent in the hospital was 32.7±9.01 hours.

In terms of operating time (in minutes) and hospital stay (in hours), our results showed that the groups under consideration were not significantly different despite the fact that we discovered a highly statistically significant difference across the groups based on Gastropexy sutures.

According to our findings, Abou-Ashour[5] who acknowledged that, when it came to the duration of the operation and the amount of time spent in the hospital, there was no discernible difference among the groups under investigation. Even though Gastropexy sutures showed a significantly statistically significant difference between the two groups.

Likewise, we found that our findings align with Våge et al.,[6] according to those who stated that the groups under study did not differ significantly in terms of the length of time they spent in the hospital. In all other respects, they found a statistically significant difference in the reported operating times of the groups under study.

Contrarily, our findings expressed disagreement with Okasha & Soliman,[7] who stated that the groups under study differed significantly with respect to the amount of time that operations lasted.

Our results showed that in group A, there were 4% cases of nausea, 8% of vomiting, 100% absence of bleeding, 4% of reflux symptoms in the first year following surgery, 100% absence of stomach torsion, and 100% absence of leakage when comparing the postoperative complications between the groups. On the other hand, in group B, 24% experienced nausea, 32% vomiting, and 100% did not bleed. In the first year following surgery, 24% had reflux symptoms, 16% had gastric torsion, and 4% had leakage.

Based on bleeding and leakage rates, the current investigation found no statistically significant difference between the groups. However, when it came to post-operative nausea, vomiting, reflux

symptoms, and gastric torsion, the groups were significantly different.

Consistent with our findings, Abou-Ashour[5] found no statistically significant difference in leakage across the groups, but did find statistically significant differences in post-operative nausea, vomiting, reflux, and gastric torsion.

The present study found that in group A, there was no severe GEJ incompetence, no hospital readmission within 30 days, no reoperation for complications, 16% use of antiemetic medication, 12% contact with the hospital or surgeon during the first postoperative week, and 4% excessive clinical visits within the first month.

A total of 16% of patients in group B required a return to the hospital within 30 days, 4% required a second operation due to problems, 52% used antiemetic medication, 16% experienced severe GEJ incompetence, 36% contacted the hospital or surgeon during the first postoperative week, and 24% made too many first-month clinical visits.

In terms of reoperations due to complications, our results showed no statistically significant difference between the groups. However, when it came to 30-day hospital readmissions, antiemetic use, severe GEJ incompetence, calls to the hospital or surgeon during the first postoperative week, and excessive clinical visits in the first month, there was a statistically significant difference.

Frezza et al.,9 found that 29 patients (3.6%) required a second surgery due to problems after undergoing laparoscopic stent placement.

Furthermore, Sharma & Chau,[10] of 367 patients who had LSG without OP (omentopexy), 6 patients (or 1.6% of the total) required readmission.

CONCLUSION

Significant differences in nausea, vomiting, reflux symptoms, and gastric torsion after SG with gastropexy compared to SG without gastropexy. Additionally, there were significant differences in hospital readmissions, antiemetic use, severe GEJ incompetence, hospital/surgeon calls, and excessive clinical visits in the SG with gastropexy group compared to the SG without gastropexy group.

4. Conclusion

In this observational study of 60 septic shock patients divided into saline and albumin groups, Initial hemodynamic compromise improved significantly after 6 hours of fluid resuscitation in both groups, with no significant differences between them. Both groups showed similar improvements in blood pressure, cardiac output, and oxygen saturation. Biomarkers like lactate and BNP were higher in non-survivors, who also had longer ICU and hospital stays. Overall, in-hospital mortality was 25%, with no significant difference between groups.

Disclosure

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Authorship

All authors have a substantial contribution to the article

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Conflicts of interest

There are no conflicts of interest.

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