

Evaluation of Postoperative Complications after Laparoscopic Sleeve Gastrectomy with Omentopexy versus Conventional Laparoscopic Sleeve Gastrectomy

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Abstract

Background: Laparoscopic sleeve gastrectomy is the most popular bariatric procedure with good outcome and acceptable complications (bleeding, leakage, stenosis or twist).

Aim of Study: To evaluate the role of omentopexy reinforcement of staple line in reducing postoperative leakage, bleeding and gastric twist.

Patients and Methods: This is a prospective cohort study conducted at Ain-Shams University Hospitals, in the period From May 2017 to November 2020. Four hundred morbid obese patients were recruited for this study. Ethical approval was obtained from the Ethical Committee of Ain Shams University Hospitals, and informed written consents were obtained from all patients.

Results: Our study included 200 patients who underwent Laparoscopic sleeve gastrectomy, one hundred patients underwent LSG without omentopexy (group A) and the other one hundred patients underwent LSG with omentopexy (group B). As regards the age, group A (control group) mean age of 35.74 ± 7.88 while group B (omentopexy group) mean age of 35.6 ± 7.85 . The mean BMI 40.95 ± 5.25 in group A while 40.94 ± 5.02 in group B. Three cases of group A (1.5%) while group B had no cases of postoperative leakage with *p*-value is 0.24. Two cases of group A had postoperative bleeding (1%) while it did not happen in group B with *P* value is 0.499. Gastric twist had happened in only 1 case of group A (0.5%) while did not happen in any cases of group B, *P* value is 1. The mean operative time in group A 46.08 ± 10.95 minutes, while 67.49 ± 9.19 minutes in group B with *p*-value 0.00.

Conclusion: LSG with omentopexy reduce rate of post-operative complications (bleeding, leakage and gastric twist) but need longer time than conventional LSG.

Key Words: Laparoscopic sleeve gastrectomy – Omentopexy.

Introduction

OBESITY considered one of the major health problems, over than 650 million adults suffering from morbid obesity [1].

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Obesity is considered a risk factor for developing metabolic syndrome that includes insulin resistance diabetes mellitus, hypertension and dyslipidaemia [2,3].

Nowadays laparoscopic sleeve gastrectomy and laparoscopic gastric bypass are surgical methods for management of morbid obesity if failed conservative management of obesity [4].

Laparoscopic sleeve gastrectomy is the most popular bariatric procedure with good outcome and acceptable complications [5].

Bleeding and leakage are the major early post-operative complication with low incidence but affect patient recovery and prolong hospital stay [6,7].

Leakage mainly occur at gastro-esophageal junction (90% of patients), staple line is the common site of bleeding while stenosis mainly near incisura angularis [8-11].

Staple line reinforcement used to reduce post-operative complications (bleeding, leakage and gastric twist) [11].

Multiple methods used for staple line reinforcement (SLR) either oversewing, inverting suture line or omentopexy to staple line [11].

Aim of the work:

To evaluate the role of omentopexy reinforcement of staple line in reducing postoperative leakage, bleeding and gastric twist.

Patients and Methods

Patients:

This is a prospective cohort study conducted at Ain-Shams University Hospitals, in the period

From May 2017 to November 2020. Four hundred morbid obese patients were recruited for this study. Ethical approval was obtained from the Ethical Committee of Ain Shams University Hospitals, and informed written consents were obtained from all patients.

Inclusion criteria:

- Obese patients with BMI more than 35 or obese patients with BMI more than 30 with comorbidities.
- Age from 18 to 55 years.
- Cooperative and psychologically stable patients.

Exclusion criteria:

- Patients with cirrhotic liver.
- Patients with bleeding disorder.

Preoperative assesment:

All patients were subjected to clinical assessment including history (past medical, surgical, family history and history of hormone replacement

or oral contraceptive pills intake) taking and clinical abdominal examination as well as the following investigations:

- Laboratory investigations: CBC, INR, urea and creatinine, liver enzymes, lipid profile, glyated hemoglobin, viral markers and TSH.
- Imaging: Pelvi-abdominal US, ECG, pulmonary function test, chest X-ray and Echocardiography.

Operative details:

All operations were performed laparoscopically. We used five port technique. After ports insertion we started to mobilize greater omentum from the stomach using legasure then we insert 36 Fr. Bougie then stomach transected using covadien stapler 4 cm from the pylorus to angle of his (the green reload 4.8mm was used in the first fire then the blue reload 3.5mm till complete stomach transacttion) followed by mythelene blue test to assess leakage. In group B (omentopexy group) we underwent omentopexy to staple line using prolene 2/0 or PDS 2/0 (Figs. 1,2,3).

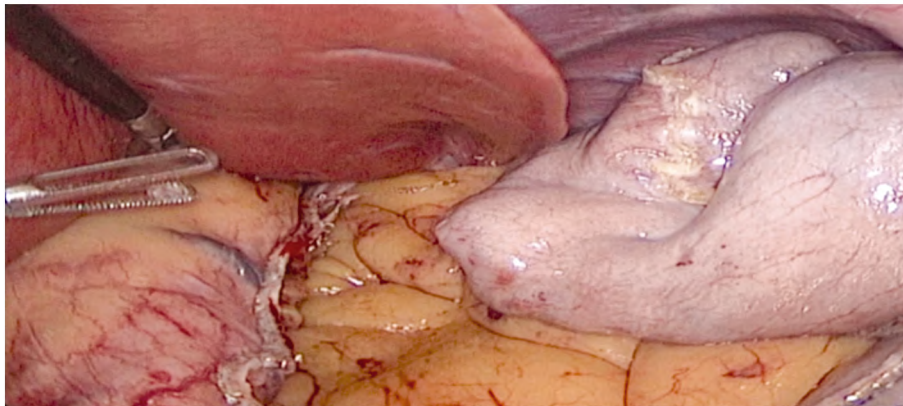


Fig. (1): Staple line after resection.

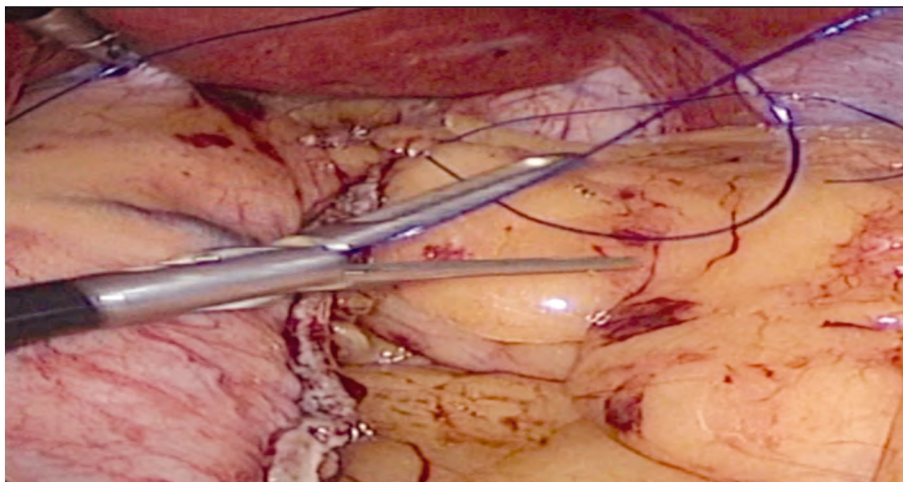


Fig. (2): Omentopexy of staple line.

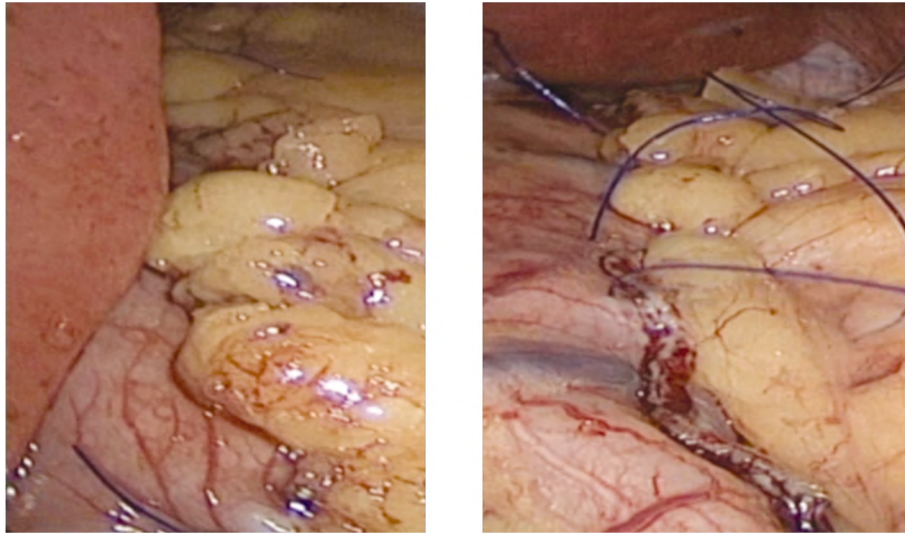


Fig. (3): After omentopexy.

Results

Demographics:

As regards the age, group A (control group) age range was between 18 and 55 with mean age of 35.74 and SD of 7 while group B (omentopexy group) had age ranging between 19 and 57 and mean age of 35.6 and SD of 7.8. For the sex, group A had 132 female patients (66%) and 68 males (34%) while group B (the omentopexy group) had 112 female patients (56%) and 88 males (44%). There was no statistically significant difference between the 2 groups as regards age; *p*-values were 0.85 and there was statistically significant difference between the 2 groups as regards sex; *p*-values 0.04 respectively. (Table 1).

For group A, BMI was ranging between 32 and 52.1 with mean BMI was 40.95 and SD of 5.25 while group B the BMI was ranging between 32 to 55.5 and mean of 40.94 and SD of 5. There is not statistically significant difference between the 2 groups as regards the BMI, *p*-value is 0.972 (Table 1).

Table (1): Patients Demographics and BMI.

	Control group No.=200	Omentopexy group No.=200	Test value	<i>p</i> -value	Sig.
<i>Age:</i>					
Mean ± SD	35.74±7.88	35.60±7.85	0.178•	0.859	NS
Range	18-55	19-57			
<i>Sex:</i>					
Female	132 (66.0%)	112 (56.0%)	4.203 *	0.040	S
Male	68 (34.0%)	88 (44.0%)			
<i>BMI:</i>					
Mean ± SD	40.95±5.25	40.94±5.02	0.035•	0.972	NS
Range	32-52.1	32-55.5			

p-value >0.05: Non significant (NS). *p*-value <0.05: Significant (S).
p-value <0.01: Highly significant (HS).
 *: Chi-square test. •: Independent *t*-test.

Comorbidities and complications (Table 2 and Fig. 4):

Thirty two patients of group A had diabetes (16%) while twenty eight patients of group B had diabetes (14%) with no statistically significant difference between the two groups, *p*-value is 0.575 (Table 2).

14% of group A patients had hypertension (28 patients) while group B the omentopexy group 12% had hypertension (24 patients). No statistically significant difference between the 2 groups as regards hypertension, *p*-value is 0.55 (Table 2).

Hyperlipidemia was associated with obesity in 16 patients (8%) of group A while in group B 12 patients (6%) had hyperlipidemia, with no statistically significant difference between the 2 groups, *p*-value is 0.433 (Table 2).

Ischemic heart disease was associated with 4 patients only of group A (2% only) while for group B 4 patients also had ISHD (2% also) with no statistically significant difference between the 2 groups, *p*-value is 0.55 (Table 2).

Postoperative leakage happened only in 3 cases of group A (1.5%) while group B had no cases of postoperative leakage, although the difference, it was not statistically significant with *p*-value is 0.24 (Table 2).

Post operative bleeding had occurred in 2 cases of group A (1%) while it did not happen in group B with no statistically significant difference, *p*-value is 0.499 (Table 2).

As regards postoperative perigastric collection, it occurred only is 2 cases of group A (1%) while

it did not occur in any cases of group B. Still not statistically significant difference with *p*-value was 0.499 (Table 2).

Gastric twist had happened in only 1 case of group A (0.5%) while did not happen in any cases of group B, *p*-value is 1, not statistically significant (Table 2).

No mortality detected in both groups.

Table (2): Comorbidities and complications.

	Control group		Omentopexy group		Test value	<i>p</i> -value	Sig.
	No.	%	No.	%			
Diabetes:							
No	168	84.0	172	86.0	0.314*	0.575	NS
Yes	32	16.0	28	14.0			
HTN:							
No	172	86.0	176	88.0	0.354*	0.552	NS
Yes	28	14.0	24	12.0			
ISHD:							
No	196	98.0	196	98.0	F**	1.000	NS
Yes	4	2.0	4	2.0			
Hyperlipidemia:							
No	184	92.0	188	94.0	0.614*	0.433	NS
Yes	16	8.0	12	6.0			
Leakage:							
No	197	98.5	200	100.0	F**	0.248	NS
Yes	3	1.5	0	0.0			
Perigastric collection:							
No	198	99.0	200	100.0	F**	0.499	NS
Yes	2	1.0	0	0.0			
Gastric twist:							
No	199	99.5	200	100	F**	1.000	NS
Yes	1	0.5	0	0.0			
Bleeding:							
No	198	99.0	200	100.0	F**	0.499	NS
Yes	2	1.0	0	0.0			

p-value >0.05: Non significant (NS). *p*-value <0.05: Significant (S). *p*-value <0.01: Highly significant (HS).
*: Chi-square test. **: Fisher's exact test. •: Independent *t*-test.

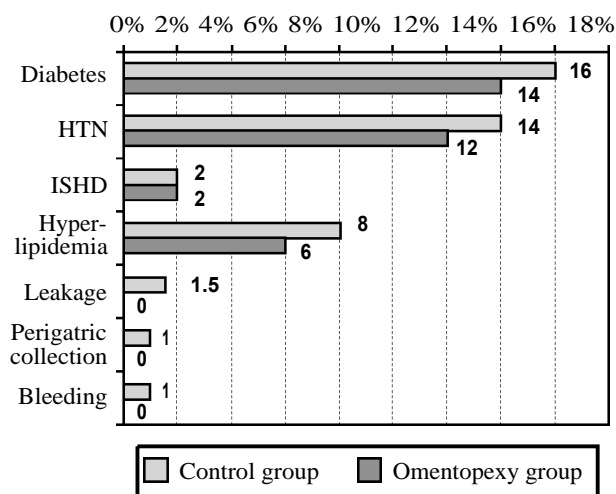


Fig. (4): Comorbidities and Complications.

As regards the operative time, group A operative time was ranging between 40 to 84 minutes with mean time 46.08 minutes and SD 10.95, while for group B the time range was between 50 to 100 minutes with mean time was 67.49 minutes and SD 9.19 minutes. This showed high statistically significant difference between the 2 groups with *p*-value 0.00 (Table 3 and Fig. 5).

As regards the hospital stay, Group A hospital stay was ranging between 1-4 days with mean stay 1.04 days and SD 0.27 days, while group B hospital stay was ranging between 1-1.5 days with mean hospital stay of 1.03 and SD 0.1. There is no statistically significant difference between the 2 groups as regards the hospital stay with *p*-value 0.432 (Table 3).

Table (3): Operative time and hospital stay.

	Control group No.=200	Omentopexy group No.=200	Test value	<i>p</i> -value	Sig.
Operative time (min):					
Mean±SD	46.08±10.59	67.49±9.19	-21.602•	0.000	HS
Range	4-84	50-100			
Hospital stay (day):					
Mean±SD	1.04±0.27	1.03±0.10	0.787•	0.432	NS
Range	1-4	1-1.5			

p-value >0.05: Non significant (NS). *p*-value <0.05: Significant (S). *p*-value <0.01: Highly significant (HS).

•: Chi-square test. •: Independent *t*-test.

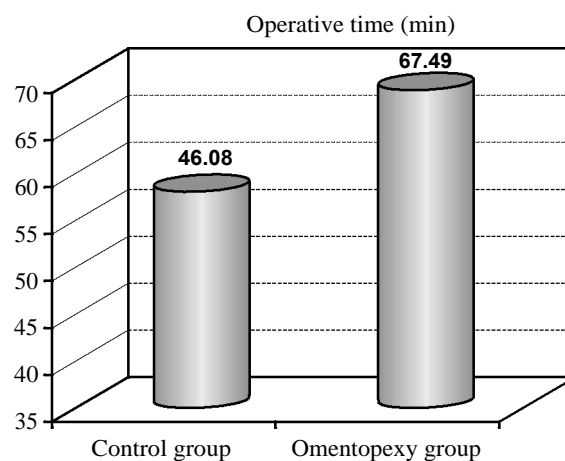


Fig. (5): Operative time

Discussion

Nowadays laparoscopic sleeve gastrectomy and laparoscopic gastric bypass are surgical methods for management of morbid obesity if failed conservative management of obesity [4].

Laparoscopic sleeve gastrectomy is the most popular bariatric procedure with good outcome and acceptable complications [5].

Bleeding and leakage are the major early postoperative complication with low incidence but affect patient recovery and prolong hospital stay [6,7].

Multiple methods used for staple line reinforcement (SLR) either oversewing, inverting suture line or omentopexy to staple line to reduce postoperative complications (bleeding, leakage and gastric twist) [11].

LSG complications usually associated with increase hospital stay and risk of mortality [14].

In our study we evaluate role of omentopexy reinforcement of staple line in reducing postoperative leakage, bleeding and gastric twist in comparison with control group with no omentopexy.

In our study the operative time, group A operative time was ranging between 40 to 84 minutes with mean time 46.08 minutes, while for group B the time range was between 50 to 100 minutes with mean time was 67.49 minutes. This showed high statistically significant difference between the 2 groups with p -value 0.00. There is extra time in omentopexy group that will be decreased by time with increase in learning curve.

Other studies reported that Bleeding from staple line after LSG ranges from 0 to 4.4% [9,12,13], while in our study Post operative bleeding had occurred in 2 cases of group A (1%) while it did not happen in group B so LSG with staple line reinforcement with omentum reduce rate of bleeding but statistically no statistically significant difference.

The rate of leak in literature 1% up to 3% with 9% mortality related to leak [15-17].

In our study Postoperative leakage happened only in 3 cases of group A (1.5%) while group B had no cases of postoperative leakage, reinforcement of staple line with omentopexy reducing leakage than conventional LSG but not statistically significant.

Himpens J et al., and Musella M et al., reported that SLR (staple line reinforcement) is reducing rate of post operative complications (leakage and bleeding) [15,18].

D'Ugo S et al., and Carandina S et al., reported in their meta-analysis that there was no significant

difference between SLR and simple LSG as regard postoperative leakage [11,19].

Chang et al., [20] reported that omentopexy prevent gastric twist that lead to stenosis and increase risk of gastric leak, in our study Gastric twist had happened in only 1 case of group A (0.5%) while did not happen in any cases of group B.

There are multiple reinforcement techniques used such as oversewing, biological Sealants, inverting suture line or omentopexy to staple line to reduce rate of postoperative complications.

As regard postoperative leakage in three cases in group A are managed conservatively with stent and two cases need pigtail insertion in perigastric collection.

Two patients in group A developed postoperative bleeding that managed conservatively with resuscitation and blood transfusion but one of them needs laparoscopic exploration after bleeding and evacuation of intra-abdominal hematoma.

Patient who developed gastric twist in group A presented with recurrent vomiting with no ability for oral uptake that managed by laparoscopic untwist with fixation of stomach by suture in peripancreatic fascia.

Conclusion:

LSG with omentopexy reduce rate of postoperative complications (bleeding, leakage and gastric twist) but need longer time than conventional LSG. More studies are needed to confirm results.

Acknowledgement: The authors declare that they have no conflict of interest.

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مقارنة لتقييم دور تثبيت منديل البطن على مكان التدبيس وعدم تثبيته بعد تكميم المعدة وتأثيره فى الحماية من المضاعفات بعد العملية

السمنة المفرطة واحدة من المشاكل فى العالم أجمع والتي تؤدى إلى أمراض مصاحبة للسمنة كارتفاع ضغط الدم والإصابة بأمراض القلب ومرض البول السكرى وارتفاع الدهون بالدم وأمراض المفاصل والعمود الفقرى وأمراض الصدر.

هناك الكثير من عمليات السمنة بالمنظار التي تساعد فى القضاء على السمنة المفرطة وأشهر هذه العمليات تكميم المعدة بالمنظار وتحويل مسار المعدة بالمنظار وهما من أكثر عمليات السمنة أماناً وانتشاراً.

عملية تكميم المعدة هي أكثر عمليات السمنة شيوعاً حول العالم ولكن هناك بعض المضاعفات التي قد تحدث بنسبة قليلة بعد التكميم وهما النزيف أو التسريب.

هناك عدة محاولات لتقليل المضاعفات ما بعد العملية منها تثبيت منديل البطن على مكان التدبيس بعد تكميم المعدة وذلك لتقليل نسبة حدوث النزيف والتسريب.

هناك طرق أخرى لتقليل المضاعفات ما بعد العملية منها أخذ غرز على مكان التدبيس لتقويته أو طى خط الدبابيس باستخدام الخيوط الجراحية.

كل هذه المحاولات لتقليل المضاعفات التي قد تحدث بعد عملية التكميم وقد تؤثر على حياة المريض.