Omentopexy versus non-omentopexy in laparoscopic sleeve gastrectomy

Emad M. Abdelrahman, Mohamed K. Abdelaal, Mohamed S. Kharoub, Mohamed O. El-Shaer

General Surgery Department, Faculty of Medicine, Benha University, Egypt

Correspondence to Emad M. Abdelrahman, Fareed Nada Street 13518, Banha, Egypt. Tel: +01226763986; Fax: 0133227491-0133213511; e-mail: emadsahan301@gmail.com, emad.sarhan@fmed.bu.edu.eg

Received: 27 June 2023
Revised: 23 July 2023
Accepted: 1 August 2023
Published: 6 October 2023

The Egyptian Journal of Surgery 2023, 42:692–696

Background
Laparoscopic sleeve gastrectomy (LSG) is a commonly performed bariatric operation nowadays all over the world. The most serious complications from this operation are postoperative bleeding and leakage. This study aimed to evaluate the effect of omentopexy in reducing the incidence of these complications.
Patients and methods
The current retrospective study included 82 patients who were eligible for sleeve gastrectomy and underwent one of the two procedures. Group A (n=41) underwent conventional sleeve gastrectomy without omentopexy and group B (n=41) underwent sleeve gastrectomy with omentopexy. Follow-up was designed for one month postoperatively for leakage or bleeding.
Results
The mean age of the eligible patients was 34.64±5.7 and 35. 32±5.42 years in group A and group B, respectively. No significant difference was reported as regards the sociodemographic data or patient comorbidities between the two groups. The mean operative time increased significantly in group B than in group A ($P<0.001$). There was no significant difference between both groups as regards postoperative leakage and bleeding.
Conclusion
According to the current results: omentopexy has no additional benefit in reducing the incidence of postoperative bleeding or leakage. However, it results in an additional increase in the operative time.

Keywords:
bleeding, leakage, omentopexy, sleeve gastrectomy

Egyptian J Surgery 42:692–696

1110-1121

Authors contribution: Emad M. Abdelrahman: conceived the concept and designed the study, conducted procedure, analyzed data, and drafted the manuscript. Mohamed K. Abdelaal: Study design, conducted the procedure, and supervised cognitive and behavioral assessments. Mohamed S. Kharoub: Collected the data and conducted the procedure, drafting and final revision. Mohamed O. El-Shaer: Concept and designed the study, conducted the procedure, analyzed data, and drafted the manuscript.

Introduction

Morbid obesity is considered a global issue. In 2016, WHO reported that 39% of adults are overweight, while 13% are morbidly obese [1,2]. Many modalities were designed to overcome this problem, but bariatric surgeries have proven to be the most successful and effective method [3]. The impact of losing weight does not only affect the aesthetic appearance, but it has a significant effect on the management of comorbidities such as type II DM and hypertension [4].

Laparoscopic sleeve gastrectomy (LSG) is the 1st gold standard bariatric operation mostly performed these days, with a significantly shorter time, rapid recovery, and short hospital stay when compared with other bariatric procedures [1]. Despite its simplicity, many modifications were applied to the procedure of sleeve gastrectomy. There is wide debate about the benefits of reinforcement of the staple line or the distance between the pylorus and the resection line. All these variations are intended to decrease postoperative complications with successful weight reduction [3,4].

As with any other surgical operation, LSG is not far from postoperative complications. The most serious postoperative complications that worry surgeons and may affect patients' life are postoperative bleeding and leakage [5].

Over the past few years, many techniques and procedures have been created. For instance, reinforcement of the staple line by oversewing or covering it with different synthetic or biological materials might be used to decrease the likelihood of these complications [6,7]. One of these used techniques is omentopexy. In addition to LSG, omentopexy is added to fix the stapled line in the stomach to the gastrosplenic and gastrocolic ligaments [8]. With this operation, the risk of complications following surgery, such as gastroesophageal reflux, postoperative food intolerance, gastric leak, and stomach twist, is reduced [9].

Some studies suggest that omentopexy has a role in preventing postoperative bleeding and leakage. However, there is still no consensus on the indication for it. Thus, this debate about the efficacy of omentopexy has motivated the authors to conduct this study.

Patients and methods

Study design

The current retrospective study was conducted at the General Surgery Department, Faculty of Medicine, Benha University Hospital throughout the period from December 2020 to January 2023. The study included morbidly obese patients eligible for LSG and completed the eligible time for follow-up. They were allocated into one of the two groups taking into consideration a ratio of 1:1. A total of 82 patients were divided into group A (n=41): patients who underwent LSG without omentopexy and group B (n=41): patients who underwent LSG with omentopexy.

Inclusion criteria included obese patients with BMI $>$ 40 or BMI $>$ 35 with metabolic syndrome and eligible for sleeve gastrectomy. **Exclusion criteria** included patients with bleeding disorders, multiple prior laparotomies, or severe liver, renal, or cardiac dysfunction.

Ethical approval was obtained following the ethical perspective of the Helsinki Declaration. Informed consent was obtained from all included patients.

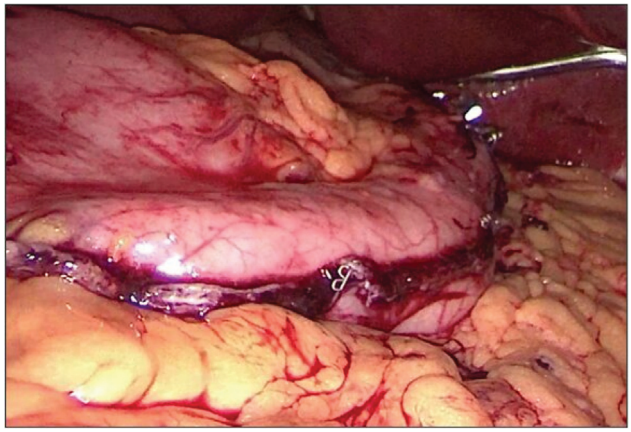
All eligible patients underwent history taking, clinical examination, and investigations including a complete assessment of metabolic syndromes including DM and thyroid functions.

Procedure

The standard protocol for LSG was followed where the 5-port-technique was used: a 5 mm epigastric trocar (as a liver retractor), 10 mm supraumbilical (for the camera), a 15 mm left hypochondrial and a 12 mm right hypochondrial (two working ports) and a 5 mm left anterior axillary line subcostal port (assistant). The first step was devascularization of the greater curvature 5 cm from the pylorus till complete mobilization of the fundus 2 cm from the angel of His using a harmonic scalpel. Stapling was done using one green reload of 60–4.8 mm (Covidien linear stapler) and then stapling was continued using blue reloads of 60–3.5 mm. (Fig. 1)

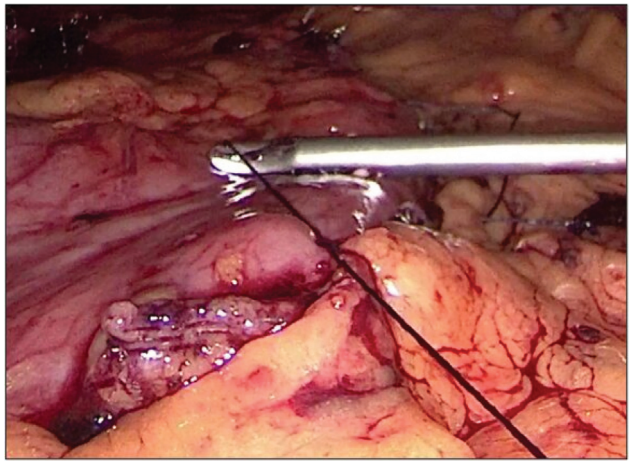
This was done in groups A and B but in group B omentopexy was done using a 2-0 PDS along the stable line Figs. 2 and 3. The absence of intraoperative leakage was confirmed by a leak test using methylene blue. Closure over the splenic drain was

Figure 1



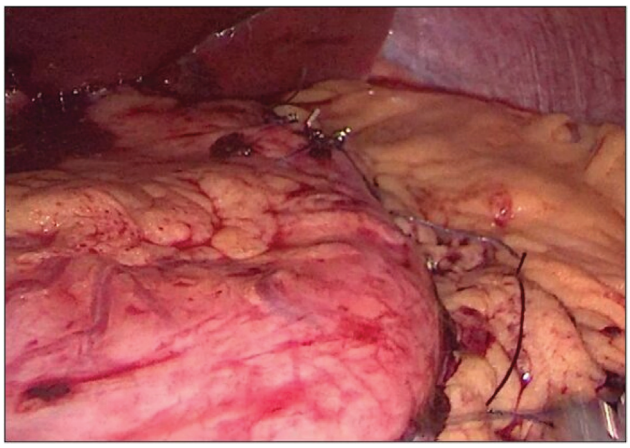
Stable line after sleeve gastrectomy.

Figure 2



Suturing the omentum to the stable line.

Figure 3



Final view of omentopexy.

done. The patients started oral sips 6–8 hours postoperatively.

The outcomes and follow-up

The primary outcome was a safe laparoscopic sleeve gastrectomy with minimal postoperative complications.

The secondary outcome was decreasing operative time, hospital stay, and overall cost.

Follow-up was designed for 1 month for monitoring the postoperative complications including wound infection, bleeding, and leakage.

Statistical analysis

The G*power 3.1 program (Universities, Dusseldorf, Germany) was used to estimate the sample size. The sample size was determined using the primary outcome of the current study, the incidence of postoperative complications such as leak and bleeding, with 95% power and an effect size of 0.9. There were 41 patients recruited for each group accounting for 20% of dropouts.

For quantitative parameters that were described by mean and SD, statistical analysis was done using Student's '*t*' test. For qualitative factors that were expressed as percentages of frequency, the chi-square test was applied. Version 21 of the Statistical Package for the Social Sciences, SPSS-20, was used. Probability values under 0.05 were regarded as significant.

Results

The current study included 82 patients that were allocated into one of the two equal groups. Group A (*N*=41) underwent LSG without omentopexy while group B (*n*=41) underwent LSG with omentopexy. The mean age was 34.64±5.7 and 35. 32±5.42 in group A and group B, respectively. There was no reported significant difference in the preoperative BMI between both groups (*P* value =0.673). Other sociodemographic data and comorbidities are shown in Table 1.

There was no significant difference between both groups regarding the mean amount of intraoperative blood loss, *P*= 0.727; however, the mean operative time in group B was significantly longer when compared with group A (*P*<0.001). The mean hospital stay was 2.3±0.82 and 2.9±0.79 in group A and group B, respectively. Table 2

The reported postoperative bleeding occurred in two cases in group A, while it was reported in only one case in group B, *P*=0.073. No significant difference was reported between both groups in postoperative complications including leakage, wound infection, seroma, or abdominal wall hematoma Table 3.

Discussion

According to the current practice, LSG is performed without omentopexy. Omentopexy had been added by some surgeons as an additional step for the operation aiming to reduce serious postoperative complications such as leakage and bleeding [10,11].

The mean reported operative time in the current study was 46.4±8.5 and 67.3±10.1 min in group A and group

Table 1 Sociodemographic data and comorbidities

Characteristics	Group A: *N*=41 LSG without omentopexy	Group B: *N*=41 LSG with omentopexy	*P* value
Age (years) mean±SD	34.64±5.7	35. 32±5.42	0.471
Sex, males *n* (%)	15 (36.6%)	17 (41.5%)	0.892
Females *n* (%)	26 (63.3%)	24 (58.5%)	
BMI mean±SD	39.8±4.9	40.1±4.56	0.673
Diabetes mellitus *n* (%)	14 (34.15%)	15 (36.6%)	0.342
Hypertension *n* (%)	2 (4.9%)	3 (7.3%)	0.541

An Independent *t*-test was used for age and BMI. Chi-square or Fisher's exact test was used for categorical data. BMI, body mass index

Table 2 Operative outcome and hospital stay

Characteristics	Group A: *N*=41	Group B: *N*=41	*P* value
Operative time (min) mean ±SD	46.4±8.5	67.3±10.1	<0.001
Intraoperative blood loss (ml) mean±SD	123±74	131±66	0.741
Hospital stay mean±SD	2.3±0.82	2.9±0.79	0.613

Table 3 Early postoperative complications

Complication	Group A: *N*=41	Group B: *N*=41	*P* value
Postoperative bleeding *n* (%)	2 (4.88%)	1 (2.44%)	0.073
Leakage *n* (%)	1 (2.44%)	1 (2.44%)	1
Wound infection *n* (%)	1 (2.44%)	1 (2.44%)	1
Seroma *n* (%)	2 (4.88%)	2 (4.88%)	1
Abdominal wall hematoma *n* (%)	1 (2.44%)	1 (2.44%)	1

B, respectively, matching approximately the time reported by ***Nosrati et al.*** [12], who reported a mean operative time of 65 and 54 min in the respective groups. Although this time is still less than what was reported by ***Sabry et al.*** [13] who reported a mean operative time of 85 min in the omentopexy group versus 55 min in the non-omentopexy group and the ***Labib M.*** [14] study was 78.33 min in the omentopexy group and 62.47 min in the non-omentopexy group. Many studies [12–14] reported a significant prolonged operative time in patients who underwent omentopexy in comparison with non-omentopexy matching the results of the current study, where the mean operative time in the present study was significantly less in group A than what was reported in group B ($P<0.001$), and this simply can be explained by the time consumption for omentopexy.

In the current study, the enhanced recovery after bariatric surgery protocols (ERAS) were followed where the discharge of the patient is recommended following meeting the subsequent criteria: consumption of 1000 ml fluids per day with no need for IV fluids as well as controlled pain with oral analgesia and full mobilization of the patient [15].

Many studies [1,11,16] have documented the hospital stay as a main difference between LSG without omentopexy and LSG with omentopexy and have confirmed that the mean hospital stay was slightly higher in group B but still insignificant matching the results of the present study.

The mean hospital stay in the current study was 2.3 ±0.82 and 2.9±0.79 in group A and group B, respectively, and this was less than what was reported by ***Pilone et al*** [11], who reported 4.5 versus 5.8 days but ***Hassan I*** [16]. reported 1.33 ±0.38 versus 1.67±0.33 days, and this much variability is assumed to be due to the difference in adherence to the ERAS guidelines and difference in the level of the outpatient care postoperatively.

Gastric leakage, which has a greater death rate than other complications after LSG, is the most serious one [17]. When the strength of the staple line cannot overcome the intraluminal pressure, leaks develop [18]. ***Sharma et al*** [19]. provide a theoretical justification for the rise in intragastric pressure following LSG. Following LSG, the ligaments' medial forces acting on the stomach are stable, but the lateral pressures are eliminated because the greater omentum was torn away. Omentopexy, which prevents the stomach from kinking and hence lowers intragastric pressure, theoretically recreates stomach stabilization within the abdominal cavity.

In the current study, no significant difference between both groups regarding the incidence of gastric leakage matching the results of ***Labib M*** [14] study. Also, omentopexy was not found to have a substantial beneficial effect on complications following sleeve gastrectomy, according to ***Afaneh et al*** [22]. and ***Hanna et al*** [21]. However, multiple research [1,9,13,19]found that the omentopexy group had much lower leakage rates than the non-omentopexy group. Their discovery was attributed to the omentum's extraordinary physiological capacity to plug leaking spots. In addition, a further study by Arslan *et al.* [9] revealed that omentopexy reduces the likelihood of twisting or kinking, which could result in proximal leaking and sleeve tube occlusion. When compared with the findings of the current study, the above-mentioned results may differ due to differences in sample size and statistical testing.

In the present study, no significant difference in postoperative bleeding between both groups was reported matching the results of the ***Labib M*** [14] study as well as Sharma *et al.* [19]. However, this comes against what was documented by a retrospective study on 2000 patients conducted by ***Sabri et al.*** [13], who documented that LSG with omentopexy can be successful in reducing bleeding and leakage while lengthening the surgical procedure. However, ***Lale et al.*** [20] recommended in a study of 3942 LSGs that omentopexy during LSG is a promising technique for preventing postoperative leakage, bleeding, and twist.

Conclusion

According to the current results, omentopexy has no impact on the prevention of postoperative complications after LSG in addition to its longer operative time and hospital stay.

Acknowledgments

Authors contribution: All authors contributed to the study concept and design, data acquisition and analysis, critical revision, and drafting.

Funding/ Support: Not funded by any scientific organizations.

Financial support and sponsorship

Financial Disclosure: The authors receive no financial support for the research project or in any techniques or equipment used in this study or in the publication of this article.

Conflicts of interest

There are no conflicts of interest.

References

1 Zarzycki P, Kulawik J, Małczak P, Rubinkiewicz M, Wierdak M, Major P. Laparoscopic Sleeve Gastrectomy with Omentopexy: is it really a promising method? —A systematic review with meta-analysis. Obes Surg 2021; 31:2709–2716.

2 Kowalewski P, Janik M, Kwiatkowski A, Paśnik K, Walędziak M. Bariatric tourists, Foreign bariatric patients treated in Poland – a survey based study. Polish J Surg 2020; 92:1–5.

3 Batman B, Altun H. Benefits of suture reinforcement in laparoscopic sleeve gastrectomy. Surg Laparosc Endosc Percutan Tech 2019; 29:539–542.

4 Mizera M, Wysocki M, Bartosiak K, Franczak P, Hady H, Kalinowski P, *et al.* Type 2 diabetes remission 5 years after laparoscopic sleeve gastrectomy: multicenter cohort study. Obes Surg 2021; 31:980–986.

5 Welbourn R, Hollyman M, Kinsman R, Dixon J, Liem R, Ottosson J, *et al.* Bariatric surgery worldwide: baseline demographic description and one-year outcomes from the Fourth IFSO Global Registry Report 2018. Obes Surg 2019; 29:782–795.

6 Iannelli A, Treacy P, Sebastianelli L, Schiavo L, Martini F. Perioperative complications of sleeve gastrectomy: review of the literature. J Minim Access Surg 2019; 15:1–7.

7 Major P, Wysocki M, Pędziwiatr M, Małczak P, Pisarska M, Migaczewski M, *et al.* Can the Obesity Surgery Mortality Risk Score predict postoperative complications other than mortality?. Wideochir Inne Tech Maloinwazyjne 2016; 11:247–252.

8 Filho A, Silva L, Godoy E, Falcão A, De Quadros L, Zotarelli Filho I, *et al.* Omentopexy in sleeve gastrectomy reduces early gastroesophageal reflux symptoms. Surg Laparosc Endosc Percutan Tech 2019; 29:155–161.

9 Arslan E, Banli O, Sipahi M, Yagci G. Effects and results of omentopexy during laparoscopic sleeve gastrectomy. Surg Laparosc Endosc Percutan Tech 2018; 28:174–177.

10 AlHaddad M, AlAtwan A, AlKhadher T, AlJewaied A, Qadhi I, AlSabah S. Omentopexy during laparoscopic sleeve gastrectomy: Is it effective in reducing postoperative gastrointestinal symptoms. A retrospective cohort study . Ann Med Surg 2021; 65:102369.

11 Pilone V, Tramontano S, Renzulli M, Romano M, Monda A, Albanese A, *et al.* Omentopexy with Glubran®2 for reducing complications after laparoscopic sleeve gastrectomy: results of a randomized controlled study. BMC Surg 2019; 19(Suppl 1):1–6.

12 Nosrati SS, Pazouki A, Sabzikarian M, Pakaneh M, Kabir A, Kermansaravi M. Can omentopexy reduce the incidence of gastroesophageal reflux disease after laparoscopic sleeve gastrectomy. Obes Surg 2021; 31:274–281.

13 Sabry K, Qassem M. The impact of routine omentopexy to staple line on the incidence of early postoperative complications after laparoscopic sleeve gastrectomy: is it worth?. Egypt J Surg 2018; 37:479.

14 Labib MF. The Omentopexy role in the prevention of post-operative gastric sleeve surgery complications. Egypt J Hosp Med 2020; 81:2199–2204.

15 Małczak P, Pisarska M, Piotr M, Wysocki M, Budzyński A, Pędziwiatr M. Enhanced recovery after bariatric surgery: systematic review and meta-analysis. Obes Surg 2017; 27:226–235. doi: 10.1007/s11695-016-2438-z

16 Hassan I. Possible role of omentopexy in minimizing post sleeve gastrectomy complications. London, United Kingdom: Surg. Endosc. 26th Int. Congr. Eur. Assoc. Endosc. Surg. (EAES); 2018: 483–614.

17 Van Rutte P, Smulders J, De Zoete J, Nienhuijs S. Outcome of sleeve gastrectomy as a primary bariatric procedure. Br J Surg 2014; 101:661–668.

18 Loo G, Rajan R, Mahmood N. Staple-line leak post primary sleeve gastrectomy. A two patient case series and literature review. Ann Med Surg. 2019; 44:72–76.

19 Sharma N, Chau WY. Remodifying omentopexy technique used with laparoscopic sleeve gastrectomy: does it change any outcomes?. Obes Surg 2020; 30:1527–1535.

20 Afaneh C, Costa R, Pomp A, Dakin G. A prospective randomized controlled trial assessing the efficacy of omentopexy during laparoscopic sleeve gastrectomy in reducing postoperative gastrointestinal symptoms. Surg Endosc 2015; 29:41–47.

21 Hanna P, Mohammed R, Nijjar M, Vazquez F, Connolly M, *et al.* Laparoscopic sleeve gastrectomy: one institution's experience with omentopexy in the prevention of gastric leaks (Retrospective review). J Obes Weight Loss 2015; 2015: Ther S5:006. doi: 10.4172/2165-7904.S5-006

22 Lale A, Aygen E, Kirkil C, Artas H, Your M. Efficacy of staple line reinforcement with omentopexy during laparoscopic sleeve gastrectomy on postoperative complications: Experience of a single center, Surg Laparosc Endosc Percutan Tech 2021; 31:181–187.