

## Describe the Complications Resulting from Obesity Surgery and the Role of Anesthesia Used

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**Abstract:** Background: In the past few years, obesity has become a significant health issue. Bariatric surgery was a common procedure used worldwide to treat severe obesity as well as comorbid conditions, but there's a lack of information regarding the procedure's medium-term security and efficacy outcomes in Iraq. Objective: This study was largely contributed to the assessment and analysis of clinical findings of complications related to patients who underwent laparoscopic sleeve gastrectomy surgery and the role of anesthesia used. Patients and methods: A cross-sectional study of patients with obesity was conducted, including 70 cases. Data were collected from different hospitals in Iraq over a period ranging from March 2022 to August 2023. All patients underwent laparoscopic sleeve gastrectomy, during which the duration of the operation, mortality rate, length of stay in the hospital, and patient hospitalization rate were recorded. During the follow-up period, the postoperative results were determined in terms of the complication rate, pain rate, and the assessment of patients' quality of life. Results: This study examined the clinical findings of laparoscopic sleeve gastrectomy (LSG) in a cohort of 70 patients. Of these, 53 were female and 17 were male. The BMI of the patients was classified into three categories: < 40 (40% of cases), 40 - 50 (47.14% of cases), and > 50 (12.86% of cases). The mean operating time was  $102.48 \pm 10.32$  minutes, and the mean hospital stay was less than three days. Bleeding occurred in four cases, and the mean length of follow-up was  $33.64 \pm 24.10$  months. A total of 45 patients were discharged from the hospital in less than three days, while 25 patients were discharged after a stay of more than three days. The mean follow-up period was  $33.64 \pm 24.10$  months; 7 patients experienced postoperative nausea and vomiting, but there are no death cases; 14 patients developed postoperative complications, where the most common being wound infection (3 cases), staple line leakage (2 cases), and symptomatic cholelithiasis (3 cases). The most common complications related to patients were wound infection (3 cases), staple line leakage (2 cases), and symptomatic cholelithiasis (3 cases). Conclusions: Bariatric surgery is a safer and less expensive option for morbidly obese individuals who have not responded to non-surgical therapies. It is effective for patients with higher BMIs and elderly individuals.

**Keywords:** Obesity surgery; Complications; Body mass index; Metabolic; and Wight loss.

## INTRODUCTION

Owing of its high prevalence as well as adverse effects on healthcare expenditures, disease, mortality, and overall quality of life, obesity has become a pandemic and an important issue for public health (WHO., 2021). It's now recognized as a chronic illness (Nguyen, N. T., *et al.*, 2011), and in the past ten years, investigators have grown increasingly interested in the quality of life in obese people. One for five women and one for seven men worldwide are projected to be obese by 2020 (Arterburn, D. E., 2020). Over one billion people now suffer from obesity. Most of those affected by obesity live in low- to middle-income nations, where rates of obesity are expected to rise three times in low-income states and two times in low-income countries in comparison to 2010 data. Public health research during the world has been spurred with the significant rise in the incidence of obesity. According to recent studies, quality of life (QoL) drops inversely proportionate to body mass index (BMI), with reductions being more severe in

individuals who are in the late stages of obesity (Brethauer, S. A. *et al.*, 2015; Brethauer, S. A. , 2019). Despite the therapeutic strategy, losing weight can enhance the quality of life in people who have obesity.

In addition to any physical health consequences, research on the subject revealed that social stigma was also associated with obesity. The direct result is an increase in the levels of well-being that are due to daily activities being directly impeded as well as general health being affected through its impact on it as a whole- reducing the quality of life, especially when there's too much weight carried in one's body (McCarron, M. M., & Devine, B. J., 1974).

Although healthier eating habits and physical activity are among the primary ways that public health initiatives are helping to curb the obesity epidemic, their effectiveness can be limited for obese people who already have obesity,

particularly those with severe or complex cases (BMI  $\geq 40$  kg/m<sup>2</sup> and BMI 35–40 kg/m<sup>2</sup> with concurrent comorbidities) (Peterli, R., Borbély, Y. *et al.*, 2013; Grönroos *s. et al.*, 2021; Arterburn, D. *et al.*, 2018; Ahmed, B. *et al.*, 2018).

LSG and RYGB are the two most common types of bariatric surgery (Sjöström, L., 2013). In cases such as these, bariatric surgery was the most appropriate medical intervention. Studies show that bariatric surgery not only results in higher weight reduction but also has been linked to improved management of type 2 diabetes when it comes with controlling the condition compared to lifestyle therapies or medication alone (Maciejewski, M. L. *et al.*, 2016; Schauer, Philip R., 2017; Rubino, F., 2008; Rhee, N. A., 2012).

The reappearance of weight gain, as well as concurrent symptoms for some patients, has led bariatric surgeons to consider adopting new techniques or changing current ones, although recent studies indicate equivalent long-term outcomes for both LSG and RYGB (Bailly, L. *et al.*, 2019; Cui, B. B. *et al.*, 2021). The SADI-S method proved to be among the most effective in these approaches in terms of producing long-term weight reduction and remitting comorbidities. However, its general implementation has been limited due to its technological complexity and the possibility for adverse results (Buchwald, H. *et al.*, 2009).

## PATIENTS AND METHODS

### Patients' selection and study design:

Seventy patients' databases were collected from Baghdad - Iraq hospitals, where those patients had LSG surgery during March 2022 and August 2023. Patients with a body mass index (BMI) of less than 45 kg/m<sup>2</sup>, super-obese patients, adolescents (those less than 20 years old) with morbid obesity, obese patients with deteriorating medical conditions and other significant co-morbidities like liver cirrhosis, and patients with a BMI of less than 45 kg/m<sup>2</sup> had been between the indications for LSG.

The initial objective of this study was to assess the procedure's safety through investigating the mortality rate after thirty days and the rates of early postoperative complications, including wound infection, deep vein thrombosis, pulmonary embolism, hemorrhages, and cardiac and pulmonary issues. Five years following the surgery, the second endpoint evaluated the

effectiveness for LSG with regard in weight loss. The proportion of excessive weight loss (%EWL) and the development of BMI was used to calculate weight loss. We also utilized the proportion for excessive body mass index reduction (%EBMIL) due to the unpredictability of %EWL according to the definition of optimum body weight.

The concept in excessive BMI itself began with BMI minus 25. A value's mean plus or minus the standard deviation was provided. Additionally, the following factors were assessed: Reduction in duration of hospital stay, complications following surgery (stricture, function obstruction, gastroesophageal reflux, trocar site rupture rate), and preoperative co-morbid illnesses (diabetes, hypertension, obstructive sleep apnea syndrome, or OSA).

### Surgical technique

The patients were positioned in different hospitals in Iraq under general anesthesia, having the surgeon standing across the legs. Two grams of cefazoline were given intravenously for antibiotic prophylaxis to every patient. During the procedure, compression stockings were worn to prevent thromboembolism and deep vein thrombosis. Four or five ports—two and three 12-mm trocars as well as two 5-mm trocars—were used to carry out the treatment. Starting at the antrum (3 cm proximal to the pylorus), the larger curvature for the stomach was fully released, exposing the gastroesophageal junction and the left pillar on the diaphragm. Dissection should be done posteriorly when a hiatal hernia has been identified in order to properly close the crus. When treating morbid obesity, a hernia Hoyuela C. LSG has been the used surgical procedures.

### Postoperative follow-up

Follow-up data were collected by a nutritionist and the surgeon who did the operation at the doctor's office after 15 days, 1, 3, 6 months, and one year, as well as semi-annually after that. Every piece of information was gathered prospectively. Follow-up after surgery: Eight days following the surgery, the first follow-up control was set up at the doctor's office. Follow-up data were collected by a nutritionist and the surgeon who did the operation at the medical office at 15 days, 1, 3, 6, months, and one year, and also semi-annually after this. Each piece of data was collected prospectively.

## RESULTS

**Table 1:** Determine the basics and demographic characteristics of patients who underwent laparoscopic sleeve gastrectomy (LSG).

Characteristics	Number of patients [70]	Percentage [%]
<b>Age, years</b>		
20 – 30	12	17.14%
31 – 40	20	28.57%
41 – 50	38	54.29%
51 – 60		
<b>Sex, n [%]</b>		
Male	17	24.29%
Female	53	75.71%
<b>BMI, [Kg/m<sup>2</sup>]</b>		
< 40	28	40.0%
40 - 50	33	47.14%
> 50	9	12.86%
<b>Comorbidity</b>		
Yes	47	67.14%
No	23	32.86%
Arterial hypertension	40	57.14%
Diabetes	25	35.71%
Kidney diseases	11	15.71%
Obstructive sleep apnea	9	12.86%
Other	20	28.57%
<b>Smoking status</b>		
Yes	13	18.57%
No	57	81.43%
<b>Education status</b>		
Not in the school	3	4.29%
Primary	9	12.86%
Secondary	10	14.29%
College/university	14	20.00%
Post - graduated	34	48.57%
<b>Income status, \$</b>		
< 900	49	70.0%
> 900	21	30.0%

**Table 2:** Enrolled the clinical findings of surgical techniques related to laparoscopic sleeve gastrectomy (LSG).

Variables	Number of patients [70]	Percentage [%]
<b>Operating time [min]</b>	102.48 ± 10.32	
<b>Bleeding</b>		
Yes	4	5.71%
No	66	94.29%
<b>Hospital stays days.</b>		
< 3	45	64.29%
> 3	25	35.71%
<b>Follow-up months</b>	33.64 ± 24.10	
<b>ICU admission</b>		
Yes	1	1.43%
No	69	98.57%
<b>General anaesthesia</b>	70	100%
<b>Postoperative Nausea and vomiting (PNOV) %</b>		

<b>Yes</b>	7	10.0%
<b>No</b>	63	90.0%
<b>Mortality rate</b>		
<b>Yes</b>	0	0%
<b>No</b>	70	100%

**Table 3:** Postoperative complications outcomes.

<b>Complications</b>	<b>Number of patients [70]</b>	<b>Percentage [%]</b>
<b>Staple line leakage</b>	2	2.86%
<b>Wound infection</b>	3	4.29%
<b>Pneumonia</b>	1	1.43%
<b>Cutaneous rash</b>	1	1.43%
<b>Urethral bleeding</b>	1	1.43%
<b>Symptomatic gastroesophageal reflux</b>	2	2.86%
<b>Hiatal hernia needing laparoscopic repair</b>	1	1.43%
<b>Gastric stricture – conversion to gastric by-pass</b>	0	0.00%
<b>Symptomatic cholelithiasis</b>	3	4.29%
<b>Total</b>	14	20%

**Table 4:** Assessment of pain scores related to patients after laparoscopic sleeve gastrectomy (LSG) in the hospital period by VAS scale.

<b>Hospital days</b>	<b>Pain scores</b>
1 <sup>st</sup> day	4.73 ± 0.46
2 <sup>nd</sup> day	3.63 ± 2.51
3 <sup>rd</sup> day	3.02 ± 1.22
4 <sup>th</sup> day	2.90 ± 1.60
5 <sup>th</sup> day	1.89 ± 0.66
6 <sup>th</sup> day	1.05 ± 0.43
7 <sup>th</sup> day	0.84 ± 0.25

**Table 5:** Assessment of the quality of life-related to patients after laparoscopic sleeve gastrectomy (LSG) during follow-up.

<b>Items</b>	<b>QoL scores</b>
Physical function	83.25 ± 9.95
Psychological function	78.68 ± 13.24
Social and emotional aspects	85.37 ± 10.78
Daily activity	90.58 ± 6.84

**Table 6:** Determine clinical findings of weight loss resulted by laparoscopic sleeve gastrectomy.

<b>Items</b>	<b>Follow-up time: five years</b>
Body mass index (BMI)	29.83 ± 5.74
Percentage of excess weight loss (%EWL)	58.48 ± 29.19
Percentage of excess body mass index loss (%EBMIL)	72.86 ± 28.50

## DISCUSSION

LSG surgery has become more and more popular in recent years due to its low issue rate and technical ease (Hutter, M. M. *et al.*, 2011). LSG is a particularly difficult operation and can prove difficult for even highly qualified laparoscopic surgeons. Previous research has documented that the experience of a surgeon and specific technical features, such as bougie size (below 40 F) and a distance to the pylorus of fewer than four cm in the first stapling, are risk factors for the development

of complications following a laparoscopy split topectomy (LSG) (Salminen, P. *et al.*, 2018).

In this study, there was no fatality, and 20% of serious procedure-related problems occurred within 25 days. No differences were observed between oversewing the staple line and using buttresses in certain cases (Thereaux, J. *et al.*, 2018). Nonetheless, a systematic summary comprising 88 studies was conducted comparing 8920 patients, which showed that the rate of leakage after LSG was significantly lesser when



absorbable membrane (Seamguard) stapling reinforcement was used (1.1%) as compared to oversewing at 2.0%, bovine pericardial strip (BPS-Peristrips) reinforcement at 3.3% or no reinforcement at 2.6% (Schauer, Philip R., Schauer, Philip R., 2017; Schauer, Philip R., 2008; Schauer, P. R. *et al.*, 2012).

In addition, it assessed how weight loss altered followed LSG as the main bariatric treatment. The study's overall findings support the notion that LSG was successful in causing a noticeable reduction in weight over the short- and long-mid-term follow-up. At the 3rd International Summit for Sleeve Gastrectomy (Mingrone, G. *et al.*, 2012), comparable results were presented about weight reduction over a 5-year period. After five years, the mean proportion of excess weight loss was 64.80% as well as 60.0%, respectively. All of these findings agree with another research which has been published thus far (Fisher, D. P. *et al.*, 2018; Bailly, L. *et al.*, 2019; Peterli, R. *et al.*, 2013). The effectiveness for LSG as a stand-alone bariatric treatment for morbid obesity is supported by the fact that its results are equivalent to those of the RYGB, the gold standard technique in bariatric surgery (Aminian, A. *et al.*, 2019).

Nevertheless, a sizable portion of the population may ultimately gain weight after LSG. Long-term consequences of LSG remain a topic of concern, and ten-year follow-up data is hard to collect. Furthermore, a high prevalence of persons lost in ongoing monitoring was not outstanding in previously published data. Although the fact that body weight recovery was evident over time, results from our series and numerous long-term observational investigations show that a significant percentage of patients kept losing weight satisfactorily beyond five years of follow-up.

In a recent comprehensive examination comprising 16 long-term trials including 492 individuals, the proportion EWL at five, six, and eight years or more of follow-up was reported as being 62.3%, 53.8%, 43%, as well as 54.8%, respectively (Billeter, A. T. *et al.*, 2019). Arman *et al.* respectively (Billeter, A. T. *et al.*, 2019; O'Brien, R. *et al.*, 2018). found that patients who kept the basic sleeve structure had a mean percentage of EBML of 62.5% following an average follow-up for 11.7 years (74.6% total research series).

## CONCLUSION

For morbidly obese individuals unresponsive to non-surgical therapies, bariatric surgery is safer

and less expensive. In comparison to other nations, obesity surgery shows high effective on patients who have greater BMIs and tend to be elderly. The worsening of psychological illnesses subsequent to bariatric surgeries has been raised in a few studies. In order to address high-risk patients and also conduct more research, it should be handled with caution.

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