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Short-term weight reduction outcome after laparoscopic sleeve gastrectomy: A single center experience from Erbil, Iraq

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Abstract

Background and objective: Laparoscopic sleeve gastrectomy has become the most common weight loss surgery worldwide. This study aimed to provide insights into the sustained effectiveness of laparoscopic sleeve gastrectomy in achieving weight loss over an extended period.

Methods: This retrospective study was conducted on 116 obese individuals who underwent bariatric surgery in Erbil, Iraq, between May 2021 and May 2022. Baseline demographic and clinical data of the patients were collected. We documented participants' weight trajectories over a 48-week follow-up.

Results: The baseline mean weight decreased from 114.7 kg at the baseline to 101.7 kg at week 12 (P <0.001), 90.7 kg at week 24 (P <0.001), 82.4 kg at week 36 (P = 0.004), and 77.5 kg at week 48 (P = 0.348). A consistent and significant (P <0.001) reduction in weight change percentages was observed as the weeks progressed. The mean weight change percentage started at -11.2% in week 12 and progressively decreased to -32.1% in week 48. A consistent increase in the percentage of excess weight loss was observed as the weeks progressed, starting at 36.3% in week 12 and progressively increasing to 41.1% at week 24 (P = 0.103), 44% at week 36 (P = 0.816), and 78.6% in week 48 (P <0.001). The percentage of excess weight loss was significantly higher among younger age groups, males, singles and those with no chronic diseases, each at different follow-up intervals.

Conclusion: Laparoscopic sleeve gastrectomy participants experienced considerable and sustained weight loss for 48 weeks. Gender, age, marital status, and chronic conditions influenced weight fluctuation to varied degrees. These results offer important insights into the efficacy of laparoscopic sleeve gastrectomy in obesity management, particularly as a short-term way to control weight.

Keywords: Laparoscopic sleeve gastrectomy; Weight reduction; Erbil; Obesity; Body mass index.

Introduction

Laparoscopic sleeve gastrectomy (LSG) has gained recognition as the most prevalent bariatric operation worldwide. Its widespread usage demonstrates its efficacy and popularity within the medical establishment and among those seeking weight loss treatments. Given its prevalence, evaluating this procedure's outcomes and effects is essential.[1,2]

Obesity and its related metabolic diseases have become a major worldwide health concern. This chronic ailment has extensive detrimental effects on the well-being of a large number of people.[3] This number highlights the urgency of implementing intervention and mitigation techniques. Obesity is a significant risk factor for different comorbidities, including type 2 diabetes, dyslipidemia, hypertension, and heart failure.[2]

The intricate interplay between obesity and

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various linked illnesses needs a comprehensive strategy for addressing this complex health issue. Consequently, searching for successful weight loss strategies has received global attention.[3]

LSG has developed as a well-established, safe, and successful method for combating obesity. This surgical approach not only aids in weight loss, but also shows potential as a therapy option for obesity-related metabolic complications.[4] The treatment includes removing a section of the stomach, resulting in reduced food intake and changes in hormonal signaling that contribute to weight loss and metabolic enhancements.[5]

Numerous studies attest to the cost-effectiveness of LSG, highlighting its ability to provide substantial health benefits while being economically viable. LSG has proven to have lower rates of perioperative problems than other surgical procedures, such as bypass surgery, making it a more desirable treatment choice for obese patients.[6,7]

Despite the wealth of evidence demonstrating the usefulness and safety of LSG, data on its use in Iraq are significantly lacking.[8] This data deficiency highlights the need for additional research and data collection in the Iraqi context. By determining the role and effects of surgical procedures such as LSG in Iraq, healthcare practitioners can better customize their strategies to tackle the rising prevalence of obesity and its associated health repercussions. This study aimed to shed light on the effectiveness of LSG in attaining weight loss over an extended period.

Methods

This retrospective study included 116 obese patients who sought bariatric surgery at our clinic in Erbil, Iraq, between May 2021 and May 2022. At the time of operation, participants were included if they were at least 20 years of age. As the preferred bariatric operation, all individuals had LSG.

Each participant's demographic and clinical data were obtained. Sweet eaters were identified, who included those with an eating behavior in which at least 50% of daily consumed carbohydrates consist of simple carbohydrates and which can be triggered by emotional factors such as stress.

The baseline measurements of age (years), height (meters), pre-surgery weight (Kg), and pre-surgery Body Mass Index (BMI) (kg/m²) were recorded. In addition, throughout the follow-up period, which lasted for 48 weeks after bariatric surgery, the researchers analyzed the participants' weight-related changes. We tracked how much the mean weight shifted throughout this period. In addition, the percentage of weight change that occurred throughout the follow-up period was computed and examined.

Statistical Analysis

The statistical package for the social sciences (version 22) was used for data analysis. Demographic and clinical information about the people in the study was summed up using descriptive statistics. Means and standard deviations were used to describe continuous variables. The frequencies and percentages of categorical variables were shown.

The change in weight (%) was calculated as ((follow-up weight - pre-surgery weight/ pre-surgery weight) X100) for all of the different time points. We calculated the percentage of excess weight loss (%EWL) as ((pre-surgery weight - follow-up weight)/ (operative excess weight)) X 100. The operative excess weight was calculated as (pre-surgery weight - ideal weight), where the ideal weight was based on the weight for having a maximum normal BMI (25 Kg/m^2).

Analysis of variance (ANOVA) and post hoc test were used to compare the mean weight, mean percentage of weight loss, and mean %EWL at different time intervals. Student’s t-test and ANOVA were used to assess the association of the

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demographic variables with each of the mean percentage of weight loss and mean %EWL across each interval separately. A *P*-value of <0.05 was considered statistically significant.

Ethical considerations

The study was conducted following ethical rules and the principles in the Declaration of Helsinki. The research ethics committee at Catholic University in Erbil approved the study protocol.

Results

Of the 116 patients with obesity who underwent LSG surgery, most were female (75%), aged ≤30 (35.3%), and married (75.9%). Approximately 42% had chronic disease, and 69.8% were sweet eaters (Table 1).

Table 1 Demographic data characteristics of patients with obesity who underwent LSG

Characteristics	No.	(%)
Gender		
Male	29	(25.0)
Female	87	(75.0)
Age group (years)		
≤30	41	(35.3)
31-40	36	(31.0)
>40	39	(33.6)
Marital status		
Single	28	(24.1)
Married	88	(75.9)
Chronic diseases		
No	67	(57.7)
Yes	49	(42.2)
Sweet eater*		
No	35	(30.2)
Yes	81	(69.8)
Total	**116**	(**100.0)**

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The baseline and pre-surgery age, height, weight, and BMI measures of patients who underwent LSG due to obesity are shown in Table 2.

The mean age±SD at baseline was 36.03±11.9 years (range 20-69). The mean±SD height was 1.62±0.09 meters (range 1.47-1.90). The mean±SD pre-surgery weight was 114.7±22.85 kg (range 78.0-190.0). The mean±SD pre-surgery BMI was 43.4±6.75 kg/m² (range 35.1-72.4.

The patients' mean weight consistently decreased from 114.7 kg at the baseline to 101.7 kg at week 12 (*P* <0.001), 90.7 kg at week 24 (*P* <0.001), 82.4 kg at week 36 (*P* = 0.004), and 77.5 kg at week 48 (*P* = 0.348), as shown in Table 3.

Table 2 Baseline characteristics of patients with obesity who underwent LSG

Variable	Mean	SD	Minimum	Maximum
Age at baseline (years)	36.03	11.9	20	69
Height in meters	1.62	0.09	1.47	1.90
Pre-surgery weight in Kg	114.7	22.85	78.0	190.0
Pre-surgery BMI (kg/m^2)	43.4	6.75	35.1	72.4

Table 3 Change in the mean weight during the follow-up period for the patients with obesity who underwent LSG

Weight (Kg)	Mean	SD	*P*-value	Post Hoc P-value*
Baseline	114.7	2.12	<0.001	
Week 12	101.7	19.84		<0.001
Week 24	90.7	17.15		<0.001
Week 36	82.4	14.12		0.004
Week 48	77.5	13.30		0.348

* *P*-value compares each follow-up period with the previous period

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The change in weight (%) was -11.2% at week 12, and it increased significantly (*P* <0.001) over the follow-up period to -20.5% at week 24, -27.8% at week 36, and -32.1% at week 48. The change in weight (%) was not significantly associated with any demographic variables. The change in weight (%) at week 48 was significantly higher among those not having chronic disease than those with chronic diseases (-33.9% vs. 29.6%, *P* = 0.021), as shown in Table 4.

Table 4 Change in weight (%) during the follow-up period for the patients with obesity who underwent LSG and the association with different demographic variables

Variable	Weight change (%)							
	Weak 12		Weak 24		Weak 36		Weak 48	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Total	-11.2	4.6	-20.5	6.1	-27.8	9.3	-32.1	9.8
P-value*	-		<0.001		<0.001		<0.001	
Age group (years)								
≤30	-11.0	5.5	-20.5	6.7	-28.0	6.3	-33.1	6.6
31-40	-10.3	3.3	-19.3	5.6	-26.8	6.7	-31.3	8.8
>40	-12.1	4.5	-21.6	5.9	-28.6	13.4	-31.7	13.1
P-value	0.248		0.280		0.680		0.678	
Gender								
Male	-11.8	5.4	-22.1	6.0	-30.3	5.9	-34.7	7.6
Female	-10.9	4.3	-20.0	6.1	-27.0	10.1	-31.2	10.3
P-value	0.383		0.102		0.098		0.092	
Marital status								
Single	-11.5	4.7	-21.9	5.8	-29.2	6.3	-34.0	6.9
Married	-11.1	4.6	-20.1	6.2	-27.4	10.1	-31.5	10.5
P-value	0.683		0.186		0.396		0.244	
Chronic diseases								
No	-11.0	4.5	-20.6	5.8	-28.9	10.5	-33.9	10.5
Yes	-11.4	4.7	-20.4	6.5	-26.4	7.4	-29.6	8.2
P-value	0.627		0.835		0.149		0.021	
Sweet eater								
No	-11.6	4.4	-21.1	5.4	-29.7	13.5	-33.7	13.2
Yes	-11.0	4.7	-20.3	6.4	-27.0	6.7	-31.4	7.9
P-value	0.482		0.489		0.160		0.231	

* This *P*-value compares each follow-up period with the previous period.

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The %EWL was 36.3% at week 12, and it increased over the follow-up period to 41.1% at week 24 (*P* = 0.103), 44.0% at week 36 (*P* = 0.816), and 78.6% at week 48 (*P* <0.001). The %EWL at week 48 was significantly higher among age groups ≤30 and 31-40 compared to those >40 (82.9% and 80.3% vs. 72.3%, *P* = 0.032). The %EWL at week 36 was significantly higher among male than female patients (51.0% vs. 41.7%, *P* = 0.003). The %EWL at week 36 was significantly higher among single than married patients (49.0% vs. 42.4%, *P* = 0.038). The %EWL was significantly higher among patients with no chronic diseases than those with chronic diseases at week 12 (*P* = 0.030), week 24 (*P* = 0.040), and week 48 (*P* <0.001). Details of %EWL during the follow-up period and the association with different demographic variables are shown in Table 5.

Table 5 Percentage of excess weight loss during the follow-up period for the patients with obesity who underwent LSG and the association with different demographic variables

Variable	Percentage of excess weight loss							
	Week 12		Week 24		Week 36		Week 48	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Total	36.3	11.6	41.1	14.3	44.0	14.5	78.6	18.8
P-value*	-		0.103		0.816		<0.001	
Age group (years)								
≤30	37.5	8.2	42.4	10.7	47.1	12.7	82.9	17.6
31-40	35.1	10.5	39.5	13.0	44.1	16.2	80.3	18.4
>40	36.3	15.2	41.1	18.5	40.7	14.3	72.3	19.3
P-value	0.666		0.672		0.148		0.032	
Gender								
Male	39.6	9.1	45.1	11.3	51.0	14.8	78.4	14.6
Female	35.2	12.2	39.7	15.0	41.7	13.7	78.6	20.1
P-value	0.082		0.078		0.003		0.952	
Marital status								
Single	38.6	8.4	44.0	10.6	49.0	13.0	83.6	17.9
Married	35.6	12.4	40.1	15.3	42.4	14.7	77.0	18.9
P-value	0.246		0.213		0.038		0.106	
Chronic diseases								
No	38.5	12.3	43.6	15.3	46.1	14.1	84.0	17.2
Yes	33.8	10.2	38.0	12.5	41.6	15.0	71.3	18.9
P-value	0.030		0.040		0.104		<0.001	
Sweet eater								
No	38.3	15.2	43.4	18.5	43.5	14.2	79.5	19.3
Yes	35.5	9.7	40.1	12.1	44.2	14.7	78.2	18.8
P-value	0.222		0.255		0.809		0.730	

* This *P*-value compares each follow-up period with the previous period.

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Discussion

Bariatric surgery is becoming more and more popular as a way to help people who are morbidly obese. LSG is a restrictive method that stands out in the world of bariatric surgery. In this procedure, up to 75% of the stomach is surgically removed. This makes the stomach smaller. Doing this reduces the stomach size without hurting its ability to work. This means less food can be eaten in a single meal without feeling full.[7,8]

The current study shows that 75% of the participants were women, and 25% were men. This is in line with larger trends seen in research on obesity. Several studies, like the ones done by Bach et al.,[9] have shown that women are more likely to be overweight. This pattern may be caused by a complex interaction of hormonal, genetic, and sociocultural factors that make men and women more likely to get obese and handle it differently. Studies by Finlayson et al. found that obesity affects people of many different ages, but the number of people who are obese tends to change with age.[10] This aligns with how obesity is spread across different age groups. Younger age groups, like those 30 or younger (35.3%), often deal with lifestyle-related factors that might lead to obesity. On the other hand, metabolic changes that come with getting older could affect the older age group (>40 years old, 33.6%). This shows how important it is to deal with obesity among people of all ages.

The fact that the distribution of marital status is similar to what Krishnamoorthy et al.[11] found makes the link between marital status and obesity even stronger. 75% of married people may have changes in their eating habits, level of physical activity, and social support networks that can affect their weight. On the other hand, single people (24.1%) might have different habits that affect their risk of being overweight. The fact that 42.2% of the participants had chronic diseases is similar to what Krishnamoorthy et al.[11] found: there is a strong link between obesity and long-term conditions like diabetes, high blood pressure, and heart disease. The presence of chronic diseases could have a big effect on how well interventions work and how weight loss efforts go. The fact that 69.8% of the participants eat sweets fits with the findings of a study by Bach et al.[9] that looked at how obese people eat. Sweets are always linked to weight gain and obesity because they cause people to eat too many calories. Having a large number of participants like sweets points to a possible area for targeted interventions that aim to change eating habits.

The main result of the current study is that the average weight has decreased steadily and significantly throughout the study period. This can be seen at several different points in time. The study's results highlight the effectiveness of the intervention in promoting weight loss and suggest a gradual and sustained improvement in participants' weight-related outcomes. At the beginning of the study or the baseline, the average weight of the participants was 114.7 Kg. This was used as a starting point for determining their weight before the intervention. This baseline measurement is an important benchmark for comparing future measurements.[11] The trend is evident at week 12, when the average weight drops significantly to 101.7 Kg. This significant drop is a good sign that the intervention is working. This was in line with what other studies had found that the average weight drops a lot after a week of bariatric surgery.[12] The study's results agree with and support what other studies have found. Aliakbarian et al.[13] found that people who tried different ways to manage their weight lost weight gradually and consistently. This consistency shows how strong the observed pattern is and adds to the credibility of the results of the present study. In the study by Pok et al.,[14] the average BMI at the follow-up after surgery was 26.2 kg. Seki et al.[15] said the mean BMI decreased after one year of follow-up. Aridi et al.[16] stated that the average total

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weight loss was 69.8% after five years. The role of LSG in short-term weight loss is shown by our results and other available data.[17-19]

One of the biggest problems with this study is its inherent selection bias because it was done at only one center and only during a specific period. This makes it harder to apply the results to a broader group of obese people, which could make the results less representative of different demographic, cultural, and regional settings. Also, because it is a retrospective study, there is a chance that some of the data is incomplete or wrong, which could affect how reliable and complete the conclusions are.

Conclusion

LSG participants lost much weight and stayed off for 48 weeks. Weight change was affected differently by gender, age, marital status, and chronic diseases, among other demographic factors. These results give us important information about how well LSG works in managing obesity. Further studies with longer follow-ups are required to assess the mid and long-term outcomes of LSG.

Competing interests

The authors declare that they have no competing interests.

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