

Postoperative outcomes of patients with severe obesity who underwent laparoscopic sleeve gastrectomy: case series

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Received

10 January 2020

Accepted

24 January 2020

Published online

27 May 2020

Cite as

Tan HL, Basilio OF. Postoperative outcomes of patients with severe obesity who underwent laparoscopic sleeve gastrectomy: case series. *SPMC J Health Care Serv.* 2020;6(1):1. <http://n2t.net/ark:/76951/jhcs3sv3y3>

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Globally, especially in the Asian and African regions, there has been a rising burden of obesity due to high consumption of energy-dense foods and the increase of physical inactivity caused by urbanization and sedentary lifestyle changes.¹ Bariatric surgery, or weight-loss surgery, remains to be the most effective treatment for morbid obesity, and it also has resulted in a substantial improvement of obesity-related comorbidities, especially type 2 diabetes mellitus.²

Laparoscopic sleeve gastrectomy (LSG) ranks as the most popular bariatric procedure in Asia, accounting for 50% of all weight-loss surgeries in 2015.³ LSG is a restrictive procedure that removes 80%, i.e., the outer margin, of the stomach, which is then reduced into a long, narrow tube (sleeve).⁴ As a bariatric procedure, LSG has been reported to attain 50-78% excess weight loss.⁵ Further, its safety, simplicity, and low propensity for cancer in postsurgical gastric remnants⁶ has made LSG the primary option for many morbidly obese patients undergoing bariatric surgery.³⁻⁷ A systematic review of 11 long-term studies done in seven Asian countries among patients with obesity and type 2 diabetes also reported significant improvement in fasting blood sugar and HbA1c levels during the duration of the studies. High remission rates (56-81%) of diabetes have been observed in these patients during the 5-year follow-up after LSG.⁵ LSG has similar results with the laparoscopic Roux-en-Y gastric bypass (LRYGB), another type of bariatric surgery, in terms of weight loss and frequency of long-term complications.⁸⁻⁹ However, LSG is technically less demanding, and is associated with a shorter operating time and hospital stay.¹⁰

In the Philippines, the prevalence of obesity increased from 4.1% in 2010 to 5.1% in 2014.¹¹ This trend may also highlight the need for more significant and sustained methods of weight loss to help control the metabolic complications of obesity. Since the recent introduction of LSG in the Philippines, with our institution, Southern Philippines Medical Center as one of the few medical institutions that offer the procedure since January 2015, short-term outcomes of this surgical approach have not been well-documented. Based on the consensus of the Asia Pacific Metabolic and Bariatric Surgery Society and the Asia Pacific Chapter of the International Federation for the Surgery of Obesity and Metabolic Disorders, bariatric surgery should be considered as a treatment option for obese Asians with body mass index (BMI) above 30 if they have central obesity (waist circumference >80 cm in females and >90 cm in males) and at least two of the following criteria for metabolic syndrome: elevated triglycerides, low HDL cholesterol levels, high blood pressure and elevated fasting plasma glucose levels.¹² In our institution, however, LSG has been performed on patients with only a BMI of ≥ 30 as the indication. We did this study to describe the postoperative outcomes of patients who underwent LSG in our institution.

We reviewed the charts of patients 18 years old and above, and with BMI ≥ 30 kg/m² who were the first few who underwent LSG in our institution. Of the 15 patients who underwent the procedure as of November 2018, only 10 patients gave their informed consent for us to access their medical records. For each patient, we collected data on age, sex, comorbidities (hypertension, diabetes mellitus, cardiovascular diseases, metabolic syndrome, knee pain, back pain, irregular menses, and asthma), and length of hospital stay. We also noted the presence or absence of any signs or symptoms indicative of acute or chronic postoperative complications of the procedure such as hematemesis, melena, fever, chills, intractable vomiting, dysphagia, food intolerance, heartburn, regurgitation, tachycardia, tachypnea, hypotension, or serial drop in hemoglobin levels. We recorded the weight and body mass index (BMI) of each patient at baseline, and on follow-up at 1, 3, 6, and 12 months after LSG. We also computed each patient's ideal body weight (IBW) using the Hamwi method.¹³ Based on these data, we computed the percentage of total weight loss (%TWL), the percentage of excess weight loss (%EWL), and percentage of excess BMI loss (%EBMIL)¹⁴ for each patient on follow-up. Likewise, we computed for the percentage of alterable weight loss



POSTOPERATIVE OUTCOMES OF PATIENTS WITH SEVERE OBESITY WHO UNDERWENT LAPAROSCOPIC SLEEVE GASTRECTOMY: CASE SERIES

Mean age of patients **39** years old

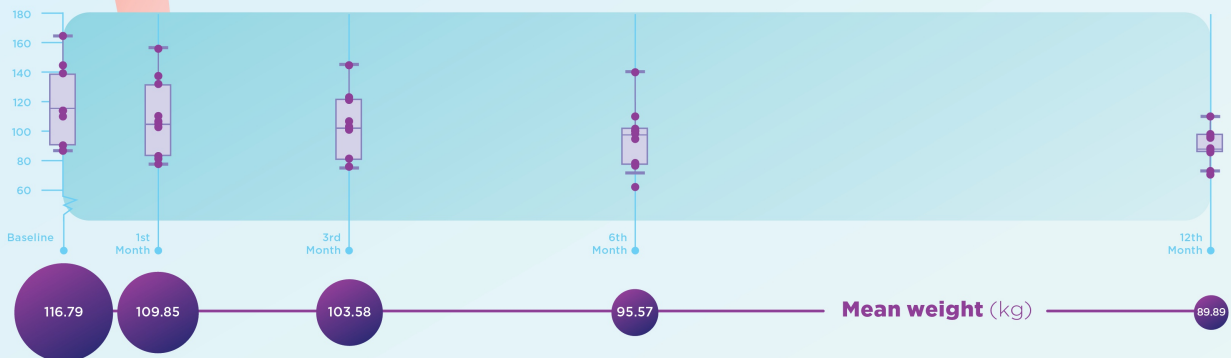
Mean length of hospital stay **5** days

Sex of patients **4** males

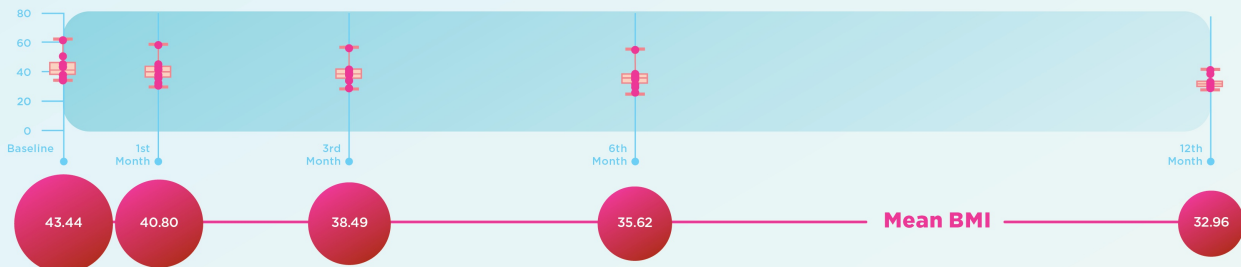
6 females



Weight (kg)



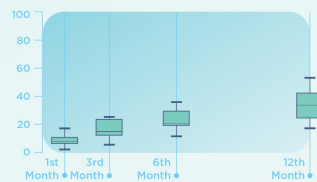
Body Mass Index (BMI)



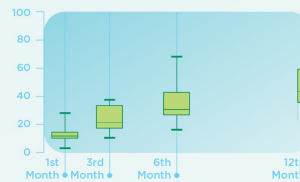
% Total Weight Loss (TWL)



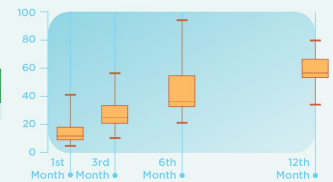
% Alterable Weight Loss (AWL)



% Excess Weight Loss (EWL)



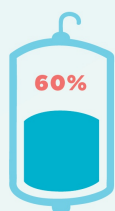
% Excess BMI Loss (EBMIL)



Comorbidities



Hypertension



Diabetes mellitus



Cardiovascular diseases



Metabolic syndrome



Knee pain



Back pain



Irregular menses



Asthma

(%AWL), a special metric that refers only to the portions of the body that is affected by weight loss (fats, muscles, water) and omits the unalterable portions (bones, connective tissues) from the equation. The main outcome measures for this study were success in bariatric surgery based on %AWL and the presence of postoperative complications, while the secondary outcome measures were success in bariatric surgery based on %TWL, and %EWL. For this study, we defined success in bariatric surgery as either having an AWL of $\geq 35\%$, a TWL of $\geq 25\%$, or an EWL of $\geq 50\%$ one year after LSG.^{15 16}

This report includes the data of 4 males and 6 females, with ages ranging from 27 to 58 years (mean: 39.20 ± 9.74 years). The most common comorbidities of the patients were diabetes and hypertension. The mean duration of hospital stay for the procedure was 4.80 ± 0.92 days. From a baseline of 116.79 ± 26.35 kg the mean weight of the patients dropped postoperatively to 109.85 ± 25.62 kg at 1 month, 103.58 ± 23.04 kg at 3 months, 95.57 ± 21.2 kg at 6 months, and 89.89 ± 11.84 kg at one year. The mean %TWL, mean %EWL, mean %EBMIL, and mean %AWL one year after LSG were $23.41 \pm 9.50\%$, $46.92 \pm 16.14\%$, $56.91 \pm 14.63\%$, and $33.65 \pm 11.55\%$. Three patients achieved at least 50% EWL, three patients achieved at least 25% TWL, and four patients achieved at least 35% AWL one year after LSG. None of the patients had any signs or symptoms indicative of acute or chronic postoperative complications of LSG during the 12-month period after surgery.

The mean %EWL that our patients achieved in this study (47%) after one year was slightly lower than those in similar studies done in Asia with weight loss outcomes of 69% to 84% EWL one year after surgery.⁵ The mean %TWL one year postoperatively among our patients (23%) was comparable to that of patients who also underwent LSG in a recent multicenter study in Korea (24%).¹⁷

However, based on %AWL as a measure of weight loss, our patients appeared to have better outcomes (34%) compared to those in the Korean study (26%).¹⁷ In the same study, the one-year %TWL and %AWL of LSG were similar to those of laparoscopic gastric banding (LAGB) and LRYGB.¹⁷ Another study done in the Philippines among patients who underwent LRYGB and LAGB reported a lower one-year %EWL (30.2%) compared to what we observed in our patients.¹⁸

The results of our study showed a one-year percentage weight loss of between 23 and 47 (depending on the metric used), which demonstrates that LSG can achieve similar or even better outcomes compared to LAGB and LRYGB.

Whereas weight loss in LRYGB is achieved by food restriction and malabsorption, it is achieved in both LAGB and LSG by lessening the food carrying capacity of the stomach. In addition, LSG also involves the resection of the gastric fundus where the hunger hormone, ghrelin is produced, giving the patient a feeling of fullness and early satiety.⁴

Among the available weight loss metrics, only %AWL is able to provide BMI-independent outcomes.¹⁵ Percentages of TWL, EWL, and EBMI, the earlier metrics used for bariatric surgery success, are thought to have significant variations and to produce biased conclusions depending on the initial BMI. This variation was not observed in %AWL.¹⁹

Another method used to assess weight loss after bariatric surgery is by using bioelectrical impedance analysis (BIA) for the evaluation of both fat mass (i.e., all fat tissues in the body) and fat-free mass (FFM; i.e., all body components except fat)^{20 21} However, the BIA method has high inter- and intra-individual variability due to changes in FFM and hydration that come with aging and occurrence of disease.²²

The absence of documented postoperative complications within the one-year follow-up period of our study may indicate that LSG can be a relatively safe option for patients who are considering bariatric surgery. In other studies acute complications—postoperative bleeding, staple line leaks, and intra-abdominal abscess—as well as delayed complications such as rebound weight gain, gastroesophageal reflux disease, and strictures are known to occur postoperatively.^{23 24}

Finally, concomitant behavioral, dietary, and psychological interventions, which were not incorporated in our patients' weight loss approach, have also been proven to complement and sustain the effects of bariatric surgery on weight.²⁵

To the best of our knowledge, this is the first published study in the Philippines on the postoperative outcomes of patients who underwent laparoscopic sleeve gastrectomy.

In this study, we found out that LSG reduced the baseline weight of obese patients by an

average of 34% AWL, 23% TWL, or 47% EWL one year after surgery. Four out of 10 patients had successful bariatric surgery (by %AWL standards) one year postoperatively. No patient exhibited signs or symptoms of acute or chronic complications within a year after LSG.

Contributors

HLT and OB both had substantial contributions to the study design, and to the acquisition, analysis and interpretation of data. HLT and OB wrote the original draft and subsequent revisions, and both authors reviewed, edited, and approved the final version of the manuscript. HLT and OB both agreed to be accountable for all aspects of the work.

Ethics Approval

This study was reviewed and approved by the Department of Health XI Cluster Ethics Review Committee (DOH XI CERC reference P12042701).

Article source

Submitted

Peer review

External

Funding

Supported by personal funds of the authors

Competing interests

None declared

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