

# Benefits and reliability of laparoscopic sleeve gastrectomy in patients aged 60 years and older

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## Abstract

**Aim:** Obesity is a disease that reduces the quality and duration of life and its prevalence is also increasing in the elderly population. In this study, we aimed to investigate the results of early and midterm weight loss and treatment of concomitant diseases and evaluate the safety and efficacy of bariatric surgery in patients aged 60 years and older who underwent Laparoscopic Sleeve Gastrectomy (LSG) in our clinic.

**Material and Methods:** We retrospectively evaluated 28 morbid obese patients  $\geq 60$  years old who underwent LSG between September 2014 and January 2018. Data reviewed included age, sex, preoperative weight and body mass index (BMI), comorbid conditions, early or delayed complications, mortality, length of follow-up, weight lost, BMI points lost, and effects on obesity-related comorbid conditions.

**Results:** Of 28 patients included in the study there were 22 (78.6%) females and 6 (21.4%) males. The average age of patients was  $63.4 \pm 3.39$ . Preoperative mean BMI was  $48.4 \pm 7.0 \text{ kg/m}^2$ . Average follow-up period 20.67 month. Postoperative median BMI was,  $36.24 \text{ kg/m}^2$  in the 6th month,  $33.47 \text{ kg/m}^2$  in the 1st year and  $31.17 \text{ kg/m}^2$  in the 2nd year. Present comorbid conditions included 23 (82.1%) hypertension, 16 (57.1%) diabetes mellitus and 3 (10.7%) obstructive sleep apnea. All of patients reported resolution or improvement in comorbid conditions. No mortality was observed in patients.

**Conclusion:** Outcomes and complication rates of bariatric surgery in patients aged 60 years and older are low and acceptable. The results of our study support bariatric surgery in elderly patients. However, detailed information should be provided about the slightly increased risks and the possibility of less satisfactory outcome.

**Keywords:** Sleeve Gastrectomy; Elderly Patients; Safety; Efficacy.

## INTRODUCTION

Thanks to advances in life conditions and medicine, the proportion of the population older than 60 years is rapidly increasing in all over the world. Obesity is a disease that reduces the standard and term of life (1) and the prevalence is also rising in the elderly population. The plurality of the obese older population suffer from multiple comorbid diseases. In addition, the prevalence of obesity-related medical complications such as diabetes and hypertension is increasing with age (2,3). One of the most actual subjects in obesity treatment is understanding the advantages of reversing the process by any means like diet, exercise, behavioral modifications, pharmacotherapy, and surgery. The efficacy of bariatric procedures in the weight loss outcomes and weight associated comorbidities compared

is largely superior to those attainable by current medical therapies (4).

Laparoscopic sleeve gastrectomy (LSG) is one of the effective methods in the treatment of morbid obesity. In this study, we aimed to investigate the results of early and midterm weight loss and concomitant diseases treatment and evaluate the safety and efficacy of bariatric surgery in patients aged 60 years and older who underwent LSG in our clinic.

## MATERIAL and METHODS

Between September 2014 and January 2018, out of 350 patients applied LSG due to morbid obesity, 28 patients aged 60 years and over were included in the study. All patients were examined in detail before surgery by a

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multidisciplinary team to evaluate the adequacy of the operation. All patients underwent sleeve gastrectomy by laparoscopic method. The patients who underwent surgery were required to meet the following criteria: BMI (body mass index) between 35 kg/m<sup>2</sup> with obesity-related co-morbidities or BMI >40 kg/m<sup>2</sup> with or without obesity-related co-morbidities. Demographic data of the patients, weight loss, postoperative morbidity and LSG's effectiveness in obesity as well as comorbid diseases were evaluated.

Operation technique: Antiembolic precautions were taken and appropriate preoperative antibiotics are administered. The operations were performed in reverse Trendelenburg and French position in which the surgeon was positioned between the legs of the patient. In all patients a total of 5 trocars (one 15 mm, two 12 mm and two 5 mm in diameter), which serve as passageways for the surgical instruments, were used. A 15 mm optical trocar was placed under direct vision. A 30 degree angled laparoscope was placed through the port into the peritoneal cavity and other ports are placed. A retractor was placed to lift the liver from the stomach. Greater curvature of the stomach was dissected free from the omentum and the short gastric blood vessels with the help of laparoscopic vessel sealing device from 2-4 cm proximal of pylorus to the angle of HIS. Posterior dissection was performed exactly in the proximal stomach during resection to avoid a wide fundic pouch. A 32 F thick dilatation tube was placed in the lesser curvature of stomach. The stomach was resected using two 4.5 mm endoscopic linear cutting staplers in antrum and 3.8 mm in more proximal parts (Staples; Medtronic, Dublin, Ireland). Laparoscopic clips were used to control hemorrhages from the staple line. The staple line along the remaining tubularized stomach was then tested for leakage by filling the operation area with physiological saline and then was inflated with air for air-water test. The resected stomach was extracted through the 15 mm trocar site. A low suction silicon drain was left along the staple line. The port sites (12 and 15 mm) were then closed with non-absorbable sutures to prevent port site hernia.

## RESULTS

Of 28 patients included in the study there were 22 (78.6%) females and 6 (21.4%) males. Mean age was 63.4±3.39 (table 1). Preoperative mean body mass index (BMI) was 48.4±7 kg/m<sup>2</sup>. Concurrent cholecystectomy was performed upon 7 patients due to symptomatic cholelithiasis, 1 cruroraphy and 1 gastric band removal were applied with LSG (who had previously placed a gastric band) using LSG trocars. The median follow-up period was 20.67 months (2-36). Postoperative median BMI and total weight loss were, 36.24 kg/m<sup>2</sup> - 31.96 kg in the 6th month, 33.47 kg/m<sup>2</sup> - 39.27 kg in the 1st year and 31.17 kg/m<sup>2</sup> - 49 kg in the 2nd year, respectively. Twenty three (82.1%) patients were present with hypertension, while 16 (57.1%) patients with diabetes mellitus (5 patients with insulin) and it was determined that the patients' need for medication was discontinued or decreased after 2 months

postoperatively (table 2). One unit of erythrocyte and 2 units of fresh frozen plasma transfusion was applied to 1 patient (3.7%) due to bleeding from the stomach stapler line. One patient (3.7%) was treated conservatively on the 20th postoperative day because of rhabdomyolysis. None of the patients had leakage from the stapler line and no mortality was observed in patients (table 3).

**Table 1. Demographic data of patients**

Mean Age (years)	63.4±3.39
Mean Height (cm)	159.6±7.3
Mean Weight (kg)	123.35±18.3
Mean BMI (kg/m <sup>2</sup> )	48.4±7.0
Female / Male Ratio (%)	22 (78.6%) / 6 (19.3%)

**Table 2. Concomitant diseases of the patients preoperatively**

Preoperative conditions	n (%)
Hypertension	23 (82.1)
Diabetes mellitus	16 (57.1)
Obstructive sleep apnea	3 (10.7)
Hypothyroidism	6 (21.4)
COPD	1 (3.6)
Coronary artery disease	1 (3.6)

**Table 3. Performed surgeries and complications**

Operation	
Laparoscopic sleeve gastrectomy	19 (16.7%)
Laparoscopic sleeve gastrectomy + cholecystectomy	7 (6.1%)
Laparoscopic sleeve gastrectomy + hiatus hernia repair	1 (0.9%)
Laparoscopic sleeve gastrectomy +gastric band removal	1 (0.9%)
Conversion to open	0
Oral intake (days)	2
Hospital length of stay (days)	4
Complications	
Hemorrhage (stapler line)	1 (3.57%)
Stapler line leak	0 (0%)
Gastrointestinal bleed	0 (0%)
Obstruction	0 (0%)
Stenosis	0 (0%)
Wound infection	1 (3.57%)
Rhabdomyolysis	1 (3.57%)
Deep venous thrombosis	0 (0%)
Pulmonary embolism	0 (0%)
Incisional hernia	0 (0%)
Acute cholecystitis	0 (0%)
Myocardial infarction	0 (0%)
Pneumonia	0 (0%)
Respiratory failure	0 (0%)
Intensive care unit requirement	0 (0%)
30-day mortality	0 (0%)

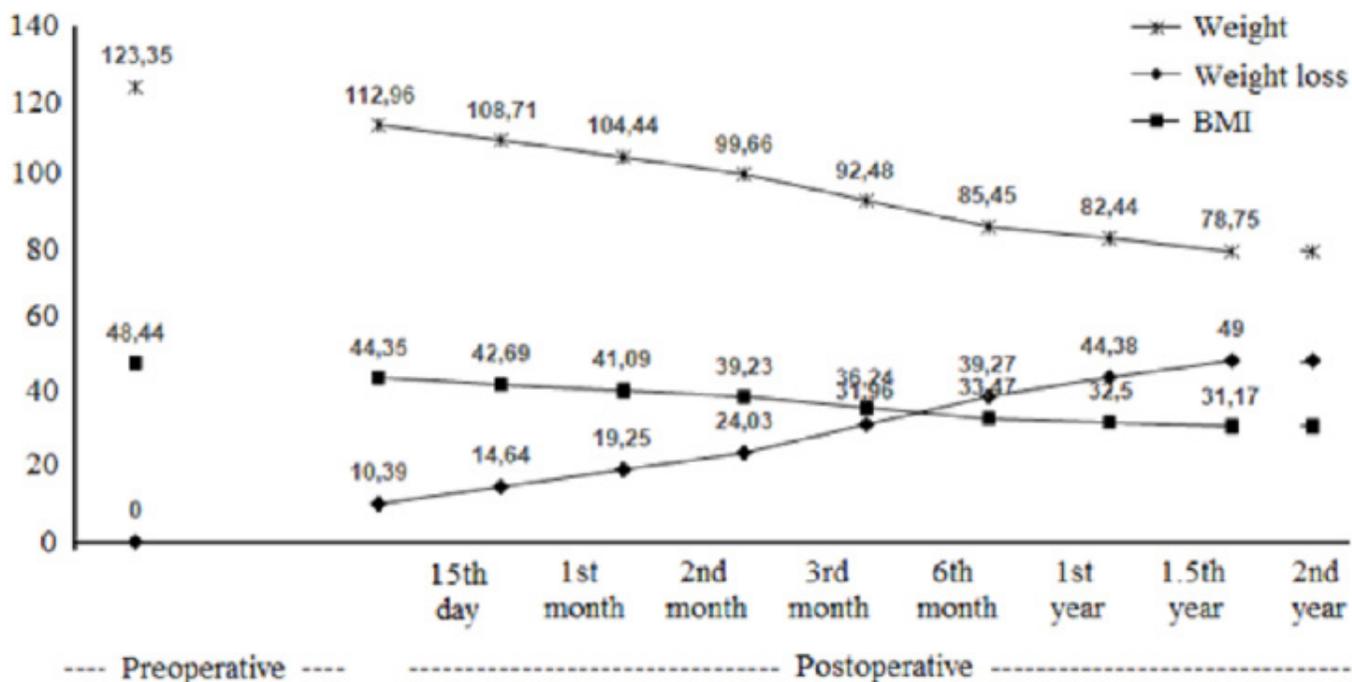


Table 4. Follow-up results of patients.

	Preop	15th day	1st month	2nd month	3rd month	6th month	1st year	1.5th year	2nd year
Weight	123.35	112.96	108.71	104.44	99.66	92.48	85.45	82.44	78.75
Weight loss	0	10.39	14.64	19.25	24.03	31.96	39.27	44.38	49
BMI	48.44	44.35	42.69	41.09	39.23	36.24	33.47	32.5	31.17

## DISCUSSION

Laparoscopic Sleeve Gastrectomy is a technique that is accepted as one of the basic bariatric surgical procedures because of its acceptable complication rates and sufficient weight loss. The long-term efficacy of LSG continues to be researched. Although there is no definitive criteria for determining the surgical technique for obesity treatment, patient preference is one of the most common indications worldwide (5). In recent years, LSG has become popular because of its shorter operating time, technically easier application and less traumatic than RYGB. Although this technique is an innovative approach, it is applied safely and increasingly in the elderly patients. The age limitations defined by the NIH Consensus Conferences in 1991 were between 18 and 50 years old (6). Thereafter the upper limit was extended to 60 years of age (7). The overall life expectancy in most countries is rapidly increasing, resulting in the growing number of aging population. By 2030, an estimated 20% of people in the USA will be older than 65 years (8,9). Varela et al. suggest that perioperative morbidity and mortality rates may be higher in elderly patients (10). But nowadays, thanks to the technological developments in bariatric surgery, standardization of the surgical technique and the quality of patient care, excellent results are obtained in elderly patients. Several risk factors for postoperative morbidity and mortality increase

with age; increased age itself remains as an important risk factor for postoperative morbidity and mortality (11). Medical complications of obesity in older populations are mainly concentrated around the metabolic syndrome involving glucose intolerance, hypertension, dyslipidemia, and cardiovascular disease (12).

We determined that 82.1% of the patients included in this study were hypertensive and 57.1% diabetic. Five patients using insulin were detected to have stopped taking insulin starting from postoperative 6th month. It was observed that only three of the patients (diagnosed diabetes patients) needed to have oral antidiabetic drugs after 6th months of the operation. Flum et al. reported that mortality rates were greater for those aged 65 years or older compared with younger patients undergoing bariatric procedures, demonstrating a nearly threefold increase in the risk of early mortality in elderly patients (4.8% vs 1.7% at 30 days, 6.9% vs 2.3% at 90 days) (13). However, of 28 patients included in our study there was no mortality observed. Patients showed a significant reduction in BMI at their 1-year follow-up visits ( $48.4 \pm 7 \text{ kg/m}^2$  vs  $36.24 \text{ kg/m}^2$ ), as well as a reduction in daily medication use. Also, patients reported improvement in quality of life following LSG (such as feeling happy, satisfaction with the body image, feel high self-esteem, spending more time with friends). This is a significant and notable finding in any patient

undergoing bariatric surgery, regardless of age. Sugerman et al. report that bariatric surgery was effective for older patients with a low morbidity and mortality. However the weight loss and improvement in comorbidities in older patients were clinically significant (14). The results of our study support the applicability of bariatric surgery in elderly patients, too (preoperative median BMI: 48.4 kg/m<sup>2</sup>, 1st year median BMI: 33.47 kg/m<sup>2</sup>, 2nd year median BMI: 31.17 kg/m<sup>2</sup>). Surgery should not be refused because of the age of these patients.

## CONCLUSION

Preoperative evaluation of these patients should be performed with great care, since comorbid diseases are more common and more complicated in advanced age group. At first sleeve gastrectomy used to be considered as an initial operation for high-risk patients. But nowadays it is considered to be as a definitive weight loss operation (15). Due to its relatively technical simplicity and its high safety profile, it has become a widely accepted operation. In fact, in many areas, SG has overtaken the RYGB as the most common bariatric operation. Currently, bariatric surgery is offered to elderly morbidly obese patients because reduction and/or resolution of comorbidities is obtained with acceptable mortality and morbidity (16,17). We believe that LSG can be performed in patients aged 60 years and over without increasing the risk of complications compared to younger patients, when it is applied with a multidisciplinary approach, in experienced clinics with a standardized surgical technique. However, it should not be forgotten that detailed information should be given to patients about the possibility of slightly increasing risks and the possibility of less satisfactory results.

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