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Single-stage laparoscopic sleeve gastrectomy: safety and efficacy in the super-obese

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ABSTRACT

Background: Laparoscopic sleeve gastrectomy (LSG) is increasingly used as a single-stage bariatric procedure. However, its safety and efficacy in super-obese patients (body mass index [BMI] > 50 kg/m^2) is less well defined. This series reports on 400 consecutive patients who underwent LSG at our institution, to evaluate safety and efficacy in the super-obese.

Materials and methods: We performed a retrospective review of prospectively collected data on 400 consecutive patients who underwent LSG at our institution. We analyzed baseline demographic data, median length of hospital stay, complications, length of follow-up, weight loss, and comorbidity resolution. We graded complications according to the Clavien-Dindo classification system. We classified patients as super-obese and non–super-obese and compared outcomes between groups. We used the two-tailed t-test and Fisher's exact test as necessary.

Results: There were 400 patients, 291 of whom were female (73%). The mean age was 44 y (standard deviation [SD] ± 9 y). The mean preoperative weight and BMI were 140 kg (SD ± 31 kg) and 49 kg/m^2 (SD ± 9 kg/m^2), respectively. There were 67 complications (16%) in total. The major complication rate was 7.2%, with one recorded death. The median length of hospital stay was 3 d, and the mean follow-up period was 1 y. A total of 170 patients (43%) were super-obese, with a mean preoperative BMI of 56 kg/m^2 (SD ± 5 kg/m^2). The mean absolute weight loss (59 *versus* 36.7 kg; $P < 0.01$) and percentage excess weight loss (58.9% *versus* 45.9%; $P < 0.01$) was significantly higher in the super-obese. The mean postoperative BMI for super-obese patients was 38.9 kg/m^2. There was no difference between groups in the incidence of major complications (8.2% *versus* 6.5%; $P = 0.56$).

Conclusion: Laparoscopic sleeve gastrectomy is safe and effective in the super-obese, with acceptable weight loss and no increase in the major complication rate.

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1. Introduction

Laparoscopic sleeve gastrectomy (LSG) was initially used as the first stage in a two-stage approach for high-risk patients undergoing bariatric surgery, but it is now commonly used as a definitive operation producing results comparable to more established procedures [1–5]. However, doubts remain about the safety and efficacy of LSG as a single-stage procedure in super-obese patients. Our previous case series demonstrated that percentage loss of excess body mass index (eBMI) (BMI points > 25 kg/m^2) was significantly less, with a higher incidence of major complications compared with non–super-obese patients [6].

The purpose of this study was to retrospectively evaluate prospectively collected weight loss outcomes and complications rates of patients who underwent LSG at our institution, as recommended by the American Society of Metabolic and Bariatric Surgery [7]. We compared the outcomes of super-obese patients with non–super-obese ones. We also reviewed the short- and medium-term data for the entire cohort to evaluate whether LSG is an effective and safe treatment option in super-obese patients.

2. Materials and methods

We performed a retrospective review of prospectively collected data for all patients who had undergone LSG at our institution from March 2007 to September 2010. The treatment and perioperative care of these patients have been detailed previously [6,8].

2.1. Preoperative characteristics and in-hospital outcomes

Preoperative characteristics collected were gender, age, ethnicity, mean preoperative weight and BMI, excess weight, and presence of obesity-related comorbidities, including type 2 diabetes mellitus, hypertension, hyperlipidemia, and obstructive sleep apnea. We recorded the length of hospital stay and 30-d complication rate. We classified complications as grade 1 to 5, according to the Clavien-Dindo classification system [9,10]. Table 1 details the definition of each grade of complication.

2.2. Outcomes

The outcomes recorded were mean time of postoperative follow-up, mean absolute weight loss, mean %EWL, and comorbidity improvement and resolution. For the purposes of this study, we defined improvement in comorbidity as a decrease in medication dose or improvement in biochemical parameters. We defined resolution as the cessation of all medications in the presence of normal biochemical parameters.

Table 1 – Definitions of complication grade according to the Clavien-Dindo Classification System [9,10].

Grade of complication	Definition
Grade 1	Deviation from the normal course of recovery not requiring pharmacological treatment or surgical or radiological intervention
Grade 2	Complications requiring pharmacological treatment
Grade 3	Complication requiring reoperation or radiological intervention
Grade 4	Admission to the intensive care unit
Grade 5	Death

2.3. Super-obese patients

After we collected data, we stratified patients into super-obese (BMI > 50 kg/m^2) and non–super-obese. We compared weight loss outcomes and complication rates between groups to evaluate the safety and efficacy of LSG in the super-obese.

2.4. Statistical analysis

We used the two-tailed unpaired t-test and Fisher's exact test to analyze parametric data as required. We created a logistic regression model to control for known potential confounders, with the independent effect of each variable subsequently evaluated. We considered results to be significant at $P < 0.05$. All data were analyzed on an intention-to-treat basis.

3. Results

There were 400 consecutive patients included in the analysis. Table 2 details the preoperative characteristics.

3.1. In-hospital outcomes

The median length of hospital stay was 3 d. In total, there were 67 complications within a 30-d follow-up period (16 %). There were 20 grade 1 complications, 18 grade 2 complications, 23 grade 3 complications, five grade 4 complications, and one

Table 2 – Preoperative characteristics.

Gender	n	%	Ethnicity	n	%	Weight characteristics	Mean	SD
Female	291	73	European	232	58	Weight (kg)	140	31
Male	109	27	Maori	88	22	BMI (kg/m^2)	49	9
			Pacific	60	15			
			Other	20	5			

The mean age of patients was 44 y (range, 20–64 y).

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