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Laparoscopic Sleeve Gastrectomy as an Initial Bariatric Operation for High-Risk Patients: Initial Results in 10 Patients

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Background: The outcomes and initial results of laparoscopic sleeve gastrectomy were evaluated.

Methods: A prospective study of the initial 10 patients who underwent laparoscopic sleeve gastrectomy (LSG) was performed. Study endpoints included operative time, complication rates, hospital length of stay and percentage of excess weight loss (%EWL).

Results: There were 5 women and 5 men, with mean age 43 years (range 31 to 52). Mean preoperative weight was 182 kg (range 125-247 kg), with mean preoperative BMI 64 (range 61-80). Indication for LSG was related to BMI in all patients. 1 patient had previous restrictive bariatric surgery. Mean operative time was 2 hours (range 1.5-2.5). No patient required conversion. There were no postoperative complications nor mortality. Median hospital stay was 7.2 days. Average %EWL and BMI at 1 year were 51% and 23 kg/m^2, respectively.

Conclusion: LSG can be safely integrated into a bariatric surgical program with good results in terms of weight loss and quality of life. LSG can be a first-stage procedure before gastric bypass or duodenal switch or a one-stage restrictive procedure if long-term results are good. LSG should be considered as a surgical option in the bariatric field.

Key words: Morbid obesity, laparoscopy, sleeve gastrectomy, bariatric surgery

Introduction

Surgery is the only proven long-term effective treatment for morbid obesity. It has been shown that bariatric surgery is feasible and safe in specialized medical centers. However, surgical treatment of high-risk patients remains a challenge even in these specialized centers. High-risk patients include super-super-obese patients with BMI >60 kg/m^2 and patients with severe co-morbities. Those patients have higher peri-operative morbidity and mortality with bariatric operations.[1,2]

Sleeve gastrectomy is a new procedure for weight loss with lower surgical risk, that is particularly suited to those patients at highest risk for surgery, either because of their medical co-morbidities or their weight.

Laparoscopic sleeve gastrectomy (LSG) has been described as a possible first-stage operation before more complex procedures such as biliopancreatic diversion (BPD) with duodenal switch or Roux-en-Y gastric bypass (RYGBP).[3] The procedure involves removing 80% of the stomach, leaving behind only a sleeve of stomach (Figure 1). This portion of stomach initially restricts the amount of food that a patient can eat and leads to initial significant weight loss. LSG is a purely restrictive bariatric operation. We report our early experience with LSG as a first-stage operation.

Figure 1. The LSG surgical procedure.

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Methods

A prospective consecutive series of 10 patients were studied to determine the safety and efficacy of LSG. In all 10 patients, the indication for LSG was super-super-obesity (i.e. BMI >60 kg/m^2). Data collected included patient demographics, past medical history, co-morbidities, weight and BMI, operative time, length of stay, and morbidity/mortality rates.

Surgical Procedure

All operations were performed laparospically using the French position (legs abducted with the surgeon standing between the patient's legs). Each procedure required 5 trocars. The dissection began on the greater curvature at 2 or 3 cm from the duodenum. The gastroepiploic vessels along the greater curvature of the stomach were divided using the Ultracision.

Once the lesser sac has been entered, the dissection continued in a cephalad direction and the lower pole of the spleen was quickly reached. At the level of the spleen, the short gastric vessels were carefully coagulated separately using the Ultracision. The dissection reached the root of the left pillar of the hiatus.

The linear stapler-cutter device with the blue load was introduced in and positioned so that the tip of the devascularized stomach was between the jaws; the tip of the instrument was oriented towards and just to the left of the visible endings of the lesser curvature vessels. Before further firing, a 32-French plastic tube was introduced perorally by the anaesthetist and advanced into the stomach.

The stapler was then positioned so that it loosely pushed the orogastric tube against the lesser curvature. Hence, the diameter of the gastric tube was at least 34 French. The instrument was fired, reloaded and the manoeuvre repeated. Finally, after five or six firings of the stapler, the greater curvature was completely detached from the stomach. A 15-mm retrieval bag was used to remove the sleeve gastrectomy specimen.

The gastric suture-line was electro-coagulated to avoid bleeding. A methylene blue test was performed to rule out staple-line leakage. A Jackson-Pratt drain was placed along the staple-line, and a nasogastric tube was left in place.

The patient was taken to the recovery room and from there back to the room. A water-soluble upper GI contrast study was performed on the second postoperative day, and oral fluids were allowed if no leakage was demonstrated. Patients were discharged after the drain was removed.

Results

Ten patients underwent LSG, 5 male and 5 female, with average age 42.7 years. All patients were defined as super-super-obese with an initial BMI of 64 kg/m^2 (range 61-80). Co-morbidities are outlined in Table1. Two patients had had abdominal surgery before the LSG: one laparotomy for appendiceal peritonitis and one laparoscopic gastric banding. In this latter patient, the indication for LSG was weight regain, and the band was removed during the LSG operation.

Mean operative time was 120 minutes (range 90-150). There were no conversions to open procedures. Mean length of stay was 7.2 days. There were no postoperative complications (no hemorrhage from the staple-line or anastomotic leakage). There were no mortalities.

Weight losses after LSG are summarized in Table 2 and Figure 2. Weight loss 6 months after LSG was 44 kg (range 38-60). Because of these good results, no patients had to undergo the second-stage operation which could be a BPD or RYGBP. However, these are preliminary results, and follow-up is short. All patients are still losing weight and did not reach the weight loss plateaus.

Table 1. Co-morbidities in 10 patients who underwent LSG

Co-morbidity	N	%
hypertension	5	50%
coronary artery disease	1	10%
sleep apnea	9	90%
asthma	1	10%
degenerative joint disease	7	70%
diabetes mellitus	3	30%
gastrooesophageal reflux disease	3	30%
stress incontinence	1	10%
dyslipidemia	4	40%

Table 2. Weight loss after laparoscopic sleeve gastrectomy

	Initial	3 mos	6 mos	12 mos
No. of patients	10	10	8	3
BMI (kg/m^2)	64	55	48	41
%EWL	0	23	41	51

Discussion

It has been proven that purely restrictive operations (i.e. laparoscopic gastric banding and vertical banded gastroplasty) are not suitable for super-obese patients because of insufficient weight loss.[4-7] Those patients require malabsorptive operations (i.e. BPD or RYGBP). However, the latter procedures are technically challenging and even more so for super-obese patients. Postoperative complications are not increased in the super-obese, but they are more often fatal.[2,8]

To avoid this, we decided like Regan et al[3] to develop a two-stage laparoscopic bariatric operation. The first stage of this procedure consists of performing a LSG. We did not experience postoperative complications with the LSG. The intragastric balloon has also been proposed as a means to induce weight loss before definitive bariatric surgery in high-risk patients.[9-11]

The two most common surgical complications after bariatric operations are staple-line bleeding and anastomotic leaks. LSG avoids anastomotic complications, but staple-line leakage and bleeding are two complications that could be encountered with LSG. Using a stapled buttressed absorbable polymer membrane could reduce these compications.[12]

LSG appears to be a safe procedure even among high-risk patients. Weight loss results have been good. They were better than those Regan et al,[3] perhaps because we constructed a narrower gastric tube (size of the intragastric bougie: 32 vs 60 French). Our results have been so good that for the moment we have not had to perform the second-stage procedure. However, follow-up and number of patients in our study are still low. Long-term results have been published with a similar operation (Magenstrasse and Mill procedure) in 100 patients,[13] where %EWL was 60% at 5 years.

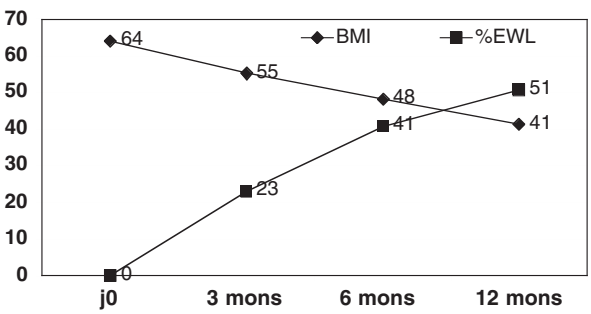

Figure 2. Percent excess weight loss and BMI evolution after laparoscopic sleeve gastrectomy.

Thus, we question if LSG is just a safe first-step procedure among super-obese patients before performing the complex operation? Is the second-step procedure always needed? Could LSG be an alternative to other gastric restrictive procedures (i.e. laparoscopic gastric banding and vertical banded gastroplasty) in all morbidly obese patients requiring bariatric surgery? Laparoscopic gastric banding and vertical banded gastroplasty are associated with significant long-term complications and poor quality of life because of gastrointestinal symptoms.[14] LSG could be an alternative, with less late complications and better quality of life. Furthermore, LSG has also been used for revisional surgery after BPD[15] and after gastric banding (one case in this study).

In two patients who were excluded from this study, we had to perform a LSG because of the presence of a gastric polyp on the great curvature at the preoperative upper GI endoscopy. Those patients were considered for RYGBP but the presence of these polyps which would have been in the bypassed portion of the stomach after RYGBP led us to perform a LSG.

Thus, for high-risk patients seeking gastric bypass or duodenal switch, it may be safer and more effective to first conduct a laparoscopic sleeve gastrectomy, and then perform a second-stage operation later. Indications for LSG among the bariatric operations should be determined by further studies.

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