Clinical Study

Laparoscopic Sleeve Gastrectomy as a Primary Operation for Morbid Obesity: Experience with 200 Patients

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Introduction. Laparoscopic sleeve gastrectomy (LSG) represents a valid option for morbid obesity, either as a primary or as a staged procedure. The aim of this paper is to report the experience of a single surgeon with LSG as a standalone operation for morbid obesity. Methods. From April 2006 to April 2011, 200 patients underwent LSG for morbid obesity. Each patient record was registered and prospectively collected. In July 2011, a retrospective analysis was conducted. Results. Patients were 128 females and 72 males with a median age of 40.0 years. Median pre-operative BMI was 49.4 kg/m². Median follow-up was 27.2 months. Median post-operative BMI was 30.4 kg/m². Median %excess weight loss (%EWL) was 63.6%. Median post-operative hospital stay was 4.0 days in the first 84 cases and 3.0 days in the last 116 cases. Six major post-operative complications occurred (3%): two gastric stump leaks (1%), three major bleedings (1.5%) and 1 (0.5%) bowel obstruction. One case of mortality was registered (0.5%). To date only 4 patients are still in the range of morbid obesity (BMI > 35 kg/m²). Conclusions. Laparoscopic sleeve gastrectomy is a formidable operation in the short-term period. Median %EWL in this series was 63.6% at 27.2 months follow-up.

1. Introduction

Obesity is a major worldwide problem in public health, reaching epidemic proportions in western countries. Bariatric surgery has been shown to be more effective in the management of morbid obesity, compared to medical treatments in terms of weight loss and amelioration of comorbidities [1].

Laparoscopic sleeve gastrectomy (LSG) represents a valid option for morbidly obese patients, either as a primary or as a staged bariatric procedure. Initially, LSG was conceived as a restrictive component of the biliopancreatic diversion and duodenal switch. Later on, LSG has been proposed as a step procedure in high-risk patients, followed by a second step Roux-en-Y gastric bypass or biliopancreatic diversion with duodenal switch [2]. Recently, LSG has been proposed as a standalone bariatric procedure. Excess weight loss and remission of comorbidities have been reported to take place in a frequency comparable with other well-established procedures [3].

The experience at our institution with LSG as a primary operation for morbid obesity started in 2006. The aim of this work is to report the five-year experience of a single surgeon single center with LSG as a sole operation for morbid obesity.

2. Methods

At our Institution, the bariatric surgery program started in 1996, with a laparoscopic gastric banding. After a 10-year experience with laparoscopic Roux-en-Y gastric bypass, gastric banding, biliopancreatic diversion with duodenal switch, and several bariatric reoperations, the first LSG was performed in April 2006. From April 2006 to April 2011, 200 patients were submitted to LSG as a primary procedure for morbid obesity.

Patients were studied preoperatively with a multidisciplinary workup including specialist counseling (surgery, endocrinology, internal medicine, psychiatry, anesthesia), gastrointestinal endoscopy, and complete performance status evaluation. Patients were well informed about the surgical procedure, with all potential advantages and possible complications and side effects. Indications for LSG were the following conditions: BMI over 60 kg/m²...
in high-risk patients, BMI between 50 and 60 kg/m² in nondiabetic patients, BMI between 40 and 50 kg/m² in patients refusing a complex procedure like Roux-en-Y gastric bypass, patients with severe gastric inflammatory disease and H. pylori infection, patients with previous abdominal surgery involving the intestines, and young patients refusing gastric banding. Diabetic patients were first selected for Roux-en-Y gastric bypass and then to LSG if they refused the gastric bypass. Specific contra-indications, apart from the general contraindications to bariatric surgery, were severe and documented gastroesophageal reflux disease and previous gastric surgery.

Standard surgical technique (Figure 1) was as follows: the patient was placed in a supine position on the operating table with his arms extended in abduction and legs opened, in reverse Trendelenburg position with a 10° tilt. The surgeon stood between the legs with the assistant on the left side of the patient, and the cameraperson to the patient’s right. Abdominal insufflation was set at 15 mmHg. Trocars were placed as follows: a 10 mm trocar (T1) 20 cm below the xiphoid process for the 30° optical system, a 5 mm trocar (T2) on the left anterior axillary line, a 12 mm trocar (T3) on the left mid-clavicular line just between the first and the second trocars, a 12 mm trocar (T4) on the right midclavicular line, and a 5 mm trocar (T5) below the xiphoid process. Using a dissecting coagulator (Ultracision, Ethicon Endo-Surgery), the greater curvature of the stomach was mobilized at a point 3 cm proximal to the pylorus. The lesser sac was entered, and staying close to the wall of the stomach, the greater curvature ligaments (gastrosplenic and gastrocolic) were divided all the way up to the angle of His.

We paid particular attention to the identification and mobilization of the angle of His with exposure of the left crus of the diaphragm to delineate the gastroesophageal junction and to facilitate complete resection of the gastric fundus. Retrogastric adhesions were taken down with the Ultracision device to allow for complete mobilization of the stomach, to eliminate any redundant posterior wall of the sleeve, and to exclude the fundus from the gastric sleeve.

After a complete mobilization of the stomach was reached, a 40 Fr orogastric tube was inserted transorally into the pylorus and placed against the lesser curvature. This helped to calibrate the size of the gastric sleeve, prevent any constriction at the gastroesophageal junction, and provide a uniform shape to the entire stomach.

Gastric transection by a cutting stapler (recently, a Echelon Flex, Ethicon Endo-Surgery) began at a point 3 cm proximal to the pylorus, leaving the antrum and preserving gastric emptying. The stapler was fired consecutively along the length of the orogastric tube until the angle of His was reached. Care was taken not to narrow the stomach at the angularis. We considered important to inspect the stomach anteriorly and posteriorly to ensure no redundant posterior stomach.

The entire staple line was inspected for bleeding and tested for leak. The patient was placed flat, and an atraumatic clamp was placed near the pylorus. The integrity of the staple line was tested by insufflating air under saline and infusing 30–60 cm³ of methylene blue into the remaining stomach.

Staple line reinforcement was performed using various techniques: (1) the stapler was supported by the application of the Gore Seamguard (W. L. Gore & Associates, Flagstaff, AZ, USA) before the introduction of the device in the abdomen; (2) the staple line was reinforced by seroserosal running sutures using absorbable material from the last firing of the stapler towards the first one; (3) the entire staple line was covered by Floseal, a thrombin gelatin matrix, gently squeezed over the entire staple line. The resected stomach was extracted through the periumbilical incision at the end of the procedure. At the beginning of the experience a nasogastric tube and a suction drain were left in place; recently, no drains and nasogastric tube were used. The fascial defects were closed with a figure of eight 2/0 nonabsorbable suture to prevent port site hernia.

A gastrografin swallow test was performed on the first postoperative day (Figure 2), and a liquid diet was started. Patients were discharged from the hospital as soon as they could walk, drink, with no fever or any clinical complication. Patients were given a liquid diet for two weeks and followed up in our outpatient clinic for years. Follow-up was performed by an endocrinologist, a nutrition expert, surgeon, and psychiatrist. The frequency of each outpatient visit was every three months for the first year and every six months for the following years.

Each patient record was registered by the surgical team and prospectively collected. In July 2011, a retrospective analysis was conducted and results are hereby presented.

3. Results

From April 2006 to April 2011, 200 patients underwent a laparoscopic sleeve gastrectomy as a primary operation for morbid obesity. They were 128 females and 72 males with a median age of 40.0 years (range from 16 to 64
Bariatric surgery is the only evidence-based approach to sustainable weight loss, improving comorbid disease and survival in morbidly obese patients.

Laparoscopic sleeve gastrectomy is a formidable operation in terms of weight loss in the short and midterm period (5 years). As a two-stage procedure, LSG was initially performed using a 60-French bougie with a 33% excess weight loss at 11 months [4]. Since then surgeons began using LSG as a primary procedure using smaller-sized bougies with greater % EWL (62%) [5]. In a recent systematic review, weight loss ranged from 33 to 85% of excess weight in patients submitted to LSG [6]. The durability of LSG at 5 years has been clearly demonstrated [7]. Mean % EWL in this series was 64.4% at 28.2-month followup. Clinical long-term results of LSG will emerge in the future when most of the authors report their experience with primary LSG over a period superior to 10 years. To date, we must conclude that LSG is an excellent weight loss operation in the short and mid-term period. In addition, LSG seems to have the potential to be an effective standalone procedure for weight loss in morbidly obese patients.
was a high-risk patient with a BMI of 58 kg/m² with severe comorbidities. Gastric leak probably occurred one week after the operation and was treated by reoperation with suture of the defect in the second case.

Some considerations must be done about this case. He was a high-risk patient with a BMI of 58 kg/m² with severe comorbidities. Gastric leak probably occurred one week after the operation and was successfully managed by laparoscopic drainage and total parenteral nutrition with complete healing of the gastric fistula. The patient is doing well at two-year followup. Unfortunately, the other patient with a greater leak died two months after the operation.

In this series in 200 consecutive cases, 6 major complications occurred (3%). Of the two gastric stump leaks, one was diagnosed two weeks after the operation and was successfully managed by laparoscopic drainage and total parenteral nutrition with complete healing of the gastric fistula. The patient is doing well at two-year followup. Unfortunately, the other patient with a greater leak died two months after the operation.

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In conclusion, LSG is a safe and effective primary treatment for morbid obesity at mid-term followup. In the present single surgeon single center experience, LSG is associated with excellent weight loss results with a median followup of 27.2 months in a various population of morbidly obese patients. Long-term studies are necessary in order to assess the exact role of sleeve gastrectomy in the world of bariatric surgery.

Conflict of Interests

The author declares that he has no conflict of interests.

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