Laparoscopic sleeve gastrectomy for morbid obesity
Our initial experience

Vittorio Lombardo*, Roberto Baratta**, Giorgio Giannone*

Azienda Ospedaliera di Rilievo Nazionale e di Alta Specializzazione, Ospedale Garibaldi-Nesima, Catania, Italy
*Division of Surgical Oncology
**Division of Endocrinology

Laparoscopic sleeve gastrectomy for morbid obesity. Our initial experience

AIM OF THE STUDY: The outcomes and initial results of laparoscopic sleeve gastrectomy (LSG) were evaluated at our Institution.

METHODS: A retrospective analysis of the initial 6 patients who underwent laparoscopic sleeve gastrectomy (LSG), between November 2006 and May 2008, was performed. The aim of this study was to assess the safety and short-term efficacy of LSG as a treatment option for weight reduction. Data collected included operative time, postoperative complications, length of hospital stay and degree of weight reduction.

RESULTS: Our 6 morbidly obese patients, who underwent LSG had an average preoperative BMI 58.2 kg/m². There were 2 women and 4 men, with mean age 45 (range 41 to 55 years). Indication for LSG was related to BMI, high perioperative risk, and body habitus for five patients. One patient underwent LSG as an alternative to laparoscopic adjustable gastric banding (LAGB). Mean operative time was 2 hours (range 1.5-2.5). We had no conversion to open procedure. There were neither postoperative complications nor mortality. Median hospital stay was 2 days. For our first 4 patients Average %EWL and BMI were 24 % and 44.5 kg/m² at 6 months and % 31.2 and 41.2 kg/m² at 1 year respectively. No patients have subsequently undergone a second-stage procedure.

CONCLUSIONS: In our initial experience, LSG is a safe and effective treatment option for the high-risk and super super-obese patient. Follow-up will be necessary to evaluate long-term results when performed as single stage operation for morbid obesity.

KEY WORDS: Bariatric surgery, Ghrelin, Glucagon-like peptide 1, Morbid obesity, Peptide YY, Sleeve gastrectomy, Surgery, Weight loss.

Introduction and Background

In recent years there has been a strong interest in the surgical treatment of morbid obesity in concomitance with the epidemic of obesity. Bariatric surgery proved effective in providing weight loss of large magnitude, correction of comorbidities and excellent short-term and long-term outcomes, decreasing overall mortality and providing a marked survival advantage.

Laparoscopic Roux-en-Y gastric bypass (LRYGBP) and laparoscopic adjustable gastric banding (LAGB) are the most commonly performed surgical procedures for weight reduction in the United States ². Super-superobese patients (body mass index >60 kg/m²) present a special subgroup among the obese population due to the higher incidence of severe comorbidities and increased technical difficulties in perioperative management ³. The optimal surgical approach still remains controversial.

Laparoscopic biliopancreatic diversion (LBPD) with distal gastrectomy (DG), Laparoscopic Roux-en-Y gastric bypass (LRYGBP) and Laparoscopic sleeve gastrectomy (LSG) with duodenal switch (DS) are good options in these super-superobese patients ⁷.
The Laparoscopic sleeve gastrectomy (LSG) is being performed more frequently by bariatric surgeons. LSG as the sole bariatric operation has been reported for high-risk super-obese patients or as first-step followed by Roux-en-Y gastric bypass (RYGBP) or duodenal switch (DS) in super-superobese patients. There are hormonal modifications induced by LSG that differ from those found after a purely restrictive procedure, involving Ghrelin, Glucagon-like peptide 1, Peptide YY and oxyntomodulin.

Patients and methods

Patients
From November 2006 to May 2008, 6 patients underwent laparoscopic sleeve gastrectomy (LSG). There were 2 women (33.3%) and 4 men (66.6%), with a mean age 45 (range 41 to 55 years).
Average preoperative BMI was 58.2 kg/m² (Tab. I). 1 patient, who underwent LSG as an alternative to laparoscopic adjustable gastric banding (LAGB), had a preoperative BMI 32.
Four (4) patients previously had a temporary use of the BioEnterics Intragastric Balloon (BIB): 1 patient lost 18 kg, 1 patient lost 8 kg and 2 patients had failed treatment. In 5 patients the body habitus was characterized by an enormous abdominal wall fat distribution. Patient’s comorbidities included sleep apnea in 5 patients (83%), hypertension in 3 patients (50%), NIDDM in 3 patients (50%) and hypertriglyceridemia in 1 patient (16%).

Technique
Patient is given I.V. antibiotic prophylaxis and low-molecular weight heparin 40 mg in the holding area. The procedure is performed with the patient supine, with a foot board. Foley catheter and Orogastric tube after intubation.

Ports placement
1. 15 mm Port
Placed about 4 cm to the left of midline between xiphoid and umbilicus just above the level of the 15-mm port. Under direct vision.

<table>
<thead>
<tr>
<th>Study</th>
<th>No. Pts</th>
<th>WL Loss %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voel linger (Gagner) 2002</td>
<td>24</td>
<td>23% at 3 m; 32% at 6 m</td>
</tr>
<tr>
<td>Elariny 2002</td>
<td>30</td>
<td>20lbs at 1 m</td>
</tr>
<tr>
<td>Crookes 2003 48Fr bougie, open</td>
<td>14</td>
<td>47% at 1 y</td>
</tr>
<tr>
<td>Cottam (Schauer) 2003 48Fr bougie, lap</td>
<td>102</td>
<td>46% at 1 y</td>
</tr>
<tr>
<td>Johnston 2003 M&amp;LM, 32 Fr bougie, open</td>
<td>230</td>
<td>63% at 1 yr</td>
</tr>
<tr>
<td>Adamo 2003 32 Fr bougie, open/lap</td>
<td>25 VG 6 M&amp;LM</td>
<td>63% at 1 yr; 73% at 18m</td>
</tr>
<tr>
<td>Lee 2004 32 Fr bougie</td>
<td>68</td>
<td>44% at 6 m; 55% at 1 y</td>
</tr>
</tbody>
</table>

2. 5 mm Port
Placed just below left costal angle as laterally as possible in the sterile field. Under direct vision.

3. 12 mm Port
Placed 2 cm to the right of the midline about halfway between the xiphoid and umbilicus. This is the first port we introduce. We usually use an Optiview (12 mm) first with a 10mm/zero degree scope through the port. Otherwise, CO₂ pneumoperitoneum with Verres needle and then trocar placement.

4. 5 mm Port
Placed to the left of the 15 mm port and at 45 degree angle between that port and the costal margin. Under direct vision.

5. 10 mm Port
Placed laterally just below the right costal angle. Under direct vision.
omentum with a sealer and divider tool. Dissection is started in the greater curvature at a point located 6 cm from the pylorus and continued to the angle of His. Once the greater curvature and the short gastric vessels are completely mobilized, the orogastric tube is removed and an esophageal dilator (Bougie) 40 Fr. is inserted transorally. The bougie size does correlate with postoperative weight loss (Tab. III). A sleeve gastrectomy is performed using a laparoscopic linear cutting stapler (green load). We carefully staple the stomach right to the bougie to allow an 80% gastrectomy and a linear gastric tube. We reinforce the suture line with 3-0 PDS intracorporeal sutures or endostich. We test the gastric tube under saline insufflating the stomach with air via an orogastric tube. The specimen is taken out through the 15mm port site. The liver retractor and the other ports are removed and closed with 2-0 PDS sutures. The skin is closed with 4-0 intradermic absorbable sutures.

Postoperative care

During the first 24 hours after the operation, all patients receive only intravenous fluids, morphine PCA and low molecular weight heparin. On postoperative day one, the patients are encouraged to ambulate and start to take liquids. Stage 1 diet, according to our Bariatric diet protocol. On postoperative day 2, the I.V. fluid and morphine PCA are discontinued once the patients tolerate a Stage 2 diet, according to our Bariatric protocol and discharged home on oral pain medication prn. Our surgical follow up is at one week, one month and every three months thereafter, for the first year, then yearly. The patient will see an endocrine and dietician at our Institution 2 weeks postoperatively and follow up with them.

Results

Mean operative time was 2 hours (range 1.5-2.5). We had no perioperative complications and no mortalities. Length of stay was 2 days in all patients. Weight (Kg) and BMI: All patients were followed for at 3 month intervals for the first year (Tab. III). Postoperatively, all six patients presented minimal abdominal pain. All of them reported great reduction in total daily ingestion and early and prolonged satiety. All patients returned to their regular activities within 4 weeks postoperatively. At one year follow-up, the comorbidities detected before surgical treatment showed clinical resolution or improvement.

Two patients did not return for their regular follow-up at our Institution for geographic reasons. At one year follow-up visit, the other four patients had no complaints. % EWL at 3, 6, 9, 12 month follow-up is shown in Tab. III

Discussion

Laparoscopic sleeve gastrectomy (LSG) as the sole bariatric operation has been reported for high-risk superobese patients or as first-step followed by Roux-en-Y gastric bypass (RYGBP) or duodenal switch (DS) in super-superobese patients. Laparoscopic Roux-en-Y gastric bypass (LRYGBP) and laparoscopic adjustable gastric banding (LAGB) are the most commonly performed surgical procedures for weight reduction in the United States.

Super-superobese patients (body mass index >60 kg/m² pre-
sent a special subgroup among the obese population due to the higher incidence of severe comorbidities and increased technical difficulties in perioperative management. The optimal surgical approach still remains controversial. Purely restrictive procedure like vertical banded gastroplasty (VBG) and laparoscopic adjustable gastric banding (LAGB) have had disappointing result in super-superobese patients (body mass index >60 kg/m²), particularly in the long-term. Laparoscopic sleeve gastrectomy seems a good option as the first step of a staged approach in high-risk and super super-obese patients (1, 4, 8); the second procedure can be done when the weight loss reaches a plateau, in the case of weight regain or simply when the patient can undergo more safely the second step regardless of weight loss stabilization or regain. The possible mechanisms that account for the limited weight loss or weight regain include a technical problem, such as an incomplete resection of the fundus of the stomach where the ghrelin producing cells are located. For this reason there is a tendency to use smaller calibre calibration tubes. Gastric dilatation has been evoked as being responsible for poor weight loss after LSG with or without DS. As a matter of fact, LSG may have a limited potential for weight loss as do most restrictive procedures. Further studies are needed to evaluate long-term effects on weight loss to definitely consider LSG a single stage procedure. We inform our patients about the risks and benefits of the procedure and anticipate the possibility of a second stage operation in case of weight regain. To date, none of our 6 patients required any further intervention. LSG seems a safe operation for the high-risk and super super-obese (body mass index >60 kg/m²) patients and an alternative for the super obese (BMI 50-60) and morbid obese (BMI 35-40) patients.

Conclusion

Laparoscopic sleeve gastrectomy (LSG) seems a safe alternative treatment option for the high-risk and super super-obese patient and as a one stage procedure for the morbidly obese patients. Our initial experience is very limited and further studies are necessary to evaluate its long-term effects.

References