# Laparoscopic Sleeve Gastrectomy

## Surgical Technique and Perioperative Care

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**KEYWORDS**

• Laparoscopic sleeve gastrectomy • Bariatric surgical technique • Perioperative care

**KEY POINTS**

- Laparoscopic sleeve gastrectomy (LSG) has demonstrated durable long-term weight loss and metabolic improvements in obese patients.
- It has proved a safe procedure with a low complication rate in appropriately selected patients.
- Adherence to key surgical tenets is critical for safe and effective patient outcomes.

**Video content accompanies this article at http://www.surgical.theclinics.com**

### INTRODUCTION

Bariatric surgery has continued to evolve over the past several decades in terms of technique and indication not only for weight loss but also as an effective treatment of type 2 diabetes mellitus and metabolic syndrome abnormalities in general.[1] The STAMPEDE (The Surgical Therapy and Medications Potentially Eradicate Diabetes Efficiently) trial demonstrated bariatric surgery as superior to the best aggressive medical treatment in terms of durable weight loss and improvement of diabetes.[2] Although LSG is largely viewed as a restrictive procedure created for weight loss in patients with morbid obesity, it also has been beneficial in treating metabolic derangements. It has evolved into an increasingly popular procedure compared with the Roux-en-Y gastric bypass and adjustable gastric banding due to its less complex surgical technique and comparable outcomes to Roux-en-Y gastric bypass with regard to durable weight loss and improvement in metabolic syndrome abnormalities. A laparoscopic adaptation of

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the Magenstrasse and Mill procedure, LSG was initially created as the first step in a 2-part procedure (biliopancreatic diversion with duodenal switch) for supermorbid obese patients in whom traditional bypass surgery was thought too high risk based on their associated comorbidities. The same 2-stage approach has also been studied for Roux-en-Y gastric bypass.[3,4] The goal was to initiate surgical weight loss, thereby improving the patient candidacy for a more complex bypass procedure in the future. The surgery consisted of restrictive gastrectomy, removing up to 80% of the stomach along the greater curvature, with subsequent revision to duodenal switch or Roux-en-Y anatomy after appropriate weight loss had occurred to reduce surgical risk.[5] The sleeve gastrectomy has since been found to have comparable results to other weight loss procedures, including the Roux-en-Y gastric bypass, and has become an increasingly popular option among both surgeons and patients. Advantages of laparoscopic sleeve gastrectomy over the roux-en-Y gastric bypass includes acceptable use in patients with inflammatory bowel disease, patients who are transplant candidates (liver and kidney), and patients with complex prior abdominal surgery or complex abdominal wall hernias. It is also a pylorus-sparing procedure that eliminates the risk of dumping syndrome. Finally, there is no increased risk of marginal ulceration or internal hernias compared with traditional bypass surgery. It is not, however, considered an antireflux procedure. Therefore, Barrett esophagus may be a contraindication. The American Society of Metabolic and Bariatric Surgery has published position statements regarding the use of sleeve gastrectomy as a bariatric procedure, establishing its safety, efficacy, and durability.[6]

An expert consensus statement published in 2012 by Rosenthal and colleagues[7] addressed the key components of surgical technique, indications for surgery, and postoperative management as well as management of complications. This article describes surgical technique for LSG as well as the preoperative work-up and perioperative management of patients undergoing the procedure at the authors' institution.

## PREOPERATIVE PLANNING

The preoperative work-up for bariatric surgery typically begins several months prior to the procedure. Most patients in need of bariatric surgery have multiple obesity-related comorbidities, which require cardiopulmonary work-up and clearances, including psychological, nutritional, and sleep study evaluation.

All patients receive extensive preoperative education from a multidisciplinary team specializing in bariatric surgical patients, including bariatric nurse coordinators, dieticians, nutritionists, and exercise physiologists. Standard biochemical blood work is obtained, including complete blood cell count, chemistry panel, liver and thyroid panels, and evaluation for any vitamin deficiencies.

Preoperative dietary modifications with evidence of discipline and the ability to sustain moderate weight loss are essential. For some high-risk patients, it is the authors' preference to place patients on a liquid low-calorie diet prior to surgery to enhance weight loss.[8] Preoperative weight loss not only improves obesity-related comorbidities but also improves visualization during surgery by decreasing intra-abdominal adipose tissue and decreasing liver volume. The authors previously described a significant reduction in both visceral and subcutaneous adipose tissue as well as reduction of liver volume after an average of 9 weeks on a low-calorie liquid diet.[9] To foster dietary compliance prior to surgery, patients are counseled in monthly dietary sessions with a certified dietician.

Cardiopulmonary work-up includes an adenosine stress test on patients older than 40 years with a history significant for coronary artery disease and associated risk