

# Morbid Obesity Treated With Laparoscopic Band Surgery Over a Sleeve Gastrectomy

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## Introduction

Bariatric surgery is the most successful weight management modality.<sup>1</sup> Laparoscopic adjustable gastric band (LAGB) surgery is one bariatric surgical procedure developed for weight reduction in patients with morbid obesity, defined as a body mass index (BMI) greater than 35 kg/m<sup>2</sup> and comorbidities or a BMI greater than 40 kg/m<sup>2</sup>.<sup>2</sup> In this report, we highlight a patient who had undergone laparoscopic sleeve gastrectomy (SG) in 2016, achieved some weight loss but regained weight after 4 years, and then underwent LAGB placement over the SG in 2020.

## Patient Case

In 2016, a 62-year-old Black woman presented to our clinic with weight concerns. She had weighed 117 kg with a BMI of 47 kg/m<sup>2</sup> and had a medical history significant for type 2 diabetes, hypertension, and chronic lower back pain

radiating to her thighs bilaterally. She also had a surgical history of cholecystectomy and cesarean sections.

The patient had attempted to lose weight by dieting, but no significant changes had occurred. The patient had also reported restricted daily functionality because of weight gain. Therefore, she was evaluated for weight loss surgery via laparoscopic sleeve gastrectomy (SG).

## Laparoscopic Sleeve Gastrectomy

Results of a preoperative review of systems had revealed mild bradycardia, moderate tenderness in the lumbar spine, and bilateral knee tenderness. The patient had denied abdominal pain, chest pain, headaches, and chest palpitations. Her vital signs were within normal limits, and no other significant changes were noted upon examination.

Results of a preoperative screening revealed a normal complete blood cell count with differential, normal comprehensive

metabolic panel, normal urinalysis, and normal thyroid functioning. An upper gastrointestinal series—a biphasic examination in which effervescent granules are used with the fluoroscopy time of 0.6 min—with air contrast was performed. The esophagus, stomach, and duodenum appeared normal, and no hiatal hernias were noted. The mucosal pattern and duodenal loop appeared normal as well. The patient was subsequently cleared for the procedure.

In preparation for the procedure, the patient was started on intravenous cefoxitin, 2 g, and subcutaneous enoxaparin, 30 g. General anesthesia was administered to the patient in an operative suite, and she was prepped and draped.

A pneumoperitoneum was noted in the upper left quadrant, and the abdomen was opened via scalpel. Two epigastric and 2 right upper quadrant ports were placed percutaneously under direct vision, as well as a liver retractor. A harmonic scalpel was used to take down the greater curve. The retrogastric space was identified, the angle of his was dissected, and short gastritis was taken down. The stomach was stapled with tissue reinforcement, and a 42-French bougie was put in place. The staple line was carried to the angle of his. Meticulous hemostasis was assured, and the greater curvature was retrieved through the 15-mm port site. The Jackson-Pratt drain was left in the abdomen and brought through a port site. The liver retractor was removed, and all ports were removed under direct vision.

After the procedure, no signs of complications or excessive bleeds were noted. At her first postoperative follow-up visit, a diagnosis of morbid obesity remained.

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Diet modifications were restricted to clear and full liquids. At the 1-week postoperative follow-up visit, the patient had denied new concerns and was advised to consume protein shakes. At this visit, the patient had weighed 108 kg, with a weight loss of 8.7 kg, but was still considered morbidly obese with a BMI of more than 40 kg/m<sup>2</sup>. The surgical site was intact and dry, with no signs of infection and a soft nontender abdomen.

At the 2-week follow-up visit, signs of proper recovery at the surgical site were noted. A high-protein, low-fat, low-carbohydrate diet was recommended. After which, the patient was monitored closely for weight loss and changes in diet with monthly follow-up visits for 4 years. However, the patient was unable to reach her goal weight of 86 kg and noted a stagnation of weight loss after 4 years. The patient's BMI had been in the obese range throughout the follow-up period, rendering the SG procedure not completely successful.

### Laparoscopic Adjustable Gastric Banding

At a follow-up visit in 2019, the patient had expressed concern about her regained weight. The patient's weight was 112 kg at that time, with a BMI of more than 40 kg/m<sup>2</sup>, which revealed an unchanged diagnosis of morbid obesity despite the procedure in 2016. Because of the patient's concern about her weight loss regression, placement of a laparoscopic band over the SG was proposed. The patient accepted, and the procedure was performed in 2020.

The patient's preoperative review of systems revealed similar findings to those noted in 2016, with additional diagnoses of rheumatoid arthritis and gastritis. Results of the preoperative screening revealed normal findings as were noted in 2016. The upper gastrointestinal series conducted at this time revealed a hiatal hernia. The patient was subsequently cleared for the procedure.

Pneumoperitoneum was obtained periumbilical, and a port was placed.

The abdomen was explored, and 2 upper quadrant ports were placed percutaneously, as well as a liver retractor. There were few adhesions related to the previous sleeve. However, there was an anterior hiatal hernia, which was dissected anteriorly and was completely reduced. Next, the pars flaccida was opened with a son incision, and the laparoscopic band passer was passed behind the stomach and out the angle of his. The band was then introduced through the 15-mm left upper quadrant port, pulled into position, and secured to itself. The band was further fixated with stomach-to-stomach sutures as needed, and the tubing was pulled through the left upper quadrant port site. Ports were removed under direct vision, and the laparoscopic band port was attached to the tubing. It was then secured in a pocket on the fascia at the left upper quadrant incision. It was sutured tightly and quickly to the fascia. Antibiotic irrigation was completed, and the wound was closed in layers.

No signs of complications were noted postoperatively. Diet instructions were restricted to clear and full liquids for 6 weeks postoperatively. A radiography scan of the upper gastrointestinal tract, kidneys, ureters, and bladder was conducted. Anteroposterior and left posterior blank views of the esophagus were conducted via fluoroscopy. Based on the results of these imaging studies, no evidence of a leak or free abdominal air was noted. There was no evidence of obstruction. The patient had reported pain at the port site, for which application of an ice pack, time to heal, and close monitoring was advised.

After 6 weeks of a full liquid diet, a high-protein, low-fat, low-carbohydrate diet was encouraged. At that time, the patient had lost 6.8 kg but was still considered morbidly obese with a BMI of more than 40 kg/m<sup>2</sup>. It was noted that the first adjustment to the band would be made at 6 weeks postoperatively. At her 3-week follow-up visit, the patient was monitored and evaluated closely. The patient was also counseled to understand the

long-term effects of a laparoscopic band placement over an SG. She is currently following the course as instructed.

### Discussion

Bariatric surgery is the most successful weight management modality.<sup>1</sup> LAGB is one of the components of bariatric surgery developed for weight reduction in patients who have a BMI greater than 35 kg/m<sup>2</sup> and comorbidities or a BMI greater than 40 kg/m<sup>2</sup>.<sup>2</sup> LAGB is a procedure performed via small incisions in which a silicone band is placed around the stomach's upper segment to create a small gastric pouch.<sup>3</sup> The band has resistance, which can be altered by adding or removing fluid via an access port in a balloon around the band. These alterations aid in slowing the movement of food from the stomach's pouch to the lower segment of the stomach. LAGB has the lowest mortality rate of all bariatric procedures and is most favored by patients who desire no anatomic alteration.<sup>4</sup> Although, the popularity of this procedure has been declining from 24.4% of all bariatric procedures in 2003 to 17.8% in 2011.<sup>5</sup> The decline may be because of the procedure's relatively modest amount of expected weight loss, coupled with complications like stomal obstruction, pouch dilation, band erosion, contamination of the band, incisional hernias, port-tubing disconnections, port infections, band slippage or prolapse, port or tubing malfunction, leakage at the port site tubing, esophageal dilatation, and esophagitis.<sup>6</sup> Almost 50% of patients will need surgical revision or removal of the band.<sup>6</sup>

Laparoscopic SG, another bariatric surgical procedure, was initially regarded as a purely restrictive procedure because it reduces stomach volume. It also encourages weight loss by inducing anorexia by removing most ghrelin-producing cells located in the gastric fundus.<sup>7</sup> In 2009, SG was the most common weight loss procedure in the United States because of significant advantages such as low complication and mortality rates, the simplicity of the procedure, preservation

of the structures of the stomach, and not utilizing foreign material inside the body.<sup>8</sup> With increasing experience, several complications reported with SG procedures include bleeding from the gastric or short gastric vessels during dissection of the greater curve, narrowing or stenosis creating gastric outlet obstruction, and gastric leaks.<sup>9</sup> Gastric leaks are the most severe complication and can occur in up to 5.3% of patients.<sup>6</sup>

In a study of 1020 patients who underwent SG, the researchers found that the mean percentage of excess weight loss (%EWL) was 86% after 1 year, 63% after 3 years, 61% after 5 years, and 52% after 8 years.<sup>10</sup> The study was interpreted into an overall success rate (defined as %EWL > 50%) of 92% after 1 year, 89% after 3 years, 75% after 5 years, and 73% after 8 years.<sup>10</sup>

The gastric sleeve could expand over time, and patients would lose resistance, which can cause weight regain. This has led to the discovery of a new method where a gastric band is placed over a vertical SG to aid in further weight loss and reduce comorbidities.<sup>11</sup> Positioning a gastric band around the upper sleeve decreases food intake volume and prevents dilatation of the gastric sleeve distal to the band in the long term.<sup>12</sup>

In a study conducted at the Center for Surgical Weight Loss at the University of Cincinnati, researchers evaluated 27 patients who had undergone an SG procedure and then a gastric band was placed 6 cm from the gastroesophageal junction.<sup>13</sup> The results were compared with those of 54 patients who had undergone a Roux-en-Y gastric bypass procedure; patients were matched for confounding factors like sex, age, and initial BMI.<sup>13</sup> Results showed that all 27 patients had improvements in their comorbidities after the band was placed over the SG, similar to the control group. Results were almost identical to patients who had undergone a Roux-en-Y gastric bypass procedure.<sup>13</sup>

## Conclusion

Placing a gastric band over an SG is a new technique that is beneficial

for patients with morbid obesity and provides additional weight loss benefits, but further studies are needed to evaluate the long-term adverse effects of such a procedure. As such, our patient is being monitored closely by the surgeon and nutritionist to ensure successful and healthy weight loss maintenance.

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