

# The Surgical Management of Achalasia in the Morbid Obese Patient

P. Marco Fisichella · George Orthopoulos ·  
Amy Holmstrom · Marco G. Patti

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## Abstract

**Introduction** Morbid obesity and achalasia may coexist in the same patient. The surgical management of the morbidly obese patient with achalasia is complex, and the most effective treatment still remains controversial. The goal of our report is to provide our evidence-based approach for the surgical management of the patient with achalasia and morbid obesity.

**Results** Three main surgical approaches have been used for the concomitant treatment of morbid obesity and achalasia: 1) a laparoscopic Heller myotomy and a laparoscopic Roux-en-Y gastric bypass (LRYGB); 2) a laparoscopic Heller myotomy with bilio-pancreatic diversion; and 3) a laparoscopic Heller myotomy with a sleeve gastrectomy. Our approach of choice is the first one discussed, that is the laparoscopic Heller myotomy with a LRYGB, as this approach can provide excellent relief of symptoms and control of reflux while at the same time treating obesity and its comorbidities.

**Conclusions** Achalasia and obesity can coexist, albeit infrequently. A laparoscopic Heller myotomy with a LRYGB allows the simultaneous treatment of both diseases. When a morbidly obese patient with achalasia chooses to have a myotomy alone and not a LRYGB, a thorough discussion of the risks and benefits should occur and the autonomy of the patient's decision-making should be respected.

**Keywords** Obesity · Morbid obesity · Esophageal achalasia · Heller myotomy · Dor fundoplication · Roux-en-Y gastric bypass

## Introduction

The relationship of esophageal diseases with obesity has gained considerable attention in the past few years. Epidemio-

logic studies have shown that obesity is frequently associated with esophageal motility disorders. For instance, Hong et al. detected abnormal manometric findings in 54 % of morbidly obese patients with a mean BMI of 50.1 kg/m<sup>2</sup>.<sup>1</sup> Because the most common symptom of achalasia is dysphagia, which usually leads to some degree of weight loss, it may seem counter-intuitive that patients with achalasia might be obese. However, current data show that achalasia may coexist in morbidly obese patients with a prevalence of 0.5–1 %.<sup>2,3</sup> The surgical management of the morbidly obese patient with achalasia is complex, because it should aim to alleviate the dysphagia and to promote weight loss and resolve the co-morbid conditions. For these reasons, the most effective treatment of these patients is still controversial. The goal of our report is to describe our preferred and evidence-based approach to the patient with achalasia and morbid obesity using two clinical-case scenarios.

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Submitted by invitation by Drs. Charles Yeo and Jeffrey Matthews

P. M. Fisichella (✉)  
Department of Surgery, Boston VA Healthcare System,  
Harvard Medical School,  
1400 VFW Parkway, West Roxbury, MA 02132, USA  
e-mail: marco6370@yahoo.com

G. Orthopoulos · A. Holmstrom  
Boston University Medical Center, Boston, MA, USA

M. G. Patti  
Department of Surgery and Center for Esophageal Diseases,  
University of Chicago Pritzker School of Medicine,  
Chicago, IL, USA

## Clinical Case Scenario 1

A 45-year-old morbidly obese female with a BMI of 45, hypertension, diabetes mellitus, asthma, and sleep apnea has been complaining for about 3 years of dysphagia,

regurgitation, and postprandial cough. A barium esophagogram showed smooth distal esophageal narrowing; an upper endoscopy showed retained food in the esophagus and ruled out a peptic stricture or cancer; and an esophageal manometry showed type II achalasia according to the Chicago classification.

In this case, our approach of choice consists in performing a laparoscopic Heller myotomy in conjunction with a laparoscopic Roux-en-Y gastric bypass (LRYGB). In fact, the laparoscopic Heller myotomy provides excellent relief of dysphagia and regurgitation, whereas the LRYGB provides excellent control of reflux after the myotomy, weight loss, and resolution or improvement of comorbidities. We feel less inclined to performing a myotomy with a sleeve gastrectomy because the gastroesophageal reflux that ensues after both procedures might be even more prevalent and severe. We also feel less inclined to performing a myotomy with a duodenal switch because of the increased complexity and metabolic derangements of the duodenal switch.

### Operative Planning

Regarding the critical part of the operation, we prefer to perform the myotomy first and then proceed with the gastric bypass performing a hand-sewn gastro-jejunal anastomosis, or a mechanical anastomosis using a linear stapler. The reason behind this choice is twofold: 1) performing the gastro-jejunal anastomosis with an EEA stapler after the myotomy exposes the patient to a perforation of the submucosa at the myotomy site by the anvil dragged through the mouth for the entire length of the esophagus; 2) especially when one anticipates a difficult myotomy (e.g., the patient had several pneumatic dilatations or Botulinum toxin injections), performing the myotomy first allows the surgeon to repair with 4–0 absorbable sutures any intraoperative perforation of the submucosa and protect the repair with an anterior fundoplication. In the event of a perforation, the LRYGB is aborted, a possibility that needs to be discussed thoroughly with the patient at length. Below is the description of the technical details of the Heller myotomy and the preparation of gastric pouch of the LRYGB.

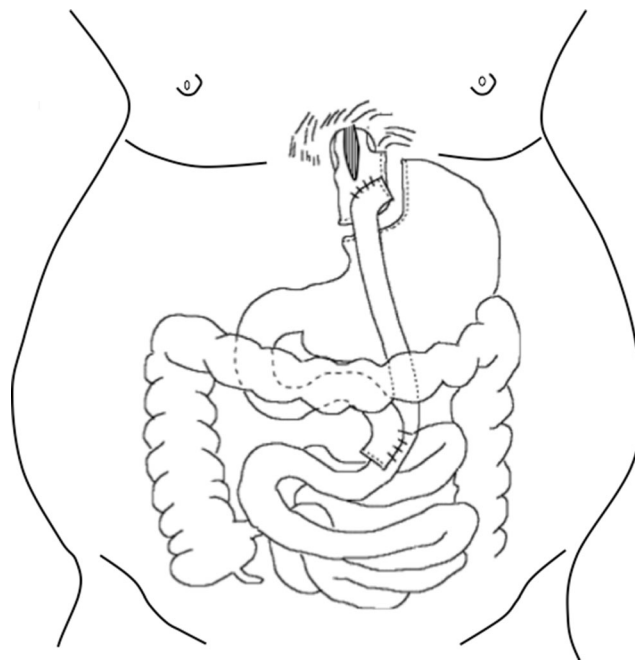
**Heller Myotomy** The patient is placed in fully steep reverse Trendelenburg. The esophagus is then bluntly dissected away from the right crus while an Allis (or Babcock) clamp provides gentle downward traction of the gastroesophageal junction. The esophageal fat pad is excised to identify the gastroesophageal junction. The orogastric tube and the esophageal temperature probe are removed. The myotomy is performed at the 11 o'clock position, on the right aspect of the esophagus, between the anterior and posterior vagus nerves. The myotomy extends 6 cm cranially onto the esophagus and 2.5 cm caudally onto the anterior wall of the stomach as

previously described.<sup>4</sup> Both vagi nerves are identified and preserved.

**Creation of the Gastric Pouch** Once the myotomy is completed, the hepatogastric ligament is incised and the neurovascular bundle of the stomach along the lesser curvature is transected with a stapler. The dissection of the posterior wall of the stomach is continued and a standard 30 cm<sup>3</sup> pouch is created by firing one more load transversally and about two more loads longitudinally towards the angle of His. Once a standard LRYGB is performed, the patient is then placed supine and an air leak test is done using intraoperative endoscopy. Figure 1 shows the completed operation.

### Clinical Case Scenario 2

A 50-year-old morbidly obese man with a BMI of 51, hypertension, obstructive sleep apnea, and degenerative osteoarthritis had several episodes of aspiration pneumonia requiring hospitalization. He had been complaining for about 1.5 years of progressive dysphagia, regurgitation, and coughing spells. An esophageal manometry showed type II achalasia according to the Chicago classification. He had been refusing surgery and had been treated with two pneumatic dilatations that resulted in mild and temporary resolution of dysphagia. Nevertheless, his dysphagia had worsened and now he is requesting surgical treatment for achalasia only. He is not interested in bariatric surgery.



**Fig. 1** Completed laparoscopic Heller myotomy and Roux-en-Y gastric bypass

In this case, our approach of choice consists in performing a laparoscopic Heller myotomy with a Dor fundoplication.<sup>4</sup> Figure 2 shows the completed operation.

The preoperative and postoperative management of patients with combined procedures is not any different from that of those who undergo only one procedure.

### Discussion and Brief Review of the Literature

Achalasia and morbid obesity are two conditions that can be effectively treated surgically. However, the surgical treatment of achalasia may result in weight gain, which can be detrimental in patients with morbid obesity. On the other hand, the isolated treatment of morbid obesity does not treat the functional obstruction of the esophagus. Thus, surgical intervention should aim towards treating both diseases simultaneously, and the approaches utilized should complement each other to achieve the desired outcome: relief of dysphagia and weight loss. Few reports in the literature have described three different techniques to achieve the goal of simultaneous treatment of achalasia and morbid obesity (Table 1).

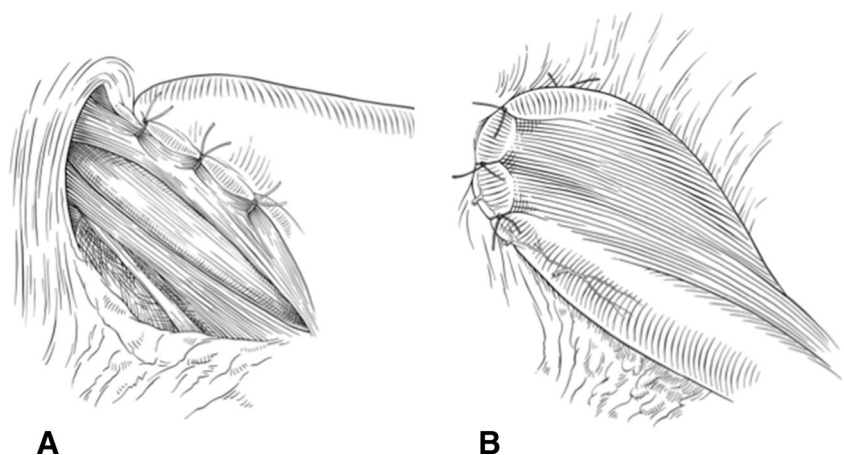
The first approach consists in performing a laparoscopic Heller myotomy and a LRYGB.<sup>5,6</sup> Kaufman et al. reported a case of a 25-year-old female who was diagnosed with achalasia and had a BMI of 58 kg/m<sup>2</sup>. Achalasia was initially managed with pneumatic dilations, which resulted only in temporary relief of dysphagia. After a simultaneous laparoscopic Heller myotomy and LRYGB, the patient had excellent relief of dysphagia, no heartburn, and a weight loss of 100-lbs 1 year postoperatively.<sup>5</sup> Similarly, O'Rourke et al. described a case of a 60-year-old female with a BMI of 52 kg/m<sup>2</sup> and a 10-year history of progressively worsening dysphagia. After several ineffective endoscopic pneumatic dilations and Botulinum toxin injections, the patient underwent a simultaneous laparoscopic Heller myotomy and LRYGB. This treatment resulted in complete relief of dysphagia and a loss of 23 kg (33 % of excess body weight) at 6 months follow-up.<sup>6</sup> The LRYGB is

also a safe option for those morbidly obese patients in whom achalasia was not detected prior to their initial bariatric operation. Oh et al. reported a patient with BMI of 49 kg/m<sup>2</sup> who initially underwent laparoscopic sleeve gastrectomy and was subsequently diagnosed with achalasia. This patient underwent a laparoscopic Heller myotomy along with conversion of a sleeve into a LRYGB that resulted in complete resolution of dysphagia and a decrease of her BMI to 31.5 kg/m<sup>2</sup> at a 6-months follow-up.<sup>7</sup> Similarly, Ramos et al. presented a case of a patient with a BMI of 47 kg/m<sup>2</sup> who started experiencing regurgitation and dysphagia 4 years after undergoing LRYGB. Esophageal manometry diagnosed achalasia and a laparoscopic Heller myotomy resulted in resolution of symptoms.<sup>8</sup>

The second surgical approach described in the literature consists in combining a duodenal switch with a laparoscopic Heller myotomy. Almogy et al. studied 638 patients who were screened with upper GI studies and eventually underwent weight reduction procedures. From the study group, three patients with BMI > 40 kg/m<sup>2</sup> had achalasia. These patients were successfully treated with a laparoscopic Heller myotomy and a duodenal switch with a modified sleeve gastrectomy that preserved a small tongue of fundus to maintain the angle of His and to allow the creation of a partial fundoplication.<sup>2</sup> Herbella et al. reported a case of patient with BMI of 43.2 kg/m<sup>2</sup> with achalasia from Chagas' disease, which was treated with a laparoscopic Heller myotomy and partial fundoplication and 9 months later with a biliopancreatic diversion. However, even if this patient's BMI decreased to 36 kg/m<sup>2</sup>, the resolution of dysphagia was not satisfactory. The authors believed that the failure to improve dysphagia was not caused by the failure of the surgical procedure rather to alimentary compulsion from the Chagas' disease.<sup>9</sup>

The third technique reported for the treatment of morbid obesity and achalasia consisted in performing a sleeve gastrectomy and a laparoscopic Heller myotomy. Hagen et al. reported a case of a 40 kg/m<sup>2</sup> who underwent a combined robotic-assisted Heller myotomy and sleeve gastrectomy. The

**Fig. 2** Laparoscopic Heller myotomy (a) and Dor, partial anterior, fundoplication (b)



**Table 1** Literature on morbid obesity and achalasia

Type of study	Year published	Achalasia symptoms	Pre-op BMI (kg/m <sup>2</sup> )	Achalasia procedure	Bariatric procedure
Kaufman et al. Case report	2005	Dysphagia, regurgitation	58	Laparoscopic esophagogastric myotomy	Laparoscopic Roux-en-Y gastric bypass
O'Rourke et al. Case report	2007	Dysphagia	52	Laparoscopic Heller myotomy	Laparoscopic Roux-en-Y gastric bypass
Almogly et al. Case series	2003	Regurgitation, nocturnal cough, recurrent aspiration	52	Laparoscopic Heller myotomy	Biliopancreatic diversion with duodenal switch
Herbella et al. Case report	2005	Dysphagia	43.2	Esophageal myotomy and partial fundoplication	Biliopancreatic diversion
Hagen et al. Case report	2010	Dysphagia	40	Robotic assisted Heller myotomy	Sleeve gastrectomy
Ramos et al. Case report	2009	Dysphagia, regurgitation	47	Laparoscopic anterior myotomy	Laparoscopic Roux-en-Y gastric bypass
Oh et al. Case report	2014	Dysphagia	49	Laparoscopic Heller myotomy	Laparoscopic sleeve gastrectomy followed by laparoscopic Roux-en-Y gastric bypass

procedure was uncomplicated, and the patient had a complete resolution of dysphagia along with 11-lb loss 5 weeks after the procedure.<sup>10</sup>

In cases like the one described in the first scenario, we added a LRYGB to the Heller myotomy, because this operation achieves a mean weight loss up to 70 % of excess body weight and resolves or improves obesity-related comorbidities, including hypertension, diabetes mellitus, and gastroesophageal reflux (GERD).<sup>11</sup> Because LRYGB creates a pouch devoid of acid-secreting parietal cells and because the Roux loop effectively protects against bile reflux, a LRYGB seems to be the ideal operation to couple with a Heller myotomy, given its ability to resolve any type of postoperative reflux more effectively than a partial fundoplication. Therefore, patients with morbid obesity and achalasia, who are willing to be treated for both conditions, can safely undergo a laparoscopic Heller myotomy and a LRYGB. Both procedures can be performed at the same time, minimizing the risk of a return to the operating room, and result in durable long-term outcomes. In addition, in the event the patient develops a peptic stricture, cancer, or if achalasia progresses to a very dilated and sigmoid esophagus, an esophagectomy is still technically feasible because the remnant stomach that retains a preserved right gastroepiploic artery can be used as a conduit. On the other hand, a laparoscopic sleeve gastrectomy precludes the use of the stomach as a conduit, is less technically demanding, and has lower complication rates when compared to a LRYGB.<sup>11</sup> However, Dupree et al. suggested that a laparoscopic sleeve gastrectomy increases the risk of developing GERD.<sup>12</sup> Then, because gastroesophageal reflux might be significant when a myotomy is performed during a sleeve gastrectomy, this operation may not represent the best surgical option in these cases. We also feel less inclined to performing a Heller myotomy with a duodenal switch because of the

increased complexity and severe malnutrition and vitamin deficiencies of the duodenal switch, even despite vitamin supplementation.<sup>13</sup> Similarly, a gastric banding in the setting of achalasia or other esophageal motility disorders is an absolute contraindication, as the band provides an outflow obstruction to an already compromised esophageal peristalsis.

Regarding cases like the one described in the second scenario, we have found that some of our morbidly obese patients with achalasia were not interested in undergoing a bariatric operation, as their main concern was to obtain relief of dysphagia. In these cases, or when dysphagia is so invalidating that the patient is not willing to wait for the necessary work-up prior to bariatric surgery, or when the patient does not qualify for a bariatric operation, the surgeon can perform a laparoscopic Heller myotomy with a partial fundoplication to prevent postoperative reflux. We have noticed that the myotomy is more difficult in obese patients because of the size of gastroesophageal fat pad, which could lead to injury in the anterior vagus nerve. However, the patient will need to understand that the treatment of morbid obesity can be deferred to a later time but at an increased risk. Performing a LRYGB after a Heller myotomy is challenging because one should first take down the anterior fundoplication, or the adhesions between the myotomy with the left lobe of the liver (in case of a Toupet) with the risk of perforating the esophageal submucosa. Alternatively, one may choose to treat achalasia with a myotomy without a fundoplication, leaving the option open for a subsequent bariatric procedure. However, there is no guarantee that the patient may want to undergo a bariatric procedure in the future. In this case, the patient will have to bear with gastroesophageal reflux that has not been prevented by a fundoplication. Regardless, even this latter approach is technically challenging. In fact, the adhesions of the left lobe of the liver to the exposed esophageal submucosa may

increase the risk of esophageal perforation. A potential alternative to treat achalasia and obesity in a staged fashion is to perform a peroral endoscopic myotomy (POEM). This option may not preclude a future bariatric procedure. We believe that the clinician should have a thorough discussion of the risk, benefits, alternatives, and long-term outcomes of all procedures, as well as the operative planning, but in the end respect the ethical autonomy of the patient's decision-making.

## Conclusions

In conclusion, achalasia and obesity can coexist, albeit infrequently. We favor a laparoscopic Heller myotomy with a LRYGB as the best comprehensive surgical management for the patient with achalasia and morbid obesity. In those patients who refuse bariatric, a laparoscopic Heller myotomy with Dor fundoplication alone should be performed. A thorough discussion of the outcomes of the operative strategy and the respect of the ethical autonomy of the patient's decision-making should direct the proper surgical management.

**Conflict of Interest** The authors have no conflicts of interest to declare.

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