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CASE REPORT

Robotic heller myotomy and Dor fundoplication for achalasia in a woman with morbid obesity

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Abstract Achalasia is a relatively rare condition with a prevalence estimated at less than 0.001 %. Laparoscopic or robotic Heller myotomy is an effective surgical treatment for achalasia. We present the first published case of a morbidly obese achalasia patient treated with robotic Heller myotomy and Dor fundoplication. The operative time was 175 min, with an estimated blood loss of 110 ml. The patient had a normal bowel transit on postoperative day 2, and he was discharged on postoperative day 4 on a liquid diet. A follow-up at 2 months showed significant resolved symptoms of achalasia.

Keywords Achalasia · Morbid obesity · Heller myotomy · Robotic surgery

Introduction

Achalasia is a rare idiopathic disorder characterized by the absence of esophageal peristalsis and a defective relaxation of the lower esophageal sphincter (LES) [1, 2]. Clinical symptoms include dysphagia, chest pain, and regurgitation of undigested food, and all of these symptoms are common diagnostic clinical features of achalasia in normal-weight patients [3]. In contrast, morbidly obese patients with achalsia present mostly with respiratory symptoms which are also common in obese patients without achalasia, and this often results in the misdiagnosis of achalasia in obese patients [4]. Therefore, an accurate diagnosis of achalasia should be made in obese patients who present with recumbent cough, aspiration, and pneumonia episodes as its treatment in these patients is important in the management of such respiratory problems. Available therapeutic options include medical treatment with nitrates and calcium channel blockers, botulinum toxin injection into the distal esophagus, pneumatic balloon dilation, and surgical esophagomyotomy [2, 5, 6]. Because medications are not effective in treating achalasia, surgery currently is the best definitive clinical option to improve this condition. The esophageal Heller myotomy is a surgical procedure that results in decreased pressure on the LES muscle, making it easier for the patient to swallow. Until a few years ago, esophagomyotomy could only be performed through a left thoracotomy or laparotomy. However, minimal invasive surgery has replaced these open approaches [7, 8]. Recent experiences with robotic Heller myotomy have demonstrated that this is a safe and effective treatment method for achalasia [9]. Here, we report the case of a 68-year-old woman with morbid obesity and achalasia who underwent robotic Heller myotomy and Dor fundoplication. The aim of this case report was to discuss a relatively infrequent combination, i.e., morbid obesity and achalasia, complicated with respiratory symptoms and its surgical management.

Case report

A 68-year-old woman presented to our clinic with a long history of heartburn and regurgitation. She also complained of sore throat, coughs, and repeated pneumonic attacks which were attributed to asthma. More recently she had

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developed dysphagia to solids and liquids and had lost 11 kg over a 3-month period. The patient had two endoscopic pneumatic dilations at a different medical center after being diagnosed with achalasia. An esophagogastroduodenoscopy showed a markedly distended esophageal lumen with retained food and saliva, and an upper gastrointestinal (GI) barium swallow showed the bird-beak appearance of the lower esophagus, dilatation of the esophagus (transverse diameter 5.6 cm), and stasis of barium in the esophagus (Fig. 1). Esophageal manometer revealed an increase in the LES pressures during the resting and swallowing period without motility. The clinical diagnosis was achalasia. She did not wish to undergo endoscopic therapy and opted for surgery. The patient had a severe phannensteil scar residual from a previous Cesarean section. Aside from her morbid adiposity, she had a body mass index (BMI) of 54 kg/m^2. The patient's comorbidities included arrhythmia and chronic obstructive pulmonary disease with an American Society of Anesthesiologists (ASA) score of 3. The patient was counseled on the risks associated with the bariatric surgery but her primary preference was to minimize the dysphagia, regurgitation, and pneumonia attacks. She underwent a robotic Heller myotomy and Dor fundoplication using the da Vinci Robotic Surgical System (Intuitive Surgical, Sunnyvale, CA).

The patient was placed under general anesthesia and intubated with a single-lumen endotracheal tube. Following the insertion of a 12-mm trocar (camera port), the patient was placed in steep reverse Trandelenburg position and the patient cart docked. Three 8-mm trocars and one 10-mm trocar were then inserted, followed by retraction of the left lobe of the liver anteriorly using a bowel grasper (instrument arm 3). A Maryland dissector or needle driver was placed in the surgeon's left hand, and HARMONIC curved shears (Ethicon Endo-Surgery, Cincinnati, OH) or a needle driver was placed into the right hand. The 10-mm assistant port was used for the atraumatic grasper, aspirator, and suturing (Fig. 2). The stomach was dilated, with heavy adhesion around the greater curvature of the stomach. We first safely performed the adhesiolysis using the HARMONIC curved shears, then divided the gastrohepatic ligament. The phrenoesophageal membrane above the esophagus was divided with the HARMONIC shears, and the anterior branch of the vagus nerve was identified. The right crura was recognized and separated from the esophagus by blunt dissection. No posterior dissection was performed. Myotomy was started at 2 cm proximal of the esophago-gastric junction at the 11 o'clock position. First the longitudinal muscle and then the transverse muscle was cut above and below. The length of the myotomy was 8.5 cm in total, 6 cm of which was on the esophagus and 2.5 cm was above the stomach (Fig. 3). After the myotomy, an intraoperative upper endoscopy was performed, and a mucosal perforation was ruled out. Dor fundoplication was then performed on the patient (Fig. 4). Liquid diet was started on the second day post-operatively and discharged on the fourth day post-operatively. At the 2-month follow-up, GI barium-enhanced radiography revealed that the patient had a totally normal upper GI tract and the dysphagia and cough had improved substantially; the patient did not had an pneumonia episode.

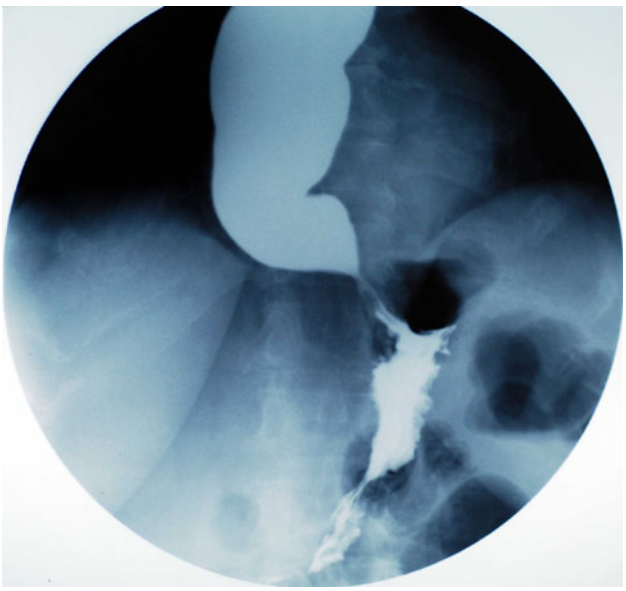


Fig. 1 Barium swallow study demonstrates a dilatation of the esophagus



Fig. 2 Postoperative photograph demonstrating the location of the ports used to perform robotic Heller myotomy and Dor fundoplication

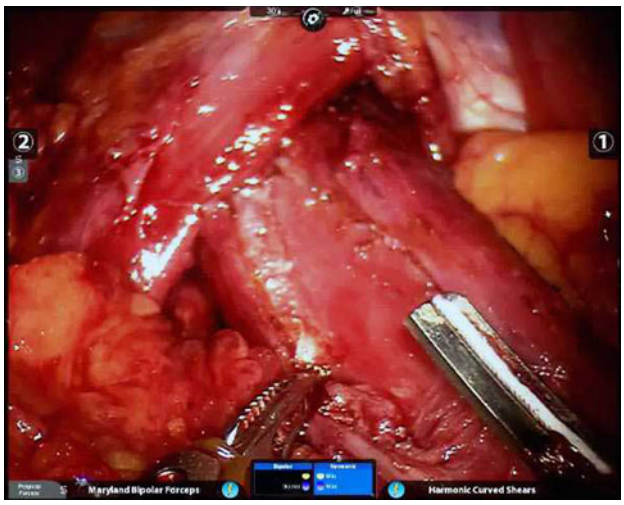


Fig. 3 Surgical field robotic Heller myotomy

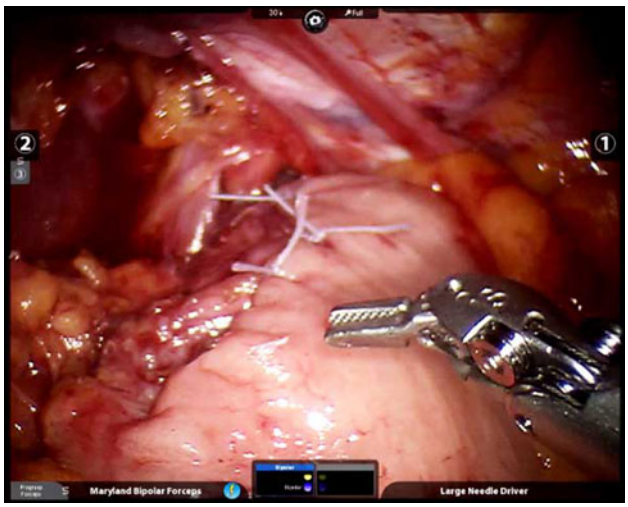


Fig. 4 The completed robotic Dor fundoplication

Discussion

Achalasia is a motor disorder of the smooth muscles of the esophagus that results from the loss of intramural neurons. Achalasia in conjunction with morbid obesity is a relatively infrequent occurrence. Nevertheless, in obese patients who present dominantly with respiratory complaints, the diagnosis and treatment of achalasia is an important step in the management of recumbent cough, aspiration, and pneumonia attacks [3]. There is currently no treatment for achalasia which results in improved activity of the denervated muscle tissue. The fundamental aims of achalasia treatment include decreasing the severity of the dysphagia complaints, correction of esophageal emptying, and improving the respiratory symptoms [1].

Pneumatic dilation and laparoscopic myotomy are considered to be the best treatments for dysfunctional LES that occurs in achalasia. Nevertheless, complications after pneumatic dilation, the most serious being esophageal perforation, have been reported in up to 33 % of patients [5]. A published series that included more than ten patients reported perforation rates of 0–8 %, with a mean rate of 2.6 % [2]. Although our patient had twice undergone pneumatic dilation with a 3.5-cm balloon, no symptom relapse was achieved.

Numerous studies suggest the validity and efficacy of the minimally invasive approach in the surgical treatment of achalasia. In a single central study of 407 patients, the conversion and morbidity rates were 1.5 % (6 patients) and 1.9 % (8 patients), respectively [10]. Postoperative gastroesophageal reflux (GER) is recognized as a potential complication of Heller myotomy. For this reason most authors now complete the Heller myotomy with an antireflux procedure [8]. Rebecchi et al. [11] performed laparoscopic Heller myotomy and antireflux surgery on 153 patients. These authors indicated that the Dor fundoplication was appropriate to prevent GER. Zaninotto et al. [10] performed the Heller–Dor procedure on their patients and documented a 90 % success rate. On completion of the Heller myotomy, many authors performed an intraoperative endoscopy to verify mucosa integrity and completeness of the myotomy. In our case, we ruled out esophageal perforation via intraoperative endoscopy.

Although laparoscopic surgery has been performed for the last 20 years, robotic myotomy is a relatively new technique [12]. The first studies involving robotic myotomy indicated that this approach is a safe procedure [13]. A three-dimensional view, ease of use of the instruments, and especially convenience in suturing are the major advantages of robotic myotomy, in addition to laparoscopic surgery. Huffman et al. [9] performed 37 laparoscopic and 24 robotic Heller myotomies. There were no esophageal perforations after the robotic surgeries, while three patients suffered from such perforations after the laparoscopic surgery. This benefit of robotic Heller myotomy over laparoscopy in terms of a decreased rate of esophageal perforation may was also reported by Horgan et al. [14].

The number of morbidly obese individuals is increasing worldwide, and these individuals represent an increasingly challenging group to treat surgically for gastrointestinal disorders. Unlike other esophageal disorders, obesity does not increase the risk for achalasia [15]. While surgery is the effective modality for the treatment of achalasia, the morbidly obese patients faces increased complications and longer postoperative recovery time. Minimally invasive surgery has been advocated for those patients to decrease postoperative morbidity. Several studies have looked at alternative methods to decrease perioperative morbidity. In one published report, laparoscopic Heller myotomy and Roux-en-Y gastric bypass surgery were performed [16],

and another case report discusses the successful performance of robotic Heller myotomy with a laparoscopic gastric sleeve resection [17].

In conclusion, the coincidence of morbid obesity and achalasia is a challenge for the surgeon. Our patient was a high-risk achalasia patient who had comorbidities with a BMI of 54. We performed robotic Heller myotomy followed by Dor fundoplication without obesity surgery. By performing robotic Heller myotomy and Dor fundoplication, our patient was able to have an uncomplicated and shortened postoperative recovery.

Conflict of interest None.

Consent section Written informed consent was obtained from the patient for publication of this case report and any accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal.

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