

## Case Report

# Thoracoscopic Heller Myotomy for Achalasia in a 3-Year-Old Child

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### ABSTRACT

**Permanent relief of symptomatic achalasia most often occurs after longitudinal esophagomyotomy. A serious drawback of this treatment has been the need for a thoracotomy or laparotomy. We report a case of esophagomyotomy using a minimally invasive thoracoscopic technique in a 3-year-old child who presented with a 6-month history of regurgitation and recurrent upper respiratory tract infections. An upper gastrointestinal series demonstrated a bird's beak at the lower esophageal sphincter. The patient underwent a left thoracoscopic modified Heller esophagomyotomy. Under endoscopic guidance, the myotomy was performed from the inferior pulmonary vein to a distance 1 cm distal to the gastroesophageal junction. The patient was discharged home on the third postoperative day. Thoracoscopy combined with endoscopy provides a patient with definitive surgical treatment for achalasia while avoiding the need for an antireflux procedure. The above patient is the youngest reported in the literature to have undergone this procedure. The case illustrates the efficacy of the minimally invasive technique for a Heller esophagomyotomy in young children.**

### INTRODUCTION

**A**CHALASIA IS UNCOMMON in children under 4 years of age.<sup>1</sup> Longitudinal esophagomyotomy, as first described by Heller in 1913,<sup>2</sup> offers permanent relief of symptoms. The drawback of this procedure has been the need for laparotomy or thoracotomy. More recently, Pellegrini and associates<sup>3</sup> reported a series of esophagomyotomies using a minimally invasive thoracoscopic technique. We report a case of esophagomyotomy using a minimally invasive thoracoscopic technique in a 3-year-old child.

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## CASE REPORT

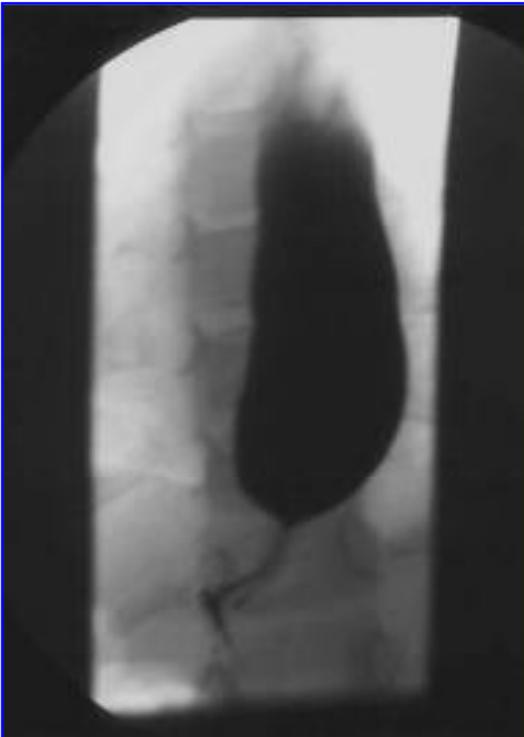
A 15-kg, 3-year-old boy presented with a 6-month history of regurgitation and upper respiratory tract infections. Evaluation included an upper gastrointestinal series demonstrating a bird's beak at the lower esophageal sphincter consistent with achalasia (Fig. 1). Preoperative esophageal manometry revealed poor motility and a lower esophageal sphincter pressure of 62 mm Hg (normal range 10–25 mm Hg), both consistent with achalasia.

After a transient improvement following botulinum toxin injection, the patient underwent a left thoracoscopic modified Heller esophagomyotomy. Oral intake was stopped the night prior to surgery. The patient was placed on single-lung ventilation via right mainstem intubation. Intravenous cafazolin (Kefzol) 25 mg/kg was administered. With the patient in a right lateral decubitus position, a four-trocar (5-mm) technique was employed. After placement of the initial trocar in the sixth intercostal space in the midaxillary line, the left thoracic cavity was insufflated with CO<sub>2</sub> to 6 mm Hg to depress the left lung. The remaining three trocars were placed in the fourth intercostal space 2 cm posterior to the posterior axillary line, the fifth intercostal space in the anterior axillary line, and the eighth intercostal space in the posterior axillary line (Fig. 2).

The endoscope was placed, bringing the esophagus into full view. The inferior pulmonary ligament was incised and dissected to the level of the inferior pulmonary vein. The esophagus was exposed. A right-angle pyloromyotomy spreader, Harmonic Scalpel, and endopecanut were used to spread the muscle fibers. The esophageal myotomy was performed from the inferior pulmonary vein to a distance 1 cm distal to the gastroesophageal junction (Fig. 3). Endoscopic illumination and insufflation revealed an intact mucosa without evidence of leak. The stomach was then decompressed endoscopically. A single chest tube was placed via the fifth intercostal port.

The patient was placed on H<sub>2</sub> blockers postoperatively. The chest tube was removed on the second postoperative day, and the patient was discharged home on the third postoperative day.

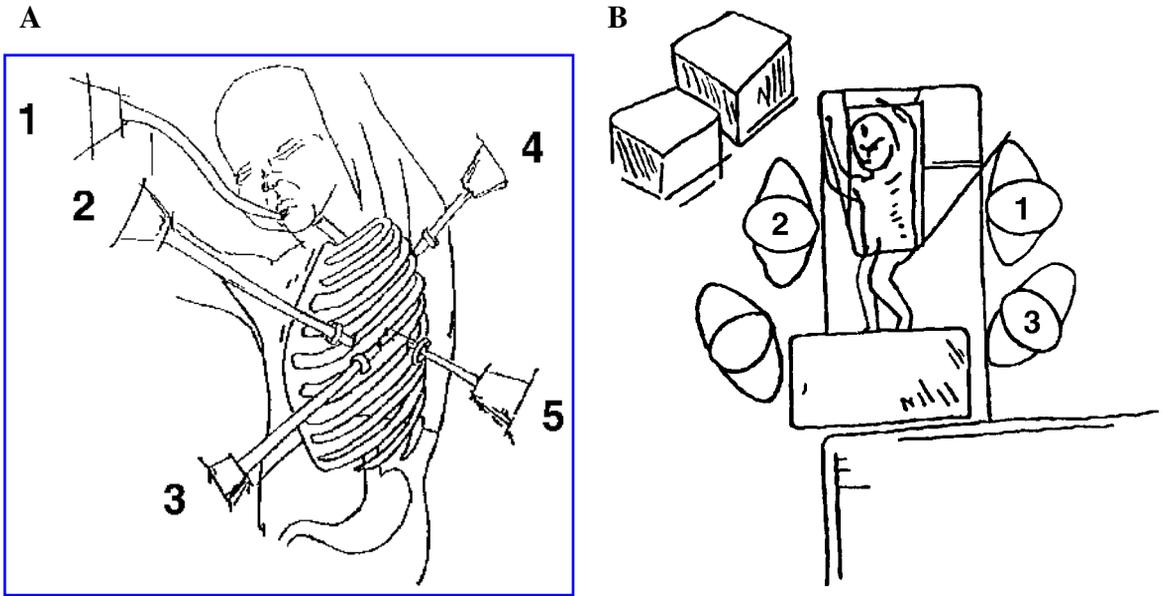
Postoperatively, the patient developed dysphagia. Repeat manometry revealed a lower esophageal sphincter tone of 19 mm Hg with poor esophageal contractility and wave propagation. He was placed transiently on cisapride. Postoperative barium swallow and upper endoscopy revealed no evidence of gastroesophageal reflux. The patient is now asymptomatic, off all medications, and tolerating a regular diet 16 months postoperatively.



## DISCUSSION

Achalasia is a disease of abnormal esophageal motility that is uncommon in the pediatric population. Patients generally present with vomiting, weight loss, growth retardation, and aspiration pneumonia.<sup>4</sup> This clinical picture results from a lack of esophageal peristalsis and failure of the lower esophageal sphincter to relax.<sup>5</sup> Various nonsurgical treatments such as pneumatic dilatation and botulinum toxin injection have been employed, with limited success. While sparing the patient an operation, the failure rate of both compared with a Heller myotomy is significantly higher.<sup>6–8</sup> Furthermore, both of these procedures offer only temporary improvement in symptoms.<sup>9,10</sup>

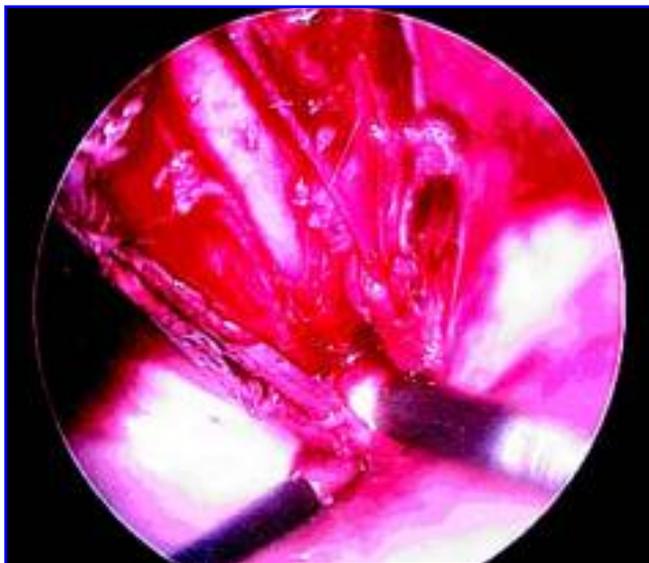
**FIG. 1.** Upper gastrointestinal series illustrating bird's beak lesion.



**FIG. 2.** Port placement and operating room arrangement. (A) Patient in right lateral decubitus position. 1 = endoscope; 2 = lung retractor in fifth intercostal space, anterior axillary line; 3 = esophageal retractor in sixth intercostal space, midaxillary line; 4 = camera/operating port in fourth intercostal space, 2 cm posterior to posterior axillary line; 5 = camera/operating port in eighth intercostal space, posterior axillary line. (B) Room set-up with patient in right lateral decubitus position. 1 = surgeon; 2 = assistant; 3 = surgical technician.

Eckardt and associates do not recommend pneumatic dilatation in children under 18 years of age.<sup>11</sup> Also, balloon dilation has been associated with esophageal perforation.

While the results from the Heller myotomy are excellent, one negative aspect has been the need for a thoracotomy or laparotomy. Pellegrini and associates first described the thoracoscopic technique for a Heller



**FIG. 3.** Endoscopic light source reveals myotomy at gastroesophageal junction.

myotomy in 1992.<sup>3</sup> Their results are comparable to those of esophagomyotomies performed via thoracotomy.<sup>12,13</sup> In addition, when the esophagomyotomy is performed through the chest, the phrenoesophageal ligament is not divided, and there is less mobilization of the esophagus, thus helping to maintain the antireflux mechanisms.<sup>14</sup> Studies have shown that when the myotomy is performed through the chest and carried to a distance not greater than 1 cm beyond the gastroesophageal junction, minimal postoperative reflux occurs.<sup>15-18</sup> Lelli and coworkers<sup>8</sup> found that in long-term follow-up, the patients do not exhibit significant reflux; thus, a fundoplication is not performed on their patients.

Endoscopic guidance during the myotomy is invaluable. The endoscopic light source helps ensure a complete myotomy to a distance no further than 1 cm beyond the gastroesophageal junction. Limiting the length of the myotomy beyond the gastroesophageal junction helps reduce the risk of postoperative gastric reflux. Endoscopic insufflation distends the esophageal mucosa, minimizing the risk of perforation.<sup>14,19</sup> Endoscopic assistance is most important at the gastroesophageal junction where the muscle fibers change direction and thin, becoming more adherent to the underlying mucosa.<sup>20</sup>

Although evidence exists that a fundoplication following esophagomyotomy may not be necessary, controversy surrounding this issue remains. Albanese recently commented that it remains "questionable" whether a Heller myotomy can be performed without an antireflux procedure in a way that eliminates dysphagia and avoids gastroesophageal reflux.<sup>21</sup> He cites results from Patti and colleagues<sup>22</sup> comparing laparoscopic and thoracoscopic techniques in 60 adults in which a Dor fundoplication was added to the laparoscopic procedure. A lower incidence of reflux was seen postoperatively. Results from pediatric patients undergoing either transthoracic, thoracoscopic, or laparoscopic esophagomyotomies indicate that an antireflux procedure is not required.<sup>8,19,20,23,24</sup> In our patient, a barium swallow and upper endoscopy study revealed no evidence of gastroesophageal reflux.

## CONCLUSION

Thoracoscopy combined with endoscopy provides the patient with achalasia with a definitive surgical treatment, avoiding the need for an antireflux procedure. The minimally invasive technique also decreases postoperative pain and results in a shorter hospital stay and a quicker return to normal activity. This is the youngest child to date in the pediatric literature to undergo a minimally invasive Heller myotomy. This case illustrates the efficacy and benefit of a thoracoscopic modified Heller esophagomyotomy in young children.

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