

Case Report

Thoracoscopic Esophagomyotomy for Achalasia in a Child

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Longitudinal esophageal myotomy is effective in relieving dysphagia in over 90% of patients with achalasia (1-8), but enthusiasm for this approach has been limited because of the need for thoracotomy. In addition, because pharmacologic agents have been largely ineffective, most children are offered pneumatic dilatation, although it is potentially hazardous and associated with a high rate of recurrence (8-12). Older reports listed recurrence rates for pneumatic dilatation at 20-25% (13). However, the results of a more recent prospective trial of pneumatic dilatation were so poor that the authors have abandoned the procedure in patients less than 18 years of age (12). We report the first successful esophageal myotomy in a child using a minimally invasive, thoracoscopic technique that obviates thoracotomy, preserves chest wall musculature, and requires only brief hospitalization.

CASE REPORT

A 13-year-old (40 kg) competitive swimmer was referred for the evaluation of long-standing dysphagia and gastroesophageal reflux. She was initially diagnosed and treated for severe reflux esophagitis, halitosis, and possible bulimia due to recurrent postprandial regurgitation of undigested food. Follow-up barium swallow revealed a markedly dilated esophagus with tapering of the distal esophagus demonstrating the "bird beak" sign consistent with the diagnosis of achalasia (Fig. 1A). Esophageal manometry revealed hypertension of the lower esophageal sphincter with a pressure of 33 mm Hg and absent relaxation with swallowing and absent (effective) peristaltic contractions in the body of the esophagus. She underwent five pneumatic dilata-

tions, each affording only short-term relief of dysphagia. Because the child swims competitively, she and the family were concerned about the effects of a posterolateral thoracotomy on her arm and shoulder mobility and strength and were reluctant to consider surgery.

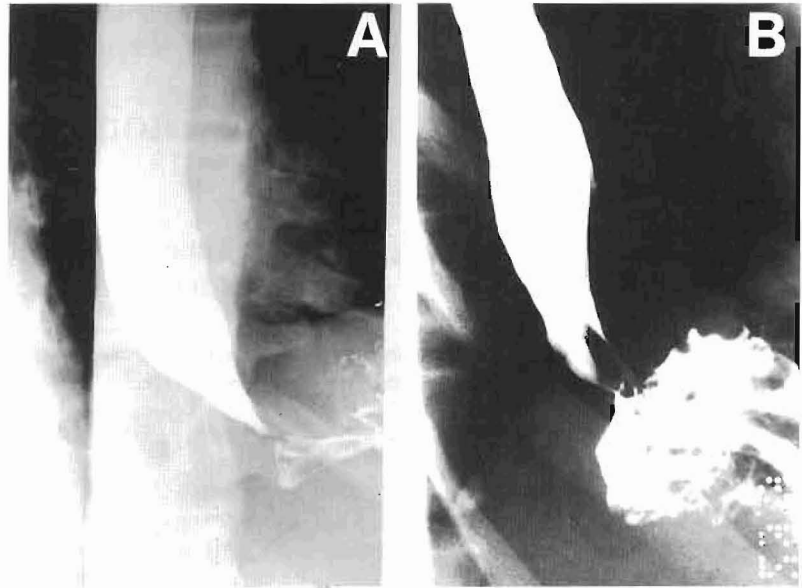
Using a four-trocar technique, a modified Heller esophagomyotomy was performed under combined thoracoscopic and esophagoscopy control. Trocars were placed in a diamond configuration more widely separated than in an adult to minimize "sword fighting." The 11-mm camera port was placed in the mid-axillary line in the fourth intercostal space. Three 5-mm ports were placed to complete the diamond pattern: one in the mid-clavicular line in the sixth intercostal space; one in the posterior axillary line in the seventh intercostal space; and the third in the mid-axillary line in the ninth intercostal space. Esophagoscopy during the procedure allowed identification of the gastroesophageal (GE) junction and assessment of the adequacy of the esophagogastric myotomy (14). The myotomy was carried 1 cm below the endoscopically defined GE junction (Fig. 2). Postoperatively, she required chest tube drainage for 48 h and resumed a regular diet without dysphagia on the second postoperative day. She was discharged home on the third postoperative day on prophylactic H₂ blockers (because of the potential for gastroesophageal reflux) and remains symptom-free 12 months postoperatively. A follow-up barium swallow demonstrates a normal esophagus without obstruction or gastroesophageal reflux (Fig. 1B).

DISCUSSION

Numerous studies have demonstrated that the most definitive treatment of achalasia for the relief of dysphagia is esophagogastric extramucosal myotomy, as first described by Heller (15). Pharmacologic agents have been largely ineffective (11). Even

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FIG. 1. A: Contrast swallow prior to Heller myotomy showing distal tapering at the esophagus typically found in achalasia. **B:** Contrast swallow after Heller myotomy showing normal-appearing distal esophagus.



the recently reported injection of botulinum toxin into the lower esophageal sphincter has been shown to be only transiently effective in adults with achalasia (16). Despite the proven efficacy of standard esophagomyotomy, because it requires laparotomy or thoracotomy, pneumatic balloon dilatation gained widespread use. While less efficacious, balloon dilatation has the advantage of not requiring anesthesia, laparotomy, or thoracotomy, and results in only brief hospitalization (12,13,16,17).

Disadvantages of pneumatic balloon dilatation include the uncontrolled and often incomplete disruption of the esophageal muscle (14). In addition, healing of the esophagus following pneumatic dil-

tation is unpredictable, and gastroesophageal reflux is common if dysphagia is completely relieved. Pneumatic dilatation is also associated with a significant risk of esophageal perforation. Pneumatic dilatation in adolescents has only occasionally been successful and is ineffective in children less than 9 years of age (13,17–20). Because of the high failure rate observed in their prospective trial, Eckardt et al. recommended that pneumatic dilatation not be performed in patients less than 18 years of age (12).

Pelligrini et al. first described thoracoscopic Heller esophagomyotomy in adults in 1992 with results comparable to those using open thoracotomy (14). This technique has not been applied in chil-

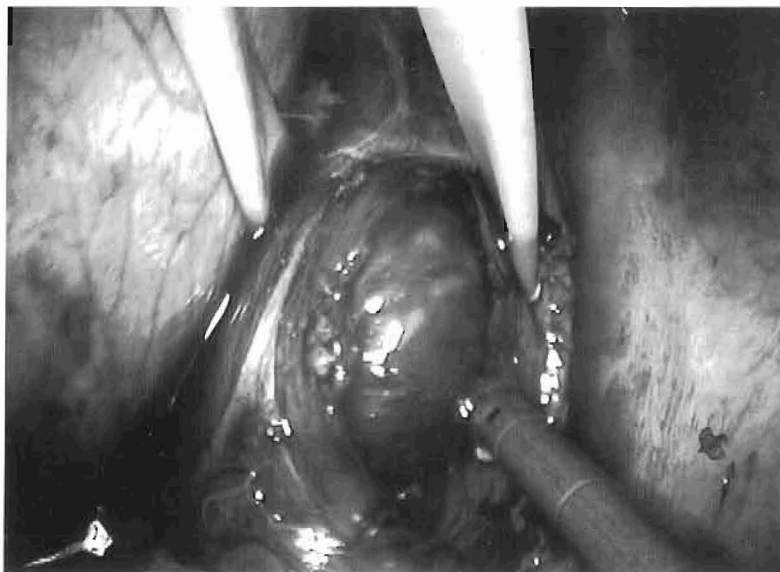


FIG. 2. Intraoperative photograph of distal esophagus after myotomy. Mucosa seen bulging from myotomy with suction probe at level of endoscopically defined gastroesophageal junction.

dren. The use of combined thoracoscopic and endoscopic control of the esophageal myotomy allows precise division of the muscular fibers. Intraluminal endoscopy during the myotomy allows identification of the gastroesophageal junction, ensuring a complete but not excessive myotomy, and may minimize the risks of postoperative gastroesophageal reflux. Myotomy that extends greater than 1 cm beyond the gastroesophageal junction is associated with a higher incidence of gastroesophageal reflux (21). This endoscopic assistance is crucial at the gastroesophageal junction as the orientation of muscular fibers changes and the layer thins and becomes more adherent to the mucosa.

The use of a thoracoscopic approach to esophagomyotomy avoided thoracotomy, allowing our patient to return to competitive swimming within 10 days of the procedure. She has had excellent relief of her dysphagia and, although she continues on prophylactic H₂ blockers, she has had no clinically significant reflux. The low attendant morbidity of thoracoscopic esophagomyotomy and its definitive nature makes this procedure in children an attractive alternative to repeated pneumatic dilatation or ineffective pharmacological therapy.

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