Laparoscopic Thal Fundoplication for the Management of Complex Gastroesophageal Reflux in Children

Alicia Eubanks, MD; Rosa Hwang; Thane Blinman, MD, MBA
Division of General, Thoracic, and Fetal Surgery, Children's Hospital of Philadelphia

Background

Thal's "unified approach" of an anterior partial fundoplication for the treatment of gastroesophageal reflux and hiatal hernia was subsequently popularized in pediatric surgery by Ashcraft and others. Advantages of this procedure include short operative time, infrequent wrap migration, reduced division of the short gastric vessels, and reduction of the risk of dysphagia and postoperative gas-bloat syndrome. With the rise of minimally invasive surgery, the Thal is now less commonly performed.

Objective

The objective of this study is to describe technical aspects of laparoscopic Thal fundoplication and to review outcomes of a 10-year cohort of patients who have undergone the procedure at our institution.

Methods and Procedures

Records of 132 children aged 0-18 years who underwent Thal fundoplication from 2013-2022 at our institution were retrospectively reviewed. Thal fundoplication was selected to answer constraints among heterogenous medical and surgical conditions, such as isolated severe reflux disease due to history of esophageal atresia repair, microgastria, repaired diaphragmatic hernia, tubular stomach secondary to chronic tube feeds, and recurrent aspiration secondary to neurologic insult.

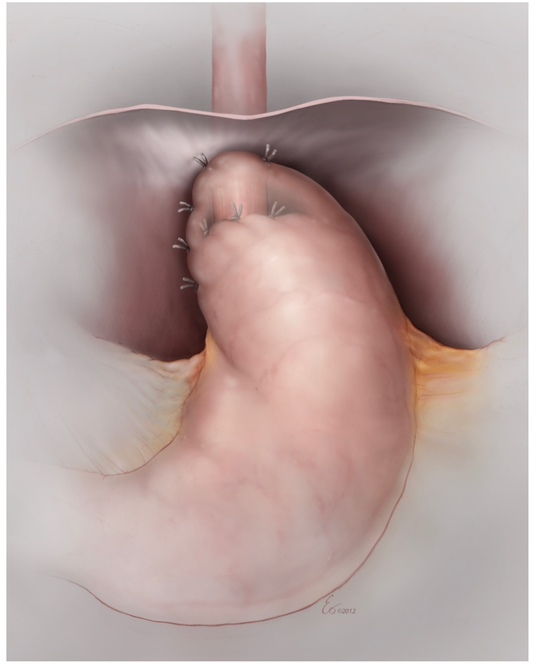


Fig 1: Anterior view of a Thal Fundoplication.

Technical Pearls

- Anterior 240 degree fundoplication
- Minimal dissection technique
- Reduce hiatal radius with 1-3 interrupted stitches
- Approximate fundus to anterior esophageal wall and crura with 2 layers of horizonal mattress braided nylon sutures

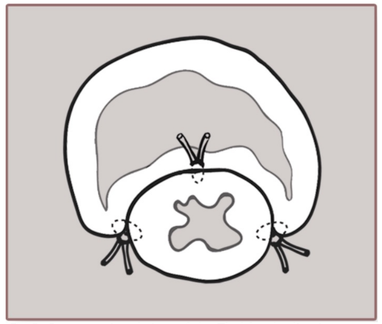


Fig 2: Cross-sectional view of the Thal fundoplication demonstrating stitches securing the gastric fundus to the anterior esophageal wall

This technique accomplishes the 4 mechanical necessities of a successful fundoplication:

- Reduction of the hiatal radius
- Maintenance of intra-abdominal esophageal length
- Restoration of the angle of His
- Increased elastance of the lower esophageal sphincter

Results

Thal fundoplication was performed in 132 patients during the study period. Revisions of previous fundoplications were common. Among these revision fundoplasties, 87.1% were performed laparoscopically. The index fundoplication was a Nissen (82.1%) or Toupet (15.4%) in most cases. One Thal fundoplication was revised in the follow up period, during a subsequent Heller myotomy for achalasia. No patients required reoperation for recurrent reflux, hiatal hernia, or wrap disruption.

Thal Fundoplications (2013-2022)	N = 132
Performed laparoscopically	115 (87.3%)
Hiatal hernia present	51 (38.6%)
Revision Fundoplasty	39 (29.5%)
Required Subsequent Revision	1 (0.7%)
Reoperation for reason other than wrap failure	4 (3.0%)

Conclusions

The Thal fundoplication can be done reliably through a minimally invasive approach. The laparoscopic approach preserves the versatility described by Thal, successfully rescuing children with complex foregut anatomy or history of prior fundoplication. The laparoscopic approach also extends the reliability of Ashcraft's modifications: patients in this cohort demonstrated universal control of GERD, while none required reoperation for recurrent reflux, hiatal hernia, or wrap disruption during the follow up period.

Contact

Alicia Eubanks, MD
Research Post-doctoral Fellow, Children's Hospital of Philadelphia
General Surgery Resident, University of Virginia
Email: eubanksa@chop.edu

References

1. Thal AP. A unified approach to surgical problems of the gastroesophageal junction. Annals of Surgery. 1968 Sep;168(3). PMC1387362
2. Ashcraft KW, Holder TM, Amoury RA. Treatment of gastroesophageal reflux in children by Thal fundoplication. J Thorac Cardiovasc Surg. Nov;82(5):706-12. PMID: 7300402.
3. Ashcraft KW, Holder TM, Amoury RA, Sharp RJ, Murphy JP. The Thal fundoplication for gastroesophageal reflux. J Pediatr Surg. 1984 Aug;19(41981):480-3. doi: 10.1016/s0022-3468(84)80280-8. PMID: 6481597.

© POSTER TEMPLATE BY GENIGRAPHICS® 1.800.790.4001 WWW.GENIGRAPHICS.COM