

## Case Report

# Laparoscopic Repair of a Congenital Diaphragmatic Hernia in an Adult

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### ABSTRACT

**A patient undergoing laparoscopic Nissen fundoplication had an intraoperative finding of a left Bochdalek hernia, which was repaired with an onlay of fenestrated PTFE. This appears to be the first report of such a case.**

### INTRODUCTION

**T**HE MINIMALLY INVASIVE ANTIREFLUX PROCEDURE currently is the preferred approach in the patient with gastroesophageal reflux disease (GERD) who has opted for surgical treatment. A variable percentage of these patients will have an associated hernia of the esophageal hiatus. A hiatal hernia in a patient with GERD usually is reduced and closed at the time of the antireflux procedure. Here, we report a patient with GERD who had a Bochdalek hernia identified and repaired during laparoscopic Nissen fundoplication.

### CASE REPORT

A 42-year-old man was referred for surgical treatment of GERD. He had had symptoms of epigastric and lower chest pain and burning for 20 years; in the past year, the burning had disrupted his sleep. Five months prior to admission, the patient had an air-contrasted barium radiogram of the upper gastrointestinal tract; although this study was technically inadequate, a retrocardiac air-fluid

interface in the left upper quadrant was identified that could also be seen on the patient's chest radiograph. The patient's physician subsequently felt obliged to obtain a CT scan of the chest and abdomen because the barium radiogram was of poor quality. The CT scan indicated that the abnormality was most likely a hiatal hernia. An esophagogastroduodenoscopy with biopsy also was performed, which demonstrated esophagitis and a patulous gastroesophageal junction, but no hiatal hernia. The esophageal and antral biopsies revealed Barrett's esophagus and gastritis with *Helicobacter*-like organisms, respectively. The patient was treated for *H. pylori* infection, but the pain and burning persisted. The gallbladder appeared normal on ultrasound scanning, and a hepatobiliary scan demonstrated only a mildly decreased ejection fraction.

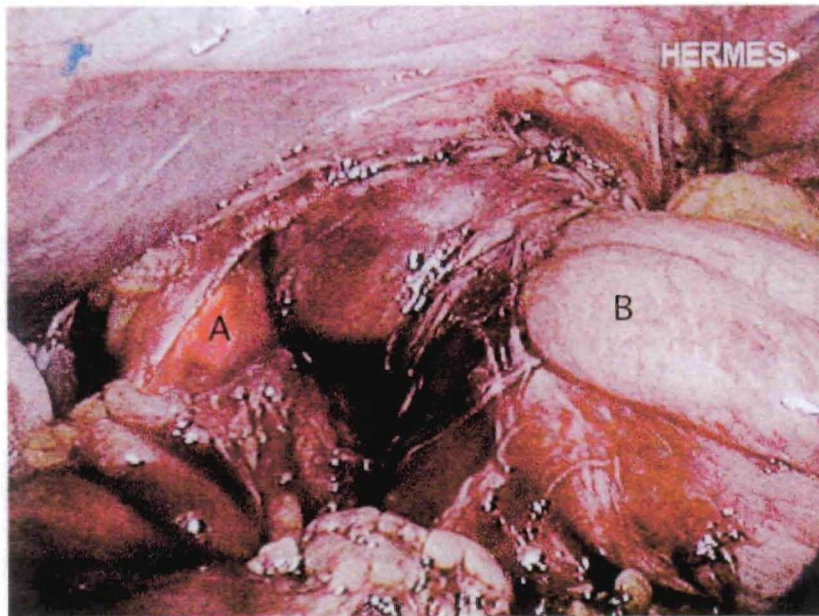
The patient was referred for surgical evaluation. It was believed that his symptoms were secondary to reflux esophagitis and hiatal hernia, possibly paraesophageal. A minimally invasive operation was recommended.

Our technique for laparoscopic Nissen fundoplication has been described previously.<sup>1</sup> The important aspects of our approach include liver retraction with an inflatable

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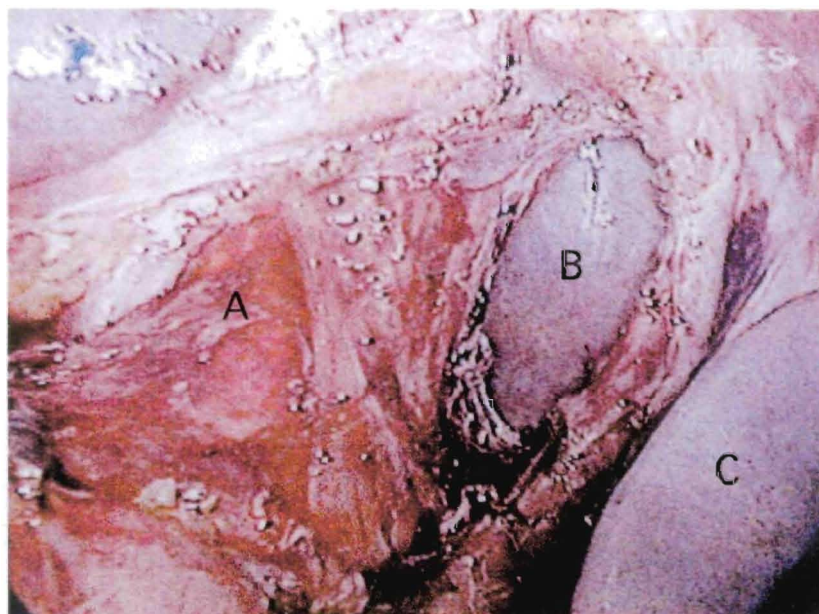
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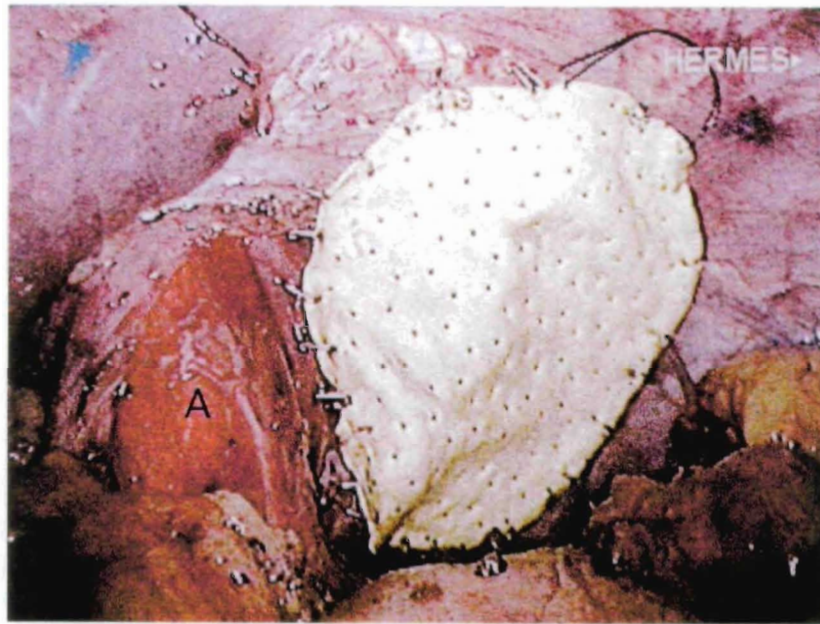
**FIG. 1.** Left Bochdalek hernia prior to reduction. Esophagus (A) is distended with lighted bougie. Body of stomach (B) is retracted laterally; fundus is incarcerated in defect.

balloon retractor (Soft-Wand<sup>®</sup>, Circon Cabot); placement of a lighted esophageal bougie to aid the periesophageal dissection; use of atraumatic graspers on the viscera (Atraugrip; Pilling Week); complete fundic mobilization with division of the short gastric vessels with the ultrasonic scalpel (Harmonic Scalpel<sup>®</sup>; Ethicon Endo-

Surgery); mobilization of the lower 5 cm of esophagus into the abdomen; construction of short (2–3-cm), floppy fundal wrap over a 50F to 60F Maloney dilator; and suture anchorage of the wrap to the diaphragm. If the patient has a large ( $\geq 8$  cm) hiatal defect, this is closed with primary curoplasty prior to creating the wrap followed



**FIG. 2.** Left Bochdalek hernia after reduction of contents. Esophagus (A) is distended with lighted bougie. Hernia defect (B) is lateral to esophageal hiatus, and spleen (C) is in lower right hand corner of photograph.



**FIG. 3.** Repair of Bochdalek hernia with onlay of fenestrated PTFE, stapled in place. Esophagus (A) is distended with lighted bougie.

by an onlay of fenestrated PTFE (MycroMesh; W.L. Gore and Associates) as a buttress.<sup>2</sup>

On exposure of the left hemidiaphragm, it was noted that the patient had herniation of his stomach into a defect located to the left of the diaphragm (Fig. 1). The stomach was reduced, revealing a 5 × 4-cm defect in the left hemidiaphragm (Fig. 2). The dissection of the gastroesophageal junction proceeded, and a cruroplasty was performed. The diaphragmatic defect was managed with an onlay of fenestrated PTFE, overlapping all the defect edges by 2 cm, and stapled in place (Fig. 3). The fundoplication was completed without incident.

A postoperative Gastrografin radiogram of the esophagus demonstrated an intact fundoplication and no hernia. There have been no complications after 6 months of follow-up. The patient has had resolution of his heartburn, is not taking any antireflux medication, and has not developed any new symptomatology. He has refused the recommended endoscopy follow-up.

## DISCUSSION

The patient's preoperative symptoms were consistent with hiatal hernia and reflux esophagitis. Reflux esophagitis and a possible paraesophageal hernia were his operative indications; However, a Bochdalek hernia was diagnosed intraoperatively. The defect was patched with PTFE. The patient subsequently had resolution of his symptoms.

Bochdalek hernia is a congenital defect of the diaphragm, most commonly occurring in the left posterolateral location. Bochdalek hernia diagnosed in adulthood is rare and usually presents as an emergency.<sup>3,4</sup> A PubMed MEDLINE search did not reveal any previous reports of minimally invasive repair of Bochdalek hernia in an adult; however, there have been reports of laparoscopic repair of Morgagni hernia.<sup>5-13</sup> These defects (retrosternal location) were treated without and with prosthetic (typically polypropylene or PTFE). We have used a PTFE onlay around the esophageal hiatus when prosthetic support is desired,<sup>2</sup> and we have not had mesh-related complication after 5 years of this practice. Specifically, we have not documented a hernia recurrence or mesh migration using the above implantation technique. Overlap of the prosthetic mesh with the defect's edges should provide a sound and durable repair, as is observed in the repair of hernial defects in other locations.

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