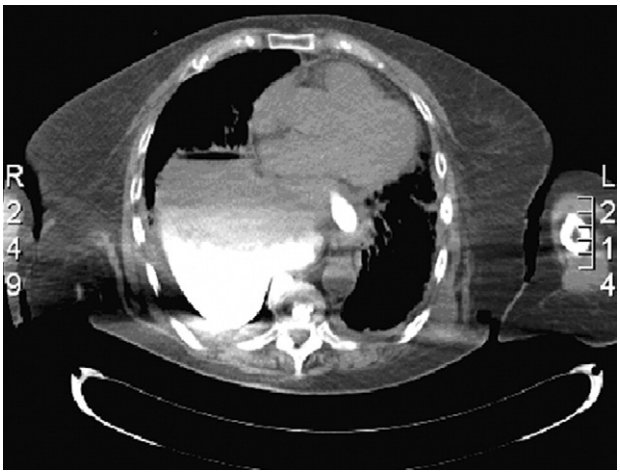


*Fig 1. Computed tomography scan of the thorax after a motor vehicle accident shows an intrathoracic stomach on the right side.*

cation was intact, with the esophagogastric junction below the hiatus.

Once the stomach was manually reduced to its natural position, the crus were reapproximated with interrupted #2 Ticron sutures (US Surgical/Syneture, Norwalk, CT) with Teflon pledgets (DuPont, Wilmington, DE); a gastrotomy/jejunostomy tube was also inserted and the site tacked to the antrum. The esophagoscope was then easily advanced into the stomach after the paraesophageal hernia reduction.

After an uncomplicated postoperative course, the patient was transferred to a physical rehabilitation unit to recover from her injuries.

## Comment

Past reports demonstrate a high degree of long-term success of the Belsey Mark IV procedure. In 1997, Fenton and colleagues [3] reported a 95% success rate for a study including 276 patients, with failure defined as a need for reoperation after initial Belsey Mark IV operation. The cited failures include two recurrent hiatal hernias and two iatrogenic esophageal perforations in the operating room during esophagoscopy. The report did not discuss the possibility of developing a traumatic paraesophageal hernia, but it stressed the increasing importance of assessing long- and short-term results of the evolving Belsey Mark procedure [3].

A similar study from 1999 [4] listed the late complications and side effects in 89 patients receiving the Belsey Mark IV operation as transient dysphagia (18%), persisent severe dysphagia (13.5%), moderate dysphagia (10%), postthoracotomy incisional pain (5.6%), bloating (3.4%), difficulty belching (2.2%), and flatulence (1.1%). This study reported one death due to an acute myocardial infarction and cited the success rate of the Belsey operation in patients without preoperative esophagitis as 91.7%. Failure was defined as recurrence of reflux, hiatal hernia, or a new persistent procedure-related symptom [4].

Concomitant injuries delay many diagnoses of posttraumatic diaphragmatic rupture, which can lead to lifethreatening complications including strangulation of abdominal viscera or compression of the heart and lungs. Because diaphragmatic hernias often occur after blunt trauma, exploratory laparotomy should include close examination of the diaphragm. Previous reports indicate that examination should focus on the area around the esophageal hiatus and near the left posterolateral area to identify any diaphragmatic ruptures.

We now suggest that the right side of the diaphragm should be kept in mind during the trauma evaluation and examined closely during surgery if the patient has undergone a previous fundoplication. If a diaphragmatic hernia is identified during the laparotomy, surgical repair can be initiated immediately. An abdominal surgical approach is used for most emergency paraesophageal hernia repairs, and previous studies have indicated the success of this method [5].

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# Benign Esophagobronchial Fistula With and Without Esophageal Obstruction: Two Ends of the Surgical Spectrum

Timothy L. Van Natta, MD, Kalpaj R. Parekh, MD, Caitlin G. Reed, MD, Saad A. Shebrain, MD, and Bassam O. Omari, MD

Division of Cardiothoracic Surgery, Department of Surgery, Division of Infectious Disease, Department of Internal Medicine, Harbor-UCLA Medical Center, Torrance, California; and University of Iowa Hospitals and Clinics, Iowa City, Iowa

**Acquired esophagobronchial fistula (EBF) is uncommon and its surgical remediation is challenging. Management depends on the cause, degree of pulmonary involvement, and existence of esophageal obstruction. We report management of two EBF cases representing extremes of the**

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Address correspondence to Dr Van Natta, Harbor-UCLA Medical Center, Department of Surgery, Box 42, Division of Cardiothoracic Surgery, 1000 W Carson St, Torrance, CA 90509; e-mail: timothy.vannatta@gmail.com.



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**surgical spectrum. One patient with EBF secondary to mediastinal fungal infection underwent pulmonary resection and esophageal repair. Another, who was positive for human immunodeficiency virus, required esophageal resection and fistula closure, but no pulmonary resection. Successful outcome was achieved in both patients.**

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Benign esophagobronchial fistula (EBF) is an uncommon disorder with a variety of causes. Surgical repair is often required for cure, and complexity of an EBF may pose considerable challenges for the thoracic surgeon. Operative decisions must take into account the cause of the fistula and location, severity of pulmonary involvement, and presence or absence of esophageal obstruction. We present two cases that illustrate these issues.

## Case Reports

### *Patient 1*

A 25-year-old previously healthy man, employed in poultry processing, was evaluated for chest pain and dyspnea. For months he had relapsing fevers and a productive cough consistently and immediately provoked by eating or drinking. Antibiotics only transiently helped. He was acutely ill on presentation and had diminished left breath sounds. Results of serology for human immunodeficiency virus (HIV) were negative. Chest roentgenogram showed complete left lower lobe consolidation. Chest computed tomography (CT) demonstrated a 7 × 4-cm mid-mediastinal mass extending into the left lower pulmonary lobe, abutting the left atrium. Although the left upper lobe was spared, the lower lobe was essentially destroyed (Fig 1). Endoscopy showed the left lower bronchi were inflamed, more so than the upper ones, and they contained abundant purulent secretions.

A sputum culture grew *Streptococcus milleri*, and the patient was treated with ampicillin. Results for acid-fast bacillus (AFB) and fungal cultures were negative. A subcarinal biopsy specimen showed only inflammation.

An esophagram revealed a 7-cm tract extending from the midesophagus to the left lower lobe bronchi and no esophageal stenosis (Fig 2). Esophagoscopy verified a fistula to the left at 27 cm from the incisors. Endoscopic ultrasound (EUS) with biopsy confirmed a benign subcarinal mass. Fistula closure and left lower lobe resection were advised. Left thoracotomy would be required for left lower lobectomy, and it was considered likely that an additional right thoracotomy would be needed to address the midesophagus.

At left posterolateral thoracotomy, the upper lobe was unremarkable, but the lower lobe was an inflammatory mass. No malignancy was present. With some difficulty, the esophagus was dissected away from lung. A lower lobectomy was performed, aided by intrapericardial vein isolation. An immediate right posterolateral thoracotomy then addressed the subcarinal esophagus. A fistula tract was identified, extending inferolaterally to the left. Esophageal myotomy allowed assessment of the perforation, which was débrided and repaired (stapled) over a 44F Maloney dilator. The myotomy was closed with sutures and the pleura was interposed between esophagus and carina.

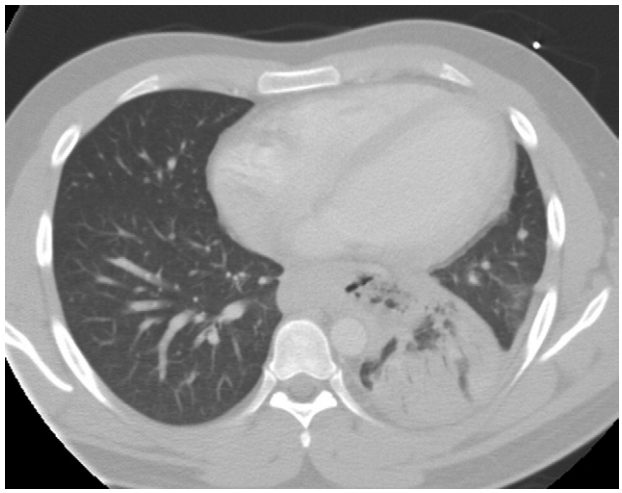

*Fig 1. A chest computed tomography scan of patient 1 shows left lower lobe destruction and upper lobe preservation.*

Pathology revealed a necrotizing granulomatous process teeming with *Histoplasma capsulatum,* consistent with occupational exposure. Itraconazole was given. A postoperative *S milleri* empyema required rib resection and drainage, after which the patient progressed well.

### *Patient 2*

A 33-year-old man presented with dysphagia and cough exacerbated by liquid ingestion. History was notable for HIV (CD4 count of 256, 25%; never on antiretroviral therapy), and a *S mitis* brain abscess requiring craniotomy 8 months prior, without residual deficit. Lower extremity venous thrombosis after the craniotomy had prompted Coumadin therapy (Bristol-Myers Squibb, Princeton, NJ).

A chest roentgenogram showed a prominent left lower infiltrate. CT revealed a paraesophageal mass from carina to gastroesophageal junction, subcarinal adenopathy, left lower lobe consolidation, esophageal dilation, and left atrial compression (Fig 3). The patient presented with upper gastrointestinal bleeding shortly thereafter and required transfusion of 2 U of packed red blood cells. Coumadin was stopped, and an inferior vena cava filter was placed.

Esophagoscopy showed inflamed, friable midesophageal mucosa and distal esophageal narrowing that was difficult to traverse. No esophageal perforation was identified. There were no gastroduodenal mucosal abnormalities, and biopsy specimens of the esophageal mucosa showed no malignancy. Bleeding resolved with acid suppression therapy and Coumadin cessation.

A repeat esophagoscopy showed decreased inflammation but marked distal esophageal compression.