

CASE REPORT

Barrett's esophagitis related bronchoesophageal fistula - the diagnostic value of persistent air leak in the ventilated setting

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ABSTRACT: A case of acquired tracheoesophageal fistula (TEF) is presented in a 44-year-old female who presented with acute respiratory failure due to bilateral aspiration pneumonia. The patient had persistent air leak while on mechanical ventilation and underwent bronchoscopy which revealed the above etiology. Histopathology showed Barrett's esophagitis. The patient underwent primary closure followed by a short course of proton pump inhibitors. There are only two prior reported cases of acquired TEF associated with Barrett's esophagitis. This condition should be taken under consideration when investigating of an explained persistent air leak in a mechanically ventilated patient.

INTRODUCTION

Tracheoesophageal fistula (TEF) is a congenital or acquired life threatening complication of a communication between the esophagus and the tracheobronchial tree or the other mediastinal structures, due to pathological conditions affecting these structures. The most common etiology of nonmalignant acquired TEF is a cuff-related tracheal injury in an intubated patient. Esophageal cancer is the most common malignant etiology (1, 2). Patients with TEF on mechanical ventilation tend to have increased secretions, and are at increased risk of aspiration pneumonia from gastric contents that reflux through the TEF into the tracheobronchial tree. Barrett's esophagus refers to the replacement of normal squamous epithelium in the lower esophagus by columnar epithelia caused by chronic exposure to gastric acidic secretions. It is associated with increased risk for adenocarcinoma of the esophagus. This report describes an unusual case of Barrett's esophagus presenting with

ulcerating TEF which was detected while investigating a persistent air leak on a mechanical ventilator.

CASE REPORT

A 44-year-old female was admitted to the hospital with a sudden onset of respiratory distress. She had a three year history of gastro-esophageal reflux disease (GERD) but no history of smoking or alcohol use. The patient was intubated and mechanically ventilated. On physical examination, she had bilateral crepitations and rhonchi on chest auscultation. Her complete blood count and comprehensive chemistry profile were within normal limits. Chest radiograph demonstrated bilateral aspiration pneumonia. During ventilation, she was noted to have a constant leak of 150cc of tidal volume with each respiration. Suspecting a cuff leak, the treating team decided to replace the endotracheal tube. However, there was no improvement in the consistent loss of tidal volume.

Emergency bronchoscopy revealed a 1cm left-sided TE fistula near the carina. Esophagogastro-duodenoscopy (EGD) confirmed the diagnosis at 30cm from the incisor teeth (Figure 1). Biopsies and brushings were obtained to exclude

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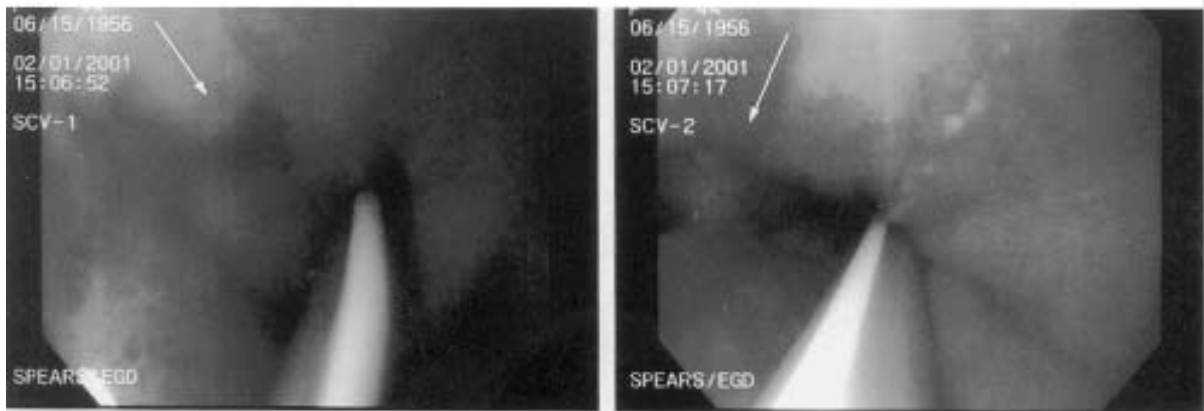


Figure 1. Tracheoesophageal fistula (TEF) at the level of the distal esophagus, as seen on esophagogastroscopy. White arrow points to the site of the TEF.

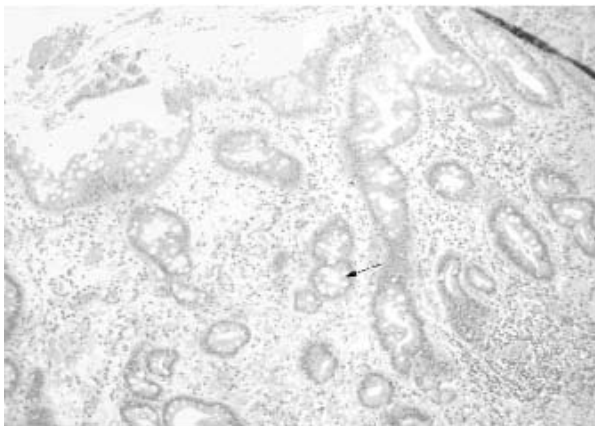


Figure 2. Medium power view of the non-dysplastic epithelial metaplasia in squamous epithelium of the esophagus (Hematoxylin & eosin stain).

malignancy. Histopathology was consistent with Barrett's mucosa with ulceration and active inflammation (Figure 2). No dysplastic or neoplastic changes were present. Computed tomography was obtained to investigate for an associated mass, but showed only a left sided tracheoesophageal fistula with no other mediastinal or abdominal abnormality. Primary surgical repair was undertaken with longitudinal suturing of the individual bronchial and esophageal components of the fistula. A small post-operative leak was identified on the barium esophagogram (Figure 3). It was successfully treated with conservative management consisting of percutaneous endoscopic jejunostomy (PEJ) tube feeding and a proton pump inhibitor therapy for 2 weeks. The patient improved and was extubated on post-surgical day 5 and discharge home in a stable condition after 2 weeks.

DISCUSSION AND CONCLUSION

Barrett's esophagus is an intestinal metaplastic response of the esophageal squamous mucosa to chronic gastroesophageal reflux (3). It can present as tongue-like extensions from the gastroesophageal junction or scattered islands of columnar epithelium in the early stages. Circumferential involvement of the esophagus is seen in advanced cases. Ulceration is identified in 10% of Barrett's esophagus. Deep wide-mouthed Barrett's ulcer can penetrate or perforate adjacent mediastinal organs. An air leak of more than 100 cc per tidal volume in mechanically ventilated patients is very unusual. Such a leak can be caused by inappropriate cuff inflation, misplacement of the endotracheal tube, pneumothorax, bronchopleural fistula, chest tube air leak and fistulas in-between the airways and the mediastinal structures. In this case, the etiology was found to be TEF. It is likely that the erosive nature of Barrett's esophagus and the proximity of the esophagus and tracheobronchial tree anatomically that led to the TEF. Proton pump inhibitors were used to decrease the gastric acid secretion to aid in epithelial healing. There are only two prior reported cases of acquired TEF associated with perforated Barrett's esophagitis (4, 5). TEFs are usually diagnosed by bronchoscopy or barium swallow studies. Our experience suggests that the detection of persistent and unexplained air leak in a mechanically ventilated patient should lead the clinician to consider TEF as a causative condition. Conditions that predispose patients to TEF should be taken into account when considering this etiology. Recognizing the presence of acquired TEF early on prevents the development of complications such as aspiration pneumonia, which could prove to be life-threatening especially in our current population of inpatients with multiple comorbidities.

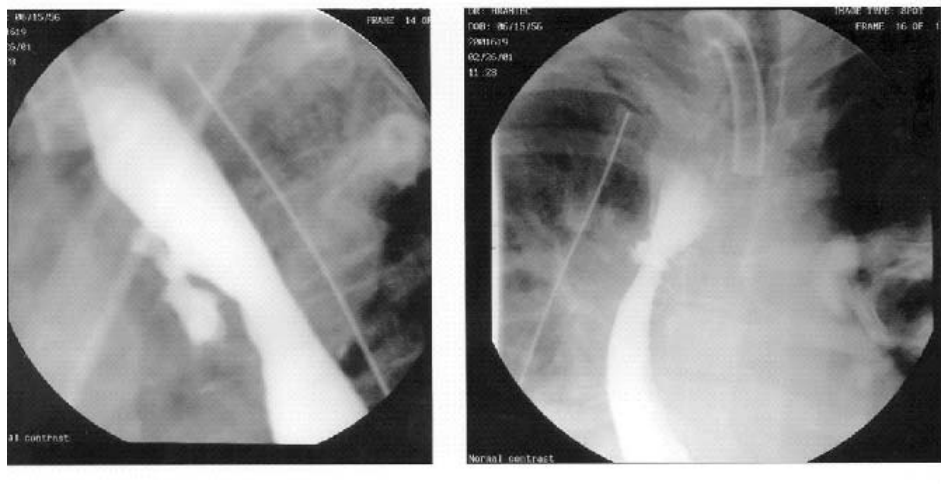


Figure 3: Barium esophagogram demonstrating post-repair leak. Arrow indicates barium leakage point.

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