

Closure of a Chronic, Non-Healing Tracheoesophageal Fistula With a New Over-the-Scope Clip

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Abstract

Tracheoesophageal fistulas can arise from both benign and malignant conditions, and often present clinically as increased secretions, coughing with or without hypoxia after swallowing, and recurrent aspiration pneumonia. We describe a tracheoesophageal fistula in a post-chemotherapy lymphoma patient that was closed with use of an over-the-scope Aponos clip.

Introduction

Tracheoesophageal fistulas can arise from both benign and malignant conditions, but mediastinal malignancies remain the most frequent cause of the tracheoesophageal fistulas.¹ These malignancies include lymphoma, head and neck cancer, and esophageal cancer. Tracheoesophageal fistulas often present clinically as increased secretions, coughing with or without hypoxia after swallowing, and recurrent aspiration pneumonia. Visualization of the defect can be achieved directly with bronchoscopy and endoscopy, or radiologically with barium swallow or CT scan.²

Case Report

A 76-year-old male with a history of mediastinal non-Hodgkin's lymphoma presented for management of a chronic tracheoesophageal fistula. The patient was last treated with chemotherapy in 2011, and he was believed to be disease-free since that time. The etiology of the fistula was not clear, but may have been related to the patient's history of mediastinal lymphoma and subsequent chemotherapy treatment. The fistula was discovered during a barium swallow evaluation after the patient developed chronic cough and recurrent aspiration pneumonia. A percutaneous gastrostomy tube with a J-arm extension into the small bowel was placed.

An esophagogastroduodenoscopy (EGD) was performed, which identified a 1-cm, epithelialized, chronic-appearing tracheoesophageal fistula in the middle third of the esophagus (Figure 1). Bronchoscopy localized the fistula to the trachea just above the bifurcation of the left and right mainstem bronchi. The fistula was firm and densely fibrotic. A fully-covered 23 mm x 125 mm Wallflex™ (Boston Scientific, Natick, MA) esophageal stent was deployed across this fistula in an attempt to divert ingested material and heal the fistula. The patient did well afterwards, with minimal discomfort and slow advancement of his diet.

A follow-up endoscopy was performed 8 weeks later. The previously placed fully-covered esophageal stent was widely patent and seen to be in appropriate positioning without evidence of migration. This stent was removed via rat tooth forceps, which revealed a persistent and essentially unchanged tracheoesophageal fistula. Given the

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Figure 1. Endoscopic image of the tracheoesophageal fistula, demonstrating a fibrotic appearance.



Figure 2. Endoscopic image of the site of the tracheoesophageal fistula following deployment of Aponos clip.

lack of improvement of the fistula despite the placement of a stent for a 2 months, we elected to use an over-the-scope clip device in an attempt to achieve primary closure of the fistula.

An Aponos clip device (Aponos Medical, Kingston, NH) was affixed to the end of a standard upper endoscope. The fistula and surrounding tissue were suctioned into the cap and the clip was deployed across the entire fistula without difficulty (Figure 2). Imaging showed no extravasation of radiographic contrast from the esophageal lumen to the airway (Figure 3). Immediately following the procedure, the patient was able to tolerate clear liquids without any symptoms of aspiration and was discharged the same day with instructions to slowly advance his diet. He has done well since the procedure without evidence of fistula recurrence.

Discussion

Historically, tracheoesophageal fistulas were managed surgically and nonsurgical candidates were treated with the placement of feeding tubes to reduce the risk of aspiration. An endoscopic approach to the treatment of gastrointestinal wall defects is ideal in the setting of active inflammation, malignancy, and surgical dehiscence, and has become first-line therapy at most institutions.³ Multiple endoscopic approaches have been employed. Most have centered on some form of direct closure device: sutures, fibrin glue, clips, or stents. Several case reports have reported methods to induce granulation tissue at the site of the fistula prior to closure (in an attempt to promote scarring after closure). Granulation can be induced via the use of argon plasma coagulation, bipolar electrocautery, or a heater probe.⁴⁻⁶ Endoscopic clips are useful for the closure of small defects, although their lim-

ited opening diameter and relatively low closure force make them less viable options for large defects or defects that are fibrotic, malignant, or inflamed.

Endoscopic stents are widely used to treat fistulas and perforations in the esophagus and often work to good effect.^{7,8} Modern self-expanding metal stents, though, can be prone to migration, obstruction, and are often associated with pain.³ Our patient's fistula did not heal despite appropriate placement of a self-expanding metal esophageal stent over the defect for 2 months. Over-the-scope clips (OTSCs) such as Ovesco (Ovesco, Tübingen, Germany) have been increasingly used for the closure of luminal defects such as perforations, anastomotic leaks, and gastrointestinal fistulas. This is likely due to their ability to grasp more tissue and provide greater compressive force.^{9,10} In a case series evaluating the performance of Ovesco OTSCs in 12 patients with anastomotic leaks, perforations, or fistulas, primary closure was successfully achieved in 9 of the 12 patients. Treatment failures were due to the inability to successfully oppose the

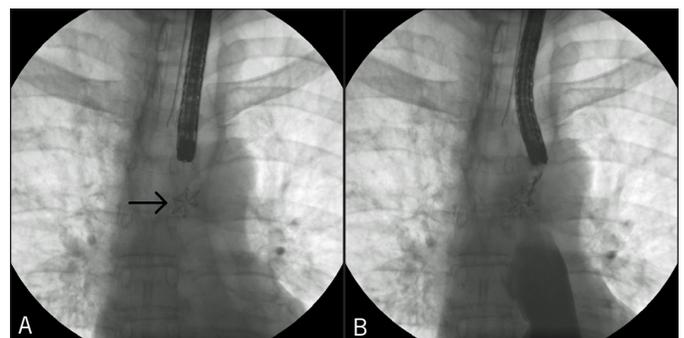


Figure 3. Fluoroscopic image of (A) the clip (arrow) in place across fistula and (B) contrast injection into the esophagus following closure of fistula. Contrast appears to be confined to the esophagus consistent with fistula closure.

tissue around the defect, incomplete closures after deployment of the OTSC, and in 1 case, a clip that spontaneously dislodged the day after placement.¹¹

The Aponos clip is an alternative over-the-scope clip. It has a transparent cap that mounts over the tip of a standard adult endoscope, similar to Ovesco or an endoscopic variceal band ligator. A 6-pronged hexagonal nitinol clip in a ring conformation rests over this cap. A trigger cable runs parallel to the scope that connects this cap to a handle. Once the margins of the defect are suctioned into to the cap, the nitinol ring can be deployed and released by performing a pushing maneuver on the handle. The prongs then pull towards each other, radially compressing the secured tissue. The clip is only available in a single size and only works with a standard EGD scope. It is unknown if the Aponos clip is better, worse, or the same as the Ovesco clip in terms of ease of use and/or efficacy, and future studies are needed.

Disclosures

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