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# Endoscopic closure of tracheoesophageal fistula for tuberculosis with an over-the-scope-clip

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**ABSTRACT**

Surgical management has been the main approach for enteral fistulae. This approach is usually complex due to comorbidities, a wasted nutritional state and anatomical difficulties related to prior multiple interventions. Therefore, endoscopic methods such as clips, self-expanding metal stent (SEMS) and recently, the over scope clip (OTSC®) are increasing in popularity and use.

Herein, we present the case of a patient with a HIV infection who was admitted due to respiratory symptoms. Radiological and microbiological studies documented a tracheoesophageal fistula due to tuberculosis (TB) and cytomegalovirus (CMV) infection. Therefore, an esophageal fully-covered stent was placed, which migrated into the stomach. The thoracic surgeons considered an esophagectomy with gastric ascent and muscle patch in the trachea. However, due to his poor nutritional status and comorbidity,

an OTSC was placed to treat the fistulae. The patient also received medical treatment with anti-tuberculotics and anti-retrovirals.

**Key words:** Tracheoesophageal fistulae. OTSC®. Tuberculosis. AIDS serodiagnosis. Endoscopic treatment.

## INTRODUCTION

The over-the-scope-clip (OTSC®, Ovesco system) is a clipping device made of nitinol. The clip is mounted on a cap in the distal tip of the endoscope, similar to variceal ligation band. OTSC® has been approved for human use in Europe since 2009 and in the United States since 2010 (1,2). This system provides a closing force as tight as a manual suture in porcine models *ex vivo* (3). It can grasp all layers of the visceral wall and this in turn leads to a full thickness scarring, without causing adhesions (4).

The most common use of OTSC® include gastrointestinal (GI) iatrogenic perforations, anastomosis leaks, correction of bariatric surgery fistulae, digestive bleeding and the closure of natural orifices transluminal endoscopic surgery (NOTES) (4). There are few case reports on the use of OTSC® for the treatment of tracheoesophageal fistula (5-7). There are no described cases to date of tracheoesophageal fistula closure with OTSC® in a patient with tuberculosis and HIV-AIDS infection.

## CASE REPORT

A 39-year-old male with a history of MSM (men who have sex with men) presented to the Emergency Department due to a dry cough of a three week duration, which worsened after the ingestion of food or fluids. He reported fever, chills, asthenia, fatigue, anorexia and a 5 kg non-voluntary weight loss during the last month. Physical examination identified mucocutaneous pallor and emaciation (weight: 53 kg; height: 167 cm; body mass index [BMI]: 19 kg/m$^2$) with bibasal rhonchus. The patient was hospitalized in order to perform biochemical studies (Table 1).

Upper digestive endoscopy identified an orifice with a diameter of 2 cm and marked inflammatory changes at 30 cm from the dental arches; biopsies were also taken (Fig. 1A). A tracheoesophageal fistula was identified via a barium esophagogram (Fig. 1B). Based on these findings, a SEMS was placed. A new endoscopy was performed three days later due to the persistence of symptoms and a SEMS migration into the stomach was identified. The stent was removed and the fistulae closed with an OTSC® (Fig. 2A and B).

Pathology and secretion reports confirmed TB. Anti-tuberculous (isoniazid 300 mg, rifampicin 600 mg, pyrazinamide 1,500 mg and ethambutol 1,200 mg) and antiretroviral (efavirenz 600 mg and tenofovir/emtricitabine 300 mg/200 mg) therapy was initiated with an adequate tolerance. The patient was discharged two weeks later with improvement of symptoms and an adequate oral tolerance. A complete closure of the fistulae was observed six months later during the endoscopic control (Fig. 2C) and the patient was asymptomatic.

**DISCUSSION**

Tracheoesophageal fistulae are an abnormal junction between the trachea and the esophagus. It can occur secondary to trauma, neoplasia, necrosis due to prolonged intubation, a rigid nasogastric tube insertion or iatrogenic endoscopic perforations and surgery. Less common causes have been described such as esophagotracheal tuberculosis. There are few reports in the literature of HIV and tuberculosis infection related tracheoesophageal fistulae. Most underwent surgical management, some with endoscopic stenting and only one had a conservative management with percutaneous endoscopic gastrostomy with parenteral nutrition (8-10). Conservative treatments with successful outcomes have been reported in small series (10). However, this involves the use of antiretroviral drugs in parenteral or liquid presentation for administration via gastrostomy. Unfortunately, the latter is not available in our center. In addition, there are no guarantees of a successful closure of large defects.

The chronic tracheoesophageal fistulae approach involves thoracotomy for surgical closure of the lesion in most cases. However, this procedure carries a high risk in patients

with a poor nutritional status and global deterioration (9,10). Endoscopic stenting has also been used but with unsatisfactory outcomes due to SEMS migration and also local complications such as a worsening of the tracheoesophageal fistulae. However, the experience with stenting in TB-related fistulas has not yet been described.

In our patient, we first placed an esophageal SEMS but this did not resolve the clinical situation, as it migrated. Therefore, OTSC® was used as a closure measure of the defect and a complete resolution of the symptoms. The OTSC® system is a promising method for the treatment of multiple GI pathologies. It could play an important role in fistulae closure in patients with multiple comorbidities and non-surgical candidates.

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**Table 1. Laboratory reports during hospitalization**

| *Biochemical labs* | *Results* | *Reference value* |
|---|---|---|
| Leukocytes | 9,600 | 4,500-110,000 $mm^3$ |
| Hemoglobin | *10.8* | 13-17 g/dl |
| Total proteins | *5.75* | 6.40-8.30 g/dl |
| Albumin | *2.2* | 3.5-5.0 g/dl |
| Transferrin | *91* | 174-364 mg/dl |
| HIV | *Reactive* | No reactive |
| Western Blot | *Positive* | Negative |
| CD4 count | *48* | 410-1,590 cel/ul |
| Tuberculosis baciloscopies | *Positive: 3/3 samples* | Negative |
| Tuberculosis culture | *Mycobacterium tuberculosis: sensitive to the first line* | Negative |

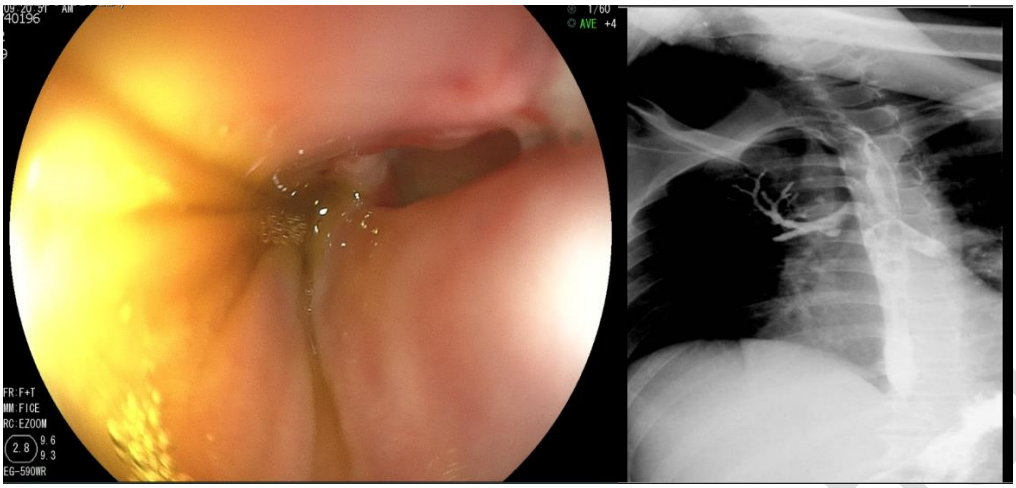

Fig. 1. Active traqueoesophageal fistulae. A. Endoscopic appearance, inflammatory changes and a purulent secretion. B. Esophagogram with an evident contrast leakage to the tracheobronchial tree.

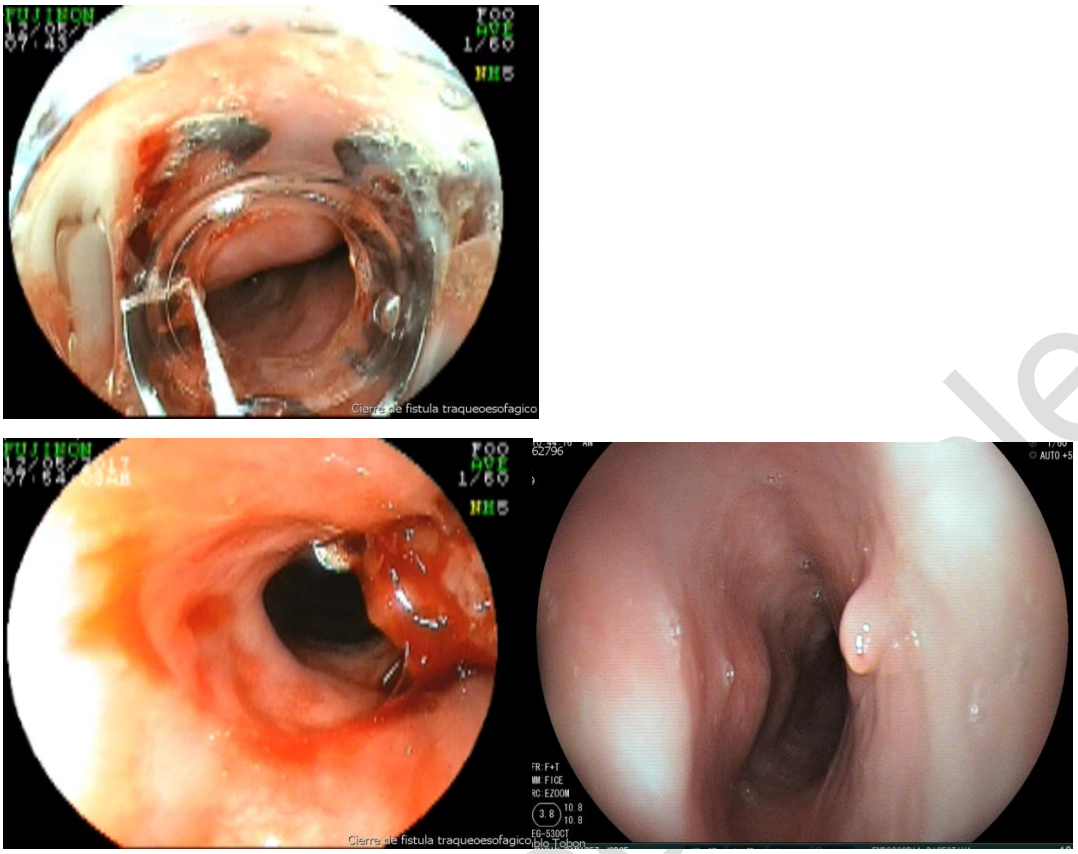


Fig. 2. Closure of tracheoesophageal fistula with Ovesco. A and B at the time of the endoscopic closure and C, six months after fistulae closure with OTSC®.