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Case Report

# Use of a double-channel endoscope for closure of a surgically failed chronic benign tracheoesophageal fistula using over-the-scope-clip

**Saumil K. Shah**

Department of Gastroenterology, Criticare Hospital, Mumbai, India

**Abstract**

This case reports the use of a double-channel therapeutic gastroscope to permanently close a surgically failed chronic, benign tracheoesophageal fistula following endotracheal intubation in an elderly lady, using the over-the-scope-clip. Argon plasma coagulation seems essential in such smooth chronic fistulas to make the edges raw. A double-channel therapeutic gastroscope would be ideal for such cases, especially in larger fistulas.

**Key words**

Argon plasma coagulation, endotherapy, OTSC clip, tracheoesophageal fistula

## Introduction

A tracheoesophageal fistula is a congenital or acquired communication between the trachea and the esophagus. Postintubation tracheoesophageal fistulas can occur uncommonly following prolonged mechanical ventilation with an endotracheal or tracheostomy tube. Such acquired fistulas usually do not close spontaneously, thus necessitating definitive surgical repair. Since surgical repair is associated with high morbidity as well as mortality, endoscopic therapeutic options have been pursued for treatment.

## Case Report

A 58-year-old lady with diabetes mellitus and hypertension was admitted in April 2013 with respiratory distress for left lower lobe consolidation with sepsis. She was intubated and was on ventilator for 6 days with antibiotic therapy, following which she recovered. Following extubation, she was noted to have bilateral vocal cord palsy with excessive coughing on taking oral liquids. She was kept on Ryle's tube feeds for 6 weeks, following which she was referred to our institution for persistent cough on swallowing liquids. A water-soluble contrast swallow documented a tracheoesophageal fistula [Figure 1]. A computed tomography scan showed a tracheoesophageal fistula [Figure 2] between the posterolateral tracheal wall and left anterolateral esophageal wall (around 5 cm above the level of the carina). She underwent a gastroscopy the following day which showed the vocal cords to be in the semi-adducted position with poor movement and a 1 cm ulcerated defect in the upper esophagus, at around 4 cm from the upper esophageal sphincter. A guidewire passed through the defect was shown to enter the trachea at around 5 cm above the carina. The lower esophagus and stomach was normal at endoscopy. Patient was suggested definitive surgery at this point. However, she wished to continue conservative treatment with nasogastric feeding for a few more weeks. She followed up after 6 weeks. Oral contrast study showed no leak or extravasation into the tracheobronchial tree. Thus, the Ryle's tube was removed, and oral feeding was attempted. Patient felt better on swallowing with no coughing. She followed in December 2013 with a 6-kg weight loss and recurrence of coughing on swallowing liquids. A barium swallow had been performed, which showed a fistulous communication between the upper esophagus and the trachea. The patient was recommended to undergo a definitive surgical procedure. The patient underwent exploration of the neck with stapling of the fistula. She recovered uneventfully following the surgery and was apparently symptom free until February 2014. However, she followed back in March 2014 with the same complaints of coughing while swallowing liquids. A water-soluble contrast swallow confirmed a persistent

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Address for correspondence:
Dr. Saumil K. Shah, Sea View, 1st Floor, West Avenue, Santacruz (W), Mumbai, Maharashtra, India. E-mail: saumilkshah@hotmail.com

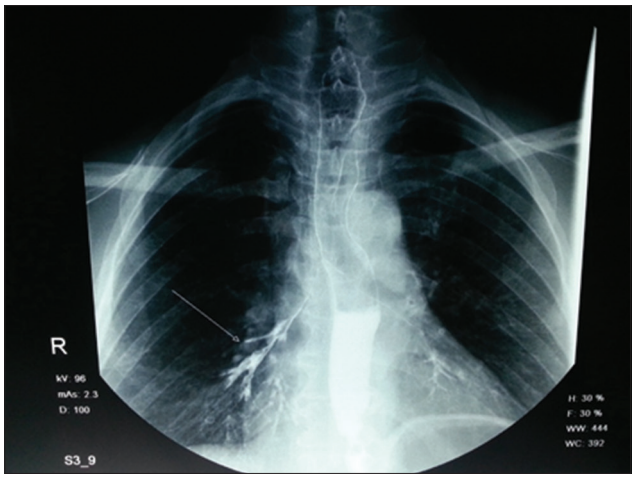


**Figure 1:** Chronic tracheoesophageal fistula documented with conray swallow

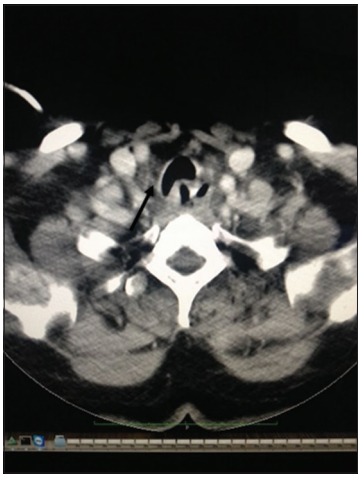

**Figure 2:** Computed tomography scan neck and chest showing the tracheoesophageal fistula tract

fistulous communication between the esophagus and trachea. A repeat gastroscopy showed a smooth 1 cm defect in the upper esophagus, at around 4 cm from the upper esophageal sphincter. The patient accepted the option of endotherapy with the over-the-scope-clip (OTSC-Ovesco Endoscopy GmbH, Tübingen, Germany), so as to seal the fistulous tract. A double-channel therapeutic gastroscope (GIF-2T100, Olympus) was used for the procedure. She underwent the gastroscopy procedure under general anesthesia. She was not intubated. The fistula edge was seen in the upper esophagus [Figure 3a]. The esophageal side of the fistula was burnt with argon plasma coagulation so as to make the edges of the mucosal and submucosal surface raw [Figure 3b]. The OTSC was loaded over the scope [Figure 3c]. A single anchor failed to grasp and pull the firm fistula site within the OTSC cap. Thus, a 2nd anchor was passed across the second channel of the double lumen therapeutic gastroscope. Both anchors were used at the two edges of the fistulous opening and pulled within the OTSC cap [Figure 3d], following which the clip was satisfactorily deployed [Figure 3e]. Oral contrast swallow confirmed complete

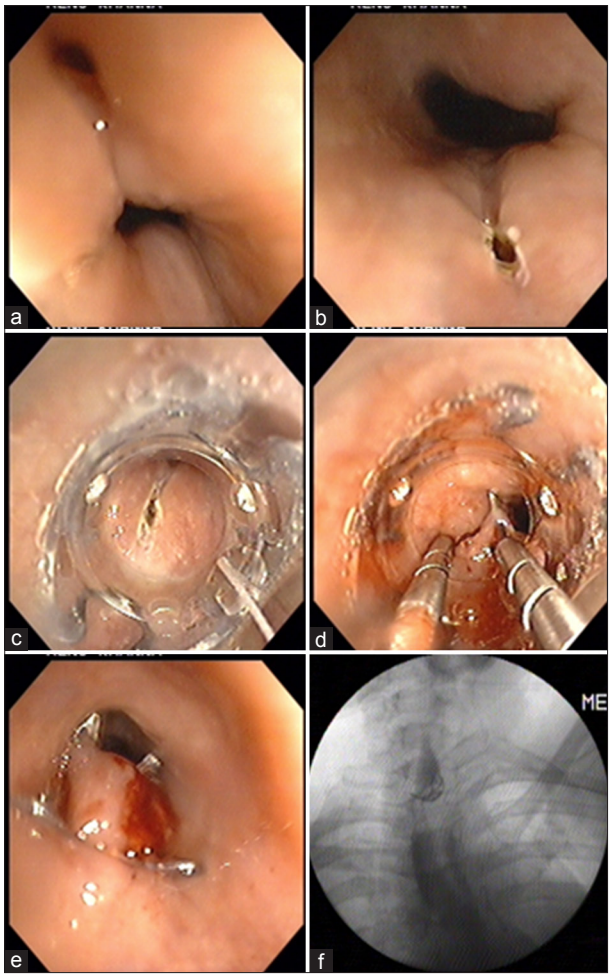


**Figure 3:** (a) Chronic tracheoesophageal fistula in upper esophagus. (b) Argon plasma coagulation of the edges to make the margins raw. (c) over-the-scope-clip device mounted over a double-channel therapeutic endoscope. (d) two anchors used to capture the fistula and position in the center. (e) over-the-scope-clip deployed satisfactorily. (f) post over-the-scope-clip deployment conray swallow performed showed no evidence of the leak

closure of the fistula [Figure 3f]. The total procedure time was around 25 min. The patient was started on oral liquids the same evening and soft diet the following day. She was discharged after 24 h. Patient remains asymptomatic at 8 months of follow-up.

## Discussion

Over-the-scope-clip is a nitinol clip with the shape of a "bear claw" which is loaded on a transparent cap that is mounted on the tip of the endoscope. Reports of the successful use of the OTSC clips are available in literature since 2007. It has been predominantly used for perforations, leaks or fistulas, acute nonvariceal gastrointestinal bleeding and for NOTES closure.[1,2] OTSC has been shown to be easy to use with good results and avoids surgery in many situations.[3,4]

Surgical intervention for esophageal leaks and fistulas is associated with high morbidity. Post-operative esophageal

leaks[5] and esophagobronchial fistula[6,7] closure endoscopically with an OTSC clip has been described earlier.

The rate of successful closure of perforations (90%) and leaks (73.3%) is reported to be significantly higher than that of fistulae (42.9%).[8] Fibrosis and scarring seem to be a problem in these patients with chronic fistulas.[9,10] Argon plasma coagulation if used to make the smooth edges of these chronic fistulas raw and induce mucosal injury, may promote vascularity and healing in this area.[11]

Another novel feature of this case was the use of a double lumen therapeutic gastroscope, which facilitated use of two anchors simultaneously to catch the fistulous tract well. There has been a report of failure to close a 15 mm fistula following gastric banding procedure, which could not be caught with a single anchor.[12] Thus, it would be possible to close larger fistulas using this double anchor technique.

This case reports successful closure using a nonsurgical endoscopic technique of a surgically failed chronic, benign tracheoesophageal fistula following endotracheal intubation in an elderly lady. Argon plasma coagulation in such smooth chronic fistulas seems essential. A double-channel therapeutic gastroscope would be ideal for such cases, especially in larger fistulas.

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