Endoscopic Closure of Tracheoesophageal Fistulas With the Over-the-Scope Clip System

Umit Bilge Dogan, Mustafa Salih Akin and Serkan Yalaki

ABSTRACT
Management of Tracheoesophageal Fistulas (TEFs) is associated with high morbidity and mortality and remains an interdisciplinary challenge. We describe the first two cases of successful endoscopic closure of TEFs due to tracheostomy tube and thoracic hydatid cysts surgery, using the Over-The-Scope Clip (OTSC) system. The OTSC system is composed of an application cap, which is mounted onto the distal tip of the endoscope and a connected releasing mechanism, installed on the handle of the scope. The rotation of the handle allows the release of the clip by a two tube sliding mechanism. Atraumatic version of OTSCs with medium sized caps, twin graspers and anchor were used in these cases. Both fistulae were successfully sealed with one clip. No complication was observed that could be ascribed to the clip itself or to the technique. One patient died because of pneumonia and septicemia after 1 week, but the symptoms of other patient were immediately improved. A thoracic radiography taken after 1 month showed that the clip is in place. Although prospective comparative clinical studies are needed to work out the drawbacks of the new OTSC device, it might be considered as a valid alternative to operation in TEFs.

Key Words: OTSC. Tracheoesophageal fistula. Endoscopic treatment. Clipping system.
Peripheral parenteral nutrition and intravenous administration of antibiotics were started, and oral intake was withheld. However, the patient died because of pneumonia and septicemia after one week.

**Case 2**: A 59-year-old woman presented with cough and vomiting of 5 years duration. She had a history of thoracic hydatid cysts surgery 5 years ago. Endoscopy revealed a 5 millimeter sized tracheoesophageal fistula placed 30 centimeters from incisors (Figure 2A). A 12 cm fully covered self-expanding metallic stent was placed into esophagus for 3 months. Control endoscopy was performed after stent removal showed no sealing of fistula. An OTSC clip (12-t) with anchor instead of twin grasper was applied by the same way (Figure 2B). Immediately after this procedure, a fluoroscopy and an abdominal CT with gastrographin showed complete closure of the fistula (Figure 2C and 2D). The symptoms of patients were immediately improved. A thoracic radiography taken after one month showed that the clip was in place.

The patients gave informed consent before the endoscopic procedure. Both fistulas were successfully sealed with one clip. No complication was observed that could be ascribed to the clip itself or to the technique. None of the patients underwent additional endoscopic treatments.

**DISCUSSION**

TEF is an abnormal connection between the trachea and the esophagus. Post-intubation TEFs uncommonly occur following prolonged mechanical ventilation with an endotracheal or tracheostomy tube. In general, depending on the size and location of the tracheal aspect of the fistula, surgical therapy involves primary repair of the fistula and, if necessary, resection and reconstruction of the trachea.1

The OTSC system is a new technique that enables the closure of GI defects (fistula, perforation sites, leaks). This clip surpasses conventional endoclips in terms of breadth and closure power and may, therefore, improve therapeutic options in endoscopy.2 It is simple to use, and experience with variceal ligation aids in feeling at ease with applying an OTSC because the application technique is alike. The OTSC system comprises a variety of clips, based on the diameter and depth of OTSC caps (11, 12 and 14 mm) used and type of teeth (atraumatic with blunt teeth vs. traumatic with sharp teeth). To date, the selection of a particular type of clip for a specific indication and location within the GI tract has not been established, and there are no recommendations or guidelines to direct the choice of clip to be used. We used 12-mm OTSCs with short (blunt) teeth (12-t) for closing TEFs.

Despite its high therapeutic efficacy in the perforation group, the primary therapeutic efficacy of OTSC in patients with anastomotic leaks and fistulas is lower.4 According to our search on PubMed; there are only two OTSC applications in the TEFs. First, Baron et al. tried the closure of a radiation-induced TEF.5 Secondly, Disibeyaz et al. tried the closure of a cuff-induced TEF.6 Unfortunately, both of them were unsuccessful because of fibrosis and spontaneous clip dislodgement.

The main problem is to entrap and hold the damaged tissue in the sealing of TEFs. We think that the most important process for success is the complete approximation of the borders of the defect and entirely pull the damaged tissue inside the cap with maximum suction.

In these cases, both fistulae were successfully sealed with one clip. No immediate complications were observed secondary to the OTSC technique. The first patient had pneumonia and septicemia when OTSC was applied. Therefore, the patient died although sealing the TEF. But cough and vomiting were immediately improved in the other patient, and a thorax graphy taken after 1 month showed that the clip is in place.
To the authors’ knowledge, these are the first report of TEFs that was sealed with an OTSC device and managed conservatively. OTSC clips are easy to apply and they can be used for closure of TEFs. Although prospective comparative clinical studies are needed to work out the drawbacks of the new OTSC device, it might be considered as a valid alternative to operation in selected cases.

REFERENCES


