

Closure of a chronic complex tracheoesophageal fistula by using endoscopic suturing



Ariel A. Benson, MD,^{1,2} David Hakimian, MD,^{1,2} Harold Jacob, MD,² Ivo Boškoski, MD, PhD³

CASE

The patient is a 50-year-old man who presented to a gastroenterology outpatient clinic for evaluation of coughing and regurgitation after drinking liquids. He reported that since his childhood he remembers having similar intermittent episodes of coughing fits and regurgitation after drinking. In addition, he reports having multiple episodes of pneumonia requiring antibiotic treatment throughout his life. The patient has no other medical history and he has no known congenital disorders.

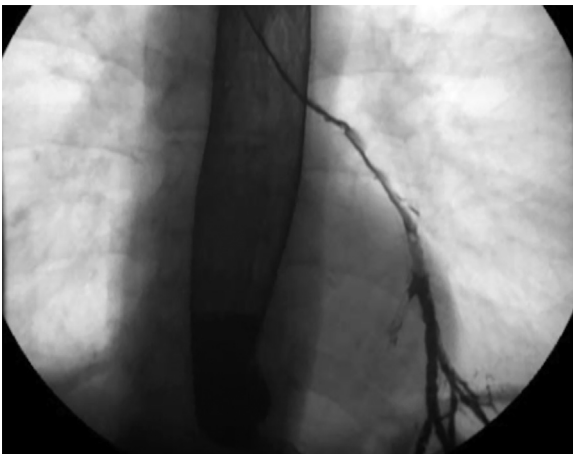


Figure 1. Image from upper GI series study showing tracheoesophageal fistula.

Initial evaluation included an upper GI series with oral contrast that showed findings compatible with a tracheoesophageal (TE) fistula and contrast seen in his left lung (Fig. 1). He then underwent EGD, which showed an area in the esophagus at 22 cm from the incisors that featured at least 3 openings extending approximately 3 cm, compatible with a complex TE fistula (Fig. 2). In addition, there was suspected mild esophageal dilation of unknown etiology. A CT scan confirmed the presence of a TE fistula (Fig. 3).

The patient was also evaluated by a pulmonologist, and bronchoscopy showed an opening 3 cm above the carina.



Figure 3. CT showing tracheoesophageal fistula.

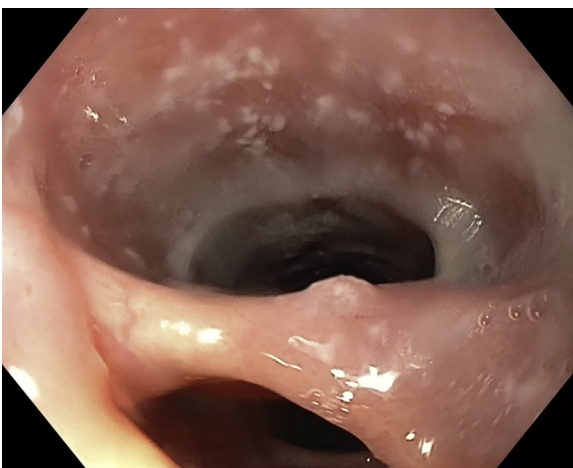


Figure 2. Endoscopy image showing tracheoesophageal fistula.



Figure 4. Argon plasma coagulation to denude mucosa before suturing.

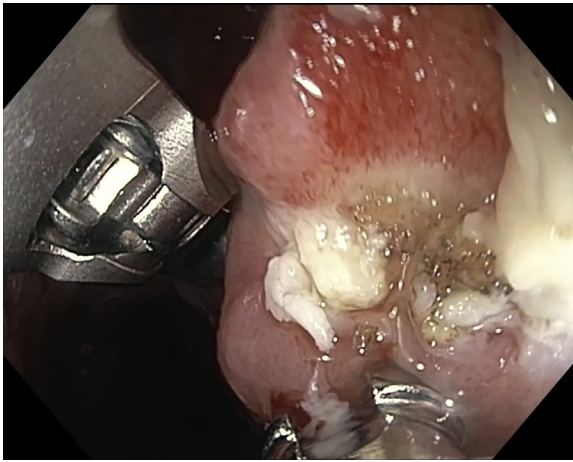


Figure 5. Endoscopic suturing of tracheoesophageal fistula.

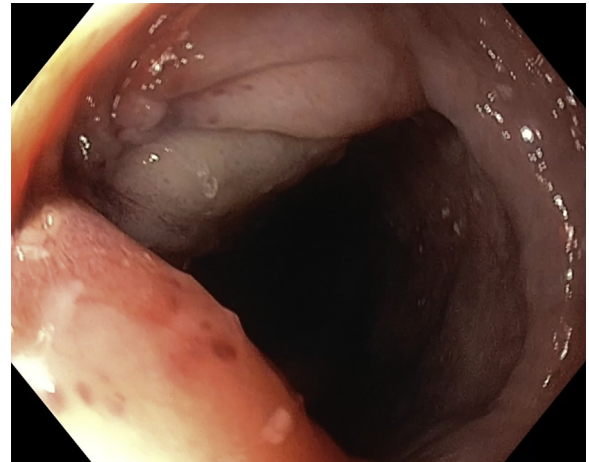


Figure 6. Endoscopic image showing closure of tracheoesophageal fistula.

Methylene blue was injected into the esophagus via nasogastric tube, and the dye was seen in the trachea, compatible with a tracheoesophageal fistula.

The etiology of the patient's TE fistula was unknown, but it was believed to be congenital because the patient had experienced symptoms starting in childhood. After multidisciplinary discussion among gastroenterologists, pulmonologists, and thoracic surgeons, endoscopic suturing was proposed as a treatment option for closure of the patient's TE fistula.

PROCEDURE

The patient was placed under general anesthesia, and an Olympus GIF-H180J (Olympus Corporation, Tokyo, Japan) was advanced to the esophagus. The complex TE fistula with multiple openings was seen. Argon plasma coagulation was applied to the fistula openings using ERBE VIO 200S (ERBE Elektromedizin GmbH, Tübingen, Germany) with settings of effect 2 and 30 W. The gastroscope was then withdrawn (Fig. 4). The Apollo Overstitch endoscopic suturing system (Apollo Endosurgery, Austin, Tex, USA) was then connected to an Olympus double channel endoscope GIF-2TH180. Three sutures were used to close the TE fistula (Figs. 5 and 6).

No bronchoscopy was performed at the time of suturing. Oxygenation status of the patient via mechanical ventilation was normal throughout the procedure. After endoscopic closure, contrast was administered to the esophagus; using fluoroscopy, no extravasation of contrast was seen from the esophagus to the trachea (Fig. 7) (Video 1, available online at www.VideoGIE.org).

OUTCOME

After endoscopic suturing of the TE fistula, the patient had improvement in swallowing for several months. One



Figure 7. Fluoroscopy study after closure of tracheoesophageal fistula, with no contrast extravasation.

year after the procedure, he reported recurrence of regurgitation after swallowing. Given the COVID-19 pandemic, the patient wanted to temporarily delay further evaluation or treatment. If, after endoscopic and radiographic evaluation, recurrence of the TE fistula is seen, repeat endoscopic suturing can be considered.

Although there are several treatment options for TE fistulas, they are often difficult to manage. Esophageal stents and endoscopic clips, both through-the-scope clips and over-the-scope clips, have been used to close TE fistulas.^{1,2} Recently, endoscopic suturing has been used for closure of TE fistulas.^{3,4} Long-term follow-up and efficacy of

endoscopic suturing closure of TE fistulas have not been assessed.

DISCLOSURE

Dr Boškosi is a consultant for Apollo Endosurgery and Boston Scientific, a grant holder for Apollo Endosurgery, and a scientific board member for Endo Tools. All other authors disclosed no financial relationships.

Abbreviation: TE, tracheoesophageal.

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Faculty of Medicine, Hebrew University of Jerusalem, Jerusalem, Israel (1), Institute of Gastroenterology and Hepatology, Hadassah University Medical Center, Jerusalem, Israel (2), Digestive Endoscopy Unit, Fondazione Policlinico Universitario Agostino Gemelli IRCCS of Rome, Rome, Italy (3).

If you would like to chat with an author of this article, you may contact Dr Benson at ari.benson@gmail.com.

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