

## Case Report

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# Ingestion of voice prosthesis in patient with total laryngectomy: A case Report

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## Abstract

Granulomatous diseases, foreign bodies, trauma, surgical procedures, and the use of high pressure intubation tubes are the most common causes of acquired benign tracheoesophageal fistula (TEF). More frequent use of invasive procedures such as intubation, tracheostomy and mechanical ventilation increases the frequency of benign tracheoesophageal fistula development, especially in intensive care patients. In this case report, the patient with a history of total laryngectomy operation, aspirated the audio device secondary to the use of excessive force and the connection of the device to the gastrointestinal system due to the existing tracheoesophageal shunt.

**Keywords:** voice prosthesis, total laryngectomy, tracheotomy, tracheoesophageal fistula

## 1. Introduction

Although acquired Tracheoesophageal Fistula (TEF) is a rare condition, it is known that mechanical ventilator sources can occur in intubated or tracheostomy patients in intensive care units. In addition to the 50% cause of acquired TEF, malignancy is the most common cause of cuff-related tracheal tube damage (1,2). In addition, iatrogenic injuries, esophageal/tracheal surgery history, foreign body or caustic substance exposure, and permanent tracheoesophageal stents are among other causes (2). Clinical symptoms in acquired TEF are usually manifested by respiratory symptoms. Typical symptoms include cough, recurrent lung infections, increased tracheal secretion, cuff leakage, aspiration of gastric contents through the tracheal tube, the air in the nasogastric tube, or abdominal distention (3,4). It is difficult to diagnose TEF due to benign causes since it does not have specific symptoms and is rare. Therefore, it may be present for a long time without being diagnosed, resulting in significant morbidity and mortality (5-8).

Early diagnosis is very important to protect the patient from potentially fatal pulmonary complications. The target treatment is to complete the repair without recurrence, but the treatment varies depending on the clinical condition of the patient, etiology, and the structure of the fistula [2]. In this case report, the migration of the sound device he used after TEF to the digestive system without any respiratory symptoms, which developed in our patient with a history of total laryngectomy operation, is described.

## 2. Case Report

A 50-year-old female patient, who underwent total laryngectomy for recurrent laryngeal carcinoma, was applied

to the emergency service after realizing that there was no sound device after intensive use (Fig. 1). In the patient's anamnesis, it was learned that there were no respiratory system symptoms, and the active complaint was only epigastric fullness. The patient's vital signs were stable at admission. In physical examination; It was observed that there was no discharge from the tracheostomy and there was no stridor, ral, roncus and wheezing in both lungs. Other system examinations were normal. The patient was first evaluated by the otolaryngology department and no foreign body was found in the examination from the tracheostomy to the carina. Afterward, a chest X-ray and then thoracoabdominal computed tomography (CT) were taken to the patient due to the suspicion of aspiration of the sound device to the respiratory or gastrointestinal tract. According to the CT interpretation, bilateral airways were intact, tracheoesophageal fistula developed, there was no foreign body in this region, and a foreign body compatible with the sound device was detected in the third part of the duodenum (Fig. 2;4). Endoscopy was not considered due to the absence of any intestinal obstruction and the patient was followed up.



Fig. 1. Voice prosthesis



Fig. 2. Tracheoesophageal fistula



Fig. 3. Foreign body in the 3rd continent of the duodenum (horizontal)



Fig. 4. Duodenum 3rd continent foreign body (axial)

In the follow-up, the patient did not have acute abdomen and ileus, oral intake was started gradually and a daily standing abdominal X-ray was taken (Fig.5). On the fifth day, a control abdominal computed tomography was performed on the patient who did not detect any foreign body in the standing direct abdominal X-ray. No foreign body was detected in the control tomography, and the patient was discharged after receiving the recommendations of the otolaryngology and thoracic surgery departments.

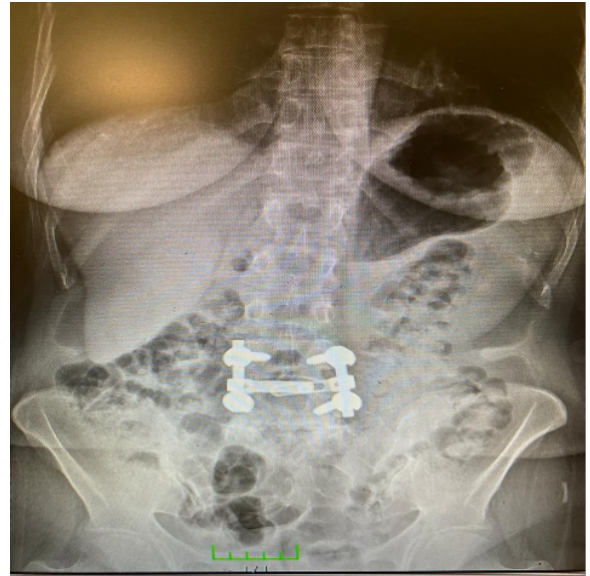


Fig. 5. Direct abdominal radiography before discharge

### 3. Discussion

TEF; it is a rare complication of various diseases of the esophagus and trachea, and most TEFs in adults have locally advanced esophageal or bronchogenic malignancies. However, TEF that develops for benign reasons may remain undiagnosed for years because of its rarity and lack of specific symptoms (5).

More than 75% of non-malignant acquired TEF is observed as a result of cuff-related trauma due to prolonged mechanical ventilation. It has been determined that erosion occurs between the trachea and the esophagus at a rate of 0.3-3% in mechanically ventilated patients. However, it is thought that tracheostomy does not reduce the risk of TEF due to mechanical ventilation (9-11). TEF caused by trauma to the posterior tracheal wall and esophagus is one of the late (> 7 days) complications of tracheotomy and its incidence is less than 1%. Fistulas seen in the early postoperative period are a result of iatrogenic injury during application (3,4,12). TEF that develops in the late period develops secondary to movement or opening of the tube, sound device, or tracheostomy cannula due to tracheal necrosis caused by excessive neck flexion, rigid aspiration, or high cuff pressure (3).

For TEF, post-feeding cough due to aspiration and persistent pulmonary infection are typical symptoms. At the same time, increased tracheal secretion, aspiration of gastric contents from the tracheal tube, rapidly developing abdominal

distension, or rhythmic filling of the nasogastric tube with a ventilator should be warning signs for TEF (13-15). Our patient was diagnosed with TEF after a total laryngectomy due to laryngeal cancer. Although primary tracheoesophageal fistula was opened in patients with advanced-stage laryngeal tumors who underwent total laryngectomy, TEF developed in this case due to acquired causes. The diagnosis of TEF can be made by high-resolution computed tomography, esophagography, or endoscopy/bronchoscopy.

However, endoscopic/bronchoscopic methods give us the best information and help determine the surgical approach by providing information about the size and location of the fistula (16). Although non-surgical treatments such as an esophageal stent, tracheal endoprosthesis, bronchoscopic fibrin glue, and hyperbaric oxygen therapy are used in the treatment of TEF, the gold standard treatment method is surgical repair (2). The first step for each patient; Stabilizing the patient should be to separate the fistula from the airway to protect the lung from contamination. Gastrointestinal system complications (ileus, foreign body reaction, etc.) due to a migrated foreign body were not observed in our patient. No life-threatening complications were encountered during close follow-up, and TEF surgery was planned after the patient stabilized.

Acquired TEF is important, especially in patients with tracheostomy, as it causes life-threatening complications. If a foreign body is detected in the gastrointestinal tract in a patient using a sound device after total laryngectomy, TEF should be considered first.

#### Conflict of interest

The authors declared no conflict of interest.

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#### Authors' contributions

Concept: A.Ş.Y.,B.B., Design: AŞY., A.M.Ş., Data Collection or Processing: A.M.Ş., B.A., Analysis or Interpretation: A.M.Ş., B.A., Literature Search: A.M.Ş., B.A.,B.B, Writing: A.Ş.Y.

#### Ethical Statement

This study was not required ethics approval.

#### References

- Green MS, J Mathew J, J Michos L, Green P, M Aman M. Using Bronchoscopy to Detect Acquired Tracheoesophageal Fistula in Mechanically Ventilated Patients. *Anesth Pain Med.* 2017 Jul 22;7(4):e57801. doi: 10.5812/aapm.57801. PMID: 29430408; PMCID: PMC5797673.
- Santosham R. Management of Acquired Benign Tracheoesophageal Fistulae. *Thorac Sur. Clin.* 2018 28(3), 385–392. <https://doi.org/10.1016/j.thorsurg.2018.05.004>
- Copeck, S.E., Mc Namee, C.J. Tracheostomy. In: Irwin, RS, Rippe JM, (eds). *Irwin and Rippe's Intensive Care Medicine.* 6th ed. Philadelphia, Wolters Kluwer Health/ Lippincott Williams & Wilkins.; 2008, 112-24.
- Mathisen DJ, Grillo HC, Wain JC, Hilgenberg AD. Management of acquired nonmalignant tracheoesophageal fistula. *Ann Thorac Surg.* 1991 Oct;52(4):759-65. doi: 10.1016/0003-4975(91)91207-c. PMID: 1929626.
- Mangi AA, Gaissert HA, Wright CD, Allan JS, Wain JC, Grillo HC, Mathisen DJ. Benign broncho-esophageal fistula in the adult. *Ann Thorac Surg.* 2002 Mar;73(3):911-5. doi: 10.1016/s0003-4975(01)03582-2. Erratum in: *Ann Thorac Surg* 2002 Jun;73(6):2038. PMID: 11899200.
- Murdock, A., Moorehead, R. J., & Tham, T. C. Closure of a benign bronchoesophageal fistula with endoscopic clips. *Gastrointestinal endoscopy,* 2005 62(4), 635–638. <https://doi.org/10.1016/j.gie.2005.06.023>
- Griffo, S., Stassano, P., Iannelli, G., Di Tommaso, L., Cicalese, M., Monaco, M., & Ferrante, G. Benign bronchoesophageal fistula: report of four cases. *The J Thorac Cardiovasc Sur,* 2007 133(5), 1378–1379. <https://doi.org/10.1016/j.jtcvs.2006.11.007>
- Kim HK, Choi YS, Kim K, Kim J, Shim YM. Long-term results of surgical treatment in benign bronchoesophageal fistula. *J Thorac Cardiovasc Surg.* 2007 Aug;134(2):411-4. doi: 10.1016/j.jtcvs.2007.04.030. PMID: 17662781.
- Aydın, Y., Eroğlu, A. Tümöre bağlı trakeoözofageal fistüller. In Bedirhan MA, ed. *Trakea. TÜSAD Eğitim Kitapları Serisi,* 2012, 203-12.
- Toker, A. Edinilmiş trakeoözofageal fistül. In Bedirhan MA, ed. *Trakea. TÜSAD Eğitim Kitapları Serisi,* 2012, 191-201.
- Marulli G, Loizzi M, Cardillo G, Battistella L, De Palma A, Ialongo P, Zampieri D, Rea F. Early and late outcome after surgical treatment of acquired non-malignant tracheo-oesophageal fistulae. *Eur J Cardiothorac Surg.* 2013 Jun;43(6):e155-61. doi: 10.1093/ejcts/ezt069. Epub 2013 Feb 26. PMID: 23444410.
- Jung YC, Sung K, Cho JH. Iatrogenic Tracheal Posterior Wall Perforation Repaired with Bronchoscope-Guided Knotless Sutures Through Tracheostomy. *Korean J Thorac Cardiovasc Surg.* 2018 Aug;51(4):277-279. doi: 10.5090/kjtc.2018.51.4.277. Epub 2018 Aug 5. PMID: 30109207; PMCID: PMC6089622.
- Harley HR. Ulcerative tracheo-oesophageal fistula during treatment by tracheostomy and intermittent positive pressure ventilation. *Thorax.* 1972 May;27(3):338-52. doi: 10.1136/thx.27.3.338. PMID: 4557006; PMCID: PMC472593.
- Hameed AA, Mohamed H, Al-Mansoori M. Acquired tracheoesophageal fistula due to high intracuff pressure. *Ann Thorac Med.* 2008 Jan;3(1):23-5. doi: 10.4103/1817-1737.37950. PMID: 19561879; PMCID: PMC2700431.
- Deepa, C., Kamat, S., & Ravindran, V. Post-tracheostomy tracheo-oesophageal fistula—an unusual presentation. *South African J Critic Care,* 2016, 32(1), 33-34.
- Yalçın Ş, Ciftci AO, Karnak I, Tanyel FC, Şenocak ME. Management of acquired tracheoesophageal fistula with various clinical presentations. *J Pediatr Surg.* 2011 Oct;46(10):1887-92. doi: 10.1016/j.jpedsurg.2011.06.025. PMID: 22008322.