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Viewing from both Sides: Tracheoesophageal Fistula

İki Taraftan Bakış: Trakeoözafegeal Fistül

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Abstract

Non-malignant tracheoesophageal fistulas in adults often occur due to complications after intubation. We present an 80-year-old female patient who was consulted because of fever and increased thicky secretions that need frequent aspiration. An intracranial hemorrhage 3 months earlier led to her undergoing a tracheostomy and gastrostomy due to the resulting prolonged intubation and nutritional issues. Both bronchoscopy and endoscopy confirmed the presence of a tracheoesophageal fistula (TEF) detected on computed thorax tomography. In bronchoscopy, TEF, which was opened and closed by both overinflated cuff and esophageal contractions, was observed. She was not a candidate for surgery, and her relatives declined an esophageal stent placement. We managed the case by sending a jejunostomy catheter through the gastrostomy tube and positioning at least 45 degrees to minimize the reflux.

Key words: *Tracheoesophageal Fistula, Cuff, Overinflation, Pneumonia, tracheostomy.*

Öz

Erişkinlerde malign olmayan trakeoözofageal fistüller genellikle entübasyon sonrası komplikasyonlar nedeniyle ortaya çıkar. Üç ay önce kafa içi kanama sonrası uzamış entübasyon nedeniyle trakeostomi ve beslenme sorunları nedeniyle gastrostomi öyküleri olan 80 yaşında kadın hasta tekrarlayan ateş ve yoğun kıvamlı sekresyon artışı nedeniyle başvurdu. Bilgisayarlı toraks tomografisinde saptanan şüpheli trakeoözofageal fistül (TÖF) bronkoskopi ve endoskopi ile doğrulandı. Bronkoskopide hem fazla şişirilmiş cuff hem de özefagus kasılmalarıyla açılıp kapanan TÖF izlendi. Ameliyata uygun bulunmayan hastaya stent yerleştirilmesi hasta yakınların tarafından kabul edilmedi. Hasta gastrostomi hattından jejunostomi kateteri gönderilerek ve reflüyü engellemek için en az 45 derece dik konumda tutulması önerileriyle taburcu edildi.

Anahtar Sözcükler: *Trakeoözefageal Fistül, Cuff, Overinflasyon, Pnömoni, Trakeostomi.*

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A tracheoesophageal fistula (TEF) is an abnormal connection between the trachea and esophagus that links the respiratory and gastrointestinal systems, which are physiologically blocked by a properly functioning epiglottis in normal situations. There are both malignant and benign conditions that can cause TEF, and the most common causes are prolonged intubation followed by iatrogenic injuries, traumas and infections. The timely diagnosis and management of TEF is vital due to such potentially grave complications as recurrent lower respiratory tract infections (LTRI), malnutrition, weight loss and dyspnea (1). We present here a case who developed TEF after a tracheostomy.

CASE

An 80-year-old female patient was referred with increased purulent and thicky secretions from the tracheostomy cannula. Her previous medical history included hypertension, coronary artery disease, atrial fibrillation and chronic obstructive lung disease. She had fallen and hit her head after experiencing dizziness three months earlier and was admitted to the emergency room with left hemiparesis, confusion and sleepiness. A cranial tomography revealed a 43x70mm hematoma and surrounding edema at the left temporal lobe, a 5 mm subdural hemorrhage and an 8 mm shift to the right. A craniotomy was performed to remove the hematoma, and a tracheostomy due to prolonged intubation in the intensive care unit. A percutaneous gastrostomy (PEG) was also performed to provide adequate nutrition. After a while, the patient complained of copious secretions from the tracheostomy cannula and fever, suggesting aspiration.

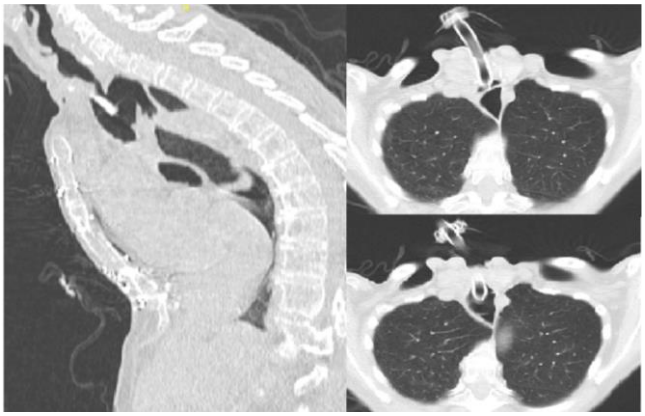

Figure 1: Computed tomography section showing tracheoesophageal fistula

Computed chest tomography revealed a TEF approximately 18 mm in length and 16 mm in width at the upper esophagus, above the tracheostomy cannula (Figure 1). Since her tracheostomy cannula was too narrow for a bronchoscope, we approached via the nasal route, which allowed us to view the aforementioned TEF above the right side of the overinflated cuff that was opening and closing with the esophagus muscle contractions (Video 1▶). An endoscopy revealed the fistula and the tracheostomy cuff (Video 2▶). The fistula was oval-shaped, and there was no stenosis in either the trachea or esophagus. Surgery was not considered due to multiple comorbidities, and we opted not to place a tracheal stent as there was no stenosis and the tracheostomy cannula was providing adequate ventilation. The patient declined an esophageal stent placement. A jejunostomy catheter was passed through the PEG and was advanced to the jejunum (PEG-J) to minimize the reflux. We recommended that the patient be positioned at least 45 degrees, anti-reflux medication and frequent suctioning of the tracheostomy cannula.

DISCUSSION

TEF is a rare complication of percutaneous tracheostomy that may be associated with an injury to the posterior tracheal wall adjacent to the esophagus during the procedure, chronic irritation of the tracheal wall by the tracheostomy tube or an overinflated cuff (2). A concomitant nasogastric tube in patients unable to feed orally increases the risk of complications (3). Co-existing diseases such as diabetes mellitus, acute infections, malnutrition and radiation, and drugs including steroids and bevacizumab may facilitate the development of a TEF (1,4).

The determination of a TEF is crucial since spontaneous closure is rare except for small fistulas. The inspection of fistula by bronchoscopy and/or endoscopy is required when imaging techniques such as barium esophagography and computed tomography suggest the presence of a TEF in suspected patients. Although the majority can be detected by direct visualization, the diagnosis of small fistulas may be challenging due to the accompanying local erythema, edema and musculature of the esophagus. They are typically round in shape, and open between the posterior wall of the trachea and the esophagus, and may appear and disappear with swallowing.

The main purposes of the treatment are ensuring the patency of the airways and protecting the lungs from aspiration, while allowing swallow of at least saliva. It is essential to view the defect from both sides, as in the present case, since treatment options can be performed via both tubes. Direct visualization will allow the size, shape and localization of the fistula to be determined, and the identification of tracheal or esophageal obstructions, thus guiding management. The treatment approach should be decided upon based on the cause, size and location of the TEF, whether the patient's surgical treatment is appropriate and survival expectancy (5). Curative surgery aims the treatment of benign TEF in suitable patients. In patients who are not candidates for surgery, stent placement, occlusive treatments (fibrin glue, silicon rings), and endoscopic clips may be considered, depending on the location and size of the lesion (1,6). When none of these methods are appropriate for the patient, PEG-J should be kept in mind for the minimization of reflux. Regardless of the chosen treatment modality, respiratory failure requiring positive pressure ventilation is the worst possible scenario, as this will hinder the healing of the treatment site, and will also result in the distention of the stomach by air, resulting in further respiratory deterioration.

General measures including bed elevation, anti-reflux treatment, aspiration of secretions, adequate nutrition and the effective treatment of possible infections are also crucial for the management of patients.

CONCLUSION

TEF is a rare but severe complication of tracheostomy in which the key symptoms are cough during feeding, dyspnea, gastric distension, increased airway secretions, recurrent LTRI and weight loss. Although they are unlikely to be curative, PEG and PEG-J can prevent the progression of the lesion.

CONFLICTS OF INTEREST

None declared.

AUTHOR CONTRIBUTIONS

Concept - O.K., S.U., U.K., F.M., Z.T.S.; Planning and Design - O.K., S.U., U.K., F.M., Z.T.S.; Supervision - O.K., S.U., U.K., F.M., Z.T.S.; Funding - F.M., O.K.; Materials - Z.T.S., U.K.; Data Collection and/or Processing - F.M., O.K.; Analysis and/or Interpretation - S.U., Z.T.S.; Literature Review - O.K.; Writing - O.K., Z.T.S.; Critical Review - F.M., S.U., U.K.

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