

Case Report: Acquired Benign Tracheoesophageal Fistula (TEF) Secondary to Neglected Tracheal Stent

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Abstract

Acquired fistula between the airway and esophagus is a rare but challenging clinical problem.

Regardless of the condition's aetiology, the persistent tracheobronchial contamination is largely to blame for its life-threatening characteristics with pulmonary sepsis and interference with nutrition. Surgical options for TEF repair is debated and several techniques proposed in literature. Surgical therapy of TEF is complex. To determine the optimal course of treatment and the ideal scheduling for the procedure, a complete preoperative evaluation is required. When possible, single stage repair of both tracheal and esophageal abnormalities with interposition of a tissue flap to separate the suture lines is the preferred

Keywords: Tracheoesophageal Fistula; Mechanical Ventilation; Interposition Omohyoid Muscle Flap

Abbreviations

TEF: Tracheoesophageal Fistula; POD: Postoperative Day; CECT: Contrast Enhanced Computed Tomography

Introduction

A pathological connection between the esophagus and the trachea is termed as tracheoesophageal fistula (TEF). TEF is a major source of significant morbidity and mortality.

Tracheoesophageal fistulas may be acquired or congenital. Despite advancements in the management of endotracheal tubes and the use of low-pressure and high-volume cuffs, acquired benign tracheoesophageal fistula (TEF) typically result from prolonged

tracheal intubation damage [1]. Nearly all benign TEFs are found in the upper and middle thirds of the trachea [2].

The development of a TEF often causes a significant impact on the patient's health and quality of life due to swallowing difficulties, recurrent aspiration pneumonia, and severe weight loss. The association of tracheal stenosis to TEF adds an ominous variable that regularly demands different management strategies such as the use of tracheal appliances to maintain airway patency when the patient is prepared for definitive surgery [1-3]. Preparation for the surgery may take weeks or maybe months and this includes weaning from mechanical ventilation, treatment of infections, chest physiotherapy and correction of malnutrition by initiation of enteral feeding [3].

Surgical correction is a major undertaking that typically requires identification and closure of the fistula along with airway reconstruction to restore airway continuity with a muscle flap interposition [4].

Recurrence of fistula will add to the complexity requiring laborious re-operations and even unorthodox techniques [5]. In high volume centers mortality and recurrence of the TEF are still as high as 11% [2].

Case Report

A 22 years old female patient had history of prolonged mechanical ventilation and a tracheostomy due to organo-phosphorous poisoning 5 years prior. She had then developed stenosis of the trachea for which tracheal stenting was done with a silicon stent. She lost to follow-up for about 5 years.

Now for the past 3 months she developed recurrent aspirations. On evaluation she was found to have a tracheo-oesophageal fistula with erosion of the previous tracheal stent into oesophagus.

Upper GI endoscopy showed a fistulous opening in upper esophagus and tracheal stent seen in esophagus lumen. Bronchoscopy showed tracheal stent in situ and fistulous opening at upper border of stent. A multidisciplinary meet was conducted with surgical gastroenterologist, lung transplant surgeon, pulmonologist and anesthetist and surgery was planned.

Intra-operatively a TEF with a tract of size of 3 cm about 3 cm below cricoid cartilage was identified. The old stent was removed and the trachea at the stricture site was resected and an end to end anastomosis was done. The oesophageal opening was closed and an interposition omohyoid muscle flap was placed. An FJ was placed as a feeding access.

She was extubated on POD-4 and orals were started on POD-8, POD-9 she developed stridor which on CECT was found due to edema of the anastomotic site which resolved with a short course of steroids. She improved symptomatically and was discharged on the 12th POD on a normal diet. It has now been 3 months follow up and she is doing well.

Discussion

Tracheo esophageal fistulas in adults are mostly due to malignancy (oesophageal 77% and lung 16%) [6]. Benign causes are

mostly post traumatic, corrosive, iatrogenic etc. [3]. Congenital TEFs are mostly associated with esophageal atresia in childhood and are rare in adults.

TEF should be suspected in patients with a known risk factor who have one or more of the following: Recurrent cough following ingestion of solid and liquids, recurrent bronchitis or pneumonia, recurrent aspiration and unexplained malnutrition. Patients on prolonged mechanical ventilation may develop TEF and experience acute respiratory distress, reduced oxygenation, loss of tidal volume during ventilation, and gastric distension etc.

Symptoms also depend upon location and size of the fistula, large proximal TEFs may present earlier with major symptoms compared to smaller distal TEFs. As TEF is rare condition and symptoms are nonspecific, the diagnosis is often delayed leading to more complications.

The diagnosis of TEF is based upon a combination of clinical, endoscopic and endoscopic findings. While computed tomography and endoscopy are not always necessary for the diagnosis, all three are typically done since they provide complimentary diagnostic and therapeutic information.

TEF's rarely close spontaneously. Endoscopic procedures with esophageal stents may be sometimes attempted but the benefits of such interventions are unproven, while on the other hand they can lead to worsening of the fistulous tract complicating definitive management.

Without appropriate treatment TEF's are associated with severe morbidity and also mortality. Management of TEF requires a multidisciplinary approach, careful assessment of the etiology, size, anatomy (tracheal and esophageal), burden of the underlying disease, and patient comorbidities as well as the risk-benefit ratio of various repair options.

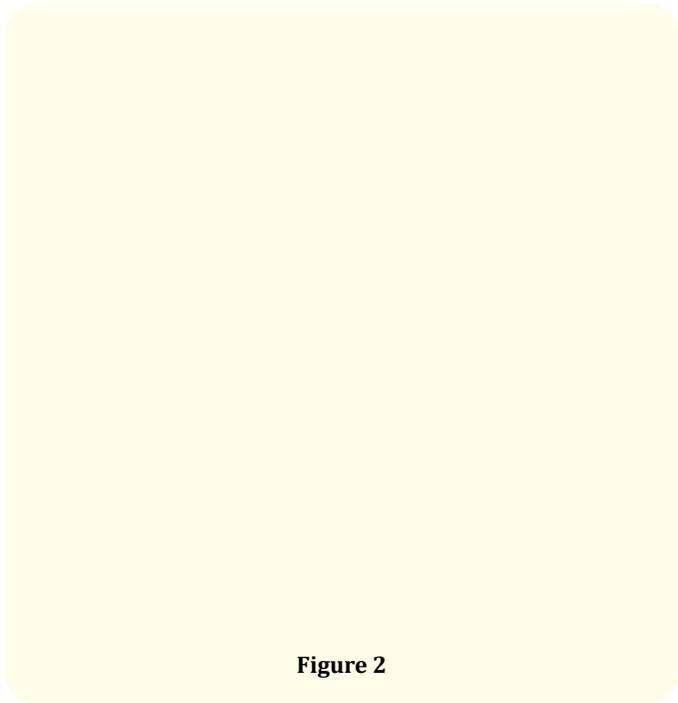
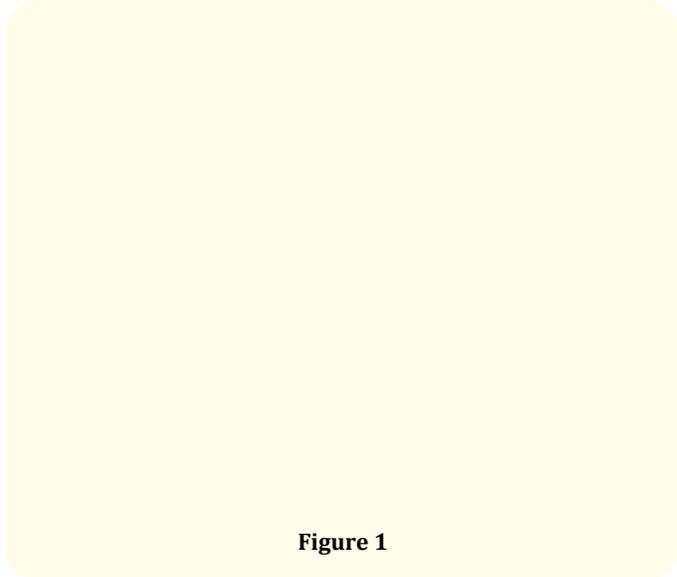
In general, surgery with a curative intent is usually performed for benign TEF, whereas palliative management is reserved for malignant TEF. Since malignancy is the more common etiology, palliative endoscopic/bronchoscopic treatments are more common [7].

Initial general measures that should be undertaken include eliminating oral intake, keeping the head of the bed elevated at 45 degrees or greater, administering anti-reflux therapy, frequent oral suctioning, treating pulmonary infection/aspiration pneumonia, and oxygenation with supplemental oxygenation (if indicated).

Surgery helps in attempting to cure a benign TEF. However, not all patients or lesions are suitable for surgical repair. Definitive surgical repair cannot be performed unless the underlying disorder is curable and site of potential anastomosis is disease-free.

Surgical repair is technically difficult thus expertise in both esophageal and tracheal surgery are critical for success. Airway management by the anesthetist is of paramount importance before proceeding to surgery. The surgical approach for TEF depends upon the size of the fistula. For small lesions, the fistula is divided and repaired using one or two layers of interposition omental or muscle flaps. Large fistulas with tracheal injury may require major esophageal and/or tracheal surgery including any combination of the following: esophageal diversion (esophagostomy) or resection, full thickness skin graft esophageal reconstruction, tracheal or laryngotracheal resection and reconstruction, and interposition muscle flap. An enteral feeding access is usually created to enable early postoperative feeding. Immediate extubation following surgery is the goal since it is thought that postoperative mechanical ventilation may lead to wound dehiscence and fistula recurrence.

Surgery is frequently fraught with complications nearly upto 50%. Perioperative mortality as high as 11% has been reported. Major complications include wound dehiscence, vocal cord paralysis, recurrent TEF, pneumonia and tracheal stenosis. Successful fistula closure following surgical intervention for benign TEF has been reported in 75% to 94% of patients [8-11].



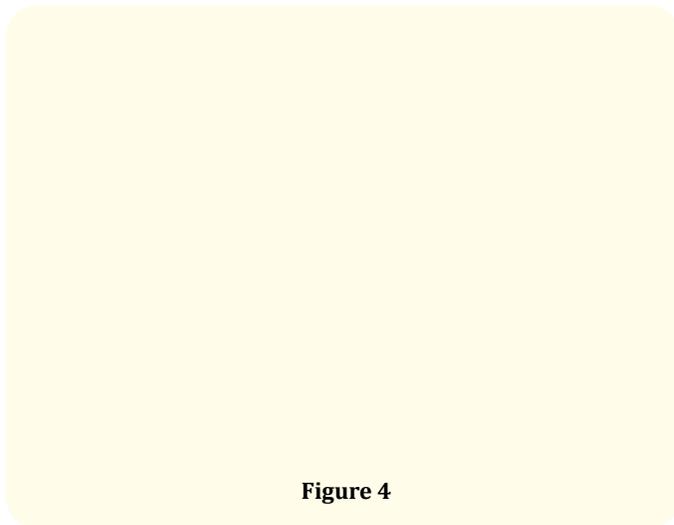


Figure 4

Conclusion

TEF due to tracheal stent is very rare and not reported in literature and management of such cases needed multidisciplinary team for planning and appropriate management. Management of such cases needs meticulous preop evaluation and optimization of patient prior to surgical repair and surgical management of such cases have good outcome.

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