



## Tracheoesophageal Fistula Following Prolonged Intubation: A Case Report and Review of the Literature

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### Abstract

*Tracheoesophageal fistula is an abnormal communication between trachea and esophagus<sup>1</sup>. Acquired tracheoesophageal fistula are a rare complication of mechanical ventilation occurring in 0.5% of intubated patient after 30 days of intubation<sup>2</sup>. Prolonged endotracheal intubation remain most common cause<sup>1</sup>. The incidence decreased after the use of low pressure and high volume endotracheal cuffs, but the intensive care units continue to provide such cases. We reported a case of tracheoesophageal fistula after prolonged intubation. Though, rare complication, high suspicion is necessary to accurately diagnose the disease in patient with history of prolonged intubation.*

### Introduction

Tracheoesophageal fistula (TOF) is an abnormal Connection between trachea and esophagus<sup>1</sup>. It may be congenital and acquired. congenital TOF are diagnosed following birth or during infancy<sup>2</sup>. Acquired TEF is an uncommon complication. Acquired TEF mostly occur secondary to several malignancies ( i.e esophageal cancer ), infection, ruptured diverticula and injuries. However, Endotracheal intubation remains the most common cause with the incidence of < 1%, first reported by D'Avignon ( 1956) and Mounier – kuhn (1958).<sup>3</sup>

The clinical manifestation differ, depending on the patient's respiratory status .cough following swallowing is the chief presentation in non ventilated patient. Air leak even with hyperinflated cuff and abdominal distension is the chief presentation in ventilared patient. Bronchoscopy, esophagogastrosopy and computed tomography are investigation of

choice<sup>3</sup>. Often the diagnosis is made early but the mortality remains high if not treated.

We present a 37 year old male case of tracheoesophageal fistula following prolonged intubation for 45 days.

### Case Report

37 year alcoholic male patient presented with hematemesis, malena, one episode of generalized abnormal body movement and transient loss of consciousness and was diagnosed with chronic alcoholism with withdrawal seizure with upper GI bleed due to oesophageal varices admitted in medicine ward. The patient was intubated on day 3 of admission and put on mechanical ventilation in respiratory ICU. Patient was remained intubated for 20 days. Treatment continued and enteral feed through ryles tube were given. Patient was extubated on day 20<sup>th</sup> as patient chest become clear and other parameter were improved. Next day after extubation, patient complained of

hoarseness of voice and cough during swallowing of liquid (bovine cough). Patient was progressively started desiderating and bilateral crepts were present. Patient again intubated on 21<sup>st</sup> day and put on mechanical ventilation. During mechanical ventilation, air leak was noticed both during inspiration and expiration along with gastric distension and 200-300 ml loss of tidal volume. Ryles tube feed were partly coming out through ETT was also noticed. Ryles tube feed were stopped. A clinical diagnosis of tracheoesophageal fistula was postulated. A flexible fiberoptic bronchoscopy revealed a fistula in posterior wall 4-5 cm above carina and confirmed with methylene blue. cuffed ETT of 805 mm inserted to length of 25 cm to bypass the fistula but still there was loss of 200 ml of tidal volume . on day 22 nd of admission, oesophageal endoscopy revealed a opening in the anterior wall of esophageal mucosa at distance of 18 cm from incisor. Consider for endoscopy repair with 11 cm cervical SEMS oesophageal stent was placed in oesophagus to seal the fistula and fixed with teeth to prevent migration . on 32th day of admission repeat oesophageal endoscopy was done and it reveal granulation tissue and fixation of SEMS . Pt was extubated on 33<sup>rd</sup> day. Again esophageal endoscopy was done 1 month later showed that fistula was still patent. The patient was referred to higher centre for appropriate surgical correction of TEF.

### Discussion

TEF can be congenital and acquired. congenital TEF are most common (1 in 4500 live birth and diagnosed at birth or during infancy. whereas acquired TEF are extremely rare and presenting in adulthood. Acquired TEF have multiple etiologies like secondary to malignant and non malignant cause including infection, trauma and uncommonly from prolonged mechanical ventilation. Malignant TEF are mostly a complication of esophageal cancer and the incidence reported at 5% in one report<sup>2</sup>. Our patient did not have any evidence of oesophageal

cancer. Prolonged mechanical ventilation remain the prime cause of acquired TEF and if left untreated may lead to recurrent pulmonary infection leading to death<sup>1</sup>. In 1972, Harley reported the incidence of TEF in pt on ventilatory assistance at 0.5%<sup>2</sup>. prolonged ventilation induced TEF usually developed after 15-200 days<sup>1</sup>. In our case, TEF develop after 21 days of intubation. several factor including prolonged intubation, irritating / abrasive tube , rigid NG tube and particularly cuff pressure greater than 30 mmHg contribute to the development of TEF in such patients . Payne et al study , it was reported that the risk factor of tracheal damage included: high cuff pressure , high airway pressure, excessive motion of tracheal tube , prolonged duration of intubation, respiratory infection, oesophageal infection, hypotension, steroid use, NG tube, female sex , advanced age and insulin dependent diabetes<sup>2</sup>. ETT cuff pressure greater than 30 mmhg can cause local ischemia or circumferential necrosis which may eventually lead to fistula formation. camilleri et al study in 1973 stated that fistula might develop even after 7 days of Endotracheal intubation<sup>2</sup>. Clinical manifestation differ and depend upon patient respiratory effort. In ventilated assisted patient – loss of tidal volume, abdominal distension associated with ventilation and aspirate of GI content from ET tube<sup>3</sup>. Bronchoscopy remains the investigation of choice. Although, a rare complication, it could be seen in clinical practice in cases with prolonged ventilation<sup>1</sup>. Prevention of TEF can occur with frequent measurement of Endotracheal cuff pressure and periodic changing of tracheostomy tubes<sup>2</sup>.

### Conclusion

TEF are rare complication of prolonged ventilation. Risk factors for TEF formation include: high cuff pressure, high airway pressure, excessive motion of tracheal tube, prolonged duration of intubation, respiratory infection, esophageal infection, hypotension, steroid use, nasogastric tube, female sex, advanced age and

insulin dependent diabetes. Early diagnosis and intervention via stenting will help lower morbidity and mortality<sup>2</sup>.

### References

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