

CASE REPORT

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# A case of migration of fractured tracheostomy tube—a case presentation

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## Abstract

**Background:** Tracheostomy is widely used for securing the airway; however, complications do occur. One such rare complication is a fracture of the tracheostomy tube which presents as a foreign body of the tracheobronchial tree.

**Case presentation:** We report a case of a 7-year-old child who presented with mild respiratory distress following fracture and migration of non-metallic tracheostomy tube in the airway. Successful removal was done via rigid bronchoscopy under general anaesthesia.

**Conclusion:** Careful inspection of the tracheostomy tube before placing and appropriate tracheostomy care is the cornerstone to prevent such rare complications associated with a tracheostomy.

**Keywords:** Foreign body, Tracheostomy tube, Bronchoscopy

## Background

Tracheostomy is a common procedure undertaken to secure the airway as an emergency procedure or in patients requiring prolonged ventilation [1, 2]. Tracheostomy tubes can either be metallic or non-metallic. About 20% of the patients who are tracheostomised are discharged with tracheostomy in situ [3, 4]. Thus these patients require proper care and management and inappropriate care may lead to unexpected complications. Fracture of the tracheostomy tube and its migration is one such rare complication. The most commonly known risk factors are the usage of the same tracheostomy tube, alkaline bronchial secretions, repeated cleaning and sterilization, ageing of the tracheostomy tube, tissue reaction to the tube and manufacturing defects [5–10]. Thus, there is a need to understand this particular complication for prevention, early recognition and management.

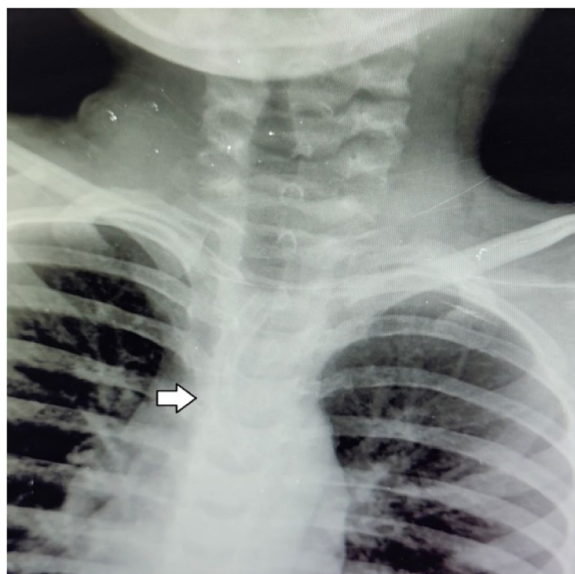
## Case presentation

A 7-year-old child presented in emergency with a history of aspiration of a part of the tracheostomy tube while doing the suctioning of the tube by the parents at their home. They noticed that neck plate was present at the place while the tube was missing.

The child was diagnosed as the case of neurodegenerative disorder with lung collapse and recurrent pneumonia 10 months back for which the patient was tracheostomised 10 months back. The patient was on a decannulation trial and had his tracheostomy tube changed 1 day before in the otolaryngology outpatient department to a 4.5-mm uncuffed tracheostomy tube polyvinyl chloride type.

At the time of presentation, the patient was haemodynamically stable with tachypnoea (25/min) and tachycardia (100/min). The saturation of the patient was 90% on room air but was maintaining saturation of 99% with an oxygen face mask. Neck examination revealed patent and contracted stoma site with minimal granulations around. Air entry was reduced on the left side as compared to the right side. The patient was then subjected to a chest X-ray (postero-anterior view) which revealed part of the tracheostomy tube in the left main bronchus (Fig. 1). The airway of the patient was then secured with 4.5 mm

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**Fig. 1** Xray soft tissue neck-AP view arrow showing part of tracheostomy tube

tracheostomy tube polyvinyl chloride type with oxygen inhalation before shifting to the operation theatre.

Rigid bronchoscopy was done with a size 4 bronchoscope while the oxygenation was done through the tracheostomy tube. Upon visualization of the neck of the tracheostomy tube, the cuff was deflated and bronchoscope was advanced in the trachea beside the tube with ventilation continued. Fractured tracheostomy was visualized around 3 cm below the stoma and was grasped with optical forceps and was delivered out along with the bronchoscope in toto (Fig. 2) and immediately the airway was secured with polyvinyl chloride 4.5mm tracheostomy tube and ventilation resumed. The child was shifted to the paediatric intensive care unit for observation and was discharged 2 days after the procedure and is doing well on follow-up.

## Discussion

Bassoe and Boe were the first to report aspiration of fractured tracheostomy tube in 1960, [11] since then various similar cases have been reported in the literature.

Metallic tracheostomy tubes are usually preferred in older children and those requiring prolonged tracheostomy, however in younger children non metallic tubes are preferred due to less airway resistance, as seen in metallic tubes due to usage of inner tubes, and they are larger, more pliable and snugly fit the airway. Additionally, mucus adherence is less due to the inert nature and smooth surface of non-metallic tubes. However non-metallic tubes are costlier and require regular



**Fig. 2** Broken tracheostomy tube

suctioning [12]. Review done by Piromachai et al. on 20 cases concluded that fracture of the metallic tube was more common as compared to the non-metallic tracheostomy tubes and trachea and the right main bronchus was the most common dislodgement site [2]. Similar findings were also reported by Parida et al. in their review of 8 cases [7]. In our case, the tube was polyvinyl chloride type and was dislodged in the trachea and left bronchus and the patient was presented with minimal respiratory distress and the airway was secured with 4.5 mm tracheostomy tube after getting X-ray done.

Junction between the neck plate and the tube is the most common fractured site followed by the distal end and fenestra [2]. The possible reasons for the fracture are the usage of the same tracheostomy tube, alkaline bronchial secretions, repeated cleaning and sterilization, ageing of the tracheostomy tube, tissue reaction to the tube and manufacturing defects [5–10]. Tracheostomy tube fracture is more common between days 5 and 22 years and the duration of symptoms before the diagnosis is 1 day to 132 months [13]. Patient presents most commonly with mild respiratory distress [14]. Other symptoms include cough, haemoptysis, wheezing, recurrent pneumonia etc. In the paediatric population, death is also reported due to the small calibre of the airway [15, 16]. Chest X-ray can easily diagnose the condition as the tube is radiopaque [13]. In our case, fracture occurred at the junction of the neck plate and tube as the tube was new so the likely reason could be the manufacturing defect and the likely reason for distal migration of the tube was the small size of the tube compared to the age, as the patient was on decannulation trial.

Rigid bronchoscopy is the treatment of choice for fractured tracheostomy tube removal and it is done through the stoma site. Some authors also reported the need for thoracotomy and bronchotomy [16]. However, in our case, rigid bronchoscopy was done and the foreign body was removed through the oral cavity, instead of the stoma site, with a small-sized 4.5-mm tracheostomy tube in situ for ventilation, as the tube was of polyvinyl chloride material and thus pliable.

## Conclusions

Tracheostomy tube fracture and migration is an avoidable complication. It can be avoided by careful inspection of the tracheostomy tube before changing the tube and appropriate tracheostomy care.

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## Authors' contributions

GS and SGoit wrote the case report. PK edited it. SG performed surgery under guidance of PK. AP edited photographs. All authors read and approved the final manuscript.

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## Consent for publication

Written informed consent has been obtained from the parent of the patient.

## Competing interests

The authors declare that they have no competing interests.

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