



## RECURRENT FRACTURE OF OUTER METALLIC TRACHEOSTOMY TUBE INTO RIGHT MAIN BRONCHUS

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### ABSTRACT

Tracheostomy is a common airway procedure for life support. Fracture of tracheostomy tube is a rare complication. We report an unusual case who had recurrent fractured metallic outer tracheostomy tube dislodging into tracheobronchial tree. A 11 year old girl who underwent tracheostomy for Idiopathic bilateral abductor palsy, presented with sudden onset of difficulty in breathing and stridor. Chest X-ray revealed a metallic tube occupying trachea to right bronchus. Removal under general anaesthesia was extremely difficult though successful finally. After 2yrs she presented with same situation which necessitated emergency removal under rigid bronchoscopy. We report this case of dislodged tracheostomy tube twice in a 11 year old because of its recurrence, unique presentation and difficulty in retrieval.

**KEY WORDS:** Tracheostomy tube, fracture, bronchoscopy,



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## INTRODUCTION

Tracheostomy is a life saving procedure with a frequency of 150-300 per 100000 patients discharged from hospital. The paediatric rate is 7.5 per 100000 discharges<sup>1</sup>. The incidence of serious complications could be as high as 43%<sup>2</sup>. The incidence of dislodged tracheostomy tube in all patients presenting to the emergency department is about 33%<sup>3</sup>. and these patients present with life threatening situations which may be extremely challenging. The broken tube often being lodged at carina and corroding the wall may cause severe respiratory obstruction and become challenging for the anaesthetist as well as the surgeon. Though rare, quite few cases of dislodged tracheostomy have been reported.

## CASE REPORT

A 11 year old girl presented with acute onset of

breathlessness since afternoon. Parents had removed the inner tube at home to notice the loss of outer steel tube covering the inner tube. She had undergone tracheostomy 1 year back for bilateral abductor palsy of idiopathic origin. On admission, the child had occasional cough, moderate tachypnea with respiratory rate of 18/min, SpO<sub>2</sub> of 96-97% on air but was breathless when lying supine. Neck examination revealed a patent tracheostomy stoma and outer tracheostomy tube was missing. Chest auscultation revealed reduced air entry on right side and this was exaggerated when supine. Chest Xray revealed a steel metallic tube in the trachea and right main bronchus (Fig-1). After preliminary treatment with oxygen, nebulizations and steroids in the emergency ward, she was shifted to operation theatre. The dislodged tube was visualized through the Tracheal stoma, but it was not possible to remove the displaced tube because of deep impaction.

**Figure1**  
***Fractured metallic tube in trachea and right main bronchus***



*Fig (1)Chest X-Ray showing the first episode of fractured tracheostomy tube in the Rt main bronchus.*

Due to bilateral abductor cord palsy the rigid bronchoscope was negotiated with great difficulty through oral cavity and glottis. Saturations decreased to 70% while attempting to remove the displaced tube. With the patient head up and general anaesthesia deepened, the rigid bronchoscope was positioned in the left main bronchus for ventilation and oxygenation. Saturations now improved to 92-93% with a rigid bronchoscope. The dislodged tube was grasped with foreign body grasping forceps and removed through the glottic opening. New Jackson's metallic tracheostomy no.24 FG tube was put.

Subsequent recovery was uneventful and nebulized bronchodilators and oxygen were administered for 24 hours in the post operative ward. The child was discharged after two days advising to get further surgery of lateralization of vocal cord. After 2yrs once again the same child came with stridor and X- ray chest showed the same situation of fractured tracheostomy tube in right main bronchus Fig-(2a and 2b). This time the fractured tube was retrieved through tracheal stoma with rigid bronchoscope(Fig-3). Post operative period was uneventful



**Figure 2a & 2b**  
***Chest X-Ray Lateral and PA view showing the second episode of fractured tracheostomy tube in the Rt main bronchus***



**Figure 3**  
***Removed fractured outer tracheostomy tube (second episode) from trachea and Rt main bronchus***

## **DISCUSSION**

A fractured tracheostomy tube is a rare complication. Cases have been reported in the past, usually associated with prolonged usage in patients with chronic airway obstruction. The first case report of a fractured tracheostomy

tube was in 1960 by Bassoe and Boe<sup>4</sup>. In a review of 20 cases, the most common fracture was at the junction between the tube and the neck plate and the most common dislodged sites were trachea and right main bronchus<sup>5</sup>. Dislodgement of either inner or outer tubes to the tracheobroncheal tree have been identified<sup>6</sup>. Traditional metallic tracheostomy

tubes are made from silver, steel, copper or zinc, all of which are prone to corrosion by body fluids, alkaline tracheal secretion or hypochlorite solutions used for cleaning<sup>7</sup>. In the modern era, metallic tracheostomy tubes are made from stainless steel which contains steel and chromium. Stainless steel does not stain, corrode or rust as easily as ordinary steel. The weak points of the tracheostomy tube are the junctions between the outer tube and the neck plate, the distal end of the tube and the fenestration site<sup>8,9</sup>. Prolonged wear, ageing of the tubes and repeated sterilization have been proposed as risk factors of a fractured tracheostomy tube<sup>8</sup>. Alkaline bronchial secretion, tissue reactivity from plastic tubes, long continued high internal stresses on the surface and manufacturing defects were also reported as causes of this complication<sup>7,9</sup>. In our opinion, the fracture of the tracheostomy tube in this patient may have been due to prolonged wear and tear and ageing of the tube. Loss to follow-up is a common problem in many reports. The cause of late complications may be due to a lack of periodical check-ups for signs of wear and tear or review of the tracheostomy care. Dislodged tracheostomy tubes may produce acute and chronic respiratory symptoms. Though acute presentations are choking and dyspnea<sup>6</sup>, children with delayed diagnosis have milder symptoms such as coughing and wheezing. One retrospective study spanning eight years identified foreign body aspiration in 4.8% of more than 650 patients. In this study, the median duration of symptomatic period before referral was 3 months though it varied widely from one to 132 months (median- three months<sup>11</sup>). Persistent respiratory symptoms, especially in those who have a risk factor for aspiration are a clue to the diagnosis of foreign body aspiration. Our patient presented with acute onset of breathlessness and this was aggravated when supine. The reasons for breathlessness in supine position could be that

the dislodged tracheal tube migrated towards carina and an increase in the severity of obstruction. Our case is peculiar in many ways. In the same patient, the fractured outer metallic tracheostomy tube has been aspirated twice over a period of 2 yrs. This rare event has not been reported in world literature. Despite giving advice to get operated for lateralization of vocal cords, the parents did not agree for surgery. Periodic replacement of tube with a new tube six monthly once was also advised. But because of illiteracy and financial constraints, the situation might have recurred. The difficulty to remove from the trachea and bronchus could be due to the fact that fractured outer tube could have corroded and its shaft could have snugly fit somewhere along the varying diameter of the involved trachea and the right main bronchus. Added to this, hyperactive airways could have held it more tightly. Added to this was the abductor palsy which made alternate means of oxygenating and securing airway more difficult. Thus muscle relaxants could not be used despite the difficulty in passing the rigid bronchoscope through the vocal cords. Several recommendations have been made for the regular tracheostomy care like proper patient training for maintenance and cleaning of tracheostomy tube<sup>10</sup>. After removal from the patient, every metal tracheostomy apparatus should be inspected for signs of wear, corrosion, and hairline fracture, especially at the junction of retention plate and tubular components. If a metal tracheostomy tube has been in use for many years, it may be prudent to replace it, thereby circumventing the possibility of fracture. It seems plausible to prevent this complication with regular inspection and replacement of the metal tracheostomy apparatus<sup>11</sup>. Also it is recommended for the manufacturers that neck plate and the tube must be made from one piece of corrosive resistant material<sup>9</sup>. We strongly suggest that the metallic tracheostomy tubes should be changed every 6 months once.

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