Case Study

Broken Portex Tracheostomy Tube - A Rare Case

Dr. Nilam U. Sathe¹, Dr. Shiwani Pidurkar², Dr. Rahul Kulkarni³, Dr. Davish Gupta²

¹Associate Professor, Department Of ENT, Seth G.S. Medical college &Kem Hospital, Mumbai.
²Senior Resident, Department Of ENT, Seth G.S. Medical college &Kem Hospital, Mumbai.
³Hon. Assistant Grant Govt. Medical College & Sir J. J. Group of Hospitals Mumbai

ARTICLE INFO

ABSTRACT

Tracheostomy procedure is commonly done to relieve upper airway obstruction; however, complications can occur. One such rare complication is a fracture of the tracheostomy tube which may presents as a foreign body and can causes airway obstruction.

We report a case of a 48-year-old male who was an operated case of decompression craniotomy with clipping of left middle cerebral artery aneurysm; emergency call was sent in view of tube blockage with mild respiratory distress following fracture and migration of portex tracheostomy tube in the airway. Successful removal was done via intraoral approach with the help of video laryngoscope.

Careful examination of the tracheostomy tube before doing the procedure and appropriate tracheostomy care(suctioning) is the basis to prevent such rare complications associated with the procedure.
INTRODUCTION:
Mechanical ventilation with prolong intubation is required in a Neurosurgery patient because of their inability to protect the airway due to excessive secretions and inadequate spontaneous ventilation. Prolong endotracheal intubation may cause injury to trachea and larynx. Tracheostomy plays an integral role in such intensive care unit patients. Tracheostomy is one of the oldest and commonest procedure done to secure the upper airway in an emergency or in patients requiring prolonged ventilatory support [1, 2]. Tracheostomy tubes can be metallic or non-metallic. About 20% of the patients who are tracheostomised are discharged with tracheostomy tube in situ [3,4]. Inappropriate care may lead to serious complications. Complications like blockage of the tracheostomy tube, difficult decanulation, tracheocutaneous fistula are some of the known complications of prolonged tracheostomy tube. Fracture of the tracheostomy tube and its migration is one of the rare complications. Fracture is commonly seen in metallic tracheostomy tube and in children. Fracture tracheostomy tube is rare complication and has a potential for catastrophic outcome. The fractured segment of tracheostomy can become tracheobronchial foreign body which has higher morbidity and mortality. Hence there is a need of regular follow up and understanding of particular complication for prevention, early recognition and management. We present a case where retrieval of fractured tracheostomy tube was performed via oral cavity using video laryngoscope.

CASE REPORT
A 48-year-old male was an operated case of decompression craniotomy with clipping of left middle cerebral artery aneurysm. An emergency call was given to Otorhinolaryngologist in view of tube blockage with mild respiratory distress and dislodgement of non-metallic tracheostomy tube. On assessment of patient it was found that ventilator connector and flange of the portex tracheostomy tube were transected from the shaft of the tube while the tube was missing. The patient was operated 8 days back and was tracheostomised just before 2 days. The tracheostomy tube was cuffed polyvinyl chloride type of size 7.5 (Figure1). At the time of presentation, the patient was hemodynamically stable with tachypnoea (28/min) and tachycardia (100/min).

Fig. 1
The patient was maintaining the saturation of 99% on room air. Neck examination revealed distally detached tracheostomy tube end, on detailed examination no tube was seen in the lower trachea and cuffed end of the tube was found in the upper airway (180 degree axial rotation of tube). Saturation was 99% on room air. There was suprastomal detachment of the portex Tracheostomy tube. Resistance was felt while removing the tube from stoma site. Video laryngoscope was advanced via oral cavity. Fractured tracheostomy was visualized below the vocal cords and was pushed upwards and was delivered out in toto (Fig. 2) and immediately the airway was secured with polyvinyl chloride 7.5 mm tracheostomy tube and ventilation resumed. The patient was in intensive care unit for observation and was advised regular suctioning after the procedure and is doing well on follow up.

DISCUSSION

Aspiration of fractured tracheostomy tube in 1960 was first reported by Bassoe and Boe. [11] after that various similar cases have been reported in the literature. No case has been reported in which nonmetallic portex cuffed tracheostomy tube broke down.

Metallic tubes are usually preferred in those requiring prolonged tracheostomy, however now a days nonmetallic tubes are preferred because of less airway resistance, compared to metallic tubes as they are larger and snuggly fit into the airway. Additionally, due to the inert nature and smooth surface of nonmetallic tubes mucus adherence is less. The metallic tracheostomy tubes have been made of 45% silver, 15% copper, 24% cadmium & 16% zinc. It has been found that zinc component of the tracheostomy tube is more responsible for the corrosion. However nonmetallic tubes are very expensive and require regular suctioning [12]. Most of the nonmetallic tracheostomy tubes are made up of polyvinyl chloride (PVC) the other materials are silicone & polyurethane. The components of these tubes are connector, neck plate, cannula, cuff & pilot balloon. And the most common
site of fracture is at the junction of neck flange & cannula. In nonmetallic tracheostomy tubes the material’s deterioration can facilitate further colonization by bacteria since pits and cracks can provide a shelter and thereby suitable conditions for adhesion of microorganisms. Review done by Piromachai et al. on 20 cases concluded that fracture of the metallic tube was more common as compared to portex tracheostomy tubes [2] and our case report gives the information regarding the portex tracheostomy tube. 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 upper trachea and the patient was presented with minimal respiratory distress and the airway was secured with 7.5 mm tracheostomy tube. 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 [5,6,7,8,9,10]. 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, hemoptysis, wheezing, recurrent pneumonia etc. 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 proximal migration is pliable nature of the tube.

Rigid bronchoscopy is the treatment of choice for fractured tracheostomy tube removal from lower airway. In bed ridden patients, flexible bronchoscopy and telescopy plays very important role in the removal of foreign body. Video laryngoscopy plays an important role in such emergency situations as bedside procedure.

Some authors also reported the need for thoracotomy and bronchotomy [15]. However, in our case, tube removal was done through the oral cavity via video laryngoscopy instead of the stoma site, as the tube was stuck in upper airway due to polyvinyl chloride material. Fracture of metallic tracheostomy tube is very common, if required to keep for long duration due to erosion of tube, however nonmetallic (portex) tracheostomy tube fracture is rare.

CONCLUSION
➢ Prolong use of metallic tracheostomy tube can give risk of dislocation into bronchus and trachea, however it is very rarely seen that portex tube gets fractured and dislodged. Hence close observation is necessary in all tracheotomy patients.
➢ It is not necessary that prolong tube will break; it is quite possible that in such short duration tube can get fractured and dislodged as seen in our case. Fracture Tracheostomy tube is not always a late complication.
➢ The quality of metallic and nonmetallic tracheostomy tube is important, as poor quality tube can lead to life threatening complications.
➢ Bedside Video laryngoscopy is a very helpful diagnostic as well as therapeutic tool in such cases.
➢ Fracture and migration of pliable tracheostomy tube is an avoidable complication which can be avoided by careful inspection of the tracheostomy tube before changing the tube, proper suctioning and appropriate tracheostomy care.

REFERENCES


