

Case Report**An Unusual Case of Fractured Tracheostomy Tube as a Foreign Body in Right Main Bronchus: A Case Report**¹Hamza Hussain Bangash, ²Misha Anam, ³Zahra Batool Manzoor, ⁴Soumyadeep Sikdar¹Queen Elizabeth The Queen Mother Hospital, Margate (United Kingdom)²Children Hospital & The Institute of Child Health, Lahore (Pakistan)³Queen Elizabeth The Queen Mother Hospital, Margate (United Kingdom)⁴Institute of Medical Sciences, Benaras Hindu University (India)**Corresponding Author:** Misha Anam, Children Hospital & The Institute of Child Health, Lahore (Pakistan)**Article Received:** 01 July 2022**Revised:** 22 July 2022**Accepted:** 10 August 2022**ABSTRACT**

In this case report, we have discussed a case of a 10-year-old boy presented with one day history of progressively worsening respiratory distress, cough, and stridor. Patient was a follow-up case of GBS with tracheostomy tube in situ. This time, he presented with fractured PVC tracheostomy tube from the junction of neck plate and tubular tracheal piece. The dislodged tubular part of the tracheostomy tube had gotten stuck in the trachea and right main bronchus at the level of the carina which was confirmed by radiological investigation. The procedure of the foreign body removal and anaesthetic challenges are also discussed in this report in detail. The aim of this study is to spread awareness among ENT specialists and general physicians about the possibility of PVC tracheostomy tube fracture and aspiration, as it is essential for the doctors to counsel the attendants on what to do when scenario like the one mentioned above, occurs.

BACKGROUND

Both elective and emergency tracheostomies are life-saving procedures. Some medical conditions necessitate tracheostomy tube being kept inside for longer periods due to suspected progression, slow recovery, and/or suspected long-term complications. In these cases, decannulation at the time of hospital discharge is inconceivable. So, the patients need to maintain tracheotomy for uncertain period. The decision of decannulation is made after clinical assessments on subsequent OPD visits and proper follow-ups. Depending on the diagnosis and the relevant protocols, the patient's attendants are guided to bring the patient for an OPD visit after every 3-6 months, unless there is an emergency or any other indication. At each OPD visit, the patient is admitted to the hospital for a short stay and is assessed for elective Laryngotracheobronchoscopy (LTB) with tube change. These regular follow ups are essential to keep the track for the pathology and to timely prevent/manage the early or long-term complications.

KEYWORDS: Tracheostomy Care, Foreign Body, Aspiration, Pediatrics, LTB, Bronchoscopy**CASE PRESENTATION****CLINICAL ASSESSMENT**

A 10-year-old boy presented to pediatric emergency department in critical condition with one day history of acute-onset stridor and severe respiratory distress. Oxygen saturation on pulse oximeter was 95% at room air with labored breathing and dry cough. Patient was vitally stable, a febrile with pulse rate 128/min, respiratory rate 26/min, and blood pressure 100/60mmHG. On examination, it was observed that the external part of the tracheostomy tube was partially dislodged and was loosely tied to the neck with straps. However, the inner part of the tracheal tube was missing.

On investigation, parents told that they did not notice the missing part of tracheostomy tube until it was pointed out by ER doctors. On auscultation, there was decreased air entry to the right side of the chest and ronchi. Left lung field was clear and all its findings were normal.

RADIOLOGICAL INVESTIGATION

An urgent Chest X-ray Anteroposterior (AP) view served as a quick, diagnostic tool showing a broken tracheal part of the Portex tracheostomy tube stuck at the level of the carina, with its upper half partially filling the trachea and the lower half completely fitting in the right main bronchus, as shown in figure 1.

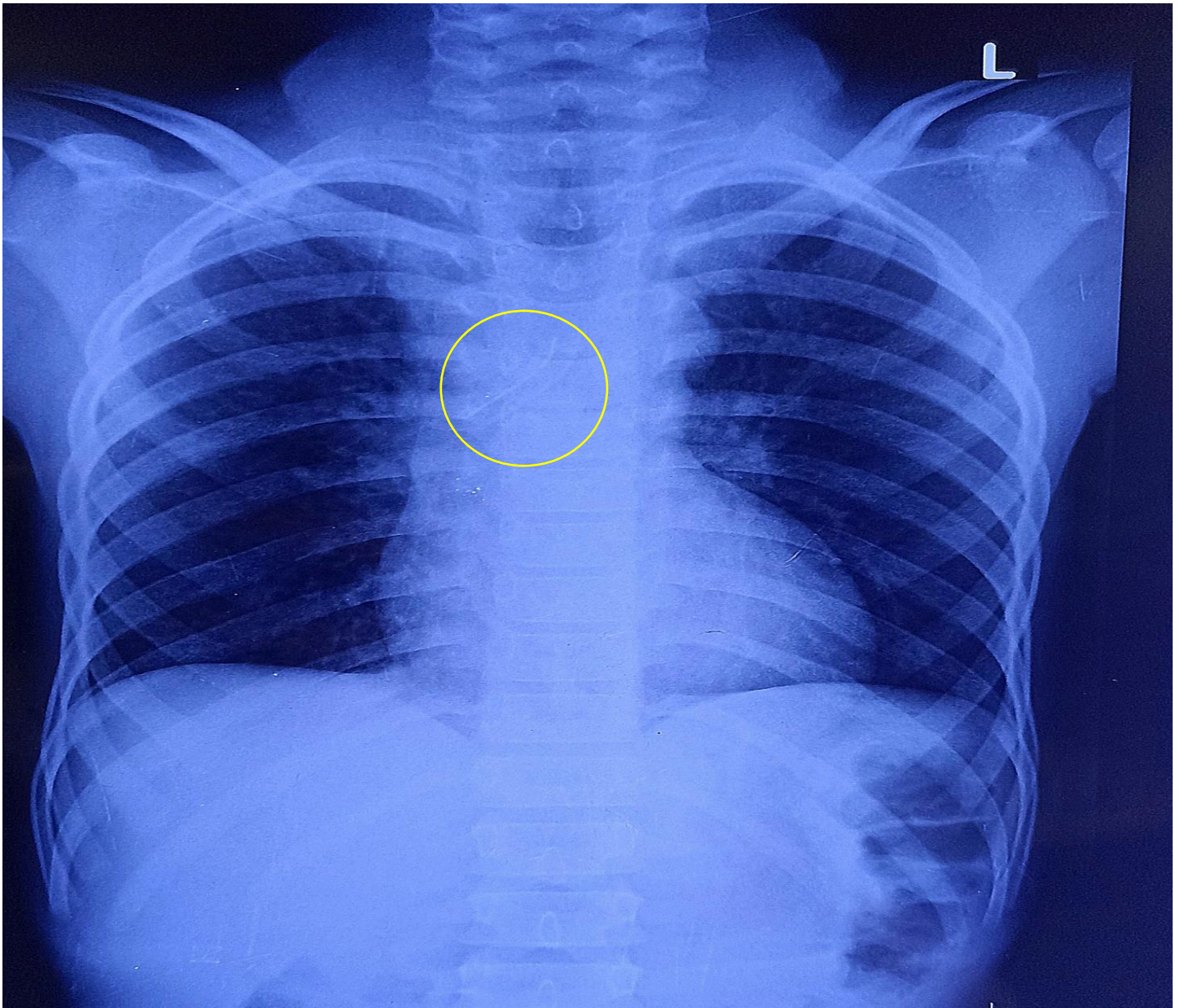


Figure 1. Chest X-ray Anteroposterior (AP) view showing dislodged tubular part of tracheostomy tube with its upper end in trachea at the level of 4th costal cartilage and lower end in the right main bronchus at the level of 6th costochondral joint

PATIENT'S HISTORY

The patient's history revealed that he was a term baby with no significant history of any disease till the age of 5 years, when he developed Guillian Barre Syndrome (GBS). Tracheostomy was performed for prolonged mechanical ventilation due to GBS induced respiratory muscle paralysis. The patient was kept under ventilatory support for one month. This event was followed by the development of subglottic stenosis, so the tracheostomy was maintained for five years despite complete treatment and recovery from GBS. Follow-up visits were

scheduled every three months for regular evaluation of subglottic stenosis and removal of suprastomal or peristomal granulation tissue if and when indicated. The patient's attendants were non-compliant and could not bring the patient for regular follow-ups. Their last visit for LTB was one and half years ago. Patient was sustaining the same tracheostomy tube for about 1.5 years which resulted in the fracture of that worn-out PVC tube.

Decannulation was attempted several times in the past but failed as the child could not maintain saturation

afterwards. On his last visit, his LTB had revealed Grade 3 subglottic stenosis. Dilatation was attempted with bougie up to size 10. The new uncuffed Portex tube of 4.5 was placed in situ and patient was discharged after stabilization.

CLINICAL MANAGEMENT

The patient was admitted to the Pediatric Surgical Emergency. All the routine investigations were performed on urgent basis. The patient was evaluated by a pediatric ENT surgeon. His Arterial Blood Gas (ABGs) analysis revealed pH 7.370, HCO₃ 21.8, PO₂ 97.4, PCO₂ 39.4, Na/K 133/3.5, BE 1.1, Sat O₂ 96%. After pre-anesthetic evaluation, the patient was prepared for an emergency LTB examination under General Anaesthesia (GA). Patient was shifted to Emergency Operation Theater. Intravenous line of 24 gauges was secured. Pulse Oximeter, Blood pressure cuff, and Cardiac monitors were attached to the child and his baseline vital readings were recorded. GA was induced by sevoflurane, fentanyl, and atracurium while securing the airway with uncuffed 5.5' Endotracheal tube (ETT).

Later, ETT was removed, and patient was ventilated via newly placed uncuffed 5.5 tracheostomy tube using a mixture of sevoflurane and oxygen. The bronchoscope (Fr 4) was introduced through larynx. With the advancement of the bronchoscope, tracheostomy tube was removed, and the patient was manually ventilated through the ventilating port of the bronchoscope, intermittently. Under GA, LTB revealed the presence of a fractured inner part of the PVC tracheostomy tube partially impacted with thick mucus plugs which were causing respiratory distress earlier. The broken part could not be removed via throat due to persistent Grade 3 subglottic stenosis. Foreign body removal was tried through tracheostomy stoma as well but failed due to localized fibrotic bands and granulation tissue obstructing 30% of the lumen of the trachea. So, the tracheostomy stoma was widened by giving 2-3cm horizontal incisions on its lateral edges. The bronchoscope of 4 Fr was introduced through the stoma and the broken portex tube was retrieved by using alligator bronchoscopy forceps (figure 2).



Figure 2. 4.5mm, worn out uncuffed Portex Tracheostomy Tube fractured at the junction of Neck strap and (Bronchoscopically retrieved) Tracheal Part.

DISCUSSION

Tracheostomy tubes are inserted in the post-tracheostomy stoma enabling the respiration in patients, by-passing the compromised vocal cords or upper respiratory tract [1]. Tracheostomy can be temporary or permanent, depending on the patient's pathology [2]. It surely is a life-saving procedure. But it needs special care as it is a direct, unguarded portal to the trachea [3]. There are two types of tracheostomy tubes depending on the material used for the manufacturing, one is metallic, and the other is made using PVC. Metallic tracheostomy tubes are high maintenance and are now obsolete due to erosions and other complications. On the contrary, PVC tubes are comparatively safe and are not high maintenance. However, wear and tear can cause fractures in plastic, especially at the junction of the neck strap and tracheal tube [4]. The aspiration of fractured tracheostomy tube is a potentially dangerous complication of tracheostomy. The retrieval of fractured tracheostomy tube needs surgical and anaesthetic expertise and is different from any other aspirated foreign body removal. For the patients with sustained tracheostomies, effective counseling of the caretakers is strongly recommended since it is a matter of life and death. On discharge, the parents or attendants should be well-educated about the tracheostomy care. They should be counseled to attend the regular follow-up visits. On every visit, patient should be evaluated for tube change and decannulation [5]. Foreign body aspiration is a common pediatric ENT emergency [6]. Early management with appropriate investigations, prompt diagnosis, and timely-performed bronchoscopy by a skilled professional has an excellent prognosis. Moreover, the patient's caregivers should be warned about all the possible complications associated with the tracheostomy to seek medical attention on an emergency basis [7, 8].

REFERENCES

1. Billington JJ, Luckett A. Care of the critically ill patient with a tracheostomy. *Nursing Standard*. 2019;34(9):59-65.
2. Doherty C, Neal R, English C, Cooke J, Atkinson D, Bates L, Moore J, Monks S, Bowler M, Bruce IA, Bateman N. Multidisciplinary guidelines for the management of paediatric tracheostomy emergencies. *Anaesthesia*. 2018 Nov;73(11):1400-17.
3. Patton J. Tracheostomy care. *British Journal of nursing*. 2019 Sep 12;28(16):1060-2.
4. Tweedie DJ, Cooke J, Stephenson KA, Gupta SL, Pepper CM, Elloy MD, Cochrane LA, Wyatt ME. Paediatric tracheostomy tubes: recent developments and our current practice. *The Journal of Laryngology & Otology*. 2018 Nov;132(11):961-8.
5. Verma R, Mocanu C, Shi J, Miller MR, Chiang J, Wolter NE, Propst EJ, St-Laurent A, Amin R. Decannulation following tracheostomy in children: A systematic review of decannulation protocols. *Pediatric Pulmonology*. 2021 Aug;56(8):2426-43.
6. Brkic F, Umihanic S, Altumbabic H, Ramas A, Salkic A, Umihanic S, Mujic M, Softic L, Zulcic S. Death as a consequence of foreign body aspiration in children. *Medical Archives*. 2018 Jun;72(3):220.
7. Bajaj D, Sachdeva A, Deepak D. Foreign body aspiration. *Journal of Thoracic Disease*. 2021 Aug;13(8):5159.
8. Singhal G, Kumar P, Goel S, Goit S, Pathak A. A case of migration of fractured tracheostomy tube—a case presentation. *The Egyptian Journal of Otolaryngology*. 2022 Dec;38(1):1-3.