

Fractured Tracheostomy Tubes into the Tracheobronchial Tree

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Abstract: *The tracheostomy technique is a traditional life-supporting airway procedure. While there are documented early and late problems with this treatment, it is generally considered healthy. A tracheostomy tube fracture and subsequent aspiration in the tracheobronchial tree is a rare late condition that may be fatal. A broken tracheostomy tube presenting as a foreign body in the tracheobronchial tree has only been recorded in a few cases. The trachea and right main bronchus were the most often identified dislodged areas, and our patient's inner flange was stuck in the trachea and left main bronchus. Foreign-body aspiration is a critical medical emergency that necessitates immediate recognition and treatment, which our patient received successfully. The most common procedure is therapeutic rigid bronchoscopic removal. A regular examination of tracheostomy treatment procedures, as well as prompt checks for symptoms of wear and tear, could be able to prevent such avoidable late complications.*

Keywords: tracheostomy operation, broken tracheostomy, tube rigid bronchoscopic removal

1. Introduction

Tracheostomy is a typical life-supporting airway operation. This operation is healthy, but there have been reports of early and late complications. Tracheostomal stenosis, innominate artery erosion, and tracheoesophageal fistula are some of the most problematic late complications. A tracheostomy tube fracture and subsequent aspiration in the tracheobronchial tree is a rare late condition that may be life threatening. Few cases of a broken tracheostomy tube presenting as a foreign body in the tracheobronchial tree have been reported in the literature. (1–4) We quickly diagnosed and successfully treated a related case in young patient with leukodystrophy, and we'd like to share what we learned.

2. Case Report

A 14-year-old male patient came to our team one day after noticing the broken inner flange of his acrylic tracheostomy

tube as a result of aggressive manipulation. This patient was admitted to Picu for leukodystrophy.

The patient had a cough and labored breathing when he arrived, but his vital signs were fine. The left side of the chest was found to have reduced breath sounds on auscultation. The density of the inner conduit, embedded partly in the trachea and partly in the left major bronchus, was distinctly seen on a subsequent X-ray of the chest [Figure 1]. He was moved to the operating room right away for a strict bronchoscopic removal when under general anesthesia. Using a long foreign body forceps, the inner flange of the tracheostomy tube was recovered from the left primary bronchus and removed from the tracheostomy stoma. [Fig. 1] A crack was discovered at the intersection of the inner tube and the neck plate. [Figures 2 and 3]. He was released the next day after making a full recovery to picu



Figure 1

The acrylic density of the inner flange, embedded partly in the trachea and partly along the left major bronchus, was plainly visible on a chest X-ray and on ct chest

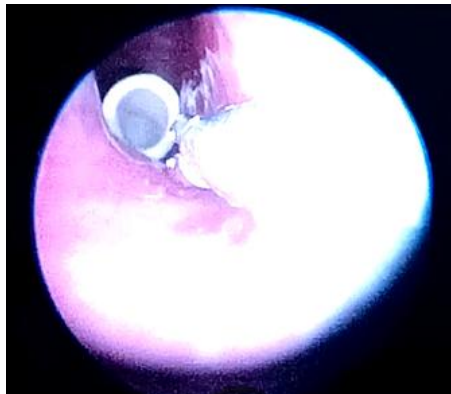


Figure 2: The broken tracheostoe tube clarely showed with regid bronchoscope



Figure 3: Broken tracheostome tube removed by regide bronchoscope

3. Discussion

Various foreign bodies in the tracheobronchial tree have been recorded. Bassoe and Boe reported the first case of a cracked metallic tracheostomy tube in 1960, and this complication has been reported in the medical literature on a regular basis since then. Gupta in 1987[2] recorded the largest series of broken tracheostomy tubes to date, consisting of nine cases over an 8-year duration. Before a definitive diagnosis can be made, patients are often misdiagnosed as having chronic respiratory problems.

Tracheostomy tubes are made of a variety of materials, including metal, PVC, and silicone. Metallic tubes are more suited for long-term use because they can be cleaned and cooked. Traditional metallic tracheostomy tubes were made of silver, copper, or zinc, and were both susceptible to corrosion from the alkaline tracheal secretions; new metallic tracheostomy tubes are made of stainless steel, which is less corrosive and less likely to crack. Despite this, metallic tracheostomy tubes have been identified in the majority of cases of broken tracheostomy tubes. [5]

A variety of causes make one of the trachesotomy tube's flanges susceptible to fracture. The tracheostomy tube's so-called weak points are the junctions between the tube and the neck plate, as well as the distal end of the tube and the fenestration region. 4–6 The intersection of the tube and the neck plate is the most often identified fracture spot. Long-term use, which causes tube wear and tear, has been suggested as a possible risk factor for tracheostomy tube

fracture. 3–6 This complication has been linked to manufacturing flaws, high internal pressures on the tube surface, and alkaline tracheobronchial secretions. 2–6 The tracheostomy tube fracture in our patient was most likely caused by excessive wear and tear, as shown by the deterioration on the tube's back. The trachea and right main bronchus were the most often identified dislodged sites,[5], and the inner flange in our patient was embedded in the trachea and left main bronchus.

Acute or persistent respiratory symptoms can result from broken tracheostomy tubes dislodged in the tracheobronchial tree. In the acute stages, air hunger and dyspnoea are typical presentation symptoms. The presenting symptoms are milder in circumstances where the diagnosis is missed and the tube lies dormant, such as intermittent coughing and wheezing, leading to patients being misdiagnosed with common respiratory illnesses like asthma, pneumonia, or chronic bronchitis. 2–7 The presence of a foreign body in the bronchial tree for an extended period of time will cause permanent pulmonary changes [8] due to mechanical pressure effects, chemical reactions, and even malignant transformation.

A chest radiograph will almost often reveal the diagnosis. [2] In long-standing situations, computed tomography of the chest with virtual bronchoscopy is useful in determining the exact location of the broken fragment in relation to the tracheobronchial tree, especially when associated chest disease is suspected.

4. Conclusion

Aspiration of foreign bodies is a major medical emergency that requires immediate recognition and treatment. Since a larger foreign body like a metallic tracheostomy tube might not be retrievable with a flexible bronchoscope, therapeutic rigid bronchoscopic removal is the mainstay of treatment [6]. The broken fragment can be removed under clear vision if it is just below the tracheostomy stoma. Bronchoscopic removal of massive aspirated specimens is a difficult process in general since most traditional devices are unable to grasp solid objects with a strong and deep grasp, and attempts can be more painful than therapeutic in some cases. In certain cases, a relieving incision at the site of a small tracheotomy opening might be necessary; but, in our patient, this was not the case. In cases where unsuccessful bronchoscopic efforts have failed, lung parenchyma saving operation with tracheobronchotomies is the only, only method for retrieving the offending tracheotomy hose. 2nd A regular examination of tracheostomy treatment techniques[9], as well as prompt checks for signs of wear and tear, could be able to prevent such avoidable late complications. Aspiration of foreign bodies is a major medical emergency that requires immediate recognition and treatment. A larger foreign body, such as a metallic tracheostomy tube, could not be retrievable with a flexible bronchoscope, so therapeutic rigid bronchoscopic removal is the mainstay of treatment[6]. Removal under clear vision is possible where the broken fragment is just below the tracheostomy stoma. Bronchoscopic removal of massive aspirated objects is a difficult process in general since most traditional devices are unable to grip solid objects with a

strong and broad grasp, and attempts can often be more painful than therapeutic locally. In certain cases, a relieving incision at the site of a small tracheotomy opening might be required; however, this was not the case in our patient. In cases where unsuccessful bronchoscopic efforts have failed, lung parenchyma saving operation requiring tracheobronchotomies is the only, only method for retrieving the offending tracheotomy hose. [2, 3]

An annual examination of tracheostomy treatment techniques [9], including timely checks for signs of wear and tear, might be able to prevent such avoidable late complications.

Footnotes

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Conflict of Interest: None declared

References

- [1] Bassoe HH, Boe J. Broken tracheotomy tube as a foreign body. *Lancet*. 1960;1:1006–7. [PubMed] [Google Scholar]
- [2] Gupta SC. Fractured tracheostomy tubes in the tracheobronchial tree: A report of nine cases. *J Laryngol Otol*. 1987;101:861–7. [PubMed] [Google Scholar]
- [3] Gupta SC, Ahluwalia H. Fractured tracheostomy tube: An overlooked foreign body. *J Laryngol Otol*. 1996;110:1069–71. [PubMed] [Google Scholar]
- [4] Majid AA. Fractured silver tracheostomy tube: A case report and literature review. *Singapore Med J*. 1989;30:602–4. [PubMed] [Google Scholar]
- [5] Piromchai P, Lertchanaruengrit P, Vatanasapt P, Ratanaanekchai T, Thanaviratananich S. Fractured metallic tracheostomy tube in a child: A case report and review of the literature. *J Med Case Reports*. 2010;4:234. [PMC free article] [PubMed] [Google Scholar]
- [6] Alqudehy ZA, Alnufaily YK. Fractured tracheostomy tube in the tracheobronchial tree of a child: Case report and literature review. *J Otolaryngol Head Neck Surg*. 2010;39:E70–3. [PubMed] [Google Scholar]
- [7] Kumar KS, Das K, DCruz AJ. Aspiration of a cryptic foreign body (tracheostomy tube flange) *Indian J Pediatr*. 2004;71:1145–5. [Google Scholar]
- [8] Hagibour A, Khan ZH. Fracture and aspiration of metallic tracheostomy tube. *Saudi Med J*. 2007;28:468. [PubMed] [Google Scholar]
- [9] White AC, Kher S, O'Connor HH. When to change a tracheostomy tube. *Respir Care*. 2010;55:1069–75. [PubMed] [Google Scholar]