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Unusual removal of a fractured tracheostomy tube retained in the right bronchus for more than one year: a case report

Retrait inhabituel d'un tube de trachéotomie fracturé retenu dans la bronche droite depuis plus d'un an : Cas clinique

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Cas clinique

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ABSTRACT

Tracheostomy tube fracture and aspiration in the lower airway is a rare and late complication. The tracheobronchial foreign body must be diagnosed and removed early to prevent life-threatening complications. Therapeutic bronchoscopic removal is the mainstay of treatment. We report a case of a 51-year-old male patient who was tracheostomized five years ago for an extended glottic carcinoma. He presented with a persisting cough after fracture and aspiration of his tracheostomy tube one year before. There was no respiratory distress or hemodynamic disorder. The chest X-ray showed a metal tube lodged in the right main bronchus. Removal was performed with a rigid pediatric esophagoscope through the tracheostomy stoma without any complication. The authors highlight the need for proper tracheostomy tube care to reduce accidental complications and present an alternative method for extracting those foreign bodies in settings where bronchoscopy is unavailable.

RESUME

La fracture du tube de trachéotomie et l'aspiration dans les voies aériennes inférieures sont des complications rares et tardives. Le corps étranger trachéobronchique doit être diagnostiqué et retiré précocement afin d'éviter des complications potentiellement mortelles. L'ablation thérapeutique par bronchoscopie est la base du traitement. Nous rapportons le cas d'un homme de 51 ans qui avait été trachéotomisé il y a cinq ans pour un carcinome glottique étendu. Il s'est présenté avec une toux persistante après une fracture et une aspiration de son tube de trachéotomie un an auparavant. Il n'y avait pas de détresse respiratoire ni de trouble hémodynamique. La radiographie thoracique a montré un tube métallique logé dans la bronche principale droite. Le retrait a été effectué à l'aide d'un œsophagoscope pédiatrique rigide à travers la stomie de trachéotomie sans aucune complication. Les auteurs soulignent la nécessité d'entretenir correctement le tube de trachéotomie afin de réduire les complications accidentelles et présentent une méthode alternative pour extraire ces corps étrangers dans les environnements où la bronchoscopie n'est pas disponible.

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Introduction

Tracheostomy is a standard emergency procedure in airway management. It involves the placement of a tracheostomy tube to provide appropriate ventilation for patients [1]. It is a life-saving surgery indicated in cases of upper airway obstruction. Despite an estimated mortality rate of less than 5% [1], early or late complications can be encountered. Late complications include airway scarring, granulation formation, tracheoesophageal fistula, and innominate artery erosion [2]. Improper tracheostomy care can result in adverse outcomes such as fracture of tracheostomy tubes with aspiration of the fragment into the airway.

Fracture of metallic tracheostomy tubes with aspiration is a rare complication [2]. A foreign body lodged in the airway requires emergent attention due to the inherent risk of airway compromise, which could be potentially life-threatening [3]. Extracting this type of foreign body is challenging and usually requires bronchoscopy [4].

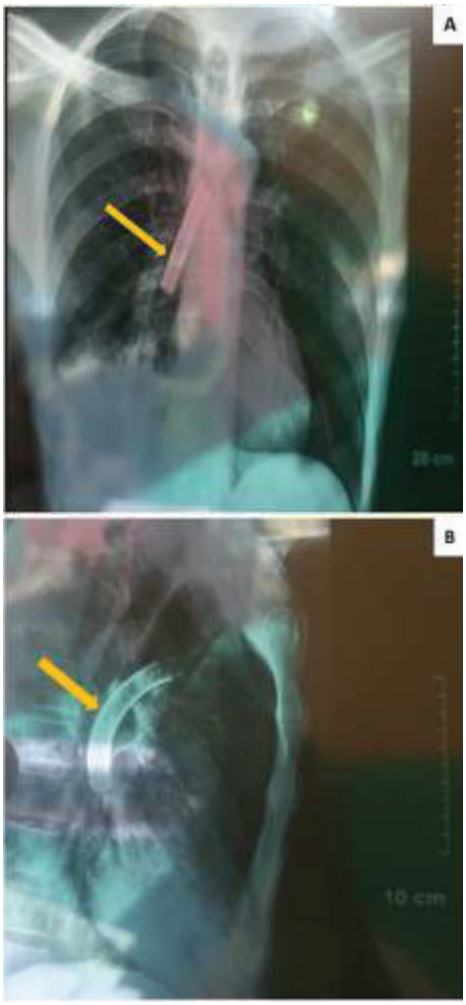
The reports describing using a rigid esophagoscope to extract a fractured tracheostomy are rare in the literature. The authors report a case of a 51-year-old male patient with a broken metallic tracheostomy tube lodged in the right main bronchus one year after aspiration, which was successfully removed with a rigid pediatric esophagoscope through the tracheostomy stoma. They also proposed some recommendations for proper tracheostomy care.

Case report

A 51-year-old male patient presented to the Ear, Nose, and Throat (ENT) Unit of the Yaounde Central Hospital with a complaint of intermittent cough, chest pain, and excessive purulent sputum without respiratory distress. The patient was tracheostomized five years ago for an obstructive laryngeal carcinoma. For the last five years, the patient was lost to follow-up but was able to remove and clean his tracheostomy tube himself. There was a history of aspiration of a fragment of his tracheostomy tube while attempting to remove it for cleaning one year earlier. The patient did not seek our opinion regarding this tracheostomy tube aspiration until his present consultation.

On presentation, the patient had a cough and labored breathing with typical vital signs. There were decreased breath sounds on the right side on the auscultation of the chest. There was a partial stenosis of the tracheostomy stoma.

A chest X-ray clearly showed the metallic density of the fractured tracheostomy tube lodged in the right main bronchus, with a homogeneous right basal opacity (**Figure 1 A and B**).



Figures 1 A, B: Chest X-rays showing the metallic density of the fractured tracheostomy tube lodged in the main right bronchus (yellow arrow) with basal lung condensation

The patient was admitted for ten days for parenteral antibiotic treatment of his pneumonia. After obtaining his consent, the patient was shifted to the operating room for the extraction of this foreign body under general anesthesia.

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We first enlarged the tracheostomy stroma and inserted a fiber optic pediatric esophagoscope. In this way, they are easily retrieved from the right main bronchus and removed through the tracheostomy stoma without any perforation location of the fracture (**Figure 1 C**).

Figure 1 C: Photograph of the retrieved fractured (12.5 cm-long) metallic tracheostomy tube

The patient was discharged on broad-spectrum antibiotics the following day, and a new tracheostomy tube was placed. During the one-week follow-up, he was fine, and we provided him with good practice and advice about tracheostomy tube care.

Discussion

The first tracheostomy tube fracture with migration into the tracheobronchial tree was described in 1960 [5]. The most prominent case series (nine patients) was reported by Gupta et al. in 1987 over eight years [6]. Piromachai et al. reviewed 20 cases of aspiration of fractured tracheostomy tubes from 18 published studies. They involved 15 males (75%) and four females (20%), and the most typical sites of lodgment were the trachea and right main bronchus [1], as in our case.

In our case, the fracture was located at the junction between the tube and neck plate, and we identified prolonged wear and aging of the patient's medical device. Even if the distal end and the fenestra have been reported, the junction between the tube and neck plate remains the most encountered fracture site [1]. Fractures are attributed to progressive weakening due to repeated tracheostomy tube care or mechanical stress at the tube-flange junction area [6]; another reason reported was the stenosis of the tracheal stoma, as seen in our case, which seems to increase the risk of fracture [7]. Prolonged use of a tracheostomy tube is a significant factor for failure, primarily due to the cost of the tube and restricted access to follow-up. As most patients with aspirated tracheostomy tubes self-present with little or no symptoms, it is essential to properly examine the tracheostomy tubes on follow-up to identify impending fractures [8].

Tracheostomy tube fracture can occur between 5 days to 22 years after the placement, and patients can present within a duration of 1 day – 132 days, with a median interval of three months [9]. An aspirated tracheostomy tube migrating into the tracheobronchial tree can be responsible for acute or chronic respiratory signs. Patients are most often misdiagnosed as having chronic respiratory conditions [10].

A chest x-ray or CT scan makes the diagnosis. The foreign body can be retrieved using a flexible, rigid bronchoscope, 0° endoscope, thoracotomy, and bronchotomy under sedation or general anesthesia [1,3,6-10]. A stomal release may be required to allow instrumental access. For this purpose, we use a fiber optic pediatric esophagoscope through the tracheal stoma; this method has not yet been reported.

Many cases of fractured tracheostomy tubes are from developing countries. Patients in these countries use the same tube for prolonged periods due to economic constraints associated with replacing tubes. They use only inferior quality tubes, are lost in follow, and practice poor tracheostomy care [7]. A periodic review of the techniques of tracheostomy care, including timely check-ups for signs of wear and tear, can eliminate such avoidable late complications [9, 11].

Conclusion

Aspiration of a fractured tracheostomy tube is a rare complication. In developing countries, tracheostomized patients must be educated on the importance of follow-up visits, tube care, and replacement and immediately seek specialized opinion and care. These are essential to prevent this complication. The rigid fiber optic pediatric esophagoscope can retrieve these foreign bodies.

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