Indian Journal of Otolaryngology and Head & Neck Surgery (2024) 76:1183–1186
https://doi.org/10.1007/s12070-023-04206-1

CLINICAL REPORT

Beyond the Norm: Tracheostomy's Vital Role in Unconventional Foreign Body Removal

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Received: 21 August 2023 / Accepted: 31 August 2023 / Published online: 2 September 2023

Abstract
Background: Foreign Body Aspiration (FBA) is one of the paediatric emergencies which require timely diagnosis and management. The inherent tendency of children to explore small objects with their mouths often prove to be fatal as they are difficult to remove once aspirated. Case Report: We present the case of a 5-year-old boy who presented with dyspnea and vomiting following the aspiration of a pen cap. Chest radiograph and Rigid Bronchoscopy helped to identify the foreign body but it couldn't be removed by Rigid Bronchoscopy alone due it's wedge-shaped nature. Hence, an unconventional method of foreign body removal was performed by making a tracheostoma, pushing the foreign body to the level of tracheostoma and thereby taking it out from the tracheostoma under strict monitoring of anesthesia team. Conclusion: Alternative approaches like this are required for prompt intervention in a difficult case as it helps to reduce complications produced by repeated failed attempts.

Keywords Tracheal foreign body · Tracheostomy · Difficult airway · Bronchoscopy

Introduction

Foreign Body Aspiration (FBA) is one of the most significant causes of death in children [1] and its timely removal can reduce subsequent morbidity and mortality. The inherent tendency of children to explore objects with their mouths makes them more prone to FBA [2].

Early diagnosis of FBA helps us reduce treatment delays and is often done by chest radiography, clinical history in case of witnessed aspiration, or rigid bronchoscopy [3]. Small foreign bodies like magnets, buttons, etc. are commonly aspirated, and difficult to remove, hence they end up being fatal [4].

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Case Presentation

The patient is a 5-year-old male child who presented to the paediatric casualty with acute onset breathing difficulty, vomiting, and difficulty in swallowing following the aspiration of a pen cap at his residence. The vital signs were stable and included, Pulse Rate:112 bpm, Blood Pressure:102/64 mmHg, Respiratory Rate: 36/minute, and SpO2: 94% in room air. The patient had no history of any other specific disease.

Physical examination revealed respiratory distress with intercostal and suprasternal retraction along with noisy breathing. On auscultation bilateral air entry was reduced and the decreased air entry was more pronounced in the left side. No other significant findings were present on the examination. Chest radiography along with radiography of soft tissue neck showed the presence of a doubtful foreign body in the trachea with left lung hyperinflation. (Fig. 1).

The patient was admitted and underwent Rigid Bronchoscopy under general anaesthesia in emergency operation theatre. A size 4.5 Rigid Bronchoscope was used for the procedure and the foreign body was identified in the trachea but could not be taken out through the glottis even after multiple attempts due to the slippery nature of the plastic pen cap. Added to this, was the wedging effect provided by the tip

Fig. 1 Preoperative chest and neck radiograph. Source: Authors

Fig. 2 Swallowed foreign body (view 1). Source: Authors

which had abducted the vocal cords and allowed the cap to slide in but the base end being wide, prevented it from being taken out through the glottis (Figs. 2 and 3).

Luckily, ventilation was maintained in this case due to the central lumen in the cap. Hence, a tracheostoma was

Fig. 3 Swallowed foreign body (view 2). Source: Authors

made at the level of the second tracheal ring and the foreign body was pushed via the help of grasping forceps and bronchoscope in a controlled manner with strict monitoring of hemodynamics by anesthesia team. The foreign body was brought to the level of tracheostoma by this method. Finally, it was taken out through the tracheostoma. Size 5 portex cuffed tracheostomy tube was placed afterwards and the child was shifted to paediatric ICU for weaning off from the ventilator (Fig. 4).

Decannulation and strapping were done on the same day and the patient was kept under observation for respiratory distress. The patient was discharged in good condition after being monitored for 2 days and was subsequent follow-up after a week was advised in which the child was doing well with no complaints.

The authors declare that no patient data appear in this article and have obtained the written informed consent of the patient mentioned in the article.

Discussion

Children and infants tend to aspirate foreign bodies easily and it gets lodged in the right bronchus more frequently as compared to the left [5]. As ventilatory function can be managed by the other lung the problem is less severe as compared to a foreign body lodged in the trachea. Small foreign bodies are often difficult to remove and includes magnets,

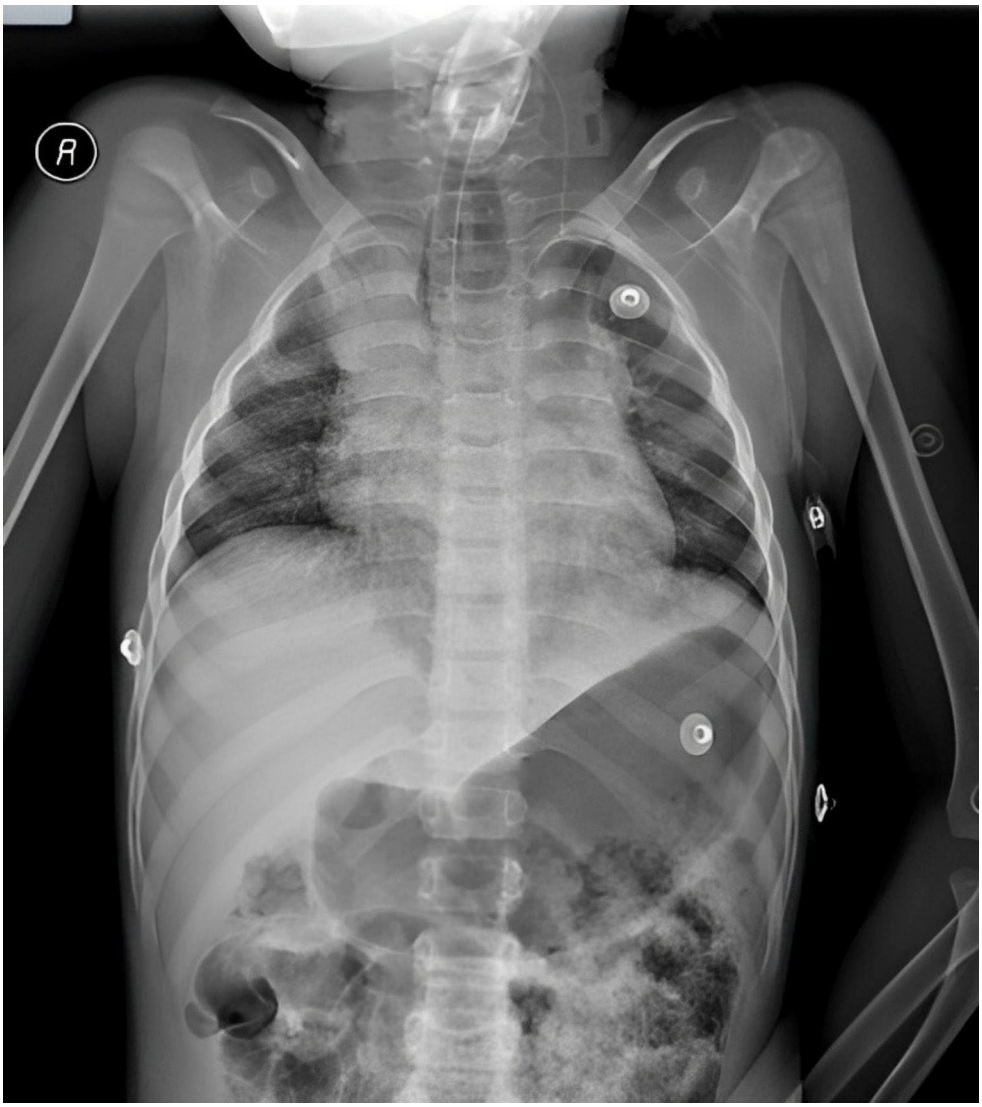

Fig. 4 Post operative radiograph with tracheostomy tube insitu. Source: Authors

pen caps and even button batteries which can cause necrosis of the airway.

The presenting symptoms of FBA includes choking, wheezing, coughing and unilateral pulmonary sounds [6]. Witnessed FBA is easy to diagnose as compared to unwitnessed FBAs as the symptoms can either be present as a complication of asthma or respiratory infections and because the sensitivity and specificity range of radiography can vary. This is likely to delay treatment due to late diagnosis.

Rigid Bronchoscopy is used as the gold standard for the assessment and management of foreign body lodged in the airway [7–9]. In the present study since the foreign body could not be taken out through the glottis, a tracheostomy had to be performed through which the foreign body was taken out thereby paving the way for an alternative method of foreign body removal in cases like these. Hence, when rigid bronchoscopy fails the available options like tracheostomy, bronchotomy and thoracotomy can be considered [10].

Conclusion

Prompt recognition and removal of foreign bodies are essential to reduce morbidity and mortality associated with FBA. Although Rigid Bronchoscopy is helpful in managing most of the cases, alternative modalities are required when removal is not possible as in this case where a tracheostoma was used to take out the foreign body. Repeated attempts via bronchoscopy could cause tracheal mucosal injuries predisposing to future stenosis, ventilatory deficit intraoperatively or another repeat procedure under general anaesthesia. It's imperative for the operating surgeon to recognise the need

for alternative approaches like this for prompt intervention in a difficult case.

MAIN POINTS:

1. FBA is a leading cause of child mortality; early diagnosis and removal are required to reduce morbidity and mortality.
2. Children's inclination to explore objects with their mouths increases their susceptibility to FBA, small objects like magnets or pen caps are frequently aspirated.
3. The case study involves a 5 year old male child with a pen cap aspiration, highlighting the challenges in removing foreign bodies from the trachea using Rigid Bronchoscopy and the need for alternative approaches like tracheostomy.
4. Prompt recognition and removal of foreign bodies is necessary as delayed diagnosis and repeated bronchoscopy attempts can lead to complications.

Author Contribution All the authors have equally contributed to the case report. VMS is the major contributor in writing the manuscript. HGH, KR participated in writing, editing and data interpretation along with VMS. All authors have equally participated in writing the manuscript.

Funding There was no funding required to take up the study.

Data Availability The datasets during and/or analyzed during the current study are available from the corresponding author upon reasonable request.

Declarations

Ethics Approval and Consent to Participate The study was taken after obtaining an Ethics committee approval from the Institution of Ethics Committee, JIPMER,Pondicherry, India.

Consent for Publication Written informed consent for publication of their clinical details and/or clinical images was obtained from the patient. A copy of the consent form is available for review by the Editor of this journal.

Competing Interests The authors declare that they have no competing interests.

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