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CASE REPORT

Tracheostomy-Assisted Retrival of Bullet from Right Main Bronchus: A Case Report

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Abstract

Background: Foreign body aspiration is a serious pediatric emergency that can cause severe morbidity and mortality. Early diagnosis and immediate are necessary to avoid complications. **Case Presentation:** A 5 years old boy presented with history of dyspnea, fever, cough and chest pain since 2 weeks after the ingestion of a bullet while playing. Clinical features were dyspnea, stridor and markedly reduced air entry on the right. A chest X ray revealed radio-opaque foreign body in the right main bronchus. An Emergency rigid bronchoscopy under general anaesthesia was not successful in the removal of the foreign body despite repeated attempts. Subsequently, a tracheostomy was performed and bullet removal was successful. Post-operatively, improvement was impressive, and on the 4th day, the patient was discharged in good condition. **Conclusion:** The case report describes about a difficult extraction of a foreign body from Right main bronchus, needing a tracheostomy at the end to retrieve the same in view of failure of extraction via rigid bronchoscope. Early diagnosis, appropriate imaging and a multidisciplinary strategy are important for effective management of foreign body aspiration in children. This case also highlights the limitation of rigid bronchoscopy and reminds us to be prepared for tracheostomy if required.

Keywords: Foreign body, Bronchus, Rigid Laryngoscopy, Tracheostomy-assisted

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Introduction

Foreign body aspiration (FBA) is a potentially life-threatening pediatric emergency that typically happens in children below the age of 5. FBA is accidental insertion of some foreign object like food, small object, toy or debris, into the airway, causing major respiratory distress and other serious complications if left untreated. Specifically, aspiration of foreign bodies into bronchial tree can result to life threatening conditions including airway obstruction, infection, atelectasis, pneumonia, obstructive emphysema and even death if left untreated [1,7].

One of the less common but potentially fatal foreign body aspirations is the aspiration of a bullet or other metal object, while rare, offers a distinct diagnostic and management challenge. The right main bronchus is especially susceptible secondary to its direct course from trachea and slightly larger diameter than that of the left main bronchus, thus more likely to accommodate a foreign body [2]. This case report discusses the treatment of a pediatric patient who aspirated a bullet into the right main bronchus, necessitating the treatment by tracheostomy-assisted retrieval. The prompt and efficient retrieval of such an object is paramount to maintain minimal morbidity and mortality, and its highlights the significance of a multidisciplinary approach to the management of complex pediatric airway emergencies. This Case report emphasizes the clinical dilemmas and decision-making processes involved with foreign body aspiration, especially in the setting of unusual and dangerous objects such as bullets.

Case Presentation

A 5-year-old male child was referred to our hospital with a history of respiratory distress, fever, cough, and chest pain for 14 days. The child had reportedly aspirated a bullet while playing. On examination, he presented with dyspnea, audible stridor, and a productive cough. Auscultation revealed markedly reduced air entry on the right side and crepitations on the left. Oxygen saturation (SPO2) was maintained on room air. A chest X-ray (poster anterior view) revealed radio-opaque shadow consistent with a bullet lodged in the right main bronchus (Fig1.A). Preoperative work up was completed in the emergency department and the patient was taken for an emergency rigid bronchoscopy under general anesthesia**.**

Anesthesia was administered via a port in the pediatric bronchoscope. The rigid bronchoscope was advanced to the carina, where the bullet was visualized in the right main bronchus surrounded by mucus and slough. The smooth cylindrical bullet posed significant challenges in securing a firm grasp. Multiple attempts to extract the foreign body through the vocal cords were unsuccessful, as it repeatedly slipped back into the bronchus.

To facilitate safe retrieval of the bullet, a tracheostomy was performed due to difficulty encountered in retrieving the bullet through the laryngeal inlet. The foreign body was successfully extracted through the tracheal opening. The bullet measured 2x 1.5x 1 cm (Fig. 1B). Post-procedure, the patient was transferred to the pediatric ICU for observation. The stridor resolved, and air entry to the right lung improved. On the 2nd post-operative day, mild subcutaneous

emphysema was noted and managed conservatively. A chest X-ray on the same day confirmed the clearance of lung parenchyma. The tracheostomy tube was decannulated on the 4th day and the patient was discharged in stable condition.

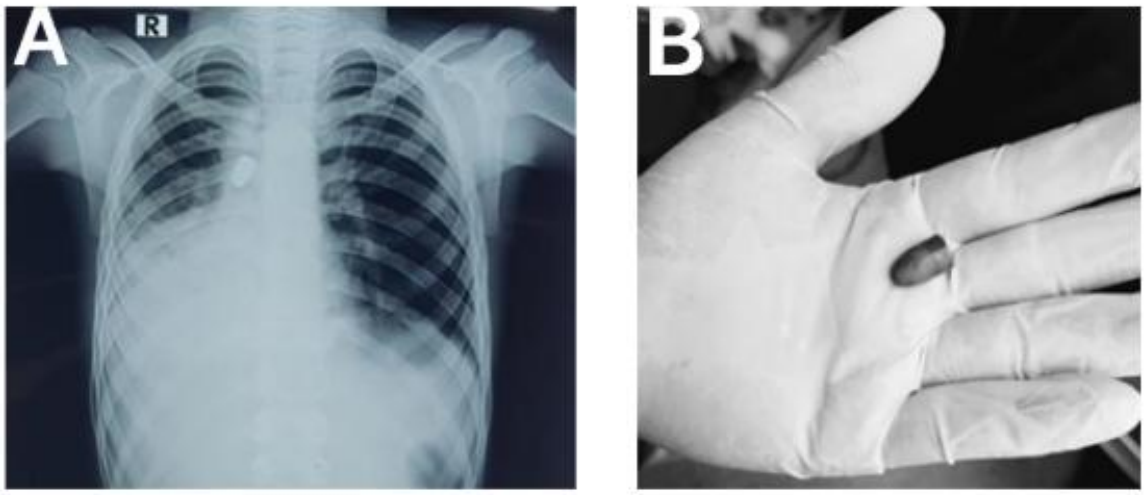

Figure 1. (A) X-ray Chest PA view showing a radio-opaque shadow consistent with a bullet lodged in the right main bronchus (B) Showing the retrieved bullet.

Discussion

Foreign body aspiration in children is typically non- radio-opaque, with the majority of objects being located in the right main bronchus [3,8]. However, the aspiration of metallic objects such as bullets is rare as it poses significant challenges due to their smooth surface. Common presenting symptoms include cough, wheezing and respiratory distress, and if these symptoms are not promptly addressed, can lead to serious complications [4].

Thorough history, physical examination, radiographic imaging and rigid bronchoscopy are gold standard in diagnosing and treating foreign body aspiration [5]. In this case too, a thorough history and physical examination was conducted and the chest X ray clearly identified the location of the bullet in the right main bronchus. The rigid bronchoscope is typically the first line tool for foreign body removal in pediatric patients due to its large lumen and better visualization capabilities compared to the flexible bronchoscope. In our case, removal of the foreign body required a novel approach, as the bullet could not be extracted through the laryngeal inlet. A tracheostomy was performed to successfully retrieve the bullet. However, other potential retrieval techniques, such as a flexible bronchoscopy with dormia baskets or suction catheters were not explored for this case.

Despite an exhaustive literature search, we found no previously published reports of bullet or metallic foreign body retrieval via tracheostomy in pediatric patients except for one case series where 7 cases of non- metallic foreign body aspirations required tracheostomy out of which 5 cases were in sub glottis and 2 cases

in the right main bronchus [6].

This case also emphasizes the importance of a multidisciplinary approach involving pediatricians, radiologists, anesthesiologists, surgeons to manage complex foreign body aspirations effectively. Prompt recognition and intervention are crucial to prevent complications such as atelectasis, pneumonia, obstructive emphysema and even death [7]. Certainly, there is a need for case series on this technique to provide a generalizable conclusions or evidence for best practice.

Conclusion

This case report presents a unique case of bullet aspiration in a child, which was removed successfully by tracheostomy following a series of unsuccessful attempts with rigid bronchoscopy. The positive outcome of the patient underscores the need for adaptable treatment options and the preparedness to utilize surgical measures when and where needed. Early diagnosis, appropriate imaging, and multidisciplinary management are essential for effective treatment of foreign body aspirations in pediatric patients.

Author Contribution

TL: Design, Patient history taking, Case management and writing manuscript of the case report. LV: Writing the manuscript of the case report. CM: Case management and review of manuscript.

Conflict of Interest

The authors declares that they don't have conflict of interest.

Ethics approval and Consent to Participate

Approved by Institutional Ethics Committee- CIHSR (CIHSR-IEC/2024-2025/EXP REV-CR/1)

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