Case Report

Not All That Wheezes Is Asthma: A Near-Fatal Case of Bilateral Bronchial Obstruction from Peanut Aspiration

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ABSTRACT

Background: Foreign body ingestion and aspiration are among the five most commonly reported exposures reported in children younger than 5 years. We present a case of delayed recognition of peanut aspiration in a toddler presenting with progressive respiratory failure.

Aim: To describe the presentation, diagnostic delay, and multidisciplinary management of a case of pediatric bilateral bronchial foreign body aspiration (FBA), and to highlight the diagnostic and resource/transfer challenges of managing this presentation across primary, district, secondary and tertiary care settings.

Case Presentation: A previously well 1.5-year-old girl presented to a primary care clinic with a two-day history of cough and audible wheeze. She received multiple beta-agonist nebulization for presumed bronchospasm in district hospital. Chest radiography (CXR) demonstrated right upper lobe collapse with left lung lucency. She was transferred to a secondary care hospital as she remained unresponsive to bronchodilators and underwent intubation and positive pressure ventilation. A repeated CXR revealed a right pneumothorax, and a chest tube was inserted. An emergency flexible bronchoscopy performed through the endotracheal tube (ETT) after intubation revealed foreign bodies in both lungs. She was urgently transferred to a tertiary hospital. Friable fragments were removed in a piecemeal fashion using a flexible pincer grasper. She was extubated on day 3 of admission and made a full recovery without neurological sequelae.

Conclusion: Unwitnessed FBA remains a diagnostic challenge. Clinicians should maintain a high index of suspicion in toddlers with respiratory distress unresponsive to bronchodilator therapy. Early diagnosis and timely intervention are essential to prevent life-threatening complications.

Keywords: Foreign body aspiration, bronchial obstruction, tracheobronchoscopy, pneumothorax, primary prevention

INTRODUCTION

Foreign body ingestion and aspiration are among the top five exposures reported in children aged ≤5 years, according to the 2024 National Poison Data System (NPDS)[1]. Airway FBA is a well-recognized cause of morbidity and mortality in toddlers, who are particularly vulnerable owing to their oral exploratory behavior and immature swallowing coordination. However, in the absence of a witnessed choking episode, FBA can closely mimic

common viral-induced wheeze or asthma, leading to diagnostic delay. This pitfall is compounded when aspirations are bilateral, as the asymmetric clinical and radiographic signs that clinicians typically rely on to localize a foreign body may be absent. We report a case of unwitnessed, bilateral peanut aspiration in a toddler who was initially managed as asthma and progressed to respiratory failure before diagnosis, illustrating the diagnostic and resource challenges of this presentation across primary, district, secondary and tertiary care settings.

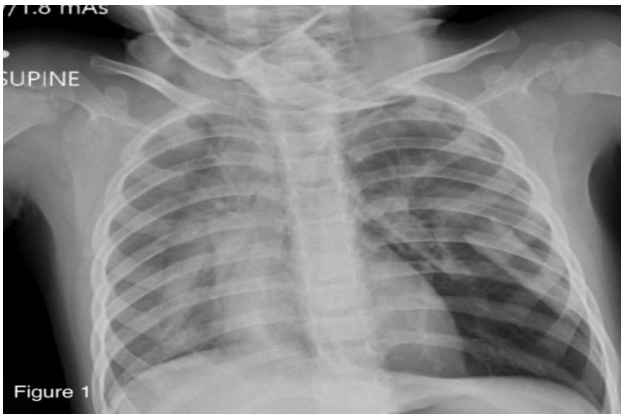
Case Presentation

A previously well 1.5-year-old girl, presented with a 2-day history of cough that had become gradually more persistent. She was brought to the clinic when she started to develop rapid breathing with an audible wheeze. She had no fever, no prior history of recurrent wheeze or bronchodilator use, and no family history of atopy. As is common in unwitnessed aspiration events, the caregivers were unable to recall specific access to peanuts or other foods preceding the onset of symptoms.

Upon arrival at primary care clinic, initial assessment by the primary care doctor revealed an audible wheeze, bilateral rhonchi and reduced breath sounds bilaterally. Further examinations showed no eczema or signs of allergic rhinitis. Her oxygen saturation (SpO_2) was 86% on room air. She was given nebulized salbutamol three times, but there was no clinical response. She started on oxygen via nasal prongs at 3 L/min and referred to the district hospital for further management.

In the district hospital, examination revealed a tachypneic child with marked subcostal recession, audible wheeze and reduced left breath sounds. Again, she was given nebulized salbutamol three times and nebulized ipratropium bromide once. Subsequently, she was given subcutaneous terbutaline 5 µg/kg followed by loading of intravenous magnesium sulfate 50 mg/kg infusion for refractory bronchospasm. Initial CXR showed right lung upper lobe collapse with left lung lucency, possible left pneumothorax (Figure 1). Referral was made to the on-call pediatrician at the secondary care hospital. Focused history-taking revealed no witnessed choking events. In addition, the child had no history of wheeze or nebulization that suggested a diagnosis of bronchial asthma. As her condition failed to improve, she was urgently transferred to a secondary care hospital with a high flow mask. Throughout the journey, the SpO_2 achieved 93%.

Figure 1. Right upper lobe collapse with left lung lucency.



FBA was suspected due to the signs of lower airway obstruction which did not respond to the treatment of bronchodilators. The Ear, Nose and Throat (ENT) specialist, emergency physician and anesthetic specialist were consulted. Upon arrival after a 1-hour journey, the patient exhibited severe respiratory distress characterized by profound chest indrawing. Arterial blood gas showed severe respiratory acidosis, pH 7.08, $PaCO_2$ 81 mmHg, PaO_2 56 mmHg, HCO_3^- 24 mmol/L, base excess (BE) -6.5 mmol/L, lactate 1.1 mmol/L.

She started on positive pressure ventilation and successfully intubated with size 4.5 cuffed endotracheal tube (ETT). Post-intubation examination revealed reduced breath sounds on the right were more pronounced than before intubation. CXR post-intubation confirmed right pneumothorax (Figure 2). A right chest tube was inserted (Figure 3) followed by emergency flexible bronchoscopy.

Figure 2. CXR taken in the sitting position after intubation reveals a newly developed right pneumothorax with right upper zone lucency; spontaneous resolution of left lung lucency.



Figure 3. Placement of a right chest tube, demonstrating the resolution of the pneumothorax and the restoration of normal lung markings.



Technical difficulties arose because the flexible bronchoscope was larger than the ETT; the ETT was therefore exchanged for a size 5.0 mm cuffed tube to allow scope passage. The flexible bronchoscopy revealed foreign bodies in both lungs with complete obstruction of the left main bronchus and 80% obstruction of the right secondary bronchus. Because the secondary care hospital lacked the necessary pincer grasper for extraction,

an emergency referral was done to the tertiary center. A repeated arterial blood gas revealed respiratory acidosis pH 7.12, $PaCO_2$ 88mmHg, PaO_2 89 mmHg, HCO_3^- 28.6 mmol/L, BE -2.2 mmol/L, lactate 0.8 mmol/L.

Due to geographical challenges, the child arrived 2½ hours later, approximately 12 hours from the time of presentation. With a multidisciplinary team already on standby, she was immediately transported to the operating theater. Direct rigid tracheobronchoscopy confirmed 90% occlusion of the right main bronchus and complete occlusion of the left main bronchus by peanut fragments and secretions. The initial extraction attempts utilizing a Dormia basket and optical forceps via rigid bronchoscope were unsuccessful, as the object could not be grasped and the aspirated peanuts were friable. A flexible pincer grasper was subsequently utilized, and the foreign bodies were successfully removed in a piecemeal manner.

Following removal, flexible tracheobronchoscopy using an Ambu scope was performed, which showed that both the main and secondary bronchi were entirely clear. The child was then reintubated with a size 4.5 uncuffed ETT. Triamcinolone acetonide 40 mg and 0.5 mL of 1:20,000 adrenaline were administered via the ETT to reduce airway edema and risk of post-extubation subglottic stenosis[2]. She was extubated on day 3 of admission and recovered fully without neurological sequelae.

DISCUSSION

The initial management of this patient appropriately focused on rapid stabilization and first-line treatment for a presumed viral-induced wheeze. At the time of presentation, FBA was explored during history taking; however, it was dismissed because the caregivers denied any witnessed choking event. Furthermore, given the child's complete lack of personal or family history of atopy, the likelihood of a standard viral-induced wheeze or new-onset asthma was low. Ultimately, the differential diagnosis of FBA was reconsidered when the child proved unresponsive to any kind of bronchodilator therapy. It was the persistent lack of clinical improvement despite multiple bronchodilator administrations that finally alerted the on-call pediatrician to reassess the case and broaden the differential. This renewed clinical suspicion was then further strengthened by a CXR revealing a right upper lobe collapse. In hindsight, recognizing these negative historical factors alongside the refractory wheeze earlier in the admission could have expedited the correct treatment.

Children between ages of 6 months to 3 years are particularly vulnerable to FBA owing to their oral exploratory habits and underdeveloped swallowing coordination. While the classic clinical picture features acute choking and coughing episodes, unwitnessed FBA can mimic asthma or pulmonary infections, frequently leading to delayed diagnosis. Clinicians must maintain a high index of suspicion for occult FBA when pediatric patients present with persistent respiratory symptoms, abrupt onset of lung collapse, or a poor response to bronchodilator, especially when the patient lacks a history of asthma or atopy.

Radiographically, a check-valve mechanism, in which air enters the bronchus around a foreign body but is unable to escape on expiration, which classically produces a unilaterally hyperinflated, hyperlucent lung with ipsilateral rib flaring and a depressed hemidiaphragm[3]. These lateralizing signs, together with asymmetric breath

sounds, are what usually direct clinicians toward the affected side in unilateral FBA. Bilateral aspiration, as in this case, removes this clue: our patient's initial CXR showed right upper lobe collapse together with left lung lucency which looks like a left pneumothorax (Figure 1); both sides were therefore already abnormal on the first film, so no side was reliably spared to anchor the diagnosis. This is consistent with the exam findings on that visit: the reduced left breath sounds noted at district hospital correspond to the left sided lucency seen on the same film. This finding was spontaneously resolved on second and the third CXR (Figure 2 and 3); we speculate that this reflected transient airway obstruction by the foreign body that did not progress to a frank pneumothorax. Foreign bodies classically lodge in the right main bronchus because of its wider caliber and more vertical orientation. The complete left main bronchus obstruction observed here is comparatively less common and aligns with local case-series data[4]. As peanuts are organic matter, prolonged exposure to airway secretions may also cause it to fragment further over time, which may explain why obstruction appeared more severe at subsequent assessment. Bilateral bronchial FBA is itself uncommon[4,5]: existing case series and reviews of airway foreign bodies describe it in only a minority of cases, likely because the absence of asymmetric clinical or radiographic findings removes the usual trigger for lateralized evaluation and delays consideration of a foreign body altogether.

In this patient, the pneumothorax might have resulted from a check-valve mechanism, in which air entering around the foreign body during inspiration became trapped on exhalation, leading to progressive air trapping and eventual alveolar rupture. Positive pressure ventilation may also have contributed to, or independently caused, an iatrogenic pneumothorax. Figure 2 shows the right pneumothorax that developed post-intubation. The directly observed findings were reduced right-sided air entry noted shortly after intubation, prompting chest tube insertion Figure 3. These findings are consistent with either mechanism, and their relative contribution cannot be determined from this case alone. Regardless of the underlying mechanism, securing and stabilizing the airway remained the first priority in resuscitation.

The choice and sequence of bronchoscopic instruments in this case reflect the practical constraints of airway foreign body retrieval rather than a fixed protocol. Outcomes depend on the foreign body's shape, consistency, friability and surface characteristics, the instruments available, and the experience of the anesthetist and surgeon involved. Flexible bronchoscopy is easier to maneuver through the pediatric airway and provides excellent diagnostic visualization, but its narrow working channel limits the size and variety of instruments it can accommodate. Rigid tracheobronchoscopy is technically more demanding to maneuver, but its larger working channel accommodates a wider range of instruments, including a flexible pincer grasper. This consistent is with after the rigid Dormia basket and optical forceps failed to grasp the friable, fragmented peanut, a flexible pincer grasper could still be used successfully to complete the retrieval.

Bronchoscopy remains the gold standard for both definitive diagnosis and therapeutic management[3,4,6]. In the case presentation, serial bronchoscopic findings differed because the friable fragments were mobile between assessments. Prompt identification and expedited intervention are imperative to minimize morbidity and avert potentially fatal sequelae.

Beyond timely diagnosis and acute intervention, primary prevention remains the cornerstone of reducing pediatric FBA[7]. Anticipatory guidance from healthcare professionals is crucial in educating parents and caregivers about age-appropriate diets and common choking hazards. Emphasizing safe feeding practices – such as ensuring the child is seated, adequately supervised, and not engaged in active play while eating – can significantly reduce the incidence of these avoidable emergencies. Broader public health initiatives and community-based education programs are also vital to reinforcing these preventive strategies and lowering pediatric morbidity.

Conclusion

Diagnosing unwitnessed FBA continues to be a significant clinical challenge. Clinicians should maintain a high index of suspicion when evaluating toddlers with respiratory distress that fail to respond to bronchodilator therapy. In partial airway obstruction, any delay in diagnosis or intervention risks progression to life-threatening complete obstruction. Early recognition, prompt investigation, and timely bronchoscopic intervention are essential to prevent a fatal outcome.

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Conflict of Interest: The authors declare no conflict of interest.

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Ethical Considerations

This case report was registered with the National Medical Research Register, Malaysia (NMRR ID-26-00800-XHC). Ethics committee review was waived for this single, de-identified case report under the above registration. Written informed consent was obtained from the patient's parent/legal guardian for publication of this case report, including accompanying clinical details.

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