Case Report

Concealed foreign body aspiration presenting as subcutaneous emphysema

Davina Stasia Teo, Zara Nasseri, Pravin Sugunan, Faizah Mohd Zaki, Tang Swee Fong, Bee-See Goh

Department of Otorhinolaryngology Head & Neck Surgery, Universiti Kebangsaan Malaysia Medical Centre, Kuala Lumpur, Malaysia

Subcutaneous emphysema is an extremely rare presenting feature of foreign body aspiration. We report a case of foreign body aspiration in the left main bronchus of an 8-year-old boy, which remained undetected for 6 months. Eventually he presented dramatically with extensive subcutaneous emphysema, pneumomediastinum and subsequent acute upper airway obstruction. (Rawal Med J 201;41:499-501)

INTRODUCTION

Foreign body aspiration (FBA) is relatively uncommon in school-age children. A large study by Zerella et al[1] showed that 64% of cases occurred in children between 1 and 3 years of age, and incidence decreases with advancing age. Nevertheless, it can be life-threatening, and is one of the leading causes of accidental death in pre-school children.[2] Here we report a case of an 8-year-old child with FBA in the left main bronchus, with extensive subcutaneous emphysema as a presenting feature.

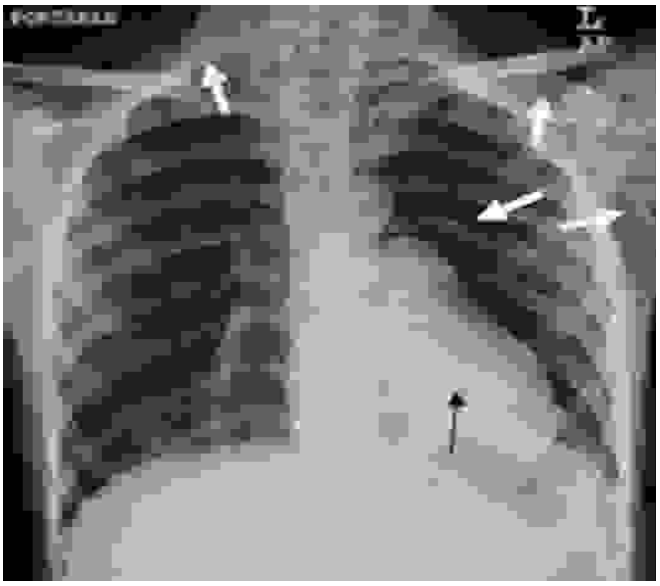
CASE PRESENTATION

An 8-year-old boy presented in acute respiratory distress to the Emergency Department of our tertiary referral center, with a 2-hour history of worsening shortness of breath. This was associated with a non-productive cough and rapidly progressive swelling involving both cheeks, the neck, chest, back and both upper arms. His parents denied history of choking, aspiration or recent trauma. Nonetheless, they noticed child had intermittent mild coughing episodes for the past 6 months.

Upon examination, the child was febrile, tachycardic, tachypnoeic and had an oxygen saturation of 85% on room air. He was in severe respiratory distress, with suprasternal, intercostal and subcostal recessions with clinical evidence of extensive subcutaneous emphysema, over both sides of the neck, extending to his anterior and posterior chest wall, and the lower half of his face. Auscultation revealed diminished breath sounds on the left side although other systemic examination was normal.

Chest x-ray showed extensive subcutaneous emphysema in the upper chest and neck region with air outlining the superior mediastinal structures, indicating pneumomediastinum (Fig. 1). There was also diffuse reticulonodular shadowing seen in both lung fields, suggestive of bronchopneumonia. Initial provisional diagnosis was bronchopneumonia with excessive coughing causing a tear in the upper airway structures. This was presumed to be the cause of the extensive surgical emphysema and subsequent respiratory distress.

Fig. 1. Chest X-ray showing extensive subcutaneous emphysema (white arrows) and pneumonia (black arrow).



The child was given flow mask oxygen, intravenous dexamathasone, nebulised adrenaline and ceftriaxone. Flexible bronchoscopy was performed, revealing mucus plug at the left main bronchus, which was removed via suctioning. A plastic mechanical pencil cap was discovered below the mucus plug. The endotracheal tube was removed, rigid bronchoscopy was conducted and the foreign body was successfully removed with optical forceps by the otorhinolaryngology team. Postoperatively, he was ventilated and sedated. We only unveiled the history of the child choking on a plastic mechanical pencil cap, which his parents thought he had accidentally swallowed 6 months ago, after the foreign body was shown to his parents.

The child showed steady improvement, and on discharge had clear lungs with equal breath sounds, and only minimal subcutaneous emphysema over the left anterior chest wall. Upon review two weeks later, he was clinically well with complete resolution of surgical emphysema and no abnormal findings on physical examination.

DISCUSSION

Foreign body aspiration diagnosis may be missed in a child if the incident is unwitnessed, and some children may not divulge information for fear of punishment. In addition, symptoms of FBA can mimic other conditions, such as asthma, croup, pneumonia, bronchitis, tracheomalacia, bronchomalacia, vocal cord dysfunction, or psychogenic cough.[3]

Diagnosis depends on detailed history and clinical suspicion, comprehensive physical examination and radiological evaluation. Radiopaque foreign bodies are relatively easy to detect on chest x-ray. Nonetheless, secondary radiographic signs, such as obstructive emphysema, atelectasis, pneumonia, and a mediastinal shift, may help in diagnosing FBA with radiolucent foreign bodies. Importantly, a normal chest x-ray does not rule out FBA.[4] If FBA is strongly suspected on clinical grounds, bronchoscopy should be performed for diagnosis and therapeutic reasons.

Foreign body aspiration in children can present in various ways, from the dramatic to the insidious. However, subcutaneous emphysema is an extremely rare presenting feature for this condition. A large Turkish study of 1660 children with suspected or confirmed FBA did not report any of them having subcutaneous emphysema as a presenting feature, and noted pneumomediastinum in only one child.[2]

The possible pathophysiology underlying development of subcutaneous emphysema and pneumomediastinum following foreign body aspiration can be due to persistent airway obstruction during expiration, causing a buildup of pressure in distal alveoli owing to a ball valve mechanism. Hyperinflation of the involved lung occurs, which results in the formation of a high pressure gradient between intra-alveolar air and perivascular interstitial connective tissue.[5] Alveolar rupture ensues, and air leak occurs from the alveoli along fascial planes to the mediastinum. From here, the air tracks upward to the neck, and can potentially extend to the subcutaneous tissues of the chest, back, abdomen and face. Air may also extend into the retroperitoneal and epidural spaces.[5]

Due to the extreme rarity of this presentation, the authors feel that children with foreign body aspiration who have subcutaneous emphysema as a presenting feature may be diagnosed late, following prolonged mechanical ventilation. Fortunately, in our patient, early bronchoscopy was performed, and the foreign body was detected and retrieved promptly. Bronchoscopy is the cornerstone of diagnosis and treatment in foreign body aspiration. Rigid bronchoscopy is generally preferred, as the success rate of foreign body retrieval is 94.5%, which is higher as compared with flexible bronschoscope.[6] In summary, FBA in children a high index of suspicion is needed to diagnose this condition. Early bronchoscopy and foreign body removal can lead to prompt resolution of emphysema and an excellent clinical outcome.

Author's contributions:
Conception and design: Davina Stasia Teo, Pravin Sugunan, Tang Swee Fong, Bee-See Goh
Collection and assembly of data: Davina Stasia Teo, Zara Nasseri, Pravin Sugunan, Faizah Mohd Zaki, Tang Swee Fong, Bee-See Goh
Analysis and interpretation of data: Davina Stasia Teo, Zara Nasseri, Pravin Sugunan, Bee-See Goh
Drafting article: Davina Stasia Teo, Zara Nasseri, Pravin Sugunan, Tang Swee Fong, Bee-See Goh
Critical review for important intellectual content: Tang Swee Fong, Bee-See Goh
Final approval and guarantor: Bee-See Goh
Corresponding author email: Dr Bee-See Goh: irenegbs@yahoo.com
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