Migration of a Foreign Body from Right to Left Lung

T Parray, E Abraham, J Apuya, A Ghafoor, M Siddiqui

Citation

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Abstract

We present an unusual case of an aspirated foreign body which migrated from right to left lung in a child with six week history of cough and wheezing. A chest radiogram, done revealed findings suggestive of a foreign body in the right lung. However, a microlaryngoscopy and bronchoscopy done in the operating room under general anesthesia actually revealed a peanut piece wedged in the distal bronchus of the left lung. Misdiagnosis of an aspirated FB can have serious implication and may complicate the clinical presentation. In addition to imaging studies, bronchoscopy is needed to confirm, retrieve or exclude the presence of a foreign body.

INTRODUCTION

Foreign body aspiration (FBA) is more common in children less than 4 years of age and is also a common cause of accidental death in this age group[1-4]. In children, nuts are among the most common aspirated foreign bodies (FB) with incidence of peanut aspiration between 31-46%[1, 5]. Other common FB seen include raisins, seeds and improperly chewed pieces of food. FBA in children is often unwitnessed, but may also present as choking while eating. Schimdt et. al. in their study concluded that 67% of children had definite history of aspiration[2]. In adults, aspiration is most commonly secondary to accidental ingestion, intoxication, seizures or neurologic disorders[3, 6]. Most aspirated FB lodge in the right main stem bronchus [2, 4]. There is a wide spectrum of clinical signs and symptoms from mild cough to total respiratory obstruction. The clinical triad for FBA in children is wheezing, coughing and decreased breath sounds[4]. The common presenting symptoms are coughing, fever, wheezing and pneumonia[1, 2.] Other signs and symptoms include dyspnea, tachypnea, cyanosis, hemoptysis, stridor, hoarsness, intercostal retractions or total respiratory obstruction.

CASE REPORT

A previously healthy 25 month-old child, weighing 12.8 kg presented to the otolaryngology clinic for evaluation of cough and wheezing for the last 6 weeks. The patient had been seen by various physicians and treated for reactive airway disease, pneumonia, possible seasonal allergies and asthma. This patient had been treated with cetirizine, montelukast, oral antibiotics, albuterol and fluticasone propionate inhalers. The medications provided some symptomatic relief, but coughing and wheezing never resolved for any length of time.

Figure 1

Figure 1: Chest Radiograph showing increased opacity in the right chest

A chest radiogram done when the patient came to our hospital, showed increased opacity in the right chest with apparent air space disease and peribronchial thickening suggesting the possibility of right side FB. The left lung was clear without focal infiltrates (Figure 1). The patient was

scheduled for a diagnostic bronchoscopy the next day under general anesthesia. The patient was brought to the OR for the possible retrieval of the FB. Inhalation induction was achieved with oxygen, nitrous oxide and sevoflurane. A 22 g IV was placed in the left upper extremity. Anesthesia was maintained with a continuous propofol infusion and intravenous fentanyl titrated to keep the patient deeply anesthetized and breathing spontaneously.

Figure 2

Figure 2: Peanut piece wedged in the distal bronchus of the left lung.

A bronchoscopy was performed with a rigid #4 ventilating bronchoscope and showed that the right mainstem and right side bronchi were unremarkable. The left mainstem was normal, but in the distal airway just above the secondary carina a FB was visualized which was revealed to be a peanut wedged in the distal bronchus (Figure 2). It was removed with 2-prong removal forceps. The broken pieces of the peanut were suctioned out. After removal of the FB, the airway was examined with a bronchoscope again to rule any remnants of the peanut/FB. The patient was discharged home the same day in stable condition. Over the period of 2 weeks the child had a complete resolution of the symptoms and has since been taken off all his medications.

DISCUSSION

Aspiration of FB is commonly reported, but migration of aspirated FB in airway (as in this case) is uncommonly cited in literature. Yamakawa et. al. reported the migration of a swallowed 5 cm toothpick from the oropharynx to the nasal cavity which was retrieved following endoscopic examination [7]. Kikuchi and his colleagues reported an interesting case of a 57 year old man with an intrapulmonary nail in posterior basal segment of the left lower lobe which migrated to main bronchus during surgery[8]. Luh and Lee reported a 4 cm long needle like object lost in the posterior pharyngeal cavity during endodontic treatment that was eventually retrieved from the mediastinum after 5 months with the sharp end penetrating the superior vena cava[9].

We found only 2 published case reports of migration of FB from one lung to another. Singal et al reported about a patient with a left postobstructive pneumonia from a FB based on radiographic findings. During bronchoscopy, however, the FB (a tooth crown) was found in the right main bronchus. The FB had migrated from left to right bronchus[10].

Wu and Wang reported a similar case like ours where a FB, a peanut was aspirated and chest radiograph revealed right lung collapse. The patient then had several episodes of coughing while waiting for bronchoscopy. Surprisingly, bronchoscopy revealed the peanut to be in the left main bronchus[11].

The mechanism of migration of the FB in our case and in the case reported by Wu and Wang is likely due to the high expiratory flow generated during coughing. This initial peak of expiratory flow lasts about 30 to 50 milliseconds and may reach flow rates as great as 12 L/s[12].This expiratory flow may be sufficient enough to expel the FB or displace it out so that it could migrate into the opposite lung.

Shape and chemical nature of the foreign object also play a role in the migration of FB[8]. Irregularly shaped and sharp pointed objects are less likely to migrate since they easily stick to the mucosa[8]. Inorganic FBs are usually inert and evoke less inflammatory response even if they migrate[13]. Organic FBs can cause severe inflammatory response and with fluid absorption, they can increase in size and result in possible airway obstruction. In addition, organic FBs have tendency to migrate[13].

If a FBA is suspected, a plain radiograph is used to locate, confirm and possibly identify the FB.

Radiological imaging may provide inconsistent signs and a normal chest radiograph may be seen in patients with aspirated FB [1, 14]. Radiolucent foreign body may be more difficult to detect, however, plain radiograph may show signs of obstructive emphysema, atelectasis, and increased radiolucency of the involved segment (e.g., may see a hyperinflated lung during expiratory phase or atelactasis on chest radiography if the FBA is lodged more distally) [15].

Other imaging techniques used to evaluate FBA include ultrasonography, computed tomography and magnetic reasonance imaging (MRI). The precise location of a radiolucent body like peanut or its fragments can be detected by MRI[14, 16].

In children, there is often no definite history of FBA. It is usually the symptoms that give clues or suspicision of a FBA. There is a wide clinical spectrum of signs and symptoms of FBA. The common presenting symptoms are cough, wheezing, dyspnea and hoarseness [1, 2]. With the accompanying respiratory symptoms these patients are incorrectly diagnosed and treated for asthma or upper respiratory tract infection like in this patient. Atypical symptoms in this patient posed diagnostic difficulty because the FB was radiolucent. Nonlocalizing findings from the migration or bilateral FBs further add to the diagnostic dilemma.

Our patient had persistent symptoms and signs compatible with respiratory tract infection and asthma but was not responsive to the medical treatment. Therefore, further work up is warranted which included bronchoscopy to evaluate the cause of respiratory symptoms. Aspirated peanut like in our patient must be removed promptly because it can swell up, become friable, and as a result becomes difficult to remove. Moreover, peanuts contain oils that evoke inflammatory reaction and pneumonitis. The higher oil content in unroasted peanuts evokes more inflammatory response[17]. It is essential after the retrieval of the FB that a complete examination of the tracheobronchial tree should be made to exclude any broken remnants or if the FB has migrated to some other sites

CONCLUSION

This case illustrates two important management issues. FBA should be considered when a patient exhibits unexplained symptoms consistent with airway obstruction and refractory to medical treatment. Nonlocalizing findings and negative radiological findings do not rule out a diagnosis of FBA. Early and a thorough endoscopic/bronchoscopic examination should be performed to rule out migration or bilateral FB[1].

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Author Information

Tariq Parray, M.D
Assistant Professor, Division of Pediatric Anesthesiology and Pain Medicine, Arkansas Children's Hospital / University of Arkansas for Medical Sciences

Edwin Abraham, M.D
Assistant Professor, Division of Pediatric Anesthesiology and Pain Medicine, Arkansas Children's Hospital / University of Arkansas for Medical Sciences

Jesus S Apuya, M.D
Associate Professor, Division of Pediatric Anesthesiology and Pain Medicine, Arkansas Children's Hospital / University of Arkansas for Medical Sciences

Abid Ul Ghafoor, M.D
Associate Professor, Division of Pediatric Anesthesiology and Pain Medicine, Arkansas Children's Hospital / University of Arkansas for Medical Sciences

M. Saif Siddiqui, M.D
Associate Professor, Division of Pediatric Anesthesiology and Pain Medicine, Arkansas Children's Hospital / University of Arkansas for Medical Sciences