

Case Report

Recurrent Respiratory Tract Infection in a 24-Year-Old Female Secondary to a Foreign Body Aspiration

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Received 3 September 2020; Revised 15 February 2021; Accepted 4 March 2021; Published 10 March 2021

Academic Editor: Gerald S. Supinski

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Foreign body aspiration (FBA) is a common problem necessitating prompt recognition and early treatment to minimize the potentially severe and sometimes fatal consequences. We presented a 24-year-old girl who was admitted for chronic cough and recurrent pneumonia associated with constitutional symptoms. She was feverish with a temperature of 39°C and had tachycardia and tachypnoea with an oxygen saturation of 98%. Investigations revealed leukocytosis. CXR showed right lower lobe consolidation, and CT thorax demonstrated collapse consolidation of the right middle and lower lobe, along with associated dilated segmental bronchioles and diffuse patch ground-glass opacity in both lung fields. Bronchoscopy revealed a pen cap at the entrance of the right lower lobe. Patient symptoms improved after removal of the foreign body. In patients with recurrent chest infection, the physician should check for the possibility of FBA and prompt for a referral to a tertiary center for further evaluation.

1. Introduction

Foreign body aspiration (FBA) is a common medical problem. Prompt action needs to be taken for early treatment and minimize the severity and fatal consequences. In the US, FBA leads to 7% of accidental death among children age less than four-year-old and 75 to 85% of accidental death in children under the age of 15 years [1]. FBA in adults mostly is seen in the sixth or seventh decade of life [2]. FBA can be further classified into organic and inorganic materials. Most organic materials causing FBA among children are nuts and seeds while among adults are food and bones. The most common types of inorganic FBA in children are beads, coins, pins, small parts of toys, or school pieces of equipment, i.e., pen caps. Dental prostheses, pills, and tops from beverage cans are the commonest FBA materials found among adult populations [1–3].

2. Case Report

A 24-year-old girl who has no medical illness was presented to the hospital with a one-year history of chronic cough and chest infection. She also had a loss of appetite and loss of weight for the past year. She was investigated for pulmonary tuberculosis (PTB), and it turned out to be negative. She noticed that her cough was getting worse, and she also had an episode of hemoptysis a week before the presentation.

On examination, she was feverish with a temperature of 39°C. Her blood pressure was 100/56 mmHg, her heart rate was 150 beats/min, and her respiratory rate was 30 breaths/min. She was hypoxic with oxygen saturation under room air of 89%. In the emergency department, she was further deteriorating, and her oxygen saturation was dropped to 80% despite on a high flow mask. She was in respiratory distress, and we decided to intubate her. Respiratory

examination revealed reduced air entry and coarse crepitations on auscultation as well as dullness on percussion over the right lower zone. Other systemic examinations were unremarkable.

Blood investigations revealed leukocytosis with a total white blood cell count of 10.4×10^9 (L). The rest of the blood investigations were normal. Chest X-ray showed a right lower lobe consolidation (Figure 1). Computed tomography of the lung demonstrated a collapse consolidation of the right middle and lower lobe, along with associated dilated segmental bronchioles. Diffuse patch ground-glass opacity was seen in both lung fields but worst in the left side and minimal fibrotic changes with associated pleural thickening in both apices (Figure 2). Tracheal aspiration fluid culture and sensitivity had no growth after five days, and the tuberculous bacilli smear was negative. Mantoux test (purified protein derivative) was also negative. She was admitted to the intensive care unit (ICU) and was started on intravenous antibiotics. Unfortunately, her general condition and blood parameter were not improved; therefore, we decided to proceed with bronchoscopy. We are caught in a surprise to find a blue-colored foreign body at the entrance of the right lower lobe bronchus during the bronchoscopy (Figure 3). The foreign body was removed from the right lower lobe bronchus, and it was a pen cap (Figure 4). After removal of the foreign body, the patient's clinical condition improved tremendously, and she was extubated. She was subsequently discharged after ten days of admission. Further history was obtained from the patient before she was discharged. She admitted that she accidentally ingested the pen cap while biting the pen cap while writing. She did not seek any medical advice at that time as she was asymptomatic.

3. Discussion

FBA materials are different according to the age group. Among children, they are prone to inhale materials such as nuts, seeds, beads, coins, pins, small parts of varying toys, or school equipment such as a pen cap. The study by Adjesto et al. involving 33 children in Northern Ghana showed the commonest FBA in children was groundnuts (39.4%), and the remaining was metallic objects (21.1%). The bronchoscopic finding noted foreign bodies (FBs) mostly localized to the right (24.2%) and left (24.2%) main bronchi, respectively [4]. There was a large study population conducted by Ciftci et al. in 2003 involving 663 children who suspected FBA, and 75% of them ingested organic materials such as sunflower seeds (27%), roasted chick-peas (15%), hazelnut (12%), and peanut (4%). In the same study, 25% of FBA cases involving inorganic materials which were straight pins (7%), the lid of ballpoint pens (6.2%), and plastic toy pieces (3.4%). However, the bronchoscopic finding noted FBs were mostly located in the right main bronchus (37%), left main bronchus (26%), and trachea (12%), respectively [5].

The FBA in the adult is unique as the commonest materials inhaled were food, bones, dental prostheses, pills, and tops from the beverage [6]. In our patient situation, we found pen caps which are usually found in children and toddlers. This is what happens when someone had a habit of

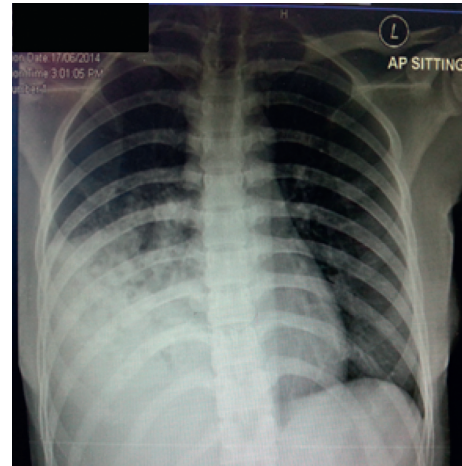


FIGURE 1: Chest radiography showed right lower lobe consolidation.



FIGURE 2: Computed tomography of the lung demonstrated collapse consolidation of the right middle and lower lobe along with the lower lobe with associated dilated segmental bronchioles. Diffuse patch ground-glass opacity seen in both lung fields, but worst in the left side.

biting the pen caps while writing and then incidentally swallowing the cap, which subsequently dislodged to the respiratory system instead of the alimentary system.

The symptoms and severity of FBA is variable from mild to severe, and it depends on the site of occlusion. Occlusion at the level of the larynx can cause choking and gagging. The patient will be presented with symptoms of hoarseness of voice, aphonia, and cyanosis and worst-case scenario, sudden death. Inspiratory stridor occurs when the obstruction is at the level of the trachea. However, an occlusion at the bronchus may cause cough, wheezing, hemoptysis, dyspnea, and chest pain [7, 8].

Chest X-ray (CXR) is essential in the diagnosis of FBA. Although 90% of the foreign bodies are radiolucent, a standard radiological workup including a posteroanterior and a lateral chest film and a lateral soft tissue neck radiograph should be done. If the patient presented within 24 hours, the CXR finding could be normal. The initial CXR finding will be unilateral or segmental hyperaeration, and the subsequent finding could be atelectasis, air trapping, pulmonary infiltrates, and mediastinal shift on expiratory film [9].

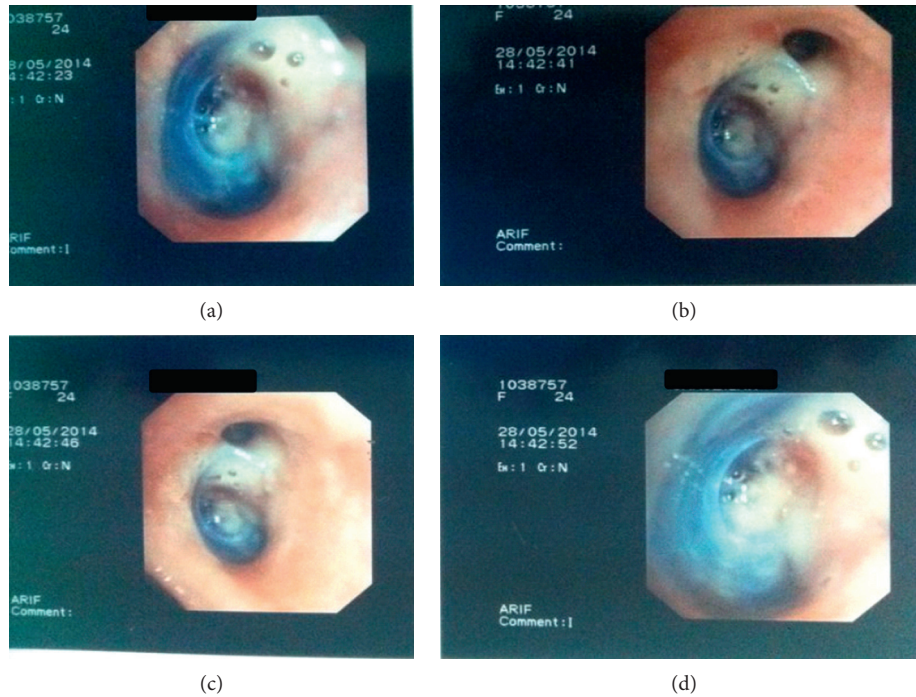


FIGURE 3: Bronchoscopy revealed a foreign body, which is blue in color at the entrance of the right lower lobe.



FIGURE 4: The foreign body is managed to remove from the right lower lobe, and it is a pen cap.

The gold standard approach for diagnosing FBA is by doing flexible/rigid bronchoscopy [10–13]. Rigid bronchoscopy is the safest and preferred instrument used in the pediatric population, whereas in adults, the flexible bronchoscope is the preferred instrument for the diagnosis and removal of airway foreign bodies compared to rigid bronchoscope [1, 2, 14]. Removal of a foreign body by using bronchoscopy from the tracheobronchial area must be done by a trained and experienced person to minimize and avoid unnecessary complications [13, 15].

Delayed complications associated with retained foreign body include nonresolving pneumonia, lung abscess, recurrent hemoptysis, lung fibrosis, obstructive emphysema, and bronchiectasis [16–18]. In our patient, chronic retention of a foreign body in the bronchus lead to obstructive pneumonia. Localize obstructive bronchiectasis is one of the most important complications of a chronic FBA and may necessitate a surgical resection if it is complicated with recurrent infections. Obstructive bronchiectasis may develop many years after the

unrecognized FBA. The standard surgical treatment for bronchiectasis is partial lobectomy of the affected lobe. There was a study reported that removal of the foreign body via bronchoscopy could achieve resolution of bronchiectasis and bronchial dilatation in a chronic FBA [13]. Hence, flexible bronchoscopy should always be considered in cases with localized bronchiectasis or nonresolving pneumonia for the possibility of FBA to avoid patients from an unnecessary surgical procedure [13, 14, 19].

4. Conclusion

FBA should always be considered in the etiology of recurrent chest infections or hemoptysis, lung abscess, middle lobe syndrome, fibrotic changes such as scar formation, and bronchiectasis. Early suspicion of FBA among patients presented with recurrent chest infections should prompt the medical practitioner to make an early referral to a tertiary center for further evaluations. The community should be educated regarding the symptoms of foreign body aspiration so that there was no delay in seeking medical treatment. Fiberoptic bronchoscopy is a safe procedure for the initial diagnosis of a foreign body. It can avoid unnecessary general anesthesia and surgical resection. Moreover, the success rate of the flexible bronchoscope in removing foreign bodies can be as high as 100% in experienced hands. Removal of a foreign body can result in the resolution of lung parenchyma or bronchial pathology and hence can prevent unnecessary surgery.

Data Availability

The data used to support the findings of this study are available from the corresponding author upon request.

Consent

Written informed consent was obtained from the patient for the anonymized information to be published in this article.

Disclosure

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Conflicts of Interest

The authors declare that there are no conflicts of interest.

Authors' Contributions

SS wrote the manuscript. MAMZ, MFH, and MABMF discussed the case. MAMZ conceived the original idea of the study.

Acknowledgments

The authors would like to thank all the medical and non-medical personnel involved in managing the patient. The authors also would like to convey their gratitude to the patients' advisers.

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