

CLINICAL CASE OF THE MONTH

Christmas Treat to Chronic Cough

Theepha Thayalakulasingham, MD; Shane Guillory, MD; Tathagat Narula, MD; Bennett deBoisblanc, MD; Arthur W. Zieske, MD; David Smith, MD; Lee S. Engel, MD, PhD; Charles V. Sanders, MD; Fred A. Lopez, MD

INTRODUCTION

Foreign Body Aspiration (FBA) is diagnosed less commonly in adults than children.^{1,2} In most cases, aspiration of foreign body in adults is associated with increased age, impaired swallowing reflex or altered mental status.^{1,2} We present a case of an adult patient who had chronic cough, nonresolving pneumonia, and no known risk factors for FBA, who turned out to have aspirated a pecan during a Christmas meal three months prior.

CASE PRESENTATION

A 63-year-old woman with a past medical history of hypertension and hypothyroidism presented to a nearby emergency department with a chief complaint of cough of nine weeks duration. Initially the cough was nonproductive and progressively increased in frequency, as well as sputum production. Over the next eight weeks, the patient had multiple presentations to physicians. She completed several courses of antibiotics for "bronchitis," including azithromycin, cefdinir, and moxifloxacin, but her symptoms continued to worsen. The patient complained of fever, malaise, night sweats, chest pain with coughing, and an unintentional weight loss of 10-15 pounds over a period of nine weeks. The patient denied shortness of breath, nausea, vomiting, diarrhea, constipation, palpitations, hemoptysis, sick contacts, or any prior incarceration. The patient's last tuberculin skin test (TST) was four to five years earlier and was reportedly "negative."

On physical exam, the patient was ill-appearing and febrile with a temperature of 101.2OF. On cardiac exam, the patient had tachycardia, a regular rhythm and no murmurs, rubs, or gallops. On pulmonary exam, she was tachypneic with a respiratory rate of 34 per minute, had intermittent inspiratory and expiratory wheezes over the right posterior hemithorax, and crackles over the right posterior lung base. She experienced paroxysms of cough throughout the exam. A chest radiograph revealed consolidation involving the right

lung base. A computed tomography (CT) of the chest demonstrated partial consolidation of the basal segments of the right lower lobe. A nodular soft tissue density was seen at the right infrahilar region which was thought to possibly represent an enlarged lymph node or a partially obstructing mass.

Laboratory work-up revealed a leukocytosis of $13.7 \times 10^3/\text{UL}$ ($4.5\text{-}11.0 \times 10^3/\text{UL}$) with 73% segmented neutrophils and 12% band forms. The patient was initially treated with broad spectrum antibiotics for a presumptive diagnosis of healthcare-associated pneumonia. However, when the pulmonary consultant was taking his history, he was able to elicit a history of choking on a pecan nut during a Christmas holiday meal approximately two and a half months prior to her initial presentation with cough. The patient underwent a bronchoscopy and a foreign body was recovered – a pecan (Figure 1)!

DISCUSSION

Epidemiology and Etiology

Foreign body aspiration is commonly seen in children, however, it is not as common in adults.^{1,2} FBA in adults ac-

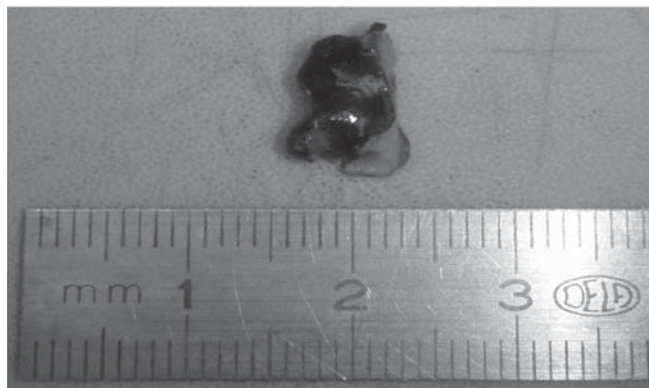


Figure 1: Foreign body (pecan nut) present in the right bronchus.

counts for approximately 20% of all reported cases.¹ Death from choking accounted for 1.2 per 100,000 deaths in US in 2007.³ In one study, FBA accounted for only 0.32% of all bronchoscopies performed in a tertiary thoracic center over an 11-year period.⁴

The most common risk factors for FBA in adults include increased age, impaired swallowing reflex, mental retardation, and altered mental status due to various causes including trauma, neurological illness, medications, substance abuse, and seizures.^{1,2,4} However, in some instances, accidental aspiration can occur in adults when they laugh, cry, or sneeze with a foreign body such as food in their mouth.² Lifestyle and eating practices in certain cultures can also predispose individuals to aspiration of certain type of foreign bodies. For example, one author reported a high prevalence of FBA associated with sapote fruit consumption in Ho Chi Minh City, Vietnam.⁵ Similarly, turban pin aspiration was reported in Muslim women who are accustomed to holding the pin between their lips while attaching their head scarf.^{6,7} The peak incidence of FBA in adults is in the sixth or seventh decade of life.^{2,8} A male predominance is reported for FBA.^{4,9,10}

CLINICAL PRESENTATION

The clinical presentation of FBA can vary depending on the location and type of foreign body.² FBA involving the proximal part of the airway, such as occlusion of the larynx, can lead to an acute presentation of choking, intractable coughing, gagging, cyanosis, dysphonia, and hoarseness, whereas occlusion involving the distal parts of the respiratory system such as the bronchi or bronchioles can be relatively asymptomatic initially.² In one study, half of the patients did not recall a choking history before the diagnosis of FBA was made, and a quarter of the patients did not recall any choking history even after the diagnosis of FBA was made.⁹ In cases of silent FBA, localized wheezing or decreased breath sounds may provide a clue to the diagnosis. Foreign bodies are more frequently recovered from the distal airways in adults as compared to children. Studies have noted that location of aspiration is preferentially on the right side in adults: 64-69% on the right versus 25-31% on the left.^{4,10} This finding is secondary to the larger diameter and greater air flow of the right main stem bronchus, as well as its more vertical nature.⁴ When the initial episode is asymptomatic, patients usually present with long-term sequela such as non-resolving pneumonias, chronic cough, localized bronchiectasis, recurrent hemoptysis, chronic atelectasis, and lung abscess.² The most common symptoms reported with FBA are cough, fever, breathlessness, wheezing, hemoptysis, and chest pain.^{1,2,8,10} The most common physical findings associated with FBA are localized wheezing or crackles, tachypnea, stridor, unilateral or bilateral decreased breath sounds, and occasionally fever.² Since older patients are more prone to FBA and likely have other co-morbidities, non-specific symptoms from an initially silent FBA can be falsely attributed to other medical problems and lead to a delay in diagnosis of FBA in this patient population.

Our patient presented with a cough of nine weeks dura-

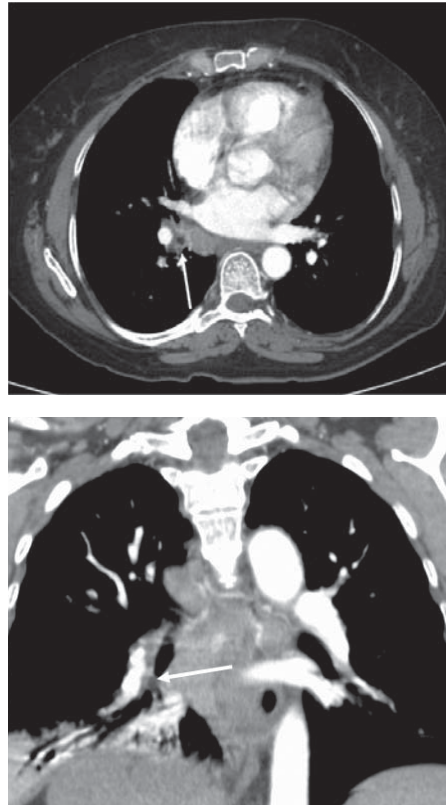


Figure 2: Axial (top) and coronal (bottom) postcontrast images of the chest demonstrate a low attenuation (-52 HU) filling defect (arrows) in the right lower lobe bronchus. The coronal images reveal postobstructive changes in the right lower lobe.

tion. Chronic cough is generally defined as cough persisting greater than eight weeks. Chronic cough in adults can result from many different etiologies including: asthma, gastroesophageal reflux disease, postnasal drip syndrome, bronchitis, angiotensin converting enzyme inhibitor usage, smoking and other irritants, bronchiectasis, eosinophilic bronchitis, and postinfectious causes.¹¹ Some uncommon causes include bronchogenic carcinoma, carcinomatosis, irritable larynx, lymphoma, persistent pneumonia, psychogenic cough, pulmonary abscess, sarcoidosis, tuberculosis, and aspiration.¹¹

DIAGNOSTIC EVALUATION

The diagnosis of silent FBA requires a high index of suspicion derived from a good history and physical exam. Radiographic data and bronchoscopy can aid with the diagnosis. In a retrospective study of 100 patients from whom a foreign body was retrieved, the diagnosis of FBA was considered in only 34% of cases. Diagnosis of FBA starts with obtaining a posteroanterior and lateral chest radiograph.^{1,2,12} One retrospective study reported that chest radiography detected the foreign body in 47% of the cases, while another study reported its utility in 22.6% of the cases.^{1,4} However, a negative chest x-ray can be found in up to 80% of adults with FBA.¹ Whether or not the diagnosis can be made from a chest radiograph depends on the type of material aspirated. Most commonly aspirated materials are organic materials such as nuts, which are radiolucent, and therefore cannot be seen on chest radiograph.^{1,2,5,10,12} Conversely, radio-opaque material such as

metals can easily be seen on chest radiograph.⁵ Other clues for FBA that can be obtained from a chest radiograph include: air trapping, atelectasis, pneumomediastinum, and obstructive pneumonia, especially recurrent obstructive pneumonia involving the same region in cases of silent FBA.^{1,9} Inspiratory and expiratory chest films can help diagnose air-trapping, a subtle clue in the case of FBA. Additionally, the chest radiograph is important to exclude other diagnoses. A lateral soft tissue view of the neck can help make the diagnosis when the upper airway is compromised by FBA.^{1,2,12} In cases with high index of suspicion for FBA and negative chest radiograph, a chest CT scan can be helpful. However the definitive diagnosis is usually made by direct visualization with a bronchoscope. One study reported that bronchoscopy was delayed longer than two weeks in 83% of the cases. Another study reported a mean duration of 25.8 months of delay before a diagnose of FBA; even a delay of as long as 25 years has been reported in the literature.^{9,10} The delay in diagnosis of FBA is more common in adults than in children.¹⁰ A bronchoscopy should be considered when a patient presents with non-resolving lung symptoms that are not explained by other common entities.

TREATMENT AND PROGNOSIS

Treatment of FBA requires removal of the foreign body as soon as possible. In most cases this can be successfully done with bronchoscopy, but it may require thoracotomy in rare instances.⁴ In cases where initial retrieval of FBA is unsuccessful, a trial of antibiotics was given followed by repeat attempt one week later to remove the foreign body.⁹ In these instances, the foreign body is usually embedded in the granulation tissue.⁹ One study noted that experienced pulmonologists had better success removing the foreign body with their first attempt.¹⁰ Historically, rigid bronchoscope had been used to retrieve foreign bodies; however, the use of fiberoptic bronchoscopy is increasingly being pursued.^{2,13,14} The fiberoptic bronchoscope is not only more useful in retrieving foreign bodies from the peripheral bronchi, but it also does not require general anesthesia, resulting in fewer complications and reduced number of hospital days.⁹ Fiberoptic bronchoscopy is also the modality of choice in patient with jaw and skull fractures.²

If the diagnosis of FBA is made in a timely manner, the foreign body can be successfully removed in 86-100% of cases.^{1,2,8,10} Mortality rates from removal have been reported to be as low as 0.1%.⁸

CONCLUSION

The diagnosis of FBA in adults can be elusive and requires a high index of suspicion. Directed questions to obtain a history of aspiration can assist. Once the diagnosis is made, prompt removal of the foreign body is essential to prevent long-term complications. Although FBA is a rare cause of chronic cough in adults, this diagnosis should be entertained when the management of other more common causes of chronic cough do not result in clinical improvement.

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Dr. Thayalakulingam is a Chief Resident of the Internal Medicine Program in the Department of Medicine at Louisiana State University Health Sciences Center in New Orleans. **Dr. Guillory** is a second-year Resident in Internal Medicine in the Department of Medicine at LSUHSC-New Orleans. **Dr. Narula** is a Chief Resident of the Internal Medicine Program in the Department of Medicine at LSUHSC-New Orleans. **Dr. deBoisblanc** is a Professor of Medicine and Physiology in the Department of Medicine at LSUHSC, Director of Critical Care Services at Medical Center of Louisiana, and Co-Director of Ochsner-LSU Pulmonary Vascular Disease clinic in New Orleans. **Dr. Zieske** is an Associate Professor in the Department of Pathology at LSUHSC-New Orleans. **Dr. Smith** is an Assistant Professor in the Department of Radiology at LSUHSC-New Orleans. **Dr. Engel** is an Assistant Professor in Clinical Medicine and Assistant Program Director of the Internal Medicine Residency Program in the Department of Medicine at LSUHSC-New Orleans. **Dr. Sanders** is the Chairman of Department of Internal Medicine, Edgar Hull Professor of Medicine, and Professor of Microbiology, Immunology, and Parasitology in the Department of Medicine at LSUHSC-New Orleans. **Dr. Lopez** is the Richard Vial Professor and Vice Chair for Education in the Department of Medicine at LSUHSC-New Orleans. He is also Section Editor of the LSMS Journal.