The radiological distribution of bronchiectasis could be a clue for an infrequent cause of chronic cough

Anh Huynh-My,[1] Bao Le-Khac,[1] Nam Vu-Hoai,[2] Lam Nguyen-Ho[1,2,3]

[1]Department of Internal Medicine, University of Medicine and Pharmacy, Ho Chi Minh City; [2]Respiratory Department, Cho Ray's Hospital; [3]Department of Respiratory Functional Exploration, University Medical Center, Ho Chi Minh City, Vietnam

Abstract

Foreign Body Aspiration (FBA) in the elderly is an uncommon but potentially life-threatening condition in the acute setting, but it can also persist in the clinical setting of neglected foreign bodies with chronic and subtle respiratory symptoms. Chest computed tomography scans can overlook radiolucent foreign bodies, but prominently focal lesions and bibasilar bronchiectasis in the appropriate clinical setting should increase the suspicion of FBA. Here, we reported a 75-year-old female patient with a chronic cough induced by a neglected airway foreign body. Bronchoscopic removal of the foreign body was performed successfully, and her cough improved enormously after that.

Correspondence: Lam Nguyen-Ho, University of Medicine and Pharmacy, 217 Hong Bang, ward 11, district 5, Ho Chi Minh City, Vietnam.
E-mail: bsholam1986@gmail.com ; nguyenholam@ump.edu.vn

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Introduction

Foreign Body Aspiration (FBA) is one of the leading causes of life-threatening accidents at home and community. Although the majority of FBA cases are primarily recorded in children, however, it is still noted in adults, especially subjects with dysphagia. Risk factors in adults include age ≥75,[1] loss of consciousness due to trauma, alcohol abuse, disease, or narcotic use.[2] Elderly patients have a high risk of FBA because of age-related poor performance of swallowing, medication use (which reduces coughing and swallowing reflex), and disease-related dysphagia (stroke and degenerative neurological diseases).[2,3] Out of the choking attack of aspiration, patients with FBA can present symptoms similar to those of chronic lung diseases (chronic obstructive pulmonary disease, asthma, and obstructive pneumonia)[4,5] due to its complications such as recurrent pneumonia, bronchiectasis, recurrent hemoptysis, pneumothorax, lung abscess, and pneumomediastinum.[6] Removal of foreign bodies should be performed as soon as possible because of its acute and long-term complications.[6] We report a case of chronic cough in an elderly patient whose final etiology was associated with a neglected airway foreign body.

Case Report

A 75-year-old female patient presented at the respiratory outpatient clinic with a one-year history of dry cough. Her past medical history was hypertension, which was treated with an angiotensin-converting enzyme inhibitor (a possible cause of chronic cough, but it had been used for more than 10 years without a previous cough). No symptoms relating to allergic rhinitis and asthma were documented. On physical examination, blood pressure was 145/85 mmHg, pulse was 87/minute, respiratory rate was 18/minute, and Pulse Oximetry (SpO_2) was 99% with ambient air. Lung auscultation showed bibasilar crackles scattered. The patient had visited other hospitals previously with the normal result of Chest X-Ray (CXR), but her cough did not improve. A chest Computed Tomography (CT) scan undertaken revealed bibasilar bronchiectasis, prominently localized infiltration and fibrosis at the right lower lobe, and no foreign body (Figure 1). Suspecting micro-aspiration as an etiology of bibasilar bronchiectasis, the

patient's medical history was asked carefully to unravel the suitable symptoms and a potential FBA attack before the cough. Therefore, a bronchoscopy revealed the foreign body at the segmental bronchus of the right lower lobe. Bronchoscopic removal was performed successfully to show little cloudy pus under a foreign body, and its nature could be the head of a chili (Figure 2). The Bronchial Lavage Fluid (BLF) cytology revealed neutrophil 62% and lymphocyte 38%, and the microbiological tests of BLF (acid-fast bacillus smear, gene-Xpert, and mycobacteria growth indicator tube culture) were negative. She completed a 2-week course of antibiotics with amoxicillin/clavulanic acid 875 mg/125 mg oral twice daily and moxifloxacin 400 mg oral once daily. The results of treatment showed that cough symptoms improved significantly (coughing was stopped almost completely).

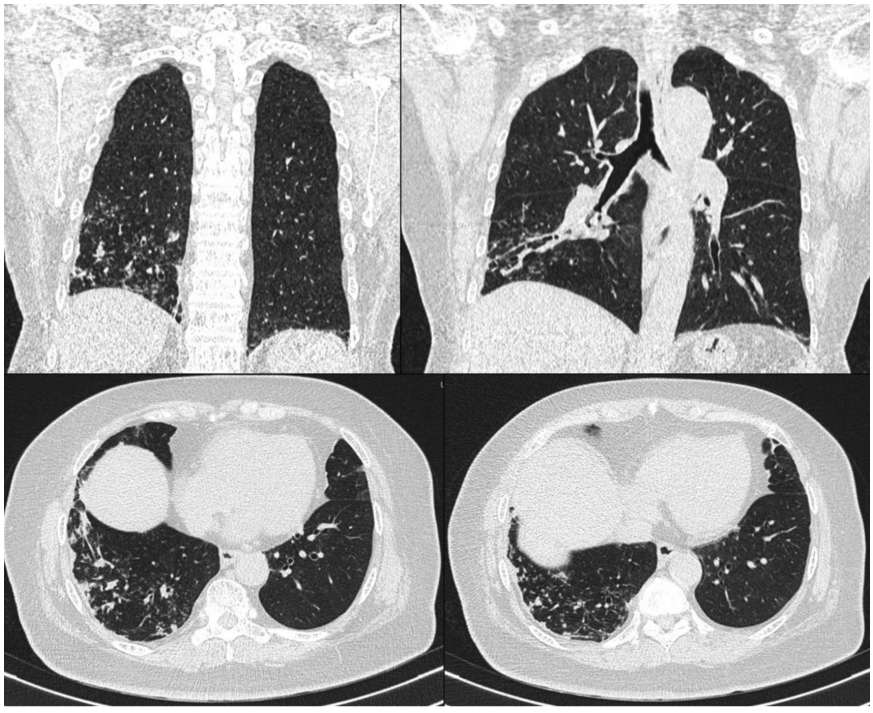

Figure 1. Chest Computed Tomography (CT) shows bibasilar tubular bronchiectasis, bibasilar fibrous lesions diffuse and at the right lower lobe prominent with bronchial wall thickening, fluid retention in some bronchial branches.

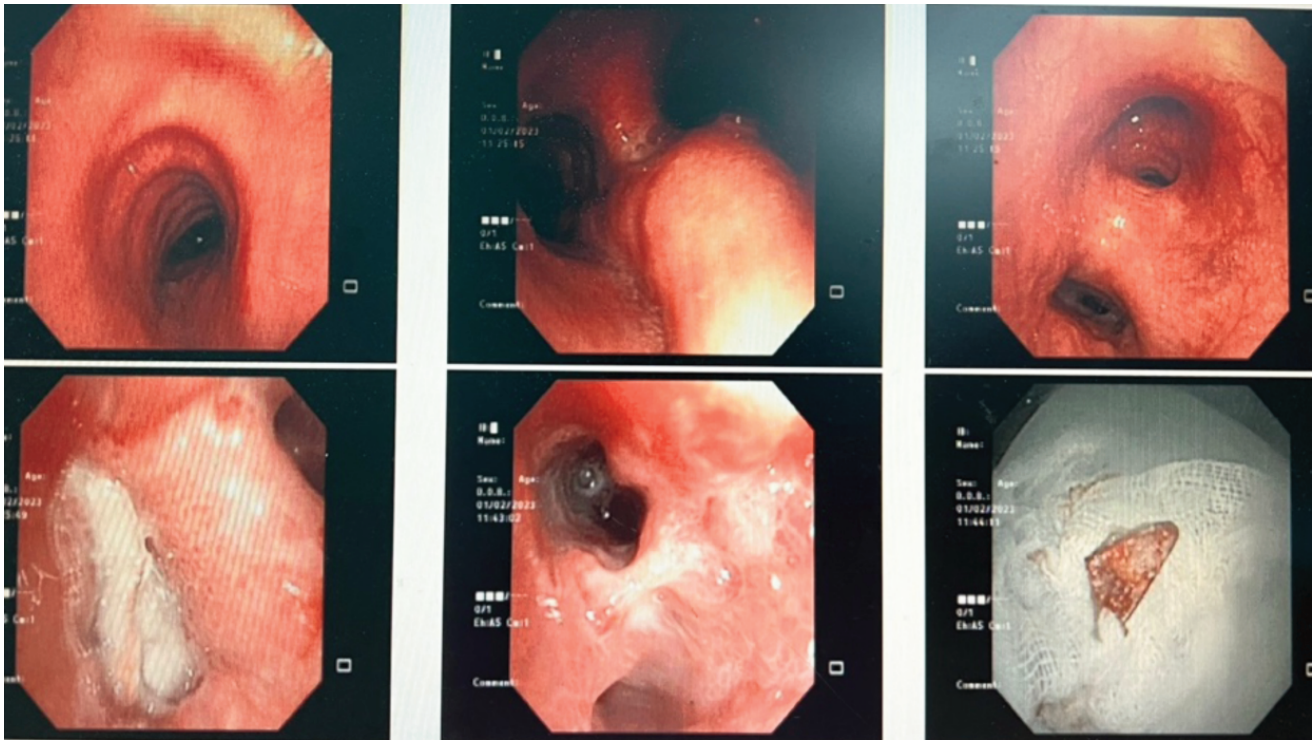

Figure 2. Flexible bronchoscopy showed the foreign body, the possible head of chili pepper, removed successfully.

Discussion

The prevalence of chronic cough (duration >8 weeks) in adults is estimated to be 10%, with common causes in the setting of normal CXR including postnasal drip syndrome, cough-variant asthma, gastroesophageal reflux disease, eosinophilic bronchitis, or drug-induced cough.[7] However, when these causes are excluded, less common causes, including bronchiectasis, lymphoma, persistent pneumonia, sarcoidosis, endobronchial tuberculosis, and FBA, should be considered. In particular, chronic cough in patients with non-responsive pneumonia, obstruction caused by tumors or foreign bodies, should be a concern.[8]

FBA occurs more commonly in children, especially 75% of cases under 3 years.[9,10] It is also reported with the frequency of 1 in 400 bronchoscopy cases in adults.[11] The average age of aspirated adults is between 50 and 60 years old, and the risk of FBA seems to increase with age.[2,4,5] Chronic coughs among elderly patients may be more complex because of changes in the cough reflex.[12] Due to the aging population, pulmonologists and geriatricians have realized that micro-aspiration or even FBA may be an important pathogenesis of aspiration pneumonia in this group.[4,5,13,14]

Cough is a common symptom of FBA, occurring in 58-96% of patients,[4,15-17] along with other symptoms such as wheezing, shortness of breath, hemoptysis, and chest pain, all of which were influenced by the foreign body size and its obstructive location. Asymptomatic FBA patients accounted for 2-10% were identified incidentally on radiology and bronchoscopy.[4,15,18] Large foreign bodies obstructing the main airway (pharynx and trachea) are more likely to cause acute asphyxia with a supraglottic location in one-third of cases.[19] More commonly, however, foreign bodies migrate into the lower lobes of the lung, especially the intermediate bronchus or branches of the right lower lobe bronchus, similar to our case. The more vertical angle and larger diameter of the right main bronchus compared to the left could be an underlying mechanism to explain.[20] Surprisingly, in adults, about 40% of FBA is found in the left airway, opposite to only 5-11% of cases in the right bronchus.[5,18,21-23]

In children, foreign bodies such as nuts, seeds, and other organic matter are common. However, in adults, the nature of inhaled foreign bodies is diverse, ranging from organic to inorganic. Inorganic foreign bodies, such as nails (hands, feet) or needles, occur mainly in young or middle-aged people during "do-it-yourself" activities or in those with mental illness.[24] Organic foreign body - food - is the most commonly reported inhaled foreign body due to poor chewing or swallowing function. The type of inhaled food varies according to local culture or ethnicity.[25] For example, in people in the West, China, and the Middle East, FBA related to plant matter, bones, and watermelon seeds are the most inhaled foods, respectively.[15,26,27]

In clinical practice, standard posterior-anterior and lateral CXR should be obtained in all suspected patients, even chest CT scans. Most foreign bodies are radiolucent and not easily identifiable on CXR.[28,29] In our case, as an example, even the result of a chest CT scan was still inconclusive about the presence of a foreign body. Because of the silent and subtle presentation of FBA in the elderly, the imaging in most cases depicts the consequences of long-neglected FBA, including post-obstructive pneumonia, atelectasis, and rarely, emphysema, pneumothorax, unilateral pulmonary distension or focal bronchiectasis.[23,28,30] Our case showed prominent focal signs of pneumonia and bronchiectasis in the right lower lobe, which was a suspicious clue for FBA.

Given its wide availability, flexible bronchoscopy is often indicated for non-life-threatening FBA in adults, especially those with small foreign bodies in the lower airways or even the missed foreign body with chest CT imaging. Flexible bronchoscopy can provide information regarding the accurate location of foreign bodies, facilitate the selection of necessary instruments as well as conduct the removal of foreign bodies.[31] With high clinical suspicion and localized imaging features, a bronchoscopy was performed, and the foreign body was removed successfully in our case. The foreign body is most likely a chili head. The nature of the foreign body is a cough stimulant (capsaicin is a commonly extracted ingredient, used for the cough stimulation test in most studies). So cough, in this case, may be due to a combination of irritation from the foreign body as well as caused by the consequence of its obstruction.

Conclusions

FBA in the elderly can be encountered in clinical practice. In most cases, the clinical presentation of FBA in the elderly is persistent or insidious, possibly due to foreign bodies located in the distal bronchi. Cough is a common symptom, followed by symptoms associated with complications of FBA. Therefore, clinicians must always be vigilant about FBA when approaching the diagnosis of chronic cough, especially in situations of persistent cough that are poorly responsive to conventional therapies and in high-risk populations, including people ≥75 years of age, neurological disorders, loss of consciousness and use of alcohol or sedatives. Chest CT scans can overlook radiolucent foreign bodies, but prominently focal lesions and bibasilar bronchiectasis in the appropriate clinical setting should increase the suspicion of FBA. Bronchoscopy is still considered the gold standard in the diagnosis and treatment of FBA until now.

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