

Foreign body aspiration as a cause of cryptogenic hemoptysis in a child

A case report

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Abstract

Rationale: Hemoptysis is rare but potentially life-threatening condition in children. The most common cause of pediatric hemoptysis is lower respiratory tract infections. Sometimes foreign body aspiration may result in hemoptysis too.

Patient concerns: A 4-year old girl suffered from recurrent cryptogenic hemoptysis for almost 2 years.

Diagnoses: The wheatear was finally found to be the underlying cause.

Interventions: The girl received multiple bronchoscopy.

Outcomes: The girl's symptoms improved rapidly and remained well without relapse of hemoptysis.

Lessons: This case indicates that foreign body aspiration should be considered in any child with recurrent cryptogenic hemoptysis and persistent focal lung injury. Multiple bronchoscopy is rational in order to find out the underlying reasons.

Abbreviations: CRP = C reacting protein, CT = computed tomography, FBA = foreign body aspiration.

Keywords: bronchoscopy, child, foreign body aspiration, hemoptysis

1. Introduction

Hemoptysis is a rare but potentially fatal condition in childhood. The diagnosis of pediatric hemoptysis can be challenging.^[1] The etiologies of childhood hemoptysis include infection, extra-pulmonary bleeding, foreign body aspiration (FBA), trauma, and cardiac disease.^[2] Here, we described a 4-year old girl who suffered from recurrent cryptogenic hemoptysis for almost 2 years, and wheatear was found to be the underlying cause. In children with recurrent cryptogenic hemoptysis multiple bronchoscopy is rational.

2. Case presentation

A 4-year-old girl presented with a history of 1 year and 9 months of recurrent cough and hemoptysis in January, 2017. The first episode

of hemoptysis occurred in May, 2015. Her parents reported the patient coughed up about 5 mL fresh blood without fever, tachypnea, wheezing, sweating, weight loss and so on. She was diagnosed as pneumonia in a local hospital and the symptoms resolved after administration of antibiotics. Since then, the girl experienced around 10 episodes of minor hemoptysis accompanied by dry cough. The maximal amount of blood coughed out was no more than 5 mL. Her chest CT scan revealed segmental pulmonary atelectasis of the inferior lobe of her left lung in May, 2016. She received bronchoscopy in a tertiary children's hospital without significant findings. Although she had been hospitalized in different tertiary referral centers for 4 times the girl still had episodes of hemoptysis. On examination she was in good nutrition, her respiratory rate was normal, no nasal flaring and chest wall retraction, and no clubbing fingers. The breath sounds were harsh but neither wheezing nor rales were heard. Other physical examinations were unremarkable. Computed tomography (CT) angiography of heart and thoracic vessels was normal. Chest CT showed opacity and segmental pulmonary atelectasis in the inferior lobe of her left lung (Fig. 1). Her complete blood count (white blood cell $11.0 \times 10^9/L$, hemoglobin 127 g/L, platelet $376 \times 10^9/L$) and C reacting protein (CRP) were normal. The biochemical tests and the levels of prothrombin time, activated partial thromboplastin time, erythrocyte sedimentation rate, and autoantibodies were normal. The serum test for *Mycoplasma pneumoniae* antibody was positive with the titer of 1:640. The pathogens including bacteria, tuberculosis, and fungus were not found since the sputum culture, tuberculin interferon gamma release assay, tuberculin skin test, serum G test, and fungal GM test were all negative.

After admission, the girl was treated by azithromycin and other supportive agents. Because the inferior lobe of her left lung remained to be atelectatic and recurrent refractory hemoptysis persisted for a long time, we persuaded her parents and performed flexible bronchoscopy with a pediatric bronchoscope (Olympus XP260F; Olympus Co., Tokyo, Japan) again. It was seen the posterior basal segment of left lower lobe was obstructed

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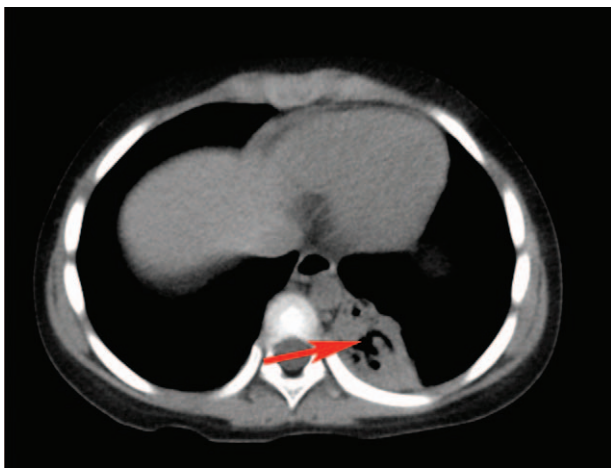


Figure 1. Chest computed tomography showed opacity and segmental pulmonary atelectasis in the inferior lobe of the patient's left lung.

by much inflammatory secretions. After normal saline lavage, foreign bodies were found blocking the 5th and 6th bronchus; finally 5 grains of wheatear were removed by forceps with bronchoscope (Fig. 2). Four days later we performed bronchoscopy again, another 2 grains of wheatear were removed. After bronchoscopy, the girl's symptoms improved rapidly and she was discharged. At follow-up in October 2017, she remained well without relapse of hemoptysis.

3. Discussion

In children, the most common cause of hemoptysis is lower respiratory tract infections. Pneumonia, bronchitis, and pulmonary tuberculosis are reported to be the most common specific etiologies identified.^[2] Sometimes FBA may result in hemoptysis too.^[1,3] A focused physical examination can lead to the diagnosis in most of the cases. Chest radiographs often aid in diagnosis and assist in using 2 complementary diagnostic procedures, fiberoptic bronchoscopy, and high-resolution computed tomography.^[1] In our case chronic pneumonia is present; however, no evidence of chronic infections are found such as tuberculosis and invasive fungal infection. Although the patient once received bronchoscopy, recurrent hemoptysis and persistent atelectasis of the inferior

lobe of her left lung prompted investigation by bronchoscopy again. After the removal of wheatear the girl resolved rapidly and did not have the episodes of hemoptysis again. Thus, the etiology of her cryptogenic hemoptysis is FBA.

FBA is a common cause of respiratory compromise in early childhood. Symptoms can vary considerably according to the site of the foreign body in the airways. In the majority of cases, the foreign body migrates to the bronchi and clinical signs are much less constant. The most common symptoms of FBA are cough, respiratory distress, and wheezing.^[3] Some patients are asymptomatic or suffer from persistent focal pneumonia. Obstructive emphysema is the most specific radiographic sign.^[4] In the presence of a choking history, abnormal lung auscultation, and abnormal chest radiograph it is not difficult to make a diagnosis of FBA.^[5] However, in patients without a positive history and typical symptoms the diagnosis of FBA is always difficult and delayed to make, which is associated with increased incidence of complications.^[5]

Flexible bronchoscopy is the most sensitive and most specific examination in the diagnosis of FBA, but is not always available.^[4] Moreover, about 1% patients with susceptible FBA have negative bronchoscopic findings.^[6] One of the reasons in negative bronchoscopic FBA is that foreign body is so deep in the airways that bronchoscope could not reach. Second, hyperemia and edema of bronchial mucosa combined with inflammatory secretions interfere with the observation of airways, in which case doctors must be very careful or foreign bodies may be missed. What is more, doctors must communicate thoroughly with patients and their guardians to let them understand the limitation of medicine to reduce the disputes between doctors and patients, especially in countries with high incidence of medical disputes such as in China.

In short, FBA should be considered in any child with recurrent cryptogenic hemoptysis and persistent focal lung injury. Sometimes multiple bronchoscopy is rational in order to find out the underlying reasons. Long time follow-up is needed in patients with FBA to prevent complications.

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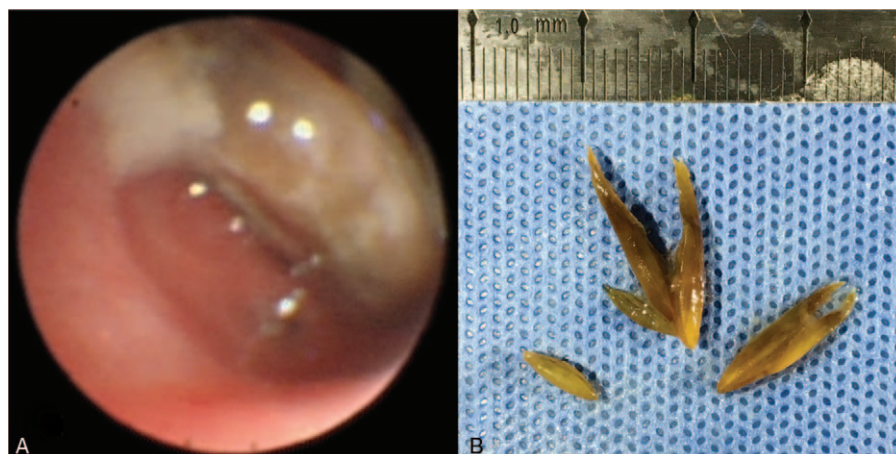


Figure 2. Foreign bodies were seen under bronchoscopy (A) and were grains of wheatear (B).

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