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EC PULMONOLOGY AND RESPIRATORY MEDICINE

Case Report

Removal of a Foreign Body Hiding in the Airway for 24 years via Bronchotomy

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Received: November 14, 2018; **Published:** November 30, 2018

Abstract

Foreign body aspiration mostly presents as an acute emergency with cough, choking, and dyspnea. However, in certain cases, they can remain hidden for many years and may result in serious complications such as pneumonia, atelectasis or bronchiectasis. It is even worse that patients could be misdiagnosed and wrongly treated because symptoms for undetected aspirated foreign bodies may resemble asthma or bronchitis. Therefore, a high index of suspicion is needed as many of the patients do not remember the incident with the foreign body. We herein present a case of a 32-year-old male with an unidentified foreign body in his airway who complained about recurrent episodes of cough with periodic exacerbations since childhood. Last year his symptoms worsened with recurrent episodes of fever, chills as well as night sweats. After evaluation, an occult foreign body was detected in his left bronchus. Following successful removal of the foreign body via bronchotomy, the patient fully recovered soon.

Keywords: *Airway; Bronchotomy*

Introduction

Foreign body aspiration (FBA) is a common event, with significant potential for morbidity and mortality [1]. Diagnosis is not always easy and may go unrecognized for a long time. An occult foreign body can result in systemic and respiratory symptoms, and sometimes it may be misdiagnosed with chronic pneumonia, bronchitis, asthma, or malignancy. The definitive treatment of the tracheobronchial foreign body is the removal as soon as possible [1-3]. We present a case of a 32-year-old male patient with a foreign body hidden in his airway for 24 years. After proper diagnosis and treatment, he underwent full recovery.

Case Report

Patient is a 32-year-old male with past medical history of left varicocelectomy. He mentioned that he accidentally swallowed one plastic push pin when he was 8 years old. After a brief episode of severe cough and mild respiratory distress at that time, he instantly recovered without any apparent repercussion, and thus he never considered it relevant. Since then the patient had complained of a mild but persistent cough and shortness of breath on exertion with periodic exacerbations. However, he did not seek any medical attention. There was a definitive change in the pattern of the cough during the last 20 years, such as the cough becoming worse, especially at night then mild wheezing and brief periods of chest pain. In order to solve his problems, he consulted a pneumologist. However, he had completely forgotten about the push pin episode and didn't mention to his physician. A chest x-ray at that time revealed some mild bronchial thickening with focal atelectasis, and a spirometry revealed an obstructive defect. Based on his clinical findings, he was misdiagnosed with asthma. For which, he was treated with inhaled anticholinergic agents and corticosteroids. Although his symptoms slightly improved with these medications during the following years, the cough never disappeared and the patient got used to it. Last year his symptoms

worsened i.e. recurrent episodes of fever, chills, night sweats, weight loss and one episode of hemoptysis. Thus, he presented for a medical evaluation in our hospital.

On clinical examination, a malnourished and tachypneic patient was encountered. Chest auscultation revealed reduced air entry, with some wheezes and crackles in the left infrascapular area. A new chest x-ray examination showed diffuse bronchial thickening, hyperinflation and a 1 x 1 cm nodule in the left apical region. Further examination with a contrast-enhanced thoracic CT (Computed Tomography) revealed a 1 x 1 x 0.5 cm endobronchial foreign body in the left primary bronchus 1 cm distal to the carina, some small bronchiectases filling with mucus and visualized left hilar lymph nodes as well (Figure 1A and 1B).

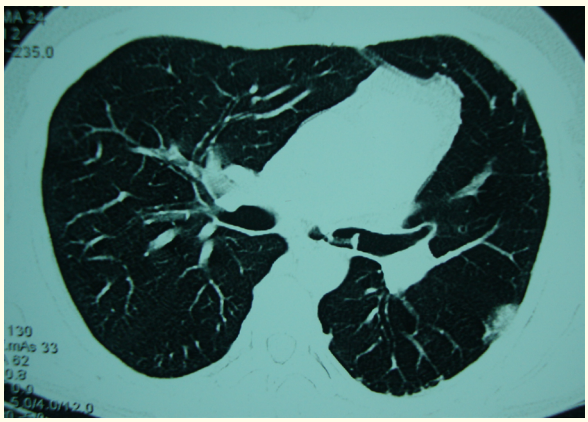


Figure 1A: *Contrast-enhanced thoracic CT revealing a 1 x 1 x 0.5 cm endobronchial foreign body in the left primary bronchus.*

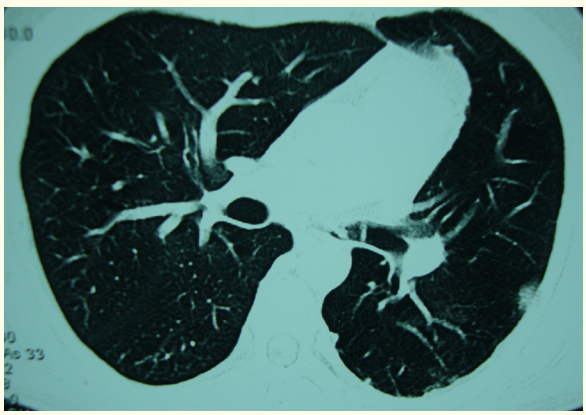


Figure 1B: *Contrast-enhanced thoracic CT revealing some small bronchiectases filled with mucus and left hilar lymph nodes.*

After a consultation with a cardiothoracic specialist, following strategies were performed.

At first, flexible bronchoscopy revealed stenosis in the left main bronchus immediately below the carina, which occluded more than 95% of the bronchial lumen and did not allow the passage of the flexible bronchoscope. In addition (Figure 1C) the bronchus was covered with whitish mucus and the foreign body was surrounded by reddish granulomatous and fibrous material within the stenosis (Figure 2A).

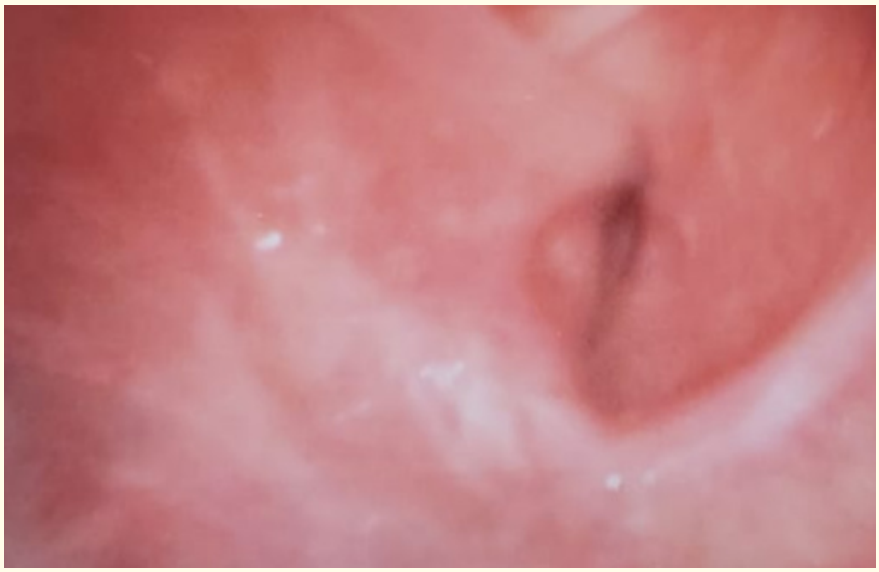


Figure 1C: *Bronchoscopy, stenosis in the left main bronchus immediately below the carina*

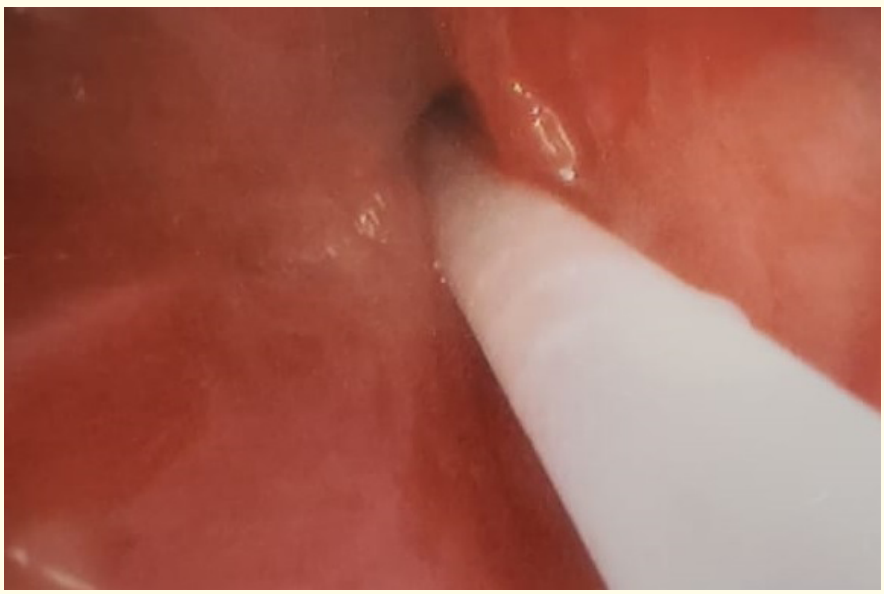


Figure 2A: *Stenosis in the left bronchus.*

After 3 failed attempts to try to remove the foreign body, a conversion to open surgery was decided. After a left posterolateral thoracotomy, the left primary bronchus was identified and the site of the stenosis was localized with bronchoscopic assistance. A 2 cm bronchotomy was performed along the primary left bronchus, in which a 1 x 1 x 0.5 cm plastic push pin firmly attached to the mucosa of the bronchus. Subsequently, the push pin was gently removed and the mucosa was also extensively debrided (Figure 2B, 2C and Supplementary Video).

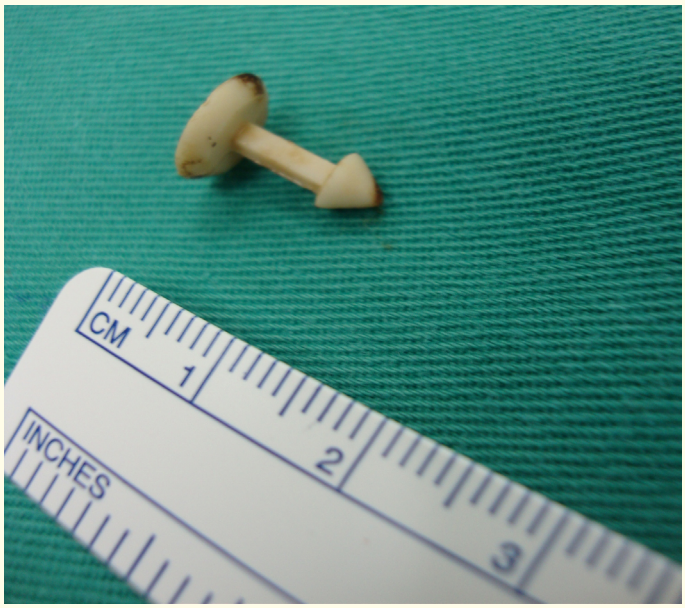


Figure 2B: *Plastic push pin, front view.*

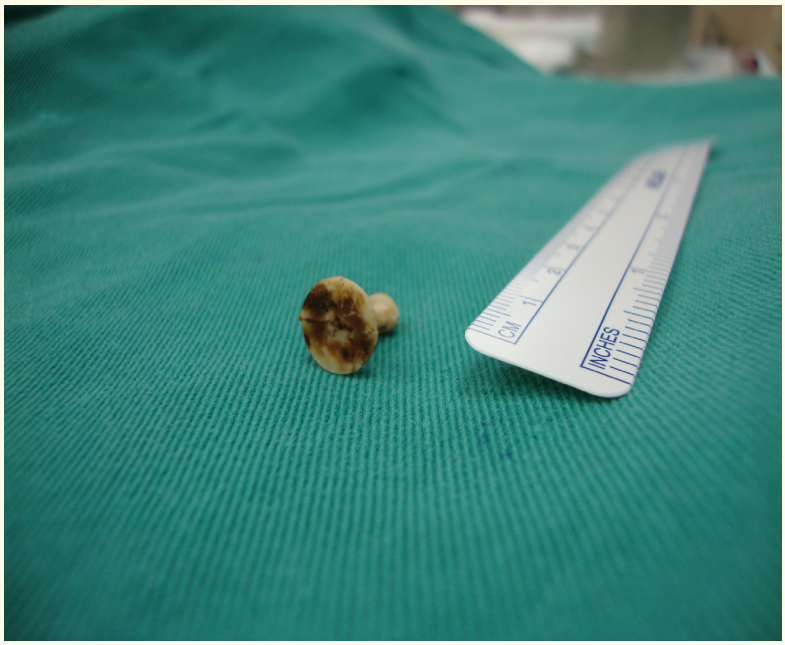
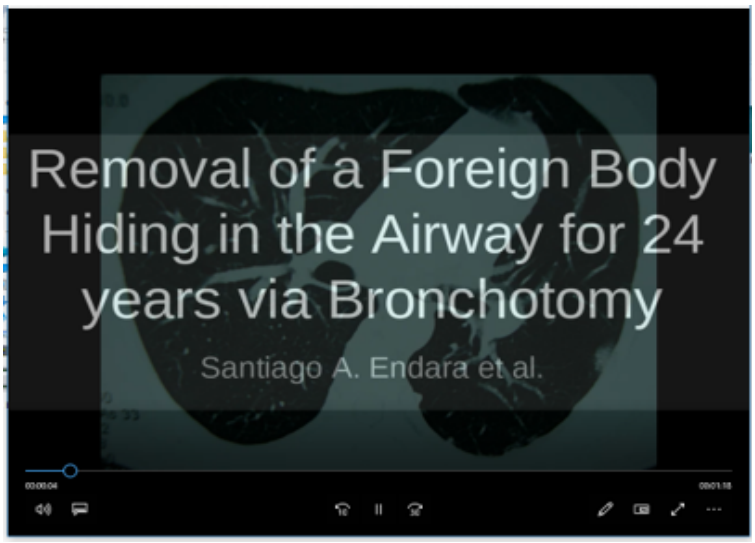


Figure 2C: *Plastic push pin, side view.*



The bronchotomy was closed with an absorbable suture along with an intercostal muscle patch graft, and the remainder of the procedure continued without any complication (Figure 3). Microbiology of the push pin revealed multiple Gram-positive bacteria. Pathology confirmed the granulomatous nature of the tissue sample resected around the foreign body.

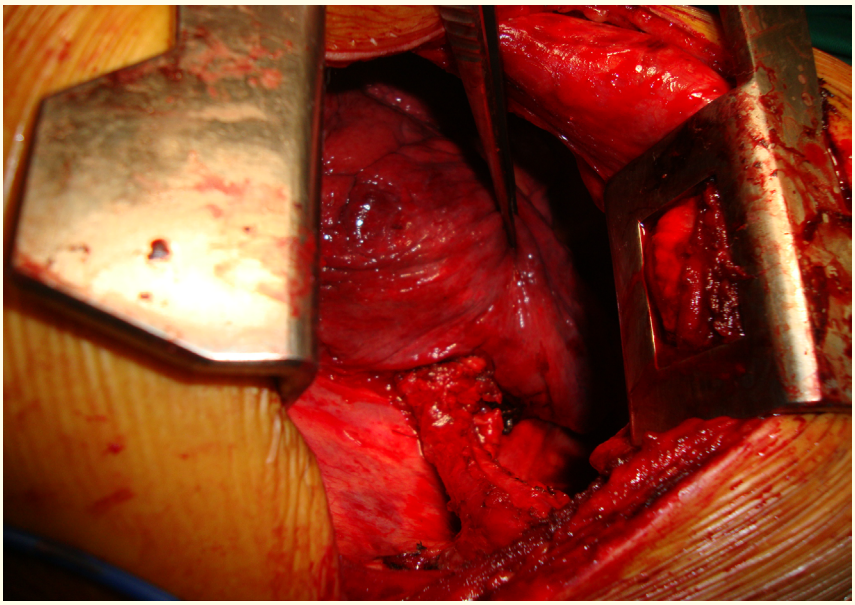


Figure 3: *Intercostal muscle patch graft over bronchotomy.*

The postoperative course of the patient was uneventful including removal of thoracic drainage on the 3rd postoperative day and discharge of the patient soon after. He underwent full recovery and completely overcame his respiratory symptoms.

Discussion

Aspiration of foreign bodies into the tracheobronchial tree is a common condition in clinical practice [1,2]. It used to be a lethal disease before the 20th century but with the development of diagnostic and treatment techniques, the mortality has decreased exceptionally [3]. Aspiration of foreign bodies happens mainly in children between the ages of six months and four years. It is rare for adults unless a clear history of an aspiration event can be obtained [1]. Despite clinical presentation is highly variable and nonspecific [3], the classic triad of cough, dyspnea, and cyanosis occurs only in a small percentage of patients [2]. Early symptoms of aspiration include acute dyspnea, asphyxia, laryngeal edema, pneumothorax, and cardiac arrest [1]. However, a foreign body can remain undetected for years, which could lead to a recurrent cough, fever, and even hemoptysis [1]. As our patient experienced, it is even worse that it may be interpreted or misdiagnosed as asthma, bronchitis or chronic pneumonia [1,3].

Prolonged contact between the foreign body and the airway mucosa causes a chronic inflammation with edema and finally fibrous stenosis [3]. Unfortunately, delayed diagnosis and treatment is not a rare event (56.6% receive delayed treatment and 78.8% are misdiagnosed) mainly due to the lack of physician experience and clinical suspicion [1,4]. The longest reported duration of foreign body retention in the tracheobronchial tree was 40 years [1]. In our patient, the foreign body was aspirated and remained hidden in his airway for 24 years, which is due to his symptoms, lack of access to proper healthcare, misdiagnosis, and inappropriate treatment.

The site of lodgment of the foreign body depends on the anatomy of the tracheobronchial tree of each patient and the position of the body at the time of aspiration. The right bronchi are usually more affected than the left [5] that can be due to vertical nature of the right main bronchus, its larger diameter, and greater airflow [1,2].

Nonetheless, in children, aspiration of foreign bodies may occur in either bronchus and usually lodge in the proximal airways due to the smaller bronchial diameter in this age group [6].

The diagnosis is made by visualizing the foreign body by means of images or with bronchoscopy. Non-radiopaque foreign bodies can easily be missed on routine chest examination but may be suggested by the presence of atelectasis, air entrapment, and hyperinflation [1]. Chest radiography may be useful in 68% of cases [1], nonetheless thoracic CT is superior to chest x-rays in identifying foreign bodies and should be considered the examination of choice [5].

Vegetables, food, shawl pins, straight pins, safety pins, a piece of straw and stones are among the most common foreign bodies found [1], most of the times they may act as a carrier for bacterial colonization and could perpetuate respiratory infections [7].

The definitive treatment of the tracheobronchial foreign body aspiration is the removal as soon as possible. Since the introduction of bronchoscopy by Gustav Killian in 1897, Bronchoscopy has become the standard [5]. Surgical treatment is reserved for cases in which bronchoscopy is unsuccessful or there are irreversible bronchial or lung complications [2,8], as it happened in our case.

In our patient, after the foreign body was detected, it was successfully extracted with surgery. Parents and caregivers should be very careful with what children play, as aspiration can be potentially lethal or result in, as our case, significant morbidity and expose patients to potentially dangerous therapies. A high clinical suspicion is needed as foreign bodies can remain hidden for a long time and should be considered in the differential diagnosis of every patient with chronic respiratory symptoms.

Conclusion

Aspiration of foreign bodies is a potentially lethal condition. However, in rare cases, they can remain not only in the airway but also undetected for a long time, which results in significant morbidity. Timely detection, a high clinical suspicion, and an accurate treatment could avoid all these scenarios and all its social, and physical ramifications.

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Volume 7 Issue 12 December 2018