

BRONCHIECTASIS IN A PATIENT WHO INHALED A FOREIGN BODY (CASE REPORT)

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Abstract

Foreign body aspiration is a life-threatening condition that must be treated immediately. It can be peanuts, nuts, plastic, hairpins, needles, pieces of bone, teeth, dental fillings, etc. Incidents most often occur in children, especially under 3 years of age, but also in adults. Clinical manifestations can vary from mild to severe. Treatment includes bronchoscopy, VATS, and thoracotomy. Thoracoscopy-assisted surgeries can reduce postoperative morbidity, pain, and length of hospitalization.

It is known that the long-term presence of a foreign body in the bronchial tree not only results in inflammation, but also causes complications such as bronchiectasis, hemoptysis, and empyema.

In our case, we are talking about a young patient aged 32, who was hospitalized at the University Hospital for Pulmonology and Allergology due to a frequent lower respiratory infections and productive cough in the last 5 years. On several occasions she was treated with antibiotic therapy, but without improvement. On the current hospitalization she was treated with double antibiotic therapy and the cough subsided. Later CT scan of the lungs was performed and a foreign body was clearly visualized. She was scheduled for bronchoscopy and extraction of the foreign body. The intervention was successful and our patient is in good condition.

Keywords: cough, foreign body, bronchiectasis, bronchoscopy.

Introduction

Bronchiectasis was first described by Laennec in 1819, when it was most commonly seen as a complication of pulmonary tuberculosis.

Foreign body aspiration is a rare and life-threatening event, with 0.16 to 0.33% of bronchoscopic procedures in adults being due to this condition. [7]

In late diagnosis, the presence of a foreign body can cause recurrent pneumonia, bronchiectasis, recurrent hemoptysis, among other complications.

Foreign body aspiration is uncommon in adults, but physicians should be aware of its possibility. There are risk factors that predispose to this, additional risks include injuries with loss of consciousness, epilepsy, endotracheal intubation, dental surgical procedures, psychiatric illness, and drug or alcohol abuse. [1]

Bronchiectasis is defined as a persistent dilation of the airways and is generally associated with symptoms of persistent cough, usually with copious sputum production, and episodes of exacerbations characterized by the following symptoms: increased volume and/or purulent sputum, shortness of breath, fatigue, chest pain, hemoptysis, and fever. [8]

In cases of massive involvement, progressive airway obstruction develops, most commonly in cystic fibrosis. [9] Patients with bronchiectasis often have chronic infection with pathogens such as

Pseudomonas aeruginosa and several exacerbations each year. Initiating and perpetuating factors have been defined as the cause of the development of bronchiectasis. Initiating factors include impaired mucociliary clearance, abnormal mucus, infections, autoimmune airway inflammation, systemic immunodeficiency, and noninfectious and nonautoimmune conditions. Perpetuating factors: toxins, biofilms, cellular inflammatory products, proteases, mucus hypersecretion, abnormal mucus due to inflammatory processes, abnormal mucus clearance, bronchial obstruction with mucus, other types of airway obstruction.

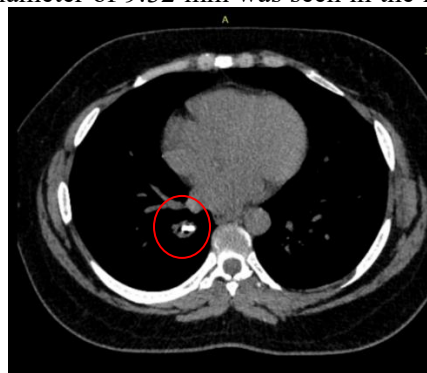
Case report

Our case involves a young patient aged 32, who was hospitalized at the University Hospital for Pulmonology with Allergology due to a productive cough for a longer period of time around 5 years. She was treated on an outpatient basis on several occasions with antibiotic therapy, but without improvement.

From the patient's history: in 2017, she was diagnosed with epilepsy by a neurologist. Due to frequent lower respiratory infections, the patient underwent skin allergy tests that were negative for the existence of an allergy, as well as microbiological examinations of sputum for tuberculosis, also negative.

The patient had a previous hospitalization at the University Hospital for Pulmonology and Allergology in February 2024, and was then regularly monitored on an outpatient basis, receiving regular pulmonary bronchodilator and corticosteroid therapy (LABA + ICS). One week before the current hospitalization, due to worsening cough, she went to her primary care physician where a chest X-ray was performed with a finding of a marked bronchovascular pattern and suspicious right paracardiobasal bronchiectasis. In order to further differentiate the condition, a CT scan of the lungs was performed when a finding of severely inflamed paracardial chylobasal bronchiectasis were seen. A throat swab was taken and *Streptococcus pyogenes* was isolated, this initiated our patient to be hospitalized at the University Clinic for Pulmonology and Allergology for further treatment. During hospitalization, she was treated with double antibiotic therapy. (Amp.Clindamycin and Tabl.Metronidazol). The upper respiratory panel performed confirmed infection with human coronavirus.

After the end of the treatment, a control CT scan of the lungs was performed, which showed reduced inflammation of the bronchiectatic changes with localization from the middle to lower parts of the lower right lobe. A calcification with a diameter of 9.32 mm was seen in the lower hilar pole area.



Picture 1 . CT of the lungs from November 2024.



Picture 2 . CT of the lungs the foreign body

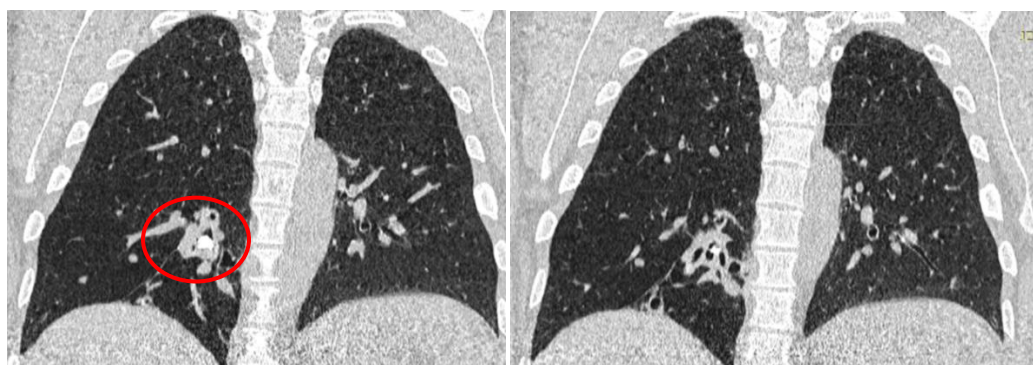
From the laboratory analyzes: Leukocytes $5.9 \times 10^9/L$, Erythrocytes $4.1 \times 10^{12}/L$, Platelets $383 \times 10^9/L$, Hemoglobin 95 g/L, CRP 9.5 mg/L, Viral markers: HIV Ag/Ab combo Nonreactive, HBsAg Nonreactive, AntiHBc Nonreactive, AntiHCV Nonreactive, an infectious disease specialist was consulted and serological analyzes ELISA – HIV were prescribed to be done. All the results came negative.

Table 1. Lab analysis

WBC	$5,9 \times 10^9/L$
RBC	$4.1 \times 10^{12}/L$
PLT	$383 \times 10^9/L$
HGB	95 g/L
CRP	9,5 mg/L

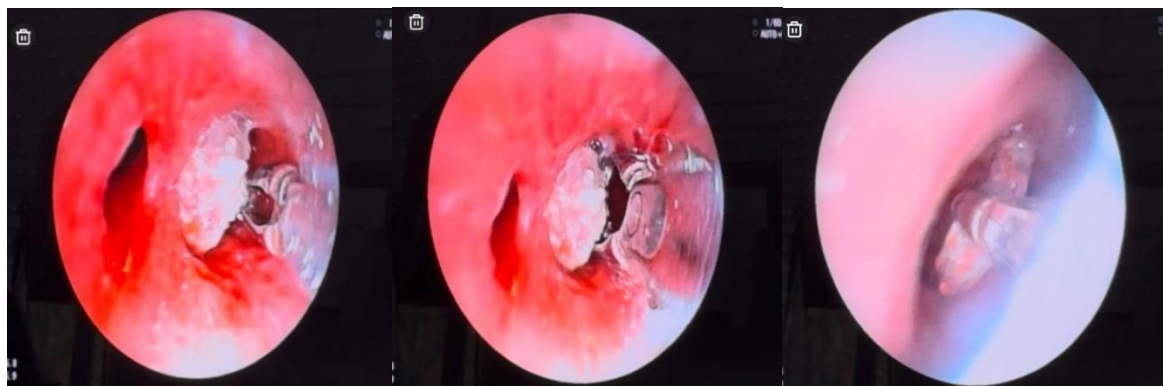
Table 2. Viral markers

HIV Ag/Ab combo	Nonreactive
HbsAg	Nonreactive
AntiHBs	Nonreactive
AntiHBc	Nonreactive
AntiHCV	Nonreactive



Picture 3 . CT of the lungs – coronal view for viewing the foreign body.

Flexible bronchoscopy was performed and on the distal part of the intermediary bronchus of the right lung the foreign body was clearly visualized. It was removed out in one act. Pictures 4.



Picture 4 .Bronchoscopy, visualization and extraction of the foreign body.

Two weeks after the hospitalization our patient was feeling fine and cough free. A consultation with a thoracic surgeon is planned for a possible surgical procedure for surgical treatment of the bronchiectasis.



Picture 5 . The extracted foreign body

Discussion

Bronchiectasis is defined as a reversible or irreversible dilation of the bronchi due to damage to the bronchial walls. Common causes include postinfectious, foreign body aspiration, host defense defects, genetic syndromes, anatomical defects, and compression of the external airways. [10]

Foreign body aspiration is associated with inflammation in the bronchial tree. For example, nuts contain carbohydrates, fats, proteins, fibers, polyphenols, alkaloids, and minerals, and alkaloids are the most important biologically active ingredients. They stimulate the production of tumor necrosis factor-alpha (TNF- α) and interleukin-1 and 4 (IL-1, IL-4) in the peripheral blood [4].

Arecoline, in the presence of TNF- α and IL-4, stimulates the production of the chemokine Eotaxin-1, which attracts Th2 lymphocytes and eosinophils as in allergic asthma, [5].

It is known that the long-term presence of a foreign body in the bronchial tree not only results in inflammation, but also causes complications such as bronchiectasis, hemoptysis, and empyema.

In children, an aspirated foreign body can mimic a congenital pulmonary airway malformation from a radiological point of view. [2]

Foreign bodies usually end up lodged in the lower bronchi or in the middle bronchus of the bronchial tree and can sometimes be present there for a long time, as in our case, 5 years.

In our case, the patient aspirated it at the age of 27, probably during an epileptic seizure, and it was discovered in November 2024.

By providing a direct field of view, bronchoscopy is a key technique for identifying and removing the foreign body [3,11]. In our case, the definitive diagnosis was achieved by flexible bronchoscopy, indicating that flexible bronchoscopy is a sensitive and specific examination in the diagnosis of a foreign body and is important in its removal from the bronchial tree.

In our case, the aspirated foreign body was not only definitively diagnosed by bronchoscopy but also removed in a single act.

Conclusion

Foreign body aspiration is a rare but life-threatening event, accounting for 0.16 to 0.33% of bronchoscopic procedures in adults. Due to delayed diagnosis, a foreign body can cause recurrent pneumonia, bronchiectasis, recurrent hemoptysis, among other complications.

We present a case report of foreign body aspiration with a history of prolonged cough and a 5 year delay in diagnosis. In such cases, it is challenging to make a diagnosis where a long time has passed since the aspiration. Taking careful history is exceptionally important for making the above diagnosis.

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