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Rhonchus and Valve-Like Sensation as Initial Manifestations of Long-Standing Foreign Body Aspiration: A Case Report

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Study Design A
Data Collection B
Statistical Analysis C
Data Interpretation D
Manuscript Preparation E
Literature Search F
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Conflict of interest: None declared

Patient: Male, 52
Final Diagnosis: Foreign body aspiration
Symptoms: Rhonchus • thoracic valve-like sensation
Medication: —
Clinical Procedure: —
Specialty: Pulmonology

Objective: Rare disease

Background: Foreign body aspiration (FBA) is an unusual medical condition among adults, with most of the cases associated with identifiable risk factors such as significant neurological impairment, drug or alcohol intoxication, and poor dentition. In some cases, however, FBA can present in an asymptomatic way, with estimates that 80% of lodged bodies are not visible on plain chest x-ray, leading to delayed diagnosis and requiring additional imaging techniques and procedures. We report an unusual case of long-standing FBA manifested as rhonchus and a thoracic valve-like sensation in an otherwise healthy man.

Case Report: A 52-year-old man was referred to our office complaining of abnormal respiratory sounds and an unusual valve-like sensation in the chest. According to the patient, both symptoms began approximately 18 months ago, when he was treated for recurrent respiratory infections, but without resolution of such symptoms. After careful initial assessment, a computed tomography scan of the chest was performed, which showed a high-density structure inside the left main bronchus, raising the potential diagnosis of foreign body aspiration. The patient successfully underwent flexible bronchoscopy, and throughout follow-up he remains asymptomatic with no apparent complications.

Conclusions: Foreign body aspiration remains a rare medical condition among adults. We present an unusual case of long-standing foreign body aspiration manifested as rhonchus and a valve-like sensation in the chest. Detailed clinical examination and proper diagnostic tools should be carefully selected to support a timely diagnosis and prevent late complications of this particular disease.

MeSH Keywords: Bronchoscopy • Foreign Bodies • Respiratory Sounds • Tomography, X-Ray Computed

Abbreviations: **FBA** – foreign body aspiration; **CT** – computed tomography

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Background

Foreign body aspiration (FBA) is an unusual medical condition among adults, with estimates that around 20% of cases occur in patients over 15 years of age [1]. Observational studies highlight the low incidence of this disease, and Limper et al. found only 60 reported cases of FBA in adults over a 33-year period [2–4]. Most cases are associated with identifiable risk factors such as significant neurological impairment, drug or alcohol intoxication, and poor dentition [5].

In adults, the nature of inhaled objects is variable, ranging from organic to inorganic materials [6]. Organic materials include bone fragments (particularly chicken bones and fish bones), pieces of vegetables or fruits (such as cherry pits), and seeds (such as melon and sunflower seeds) [6]. Inorganic materials include nails or pins, and even aspiration of prostheses, dental debris, and appliances. Overall, food is the most frequently aspirated foreign material in adults [7]. Clinical manifestations are largely dependent on the degree of obstruction and length of time since initial aspiration. For instance, many patients present with subtle respiratory symptoms such as chronic cough, wheezing, and dyspnea, whereas others may present with recurrent bacterial or fungal infections, and in some cases FBA may even ensue without symptoms [8,9]. More serious cases can cause acute airway obstruction requiring urgent interventions to prevent asphyxiation and death [7].

The diagnosis of a foreign body aspiration requires a high index of clinical suspicion, and it is not uncommon for it to be delayed by weeks to months, leading in some cases to chronic complications such as bronchiectasis and bronchial stenosis [7]. Consequently, the use of imaging techniques is required, and although plain chest x-ray is considered the least expensive and more accessible stepwise option, reports suggest that in approximately 80% of cases, the lodged body cannot be easily defined on plain films, probably because most ingested foreign bodies are radiolucent [10]. Therefore, computed tomography (CT) scans are considered a more sensitive method for detecting FBA and its complications than are chest x-rays [11]. Regarding anatomic location, most aspired foreign bodies are identified resting within the right bronchiole due to it being wider, more vertical, and shorter than the left bronchiole [8].

In situations where clinical suspicion remains high for a foreign body, or when imaging methods are unrevealing, visual inspection of the airways is recommended for both a confirmatory diagnosis and prompt extraction of the aspirated body. For this, the method of choice may be either rigid or flexible bronchoscopy. The success rates for flexible bronchoscopy in adults is estimated at around 89.6%, with the additional advantage of requiring less sedation, and with better ability to reach distally wedged bodies compared to rigid bronchoscopy [4,8]. However, rigid bronchoscopy may be preferred for foreign bodies located in central airways and those that cannot be removed by flexible bronchoscopy [8].

We report an unusual case of long-standing FBA manifested as rhonchus and a thoracic valve-like sensation in an otherwise healthy adult male. Subsequently, we describe the atypical characteristics of our patient, such as the rare anatomic position of the lodged body. Finally, we discuss the relevance of imaging techniques in aiding the diagnosis of foreign body aspiration followed by successful extraction.

Case Report

A 52-year-old man was referred to our office complaining of abnormal respiratory sounds and an unusual sensation in the chest. According to the patient, both symptoms began approximately 18 months ago. His past medical history was fairly unremarkable, with no history of smoking, hospital admissions, or familial history of pulmonary diseases. The patient recalled several episodes of unspecified respiratory tract infections treated with self-administered short antibiotic courses and other-the-counter medications due to his occupation requiring long periods of time at sea, during which he had no access to medical care.

On physical examination, rhonchus was heard in the left lung, best described as a low-pitched, continuous snoring sound, mostly heard at inspiration. Additionally, the patient complained of a valve-like opening sensation in the left-parasternal region, which was not evident by traditional auscultatory methods. Based on the initial assessment, additional imaging methods were required. Plain chest x-ray was unremarkable, with no gross abnormalities or radiopaque structures visible. However, a non-contrast CT scan of the chest revealed a high-density structure with a bone-like density located inside the left main bronchus (Figure 1). One week later, the patient underwent flexible bronchoscopy with the suspected diagnosis of FBA. During the procedure, a fragment of chicken bone was found at the entrance of the left main bronchus (Figure 2). The extraction of the foreign body was successful and the patient was discharged on the same day, with prompt recovery.

One week later, follow-up revealed remarkable clinical improvement; both the rhonchi and the valve-like opening sensation had disappeared. Six months after the initial assessment and procedure, the patient remains asymptomatic with no apparent complications.

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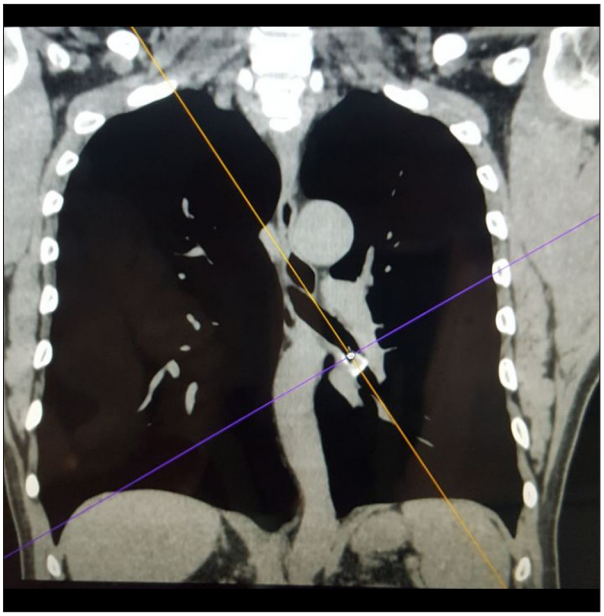

Figure 1. Non-contrast CT scan of the chest demonstrating a radiopaque structure located inside the left main bronchus, with bone-like density.

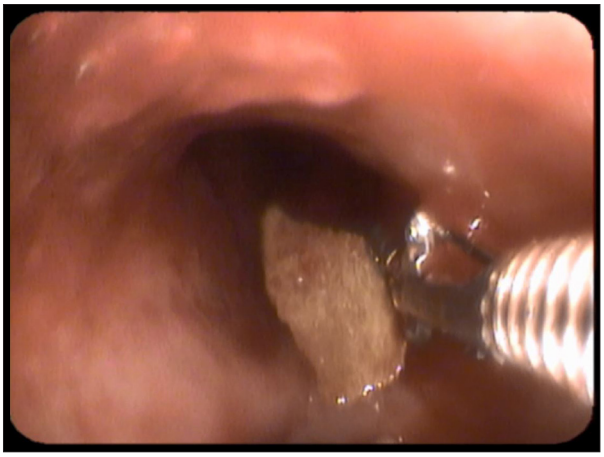

Figure 2. Foreign body visible upon flexible bronchoscopy. After removal, it was discovered to be a chicken bone fragment.

Discussion

Foreign body aspiration is an uncommon but serious medical condition that may be associated with significant morbidity and mortality among adults [12]. A recent systematic review of the literature found that without a history of aspiration, the diagnosis is difficult to establish and is usually delayed by weeks to months [8]. Even for subjects with a positive history for aspiration, it was found that most patients present late to medical facilities, probably due to the innocuous nature of the symptoms, and, in some cases, spontaneous resolution [8,10]. Here, we present a patient with rhonchus and a valve-like sensation as the initial manifestations of a long-standing foreign body aspiration, both being atypical symptoms of an unusual pathology at an unusual stage of life.

As a symptom, rhonchus is defined as a low-pitched continuous snoring sound heard on either inspiration or expiration [13]. It can be found in individuals with either secretions or large airway narrowing and with abnormal airway collapsibility, which are features common to chronic obstructive pulmonary disease and bronchitis [14,15]. In our patient, neither airway narrowing nor abnormal collapsibility were appreciated on imaging. Although atelectasis, as well as emphysema, pneumonia, and/or a mediastinal shift, are present in approximately 72% of cases, our patient did not present any such abnormalities [16]. This is in part explained by the type of obstruction related to the valve-like sensation described by the patient. The medical literature describes 4 types of obstruction associated with foreign body aspiration [17]. In one of them, the foreign body acts as a bypass valve that results in partial obstruction through both phases of respiration, with a mild disturbance in aeriation that is not enough to enhance collapsibility or produce abnormalities visible on chest x-rays [18]. This is one of the reasons why a negative film should not exclude aspiration. As a matter of fact, this method only achieves a sensitivity and negative predictive value of 66.6% and 18.7%, respectively [19].

Despite the atypical characteristics of FBA in this patient, as well as his age and negative past medical history for degenerative diseases or low-consciousness states, a CT scan was performed. This imaging modality was reported to achieve a sensitivity of 68% and a specificity of 98% [20]. However, its superior sensitivity over chest radiographs becomes even more notable with faintly opaque objects, especially if surrounded by air [21]. In fact, in a publication assessing the imaging findings in 19 adult patients with tracheobronchial foreign bodies, chest CT identified radiopaque foreign bodies in 84.2% of cases, while chest radiographs only did so in 15.8% of individuals [11]. Our patient's CT scan showed a foreign body, that despite its anatomical predilection to travel to the right bronchiole, was found to be resting on the left bronchial tree. A prompt extraction of the FB was performed using flexible bronchoscopy due to its high rate of success in adults [8].

Conclusions

Foreign body aspiration is a rare condition in adults, and a high index of suspicion is key to accurate diagnosis. In certain cases in which atypical respiratory symptoms are the only clue, diagnostic tools should be carefully selected to support the diagnosis. Because CT is considered a sensitive imaging technique and it is often used to evaluate several respiratory conditions in adults, we stress the importance of early use in screening individuals with

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a foreign body in the bronchial tree, even when unsuspected. Otherwise, this condition may be misdiagnosed or diagnosis can be delayed, leading to complications such as lung abscess, high medical expenses, and disturbances in quality of life.

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Conflict of interests

None.

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