CASE REPORT

Recurrent pneumonia due to endobronchial foreign body

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SUMMARY

Endobronchial foreign body is a well-known but rare diagnosis when encountering adult patients with unexplained recurring pneumonias. Often, the symptoms are subtle and can be mistaken for other more common conditions. A high degree of clinical suspicion is essential in diagnosing these patients. In the presented case of recurrent pneumonia and prolonged coughing, an endobronchial foreign body was revealed several months after the aspiration when a thorough medical history was taken. An almond was found by flexible bronchoscopy and removed by emergency rigid bronchoscopy; the symptoms later resolved. We discuss the importance of taking a thorough medical history, which in many cases is the clue to correct diagnosis and treatment. In addition, we discuss the diagnostic workup and therapy in cases of endobronchial foreign bodies.

BACKGROUND

Endobronchial foreign body is a well-known but rare differential diagnosis when encountering patients with unexplained recurrent pneumonia. Often, the symptoms are subtle and can be mistaken for other more common conditions such as chronic obstructive pulmonary disease (COPD), pneumonia and lung cancer. A high degree of clinical suspicion is essential in diagnosing endobronchial foreign bodies. A thorough interview and physical examination is often what provides the diagnostic clue. The lesson for the physician is that, when given the time, patients often reveal details they had either forgotten or considered unimportant, or maybe even embarrassing. These details are often what lead to the clinical suspicion necessary in planning the diagnostic workup.

CASE PRESENTATION

An elderly woman previously diagnosed with COPD (forced expiratory volume in 1-s (FEV₁) 1.1 L (84%), forced vital capacity (FVC) 1.87 L (113%) and FEV₁/FVC 58.97, GOLD classification A) and pulmonary embolism was admitted to the hospital due to 5 months of coughing and recurring pneumonias.

Prior to the admission her family physician suspected pneumonia and antibiotic treatment was administered with improvement in symptoms. After a few weeks, symptoms recurred and antibiotic treatment was resumed, but this time without effect, and the patient was admitted to hospital.

On admission, she presented with productive morning cough and progressive dyspnoea. A detailed medical history revealed that her family

had made comments on her laboured breathing and very distinct respiratory sounds. In addition, she remembered an episode where an almond had got stuck in her throat, and that she was not sure whether it had come up during the following coughing episode. She reported no haemoptysis, chest pain, leg oedema, loss of weight or night sweats.

On physical examination the patient appeared well, with blood pressure 131/83 mm Hg, pulse 103/min, temperature 37.5°C, respiratory frequency 16/min and oxygen saturation 95% on room air. Chest examination revealed prolonged expiratory time and inspiratory stridor. Biochemical analysis revealed elevated C reactive protein of 125 mg/L (reference value <6 mg/L) and a white cell count of $10.3 \times 10^9/L$ (reference value $3.50\text{--}8.80 \times 10^9/L$). Renal and liver function tests and electrolytes were normal.

INVESTIGATIONS

Chest X-ray requested by the family physician before admission showed hyperinflation and was interpreted as compatible with the previous diagnosis of COPD.

CT of the chest revealed a half-moon shaped change in the lower left main bronchus, initially interpreted as mucus plugging ([figure 1](#)).

DIFFERENTIAL DIAGNOSIS

Because of the information retrieved at admission and at the physical examination, endobronchial foreign body was initially suspected. Other diagnoses considered were acute exacerbation of COPD, community acquired pneumonia and lung cancer. Diagnostic workup and treatment were planned accordingly.

TREATMENT

On admission, the patient was administered inhaled steroids, bronchodilators and intravenous antibiotics. Flexible bronchoscopy was performed in conscious sedation, and a round, smooth foreign body was located in the left main bronchus. Attempts at removing it with forceps and a wire retrieval basket were unsuccessful. Subsequently, emergency rigid bronchoscopy under general anaesthesia was performed to retrieve the foreign body, which proved to be an almond. After removal of this, the patient continued to receive intravenous antibiotics for 3 days.

OUTCOME AND FOLLOW-UP

On discharge, symptoms were diminished and oral antibiotics were given for 7 days. After 2 months,

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Figure 1 CT of the thorax, showing what initially was described as a possible mucus plug, but in fact was the almond stuck in the bronchia. Courtesy of Department of Radiology, Vejle Hospital.

the patient was seen in the outpatient department, and was reportedly in her usual state of health without any intercurrent infections.

DISCUSSION

Endobronchial foreign bodies are relatively common in children. Rafanan and Metha¹ reported that 75–85% of all cases of foreign body aspiration are seen in children younger than 15 years of age, with peak incidence found by Baharloo *et al*² in the second year of life, accounting for 48% of total cases in children. In adults, cases are rarer, but nevertheless seen in all ages with peak incidence in the sixth and seventh decade of life.^{2–4} In each case, time passed from aspiration to diagnosis and subsequent removal of the foreign body can range from hours to years.^{2–5} In most cases, late diagnosis is due to subtle symptoms like cough, sputum production, fever, chill, wheezing, recurrent pneumonia and shortness of breath.^{1–2–5}

Diagnostic tools like chest X-rays are of very limited use in these cases. With organic matter the most common asphyxiated objects, numerous foreign bodies will not be radio-opaque.³ However, findings such as atelectasis, air trapping, postexpiratory mediastinal shift and recurrent pneumonia in the same location of the lung are all possible (if non-specific) indicators of a foreign body.^{1–3} Similarly, other types of imaging like CT scan and lung scintigraphy have not generally proven helpful in the diagnosis.¹ In our case, the chest X-ray was unrevealing, but the CT scan did in fact visualise the foreign body in the left main bronchus, although it was initially described as possible mucus plugging. In most adult cases though, the right bronchus is where the foreign body will be located. This has to do with the anatomy of the main airways, with the right bronchus being an almost vertical continuation of the trachea whereas the left main bronchus departs from the trachea at an angle.^{2–4}

Because symptoms are subtle and radiographic findings unreliable, a high clinical suspicion obtained from the medical history is of utmost importance.⁶ Lan found that only one in 29 patients spontaneously reported a choking event prior to presentation of symptoms. Another 14 patients could recall choking

episodes after more thorough history taking.⁵ Analogous to this finding, our patient did recall a choking episode at admission, but this information was first revealed only on specific questioning. Even though a thorough anamnestic interview was enough to raise the clinical suspicion in our case, it is important to bear in mind that the results from Lan demonstrate that approximately 50% of the patients in the chronic group will have no memory of a previous choking event even when asked specifically about this prior to the bronchoscopy.

Although no guidelines exist on endobronchial foreign body removal from the major thoracic societies (American Thoracic Society, British Thoracic Society and European Respiratory Society), we and others consider flexible bronchoscopy the diagnostic tool of choice due to the superior visualisation of the entire bronchial tree to the subsegmental level. Rafanan and Metha¹ refer to numerous case series where flexible bronchoscopy is used to remove foreign bodies and report a success rate of 86% in a total of 426 cases (ranging from 61% to 100% in each case series). In our patient, an attempt to remove the foreign body by flexible bronchoscopy with various tools failed, although performed by a very experienced respiratory physician with several thousand bronchoscopies in portfolio. A subsequent emergency rigid bronchoscopy, however, was successful in removing the almond.

In conclusion, the significance of re-evaluating a medical problem when symptoms do not respond to otherwise efficient treatment must be emphasised. As demonstrated by this case report, re-evaluation often begins with talking to the patient and by performing simple bedside examinations. In our case, this was how the suspicion of endobronchial foreign body was established.

Flexible bronchoscopy is the procedure of choice when encountering endobronchial foreign bodies. However, it is advisable to have access to emergency rigid bronchoscopy in general anaesthesia, especially in cases of proximal obstruction.

Learning points

- ▶ Endobronchial foreign body should be considered as a possible differential diagnosis in cases of recurrent pneumonia and prolonged coughing.
- ▶ A thorough interview is of crucial importance when endobronchial foreign body is suspected.
- ▶ Chest X-ray and CT scan are often unsuitable for diagnosing endobronchial foreign bodies.
- ▶ Diagnostic flexible bronchoscopy should be performed in suspected foreign body aspiration.
- ▶ Emergency rigid bronchoscopy is a rescue procedure and should always be available should extraction with a flexible bronchoscope fail.

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