Longstanding Tracheobronchial Foreign Body in an Adult

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Introduction

Foreign body aspiration in adults usually occurs in the elderly or in patients with underlying neurological impairment, excessive alcohol consumption, psychiatric diseases, Alzheimer disease, or head trauma.[1] Foreign body aspiration in young adults without these risk factors is rare, and persistence of a foreign body for an 8-year period is even rarer. We report a case of foreign body aspiration in a young adult who had no known risk factors.

Case Summary

A 21-year-old man was referred to our department because of an abnormal chest x-ray (CXR, prominence of the left hilum of the lung) revealed in a routine health examination (Fig. 1). He did not have any symptoms or restriction in daily activity. A physical examination and laboratory findings were all unremarkable. We performed a chest computed tomography (CT) scan, which revealed an inverted V-shaped opacity in the bronchus of the left upper lobe, with focal atelectasis in that region (Fig. 2). Pulmonary function tests were performed. Flexible fiberoptic bronchoscopy was carried out using local anesthesia, as we suspected a foreign body had been aspirated. A plastic straw was seen to be lodged in the left upper lobe bronchus, embedded in granulation tissue (Fig. 3), but an attempt to extract it was unsuccessful because of severe coughing. Therefore, we changed to general anesthesia and performed flexible fiberoptic bronchoscopy through an endotracheal tube. The foreign body was removed smoothly. The bronchi distal to the granulation tissue were normal and patent. After the procedure, a new interview allowed the patient to recall that he had developed a habit of chewing short drinking straws. About 8 years previously, he had aspirated a short straw accidentally while playing basketball. He experienced coughing for 2 days after this event, but this symptom disappeared. Therefore, he thought he had swallowed the straw and ignored it.

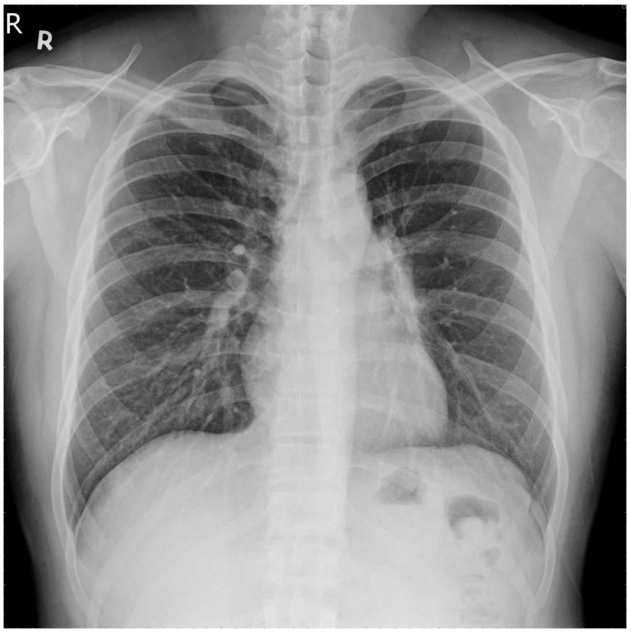

Fig. 1. Chest x-ray image demonstrating prominence of the left hilum of the lung.

After the foreign body extraction, a CXR showed improvement of the prominence of the left hilum (Fig. 4) and the pulmonary function tests also improved. The patient recovered uneventfully and was discharged from hospital 4 days later.

Discussion

Foreign body aspiration occurs most commonly in children and the elderly, and is uncommon in adults. In one study involving 1,200–1,300 routine adult bronchoscopy

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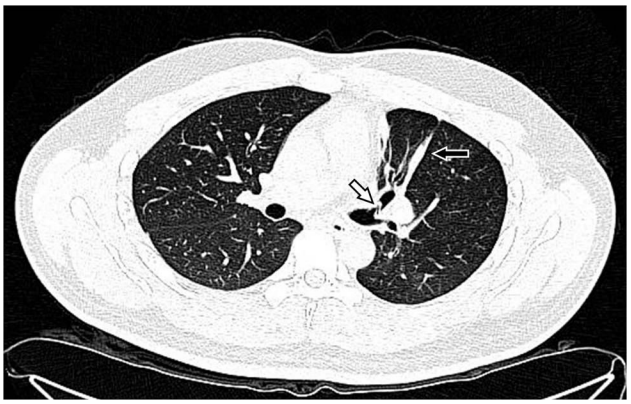

Fig. 2. Computed tomography scan of the chest revealed an inverted V-shaped opacity in the left upper lobe bronchus (white arrow) and focal atelectasis (black arrow).

practices, foreign bodies were encountered at the rate of $< 0.2\%$ per year.[2] Most of the adult patients in that series had some risk for aspiration, such as stroke, neurological and neuromuscular diseases, alcohol abuse, psychiatric diseases, Alzheimer's disease, or head trauma.[1] The common symptoms were coughing, dyspnea, wheezing, hemoptysis, and recurrent pneumonia.[1] However, the diagnosis is usually delayed because of nonspecific symptoms and physical signs. The reported mean durations of foreign body retention were 18.4 months (range 3 days to 30 years)[3] and 25.8 months (range 1 month to $>$ 10 years).[4] Adult patients usually display sudden onsets of coughing and choking after an aspiration. However, once the acute symptoms pass, the episode tends to be forgotten. Mise et al reported that only 38% of the patients remembered a possible episode of aspiration,[1] and Donado et al reported 25%.[5] In our case, the patient did not remember the episode of foreign body aspiration until it had been extracted.

Not all foreign bodies are visible on CXR. The most common findings on CXR are pulmonary infiltrations, atelectasis, hyperinflation, bronchiectasis, or even normal appearance.[1,6–8] The incidence of having a normal CXR was as high as 24%[1] and 21%.[3] Therefore, the diagnosis relies on a high level of clinical suspicion, not on imaging studies. Once the presence of a tracheobronchial foreign body is suspected, bronchoscopy must be performed. Mise et al suggested that diagnostic bronchoscopy should be performed in patients whose medical history suggested a foreign body aspiration, even in the presence of a negative physical examination and radiographic imaging.[1]

Various prevalent types of foreign body have been described in the literature, depending on climate or eating habits in different countries. The most common foreign bodies are bone fragments or food matter.[4,9] To our knowledge, there has been no previous report of drinking straw aspiration.

The most common location of a foreign body is the right intermediate bronchus and right basal bronchus.[3,4] It is thought that a foreign body is more likely to enter the more vertical right bronchial tree by gravity. In our patient, the foreign body was lodged in the left upper lobe bronchus. This is possibly because the foreign body was hollow and light, so it was sucked in during inspiration.

Both rigid and flexible bronchoscopes have been utilized in the extraction of foreign bodies, but there is no conclusion as to which is better. Some authors prefer rigid bronchoscopy, while others prefer a flexible approach. Both rigid and flexible bronchoscopies can attain a high success rate (above 90–95%).[4,5,10–12] Mise et al recommended flexible bronchoscopy with or without endotracheal intubation as the first trial.[1] They stated that flexible bronchoscopy was much more pleasant to the patient than rigid bronchoscopy and caused many fewer complications such as damage to the teeth, vocal cords, and tracheobronchial tree. In our department we also prefer flexible bronchoscopy as the first trial. It can confirm if a foreign body is present and provides better visualization of distal airways. As various modern extraction instruments are now available, the success rate of removal is high in our department.

If the foreign body lodges for a short duration, there may be only minimal erythema at the site. If the foreign body lodges for a long period, granulation tissue or inflammatory polyps will develop, which eventually cause irreversible bronchial stenosis.[13] Many authors have stated that the lung will recover completely after removal of a foreign body if there is early intervention or if there is no irreversible pulmonary parenchymal damage.[13,14] If intervention is too late, irreversible damage will occur, such as bronchiectasis or organizing pneumonia, making surgical resection of the affected lung the only treatment.[13] In our case, although the foreign body had been retained for 8 years, there was no irreversible damage discovered on CT scans (bronchiectasis or organizing pneumonia), and the bronchi distal to the obstruction site were normal and patent. Therefore, we estimate the lung will fully recover. The pulmonary function tests and CXR performed 4 days after removal of the foreign body already showed improvement. After a longer period, CT scans of the chest should become normal. One limitation of this report is that the patient was lost to follow-up, so we cannot confirm full recovery of the lung, including remission of the granulation tissue by CT scans or bronchoscopy.

Teaching Points

Foreign body aspiration in tracheobronchial tree commonly occurs in children and the elderly, especially with the risk factor of neurological impairment. In the adult it is uncommon, and difficult to make a diagnosis because of the nonspecific symptoms and CXR findings. In our case the foreign body persisted for a long period of time without any remarkable respiratory symptoms. Therefore, the diagnosis relies on

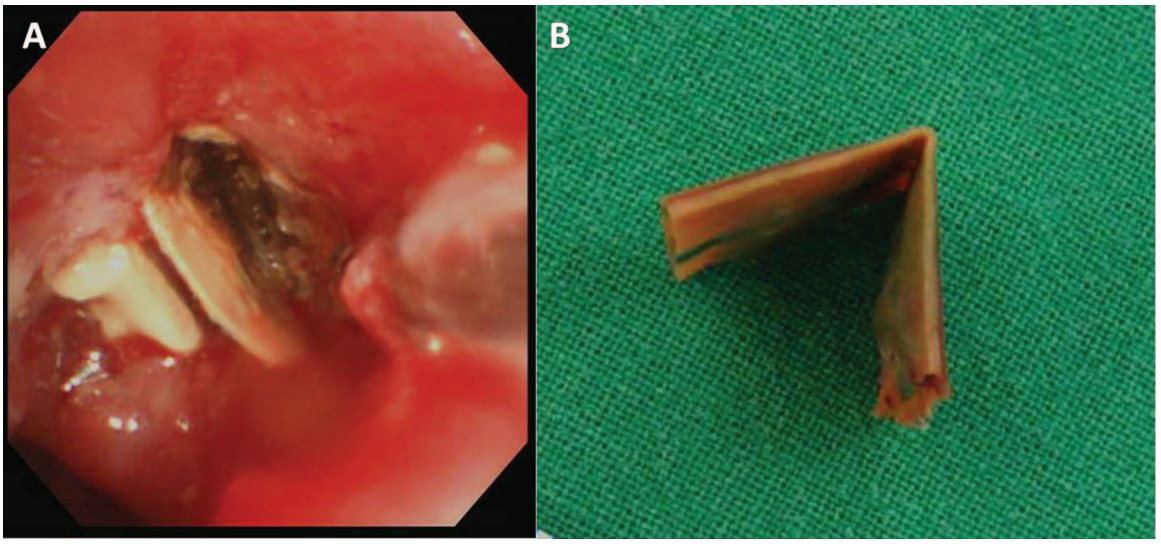

Fig. 3. A: Flexible bronchoscopy demonstrated a foreign body lodged in the left upper lobe bronchus, surrounded by granulation tissue. B: The extracted V-shaped drinking straw.

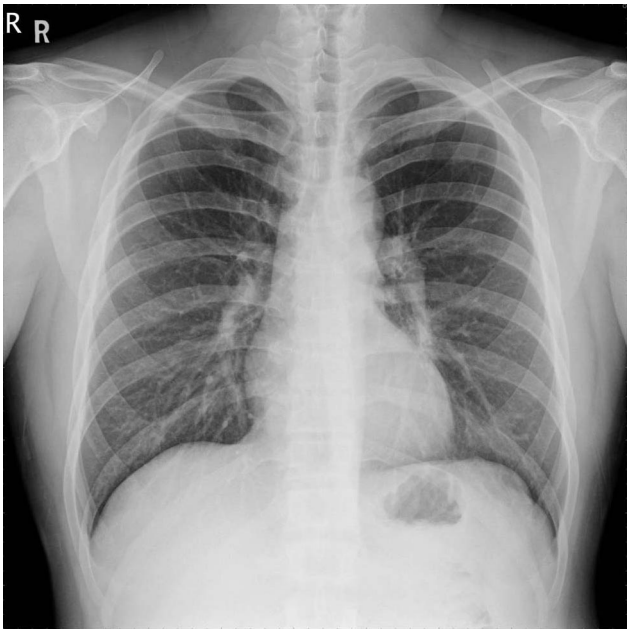

Fig. 4. Follow-up chest x-ray 4 days after extraction of the foreign body showed reduced prominence of the left hilum.

a high level of clinical suspicion. Diagnostic bronchoscopy should be performed in all suspicious cases. The most common foreign bodies are bone fragments or food matter, and the typical locations are the right intermediate and right basal bronchi. If there is early intervention, the lung will recover completely without sequelae. If intervention is too late, irreversible damage will occur, making surgical resection of the affected lung the only treatment. Every effort should be made to correctly diagnose these patients. In our patient, despite the longstanding presence of the foreign body, there were no important consequences on the bronchial tree and pulmonary parenchyma after intervention.

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