CASE REPORT

Haemoptysis in a teenager: late diagnosis of unnoticed foreign body aspiration

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SUMMARY

Chest X-ray in a 17-year-old boy, presenting with haemoptysis, revealed a radiopaque foreign body (FB) in the right lower lobe. There was no history of aspiration. CT located the needle-shaped FB in the right posterobasal lower lobe segment bronchus. In bronchoscopy, the FB turned out to be a pin, of which the radiolucent plastic head was embedded in the peribronchial tissue. Extraction by flexible and rigid bronchoscopy failed; finally, thoracotomy and bronchotomy had to be performed to remove the pin. In delayed diagnosis of a tracheobronchial FB, CT scan is not only necessary to localise the FB but also to depict or rule out secondary pulmonary changes. Nevertheless, radiolucent components of a metallic FB might be invisible even in CT, leading to underestimation of its size and extension. Late diagnosis complicates removal of tracheobronchial foreign bodies and may even necessitate open surgery, including pulmonary resections.

BACKGROUND

Haemoptysis in children is commonly due to lower respiratory tract infection. In addition to bronchiectasis, pulmonary tuberculosis, tumours and trauma of foreign body (FB) aspiration have to be considered, especially in children. Late diagnosis of an aspirated FB often makes removal difficult.

CASE PRESENTATION

A 17-year-old boy presented to the emergency department with mild haemoptysis. His medical history was normal and he was a non-smoker. He had no respiratory distress and no fever or weight loss, but when coughing he noticed small amounts of bright red blood in the sputum.

INVESTIGATIONS

Chest X-ray showed a radiopaque needle-shaped FB in the right lower lobe (figure 1). When he was told of this finding, the boy denied remembering any episode of aspiration. Since he was working in a metal-processing factory, accidental aspiration of a metal splinter was suspected. Subsequent CT scan located the radiopaque FB in the right posterobasal lower lobe segment bronchus with peribronchial infiltration but without any signs of bronchiectasis (figure 2A,B).

TREATMENT

Rigid bronchoscopy was performed. A thin metal tip was found in the posterobasal subsegment of the right lower lobe but extraction failed because of impaction of the FB into the surrounding tissue. Two weeks later, another combined rigid and flexible bronchoscopy

was performed, and the needle was removed from the surrounding tissue with small forceps; however, the white plastic head of the FB was found to be ingrown into the peribronchial tissue. This plastic part did not show in the CT scan because of its adhesion to the bronchial wall. Endoscopic removal again failed. Therefore, right anterolateral thoracotomy had to be performed. The palpable FB was removed with a clamp after bronchotomy of segment X bronchus and turned out to be a pin (figure 3A, B). The incorporation of the pin within the peribronchial tissue led to the assumption that the event of aspiration might have dated back a long way before the occurrence of haemoptysis. Fortunately, there were no irreversible pulmonary changes. Postoperatively, the patient developed pleural empyema and wound infection of the thoracotomy incision. After 1 week of intravenous antibiotic treatment he was discharged.

OUTCOME AND FOLLOW-UP

At regular follow-up the patient showed complete recovery and 1 year later only a thin right-sided thoracic scar remains.

DISCUSSION

FB aspiration is an important differential diagnosis in a child presenting with haemoptysis. While more than 80% of patients with FB aspiration are aged under 3 years, it is a rare event in teenagers, and might therefore not be considered as a differential diagnosis in patients of this age.¹ The majority of FBs are organic (peanuts, seeds, beans) and usually lead to fever and pneumonia, unlike aspiration of inorganic FBs, which happens more frequently in older children and adolescents.¹ During temporary

Figure 1 Chest X-ray, anteroposterior view: radiopaque needle-shaped foreign body in the right lower lobe.

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Figure 2 (A and B) Thoracic CT scan: metallic needle-shaped foreign body in the right posterobasal lower lobe subsegment bronchus with peribronchial infiltration.

placement of a needle between the lips, for example, accidental aspiration may occur, as is increasingly being mentioned in women wearing headscarves.² Also, a definite history of FB aspiration might be missing.

Although diagnosis of tracheobronchial FB aspiration is challenging in some cases, a radiopaque FB clearly presents on chest X-ray, often performed as the first-line investigation. CT scan provides the exact localisation of a bronchial FB and may delineate its shape and size.³ Nevertheless, as in our case, late-presenting FBs consisting of two different components (ie, radiolucent and radiopaque) that are embedded in the bronchial wall may lead to underestimation of their actual size. In late presenting tracheobronchial FBs, CT scan allows depiction of alteration of the bronchial wall in addition to showing secondary pulmonary damage. CT findings and virtual bronchoscopy facilitate planning of the individual therapy in complex cases and reduce unnecessary bronchoscopies.⁴

Rigid and flexible bronchoscopy can be successfully applied for removal of metallic bronchial FBs, although in rare cases of delayed diagnosis endoscopic removal fails. As in our case, late diagnosis complicates retrieval of the sometimes ingrown bronchial FB and finally necessitates a surgical approach.⁵ Surgical procedures involve bronchotomy and pulmonary resections. Major complications of open surgical FB removal are empyema and bronchopleural fistula. Leaving a FB in place cannot be recommended because of the unratable risk of severe pulmonary infections. Delayed diagnosis of endobronchial FB aspiration may lead to irreversible pulmonary changes, especially bronchiectasis, which may require pulmonary resections.¹

Figure 3 (A and B) Removal of the foreign body via bronchotomy showing it to be a pin. Fluoroscopic image of the pin showing the radiopaque and radiolucent components.

Learning points

- ▶ Metallic foreign body aspiration may go unnoticed and not display major symptoms for a long period.
- ▶ CT scan provides exact localisation of late-presenting foreign bodies and depicts associated secondary pulmonary damage. The invisibility of radiolucent components of metallic foreign bodies can result in underestimation of their size and extension.
- ▶ Late-presenting bronchial foreign bodies are usually embedded in the bronchial wall; extraction via bronchoscopy may be impossible, necessitating open surgical procedures, including pulmonary resections.

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Competing interests None.

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REFERENCES

- 1 Gang W, Zhengxia P, Hongbo L, *et al.* Diagnosis and treatment of tracheobronchial foreign bodies in 1024 children. *J Pediatr Surg* 2012;47:2004–10.
- 2 Al-Sarraf N, Jamal-Eddine H, Khaja F, *et al.* Headscarf pin tracheobronchial aspiration: a distinct clinical entity. *Interact Cardiovasc Thorac Surg* 2009;9:187–90.
- 3 Bai W, Zhou X, Gao X, *et al.* Value of chest CT in the diagnosis and management of tracheobronchial foreign bodies. *Pediatr Int* 2011;53:515–18.
- 4 Adaletli I, Kurugoglu S, Ulus S, *et al.* Utilization of low-dose multidetector CT and virtual bronchoscopy in children with suspected foreign body aspiration. *Pediatr Radiol* 2007;37:33–40.
- 5 Duan L, Chen X, Wang H, *et al.* Surgical treatment of late-diagnosed bronchial foreign body aspiration: a report of 23 cases. *Clin Respir J* 2014;8:269–73.

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