CASE REPORT

Case of a fractured human bone fragment as an endobronchial foreign body following a traffic incident

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SUMMARY

Endobronchial foreign bodies (EFBs) are present in various settings, such as eating or dental procedure. Accidental aspiration of foreign bodies is more common in children; however, cases of adult foreign body aspiration exist. Traumatic incidents can precipitate endobronchial aspiration of foreign bodies. Loss of consciousness, such as in coma, can result in foreign bodies being easily inhaled into the airways. Teeth or vehicle parts have been reported as EFBs following traumatic incidents. We report on a patient with chronic, sustained cough following maxillofacial trauma. Chest CT revealed an abnormal calcified endobronchial opacity. Flexible bronchoscopy confirmed the presence of an endobronchial foreign body in the left main bronchus. Following removal by bronchial forceps, the body was identified as a human bone fragment. Successful removal of the endobronchial bone fragment resulted in complete symptom remission. We concluded that post-traumatic respiratory complaints should be comprehensively evaluated, even if mild.

BACKGROUND

There are many items reported as materials of endobronchial foreign bodies (EFBs). Food-bone or dental devices can be accidentally aspirated.¹ Foreign body aspiration following trauma is rarely encountered in acute care settings. Teeth or vehicle parts have been reported as EFBs following trauma.^{1,2} Some reports recommend endobronchial examination after trauma in patients who present with unexplained respiratory distress or sustained failure to weaning from mechanical ventilation.^{2,3}

In our case, chronic cough led to further endobronchial evaluation by chest CT; this revealed an EFB in the left main bronchus. On successful removal, the foreign body was identified as a fragment of fractured mandible on pathological examination. To our knowledge, this is the first reported case of a fractured human bone fragment as an EFB.

CASE PRESENTATION

A 21-year-old man presented to our hospital complaining of a 4-month history of persistent cough following a maxillofacial trauma sustained in a roadside traffic incident. Following the incident, he was transferred to an acute care hospital where he was placed on mechanical ventilation following intubation. Having sustained multiple

traumatic injuries, including left mandibular fracture, he underwent standard therapy and surgery. During admission, he exhibited coughing that was non-responsive to antitussive medication. His clinical condition eventually stabilised, and he was discharged from the acute care hospital 1 month later.

Prior to the incident, the patient was a healthy college student, with no history of smoking or drinking. He presented complaining of chronic cough; however, there were no specific findings, with the exception of inspiratory rale.

INVESTIGATIONS

His chest X-ray was unremarkable. Chest CT revealed an endobronchial calcified opacity in the left main bronchus (figure 1). Flexible bronchoscopy was performed. We observed a white and hard material, unsynchronised with breathing, lodged in the left main bronchus (figure 2). We carefully removed it using bronchial forceps, without complication, during flexible bronchoscopy. On microscopic examination, the EFB was a bony tissue, but not a tooth, coexisting with *Actinomyces* (figures 3 and 4). We concluded that this EFB was a piece of the patient's fractured mandible.

DIFFERENTIAL DIAGNOSIS

Endobronchial calcified neoplasm, endobronchial tuberculosis

Figure 1 Chest CT at the mediastinal setting with the red arrow indicating the location of the endobronchial foreign body.

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Figure 2 Endoscopic findings following initial flexible bronchoscopy.

TREATMENT

We carefully removed EFB using bronchial forceps, without complication, during flexible bronchoscopy.

OUTCOME AND FOLLOW-UP

Flexible bronchoscopy, performed after EFB removal, revealed no bronchial sequelae (figure 5).

DISCUSSION

Food-bone and dentures are frequently encountered as EFBs in adults.^{1,4,5} EFBs can also occur following trauma. In these settings,

Figure 3 Photograph of the extracted foreign body.

Figure 4 Microscopic findings of the foreign body with H&E staining revealed a human bone tissue fragment coexisting with *Actinomyces*.

loss of consciousness may lead to a foreign body being accidentally aspirated, sometimes during intubation. If undetected, these EFBs can lead to delayed complications.^{3,6} Foreign bodies encountered following these types of traumas include car window glass, plastic, dentures, denture devices and teeth.^{1-3,6-8} Some reports have indicated that EFBs related to trauma are mostly diagnosed within a few days¹; however, other reports indicate that EFBs can remain undetected for long durations, leading to delayed complications.^{3,6} Dikensoy *et al* reported variable symptom severity on presentation with an aspirated foreign body, depending on the site of impact as well as nature of the foreign body.⁹ Given that our patient aspirated his own bone fragment, there was likely less of an inflammatory bronchial reaction resulting in his mild clinical feature despite the time since the trauma. The diagnostic value of images of EFBs depends on the nature and location of the injury.^{2,3} Chest CTs are widely used in acute care settings.^{4,5} Herget *et al* reported a case where chest CT was more useful than X-ray for evaluating EFBs

Figure 5 Endoscopic findings following flexible bronchoscopy and foreign body removal.

following severe trauma.³ Chest X-ray is sometimes sufficient to detect the EFB such as tooth or metallic objects but depending on whether the EFBs are radio-opaque, size or shape.

Chest CT will be needed when EFB is suspected but not identified by chest X-ray.

Flexible bronchoscopy or rigid bronchoscopy is a well-known procedure for removing EFBs.^{1 5 7} The presence of facial trauma can be a contraindication for rigid bronchoscopy, although there are reported cases of successful EFB extraction by rigid bronchoscopy, following failure of flexible bronchoscopy.² In contrast, some reports have indicated that flexible bronchoscopy is superior to rigid bronchoscopy in patients with spinal, jaw or skull fractures that prevent rigid bronchoscope manipulation.⁹

This case highlighted the need for evaluation of EFBs in patients who present with post-traumatic respiratory symptoms, even if mild.

Patient's perspective

I was very surprised to know that my unexplained cough was related to the traffic accident, and I was glad that my symptom improved.

Learning points

- Post-traumatic respiratory symptoms need further evaluation, including endobronchial examination.
- Chest CT is useful for evaluating endobronchial foreign body following trauma.
- Flexible bronchoscopy is used to remove an endobronchial foreign body following trauma when the patient's condition is not severe.

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REFERENCES

- 1 Lan RS. Non-asphyxiating tracheobronchial foreign bodies in adults. *Eur Respir J* 1994;7:510–4.
- 2 Madan K, Aggarwal AN, Bhagat H, *et al*. Acute respiratory failure following traumatic tooth aspiration. *BMJ Case Rep* 2013;2013:bcr2012008393.
- 3 Herget E, Hiorns MP, Mayo JR. Foreign-body aspiration as a cause of an asymmetric carina: case report. *Can Assoc Radiol J* 2004;55:13–15.
- 4 Debeljak A, Sorli J, Music E, *et al*. Bronchoscopic removal of foreign bodies in adults: experience with 62 patients from 1974–1998. *Eur Respir J* 1999;14:792–5.
- 5 Mise K, Jurcev Savicevic A, Pavlov N, *et al*. Removal of tracheobronchial foreign bodies in adults using flexible bronchoscopy: experience 1995–2006. *Surg Endosc* 2009;23:1360–4.
- 6 Zhang M, Zhou GJ, Zhao S, *et al*. Delayed diagnosis of tooth aspiration in three multiple trauma patients with mechanical ventilation. *Crit Care* 2011;15:424.
- 7 Baharloo F, Veyckemans F, Francis C, *et al*. Tracheobronchial foreign bodies: presentation and management in children and adults. *Chest* 1999;115:1357–62.
- 8 Kumar N, Goyal H, Bindra A, *et al*. Management of aspirated tooth in an adult head injury patient: report of two cases. *Saudi J Anaesth* 2014;8:276.
- 9 Dikensoy O, Usalan C, Filiz A. Foreign body aspiration: clinical utility of flexible bronchoscopy. *Postgrad Med J* 2002;78:399–403.

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