



Case report

Endobronchial use of gastrointestinal retrieval net for an aspirated dental crown

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ABSTRACT

Introduction/aim: Flexible fiberoptic bronchoscopy is generally the first line procedure for airway foreign body removal. However, removal may be challenging when surface and/or other characteristics make grasping the object difficult. We present a case in which we used a gastrointestinal retrieval net to successfully extract a dental crown, a type of foreign body with difficult-to-grasp surface characteristics.

Methods: A 72-year-old male aspirated a dental crown during an attempted molar crown fitting. Semi-emergent flexible fiberoptic bronchoscopy was undertaken using an Olympus bronchoscope with a 2.8mm working channel. Attempts at retrieval using standard forceps, and a four-wire airway retrieval basket were unsuccessful. The retrieval net (RescueNet, Boston Scientific) is a device used in gastrointestinal procedures to retrieve foreign objects, food boluses and tissue fragments. The device's external catheter is 2.5mm in diameter and is passed through the working channel of an endoscope. The handle operates in a similar manner to conventional biopsy forceps and deploys a one-sided fishnet mesh basket with an adjustable string collar that can be manipulated to enclose a target.

Results: The dental crown was easily removed with the retrieval net on the second attempt. Upon review of the literature, endobronchial usage of retrieval nets was found to be rare.

Conclusion: Clinicians should be aware that gastrointestinal retrieval nets are an option for the retrieval of airway foreign bodies.

1. Case presentation

A 72-year-old male was urgently referred by his dentist after an attempted molar crown fitting during which the dental crown was dropped into the oropharynx and aspirated.

On assessment, the patient was in no respiratory distress, but a monophonic right sided wheeze was evident. Chest x-ray (Fig. 1A) showed the dental crown lodged in the right bronchus intermedius.

Semi-emergent flexible fiberoptic bronchoscopy was undertaken using an Olympus videobronchoscope (BF-1TH190) with a 2.8mm working channel. In anticipation of a technically challenging extraction, biopsy forceps, an airway four-wire (Dormia) retrieval basket and gastrointestinal retrieval net were made available.

The retrieval net (RescueNet Retrieval Net, Boston Scientific) is a device used in gastrointestinal procedures to retrieve foreign objects, food boluses and tissue fragments such as polyps. The device's external catheter is 2.5mm in diameter and is passed through the working

channel of an endoscope. The handle operates in a similar manner to conventional biopsy forceps and deploys a one-sided fishnet-style mesh basket with an adjustable string collar that can be manipulated to enclose a target (Fig. 1B).

As anticipated, attempts at removal with toothed biopsy forceps and a four-wire airway retrieval basket were unsuccessful as the smooth metallic surface of the dental crown precluded a secure grip with either device.

The dental crown was successfully removed with the retrieval net on the second attempt (Fig. 1C); the size of the object necessitated the *en bloc* removal of the bronchoscope, retrieval net and crown. The same dental crown was successfully fitted at the patient's next dental visit and the patient's respiratory status continued to be unremarkable.

2. Review of the literature

Flexible fiberoptic bronchoscopy is generally considered to be the

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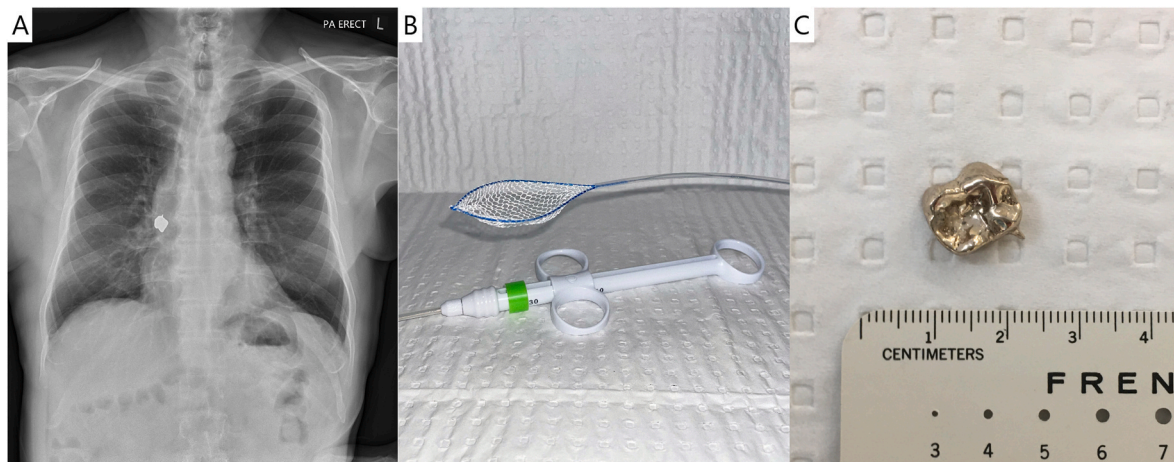


Fig. 1. A, Chest x-ray demonstrating the dental crown lodged in the distal bronchus intermedius. B, Retrieval net device: objects may be captured in the white mesh net. The handle controls the extension and retraction of the blue collar string. C, Dental crown following endoscopic removal with a retrieval net. (For interpretation of the references to colour in this figure legend, the reader is referred to the Web version of this article.)

first line procedure for airway foreign body removal and is successful in majority of cases [1,2]. However, this can present technical challenges due to the object's location, size, rotation, surface, its organic or inorganic nature and propensity to fragment. Various tools have been advocated, including simple suction, forceps, wire baskets, snares and cryobiopsy [3]. The best option is likely to vary from case to case and may be operator dependent. Where flexible bronchoscopy fails, rigid bronchoscopy may be considered and in rare cases, surgical thoracotomy may be warranted [4].

Publications detailing the bronchoscopic use of retrieval nets are rare [5]. Retrieval nets have characteristics that make them particularly suitable for situations such as extraction of small smooth objects. They may be considered when difficulties are encountered in securely grasping the foreign body with tools such as forceps or a basket, or the target object may be fragmented by manipulation. A particular advantage over Dormia airway wire baskets is the presence of a net to retain the encapsulated object.

This case also highlights the importance of pre-procedural planning and ensuring the availability of suitable instrumentation. If the retrieval net had not been available, the procedure would have been abandoned and another procedure would have to be undertaken, at considerable expense and inconvenience. Retrieval nets may be available at centers where gastrointestinal procedures are performed, independent of whether interventional pulmonology is present at that site.

Medical and dental practitioners should be aware of the potential, albeit rare, for foreign body aspiration during dental procedures. Risk factors for aspiration in adults include an altered level of consciousness, cerebrovascular disease, and dental procedures [3,6]. During dental procedures an additional risk factor for aspiration is performing the procedure in a supine position [7]. Prompt intervention may prevent complications such as post obstructive pneumonia and hemoptysis [6]. Mortality is rare but has been reported [8].

3. Conclusion

Foreign body aspiration can occur during dental procedures. Pulmonologists should consider using gastrointestinal retrieval nets to facilitate the extraction of airway foreign bodies during flexible

bronchoscopy. Retrieval nets may be available in facilities where interventional pulmonology is unavailable.

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Prior presentation

Nil.

Declaration of competing interest

I confirm that the co-authors have no conflict of interest or sources of funding to declare.

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