

Available online at www.sciencedirect.com

ScienceDirect

journal homepage: <http://Elsevier.com/locate/radcr>

Case Report

Crowning achievement: a case of dental aspiration

Nicholas M. Mark MD^a, Juan N. Lessing MD^{b,*}, Başak Çoruh MD^a^a Division of Pulmonary and Critical Care, University of Washington, Box 356522, Seattle, WA 98195, USA^b Hospital Medicine Section, Department of Medicine, University of Colorado, Mail Stop F782, 12401 E. 17th Avenue, Aurora, CO 80045, USA

ARTICLE INFO

Article history:

Received 2 September 2015

Accepted 2 September 2015

Available online 9 October 2015

Keywords:

Aspiration

Foreign body

Chest radiology

Bronchoscopy

Dental complication

ABSTRACT

Aspiration of foreign bodies during dental procedures is a rare but potentially serious complication. We present a case of a 75-year-old man who aspirated a dental crown requiring flexible bronchoscopic retrieval. We discuss the risk factors for aspiration, the radiographic features of diagnosis, and the techniques for management and retrieval.

Copyright © 2015, the Authors. Published by Elsevier Inc. under copyright license from the University of Washington. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Case report

A 75-year-old man aspirated a gold dental crown when he hiccupped during a dental procedure. He was evaluated in the emergency department immediately afterward, and focal right-sided wheezing was auscultated. A chest radiograph demonstrated a radio-opaque mass near the inferior right hilum (Fig. 1A and B). Flexible bronchoscopy was performed within hours revealing a gold crown lodged in the bronchus intermedius (Fig. 1C), which was retrieved using a basket net retrieval device (Fig. 1D and E). The patient was discharged with a temporary crown, which was ultimately replaced by the recovered gold crown.

Discussion

Aspiration of foreign bodies during dental procedures is a rare complication, occurring much less often than accidental ingestion of dental foreign bodies [1,2]. The largest review of dental aspirations, a retrospective analysis of insurance records of 24,651 French dentists over 11 years, identified only 44 cases of foreign body aspiration after a dental procedure [1]. Aspiration occurs more frequently in patients with neurocognitive disability and in those at the extremes of age. The most frequently aspirated dental objects include teeth, fillings, crowns, bridges, and dental tools [2]. Prosthesis manipulation confers a higher aspiration risk, possibly because objects become slippery after cement glue application [1]. Outside the

Conflicts of Interest: None.

Funding Sources: None.

* Corresponding author.

E-mail address: juan.lessing@ucdenver.edu (J.N. Lessing).<http://dx.doi.org/10.1016/j.radcr.2015.09.001>1930-0433/Copyright © 2015, the Authors. Published by Elsevier Inc. under copyright license from the University of Washington. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

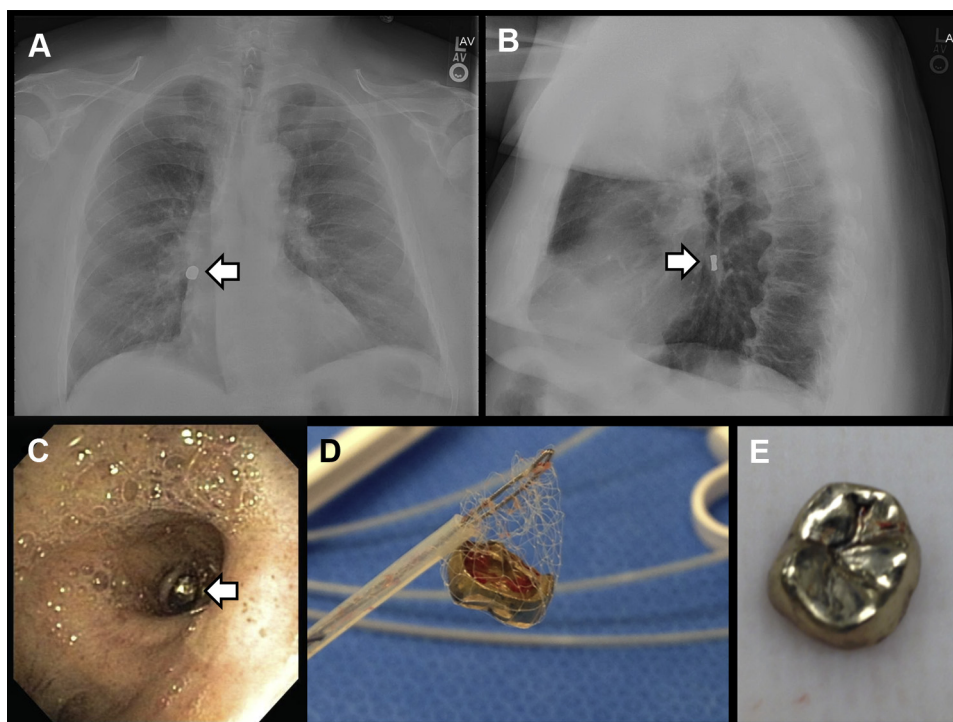


Fig. 1 – Following a dental procedure, a radio-opaque foreign body was seen on both posterior-anterior (A) and lateral (B) chest radiographs (arrows). Bronchoscopy confirmed the presence of a foreign body (C) in the bronchus intermedius (arrow), which was successfully retrieved using a basket net retrieval device (D). This recovered dental crown (E) was later re-implanted

dental office, dental aspiration can also occur in the context of seizures, trauma or, rarely, after endotracheal intubation [3].

There are several preventative strategies to minimize dental aspiration including the routine use of a rubber dam during dental work and the tying of suture or floss to the prosthesis or tools during placement to facilitate recovery. Despite this, the rate of adherence to these guidelines is reported to be less than 20% [4,5]. If aspiration does occur, patients can be instructed to cough forcefully to expel the object; however, the vast majority of dental aspirations require medical evaluation and intervention [4,6].

Detection of dental aspiration may be prompt, as in this case; however, significant delays in diagnosis have been reported and may be associated with greater morbidity [7]. It is prudent to assume that any object lost during dental manipulation has been aspirated and for the dentist to accompany the patient to a medical facility for prompt radiographic evaluation. Even asymptomatic patients should be evaluated as an aspirated object may shift causing airway obstruction.

Radiographic findings include direct visualization of a radio-opaque foreign body or identifying its effects such as atelectasis, lobar collapse, or distal hyperinflation. The most common site of tracheobronchial foreign body aspiration in adults is the bronchus intermedius because of its larger diameter and straighter course, although other airways may be affected depending on body position at the time of aspiration [8]. Computed tomography is often unnecessary, as many aspirated dental objects are radio-opaque and can be identified on a standard chest radiograph. Importantly, however, the absence

of a foreign body on radiograph does not reliably exclude aspiration and further work-up may be necessary [9].

Pulmonary consultation should be sought as bronchoscopy can confirm aspiration, and prompt retrieval may prevent complications such as atelectasis, postobstructive pneumonia, and hemoptysis [10]. Other uncommon complications of dental aspiration include airway obstruction potentially leading to hypoxemia and perforation leading to potentially fatal infectious (eg, mediastinitis) or bleeding complications.

Flexible bronchoscopy can be performed rapidly and safely under local analgesia or moderate sedation and is typically the first intervention. Several bronchoscopic techniques exist for retrieval via flexible bronchoscopy, including forceps, baskets, cages, and Fogarty balloons. In the case of occult aspiration with long latency before detection, granulation tissue can complicate object removal and potentially lead to persistent obstruction. If flexible bronchoscopy is unsuccessful, rigid bronchoscopy under general anesthesia may be required. Although the vast majority of aspirated foreign bodies can be retrieved bronchoscopically [11], occasionally a surgical approach may be necessary.

The prognosis for dental aspiration is typically excellent, as it was in this case. Morbidity, although infrequent, is attributed primarily to delays in diagnosis or to rare complications such as bleeding or perforation [7]. Occasionally, unrecognized dental aspiration may be misdiagnosed as asthma, pneumonia, bronchitis, or even cancer [7,12,13].

Dental aspiration, especially occurring during dental procedures, is a rare but important event requiring prompt

recognition, diagnosis, and treatment. Recognition of the aspirated object on chest imaging and removal of the foreign body via bronchoscopy is essential to prevent long-term sequelae.

Acknowledgment

We wish to thank Alan Rosenfeld, DDS, FACD for his editorial help and insightful comments.

REFERENCES

- [1] Susini G, Pommel L, Camps J. Accidental ingestion and aspiration of root canal instruments and other dental foreign bodies in a French population. *Int Endod J* 2007;40(8):585–9.
- [2] Tiwana K, Morton T, Tiwana P. Aspiration and ingestion in dental practice, a 10-year institutional review. *J Am Dent Assoc* 2004;135:1287–91.
- [3] Ostrinsky Y, Cohen Z. Tooth aspiration. *N Engl J Med* 2006;354:e25.
- [4] Hill EE, Rubel B. A practical review of prevention and management of ingested/aspirated dental items. *Gen Dent* 2008;56(7):691–4.
- [5] Joynt RB, Davis EL, Schreier PH. Rubber dam usage among practicing dentists. *Oper Dent* 1989;14(4):176–81.
- [6] Obinata K, Satoh T, Towfik AM, Nakamura M. An investigation of accidental ingestion during dental procedures. *J Oral Sci* 2011;53(4):495–500.
- [7] Nadjem H, Pollak S, Windisch W, Perdekamp MG, Thierauf A. Tooth aspiration: its relevance in medicolegal autopsies. *Forensic Sci Int* 2010;200(1-3):e25–9.
- [8] Baharloo F, Veyckemans F, Francis C, Bieltlot MP, Rodenstein D. Tracheobronchial foreign bodies: presentation and management in children and adults. *Chest* 1999;115(5):1357–62.
- [9] Zerella JT, Dimler M, McGill LC, Pippus KJ. Foreign body aspiration in children: value of radiography and complications of bronchoscopy. *J Pediatr Surg* 1998;33(11):1651–4.
- [10] Lu A, Aronowitz P. Better if left under pillow. *J Gen Intern Med* 2010 Aug;25(8):873.
- [11] Black RE, Johnson DG, Matlak ME. Bronchoscopic removal of aspirated foreign bodies in children. *J Pediatr Surg* 1994;29(5):682–4.
- [12] Yilmaz A, Akkaya E, Damadoglu E, Gungor S. Occult bronchial foreign body aspiration in adults: analysis of four cases. *Respirology* 2004;9:561–3.
- [13] Yurdakul AS, Kanbay A, Kurul C, Yorgancilar D, Demircan S, Ekim N. An occult foreign body aspiration with bronchial anomaly mimicking asthma and pneumonia. *Dent Traumatol* 2007;23:368–70.