Navigating the Risks of Dental Aspiration in Older Adults: A Case Study of Prompt Diagnosis and Intervention

Louise Cardoso Fava Ferreira dos Santos[1], Marcelo de Queiroz Pereira da Silva[2], Márcio Luís Duarte[1,3]

[1] Universidade de Ribeirão Preto – Campus Guarujá, Guarujá (SP), Brazil;
[2] WEBIMAGEM Telerradiologia, São Paulo (SP), Brazil;
[3] Diagnósticos da América S. A., São Paulo (SP), Brazil

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Abstract: Foreign body aspiration is a significant cause of respiratory distress in geriatric patients, often leading to severe complications if not promptly identified and treated. Dental materials account for approximately 15–20% of foreign body aspirations in adults, with symptoms that can include dyspnea, localized wheezing, and, in some cases, cyanosis and pneumonia. We report the case of a 60-year-old man who aspirated a dental crown, resulting in shortness of breath. A computed tomography scan revealed the crown lodged in the left main bronchus. The patient underwent successful bronchoscopy for foreign body removal and experienced a full recovery without complications. Neurological conditions, such as epilepsy or Parkinson's disease, increase the risk of aspiration, particularly in elderly patients, in which symptoms may be misdiagnosed due to their nonspecific presentation. While the right bronchus is more commonly affected due to anatomical structure, foreign body aspiration in the left bronchus also warrants attention. This case underscores the importance of rapid imaging and bronchoscopy to reduce the risk of morbidity and mortality from aspiration events. Increased awareness and timely intervention are essential for improving patient outcomes in cases of dental and other foreign body aspirations in older populations.

Mailing Address: Dr. Márcio Luís Duarte, Universidade de Ribeirão Preto (UNAERP) – Campus Guarujá, Av. D. Pedro I, 3.300, Enseada, Guarujá (SP), 11440-003, Brazil; Phone: 005 513 981 112 799; e-mail: marcioluisduarte@gmail.com

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Introduction

Foreign body aspiration is a common cause of respiratory distress, particularly among geriatric patients, and can be life-threatening (Lin et al., 2014). Dental aspiration accounts for approximately 15–20% of all foreign body cases in adults. Symptoms may include reduced vesicular breath sounds, localized wheezing, pneumonia, dysphonia, dysphagia, asphyxia, cyanosis, dyspnea, fatigue, fever, hypertension, and tachycardia. Dental aspiration can cause airway obstruction, and in severe cases, asphyxia death and cardiac impairment (Xu et al., 2023).

These symptoms may mimic other respiratory diseases such as pneumonia or bronchitis, or even an exacerbation of an underlying geriatric disease (Lin et al., 2014). Clinical presentation on elderly patients may be obscure, probably due to its nonspecific symptoms and history, delay on bronchoscopy intervention and other reasons. Identification and removal of foreign body is of utmost importance to avoid complications as: pneumonia, hemoptysis and granulation tissue (Lin et al., 2014). A long time dental foreign body in the bronchus can result in tissue changes like edema, pressure necrosis, inflammatory response, increased bronchial wall vulnerability. Due to the radiopaque nature of dental materials, suspected cases of dental aspiration should be promptly evaluated with a chest X-ray or computed tomography (CT) scan (Xu et al., 2023).

Here, we report the case of a 60-year-old man with shortness of breath after accidental dental crowning resolved with bronchoscopy.

Case report

A 60-year-old man presented to the emergency department with sudden-onset shortness of breath following the accidental aspiration of a dental crown approximately 10 minutes prior. His medical history included systemic arterial hypertension and diabetes mellitus, both of which were under regular treatment. On physical examination, the patient was alert and hemodynamically stable, with a blood pressure of 144/87 mm Hg, a heart rate of 99 beats per minute, and an oxygen saturation level of 93% on room air. Despite his complaints of dyspnea, pulmonary and cardiac auscultations were unremarkable, with no wheezing, stridor, or abnormal heart sounds detected.

CT scan of the chest was promptly performed, revealing the presence of a foreign body – a tooth crown – lodged in the left main bronchus (Figure 1). This finding corroborated the patient's clinical history and provided clear localization of the aspirated object. Given the risk of airway obstruction and potential complications such as atelectasis, infection, or bronchial injury, immediate intervention was deemed necessary.

The patient was taken for urgent bronchoscopy under sedation, during which the dental crown was successfully retrieved from the bronchial lumen without any complications. Post-procedure, the patient reported significant relief of his symptoms. Following a brief period of observation to ensure stability and absence of any respiratory or procedural complications, he was discharged home in good condition. He was advised to follow-up with his dentist for further evaluation and management of his dental prosthesis.

Informed consent for the publication of this case report and accompanying images was obtained from the patient.

Discussion

Neurologic injuries affecting the airways, seen in conditions such as Parkinson's disease, seizures, and altered mental states caused by alcohol, drugs, and sedatives, as well as during dental procedures and trauma resulting in loss of consciousness, are the most frequent causes of foreign body aspiration in adults (Jeon et al., 2021). Some of traumatic event's causes are: maxillofacial trauma, oral surgery with general anesthesia, adenotonsillectomy, dental extraction and endotracheal intubation (Xu et al., 2023).

Patients with epilepsy are predisposed to aspiration because of impaired cognition, seizures, suppression of cough and swallowing reflexes by sedatives and laryngeal function (Xu et al., 2023). Specially in geriatric patients, the incidence of foreign body aspiration increases with advancing in age, and aspiration can cause life threat (Lin et al., 2014). Foreign body in the airways of elderly people are frequently diagnosed as a result of pneumonia condition or respiratory failure needing to be removed rapidly (Ishimoto et al., 2021). The incidence of foreign body aspiration is particularly higher in long-term residential mental health facilities (Kim, 2014).

Although the right bronchus is more commonly affected (60% of cases), healthcare professionals should also be vigilant for foreign bodies in the left bronchus, which occur in 40% of cases (Jeon et al., 2021). The right main bronchus is more predisposed to foreign body impaction because it is larger and has a more direct continuation of the trachea compared to the left main bronchus. The angle between the right bronchus and the trachea is approximately 20–25°, whereas the angle for the left bronchus is about 40–50° (D'Addio et al., 2022). Health professionals must be alert to

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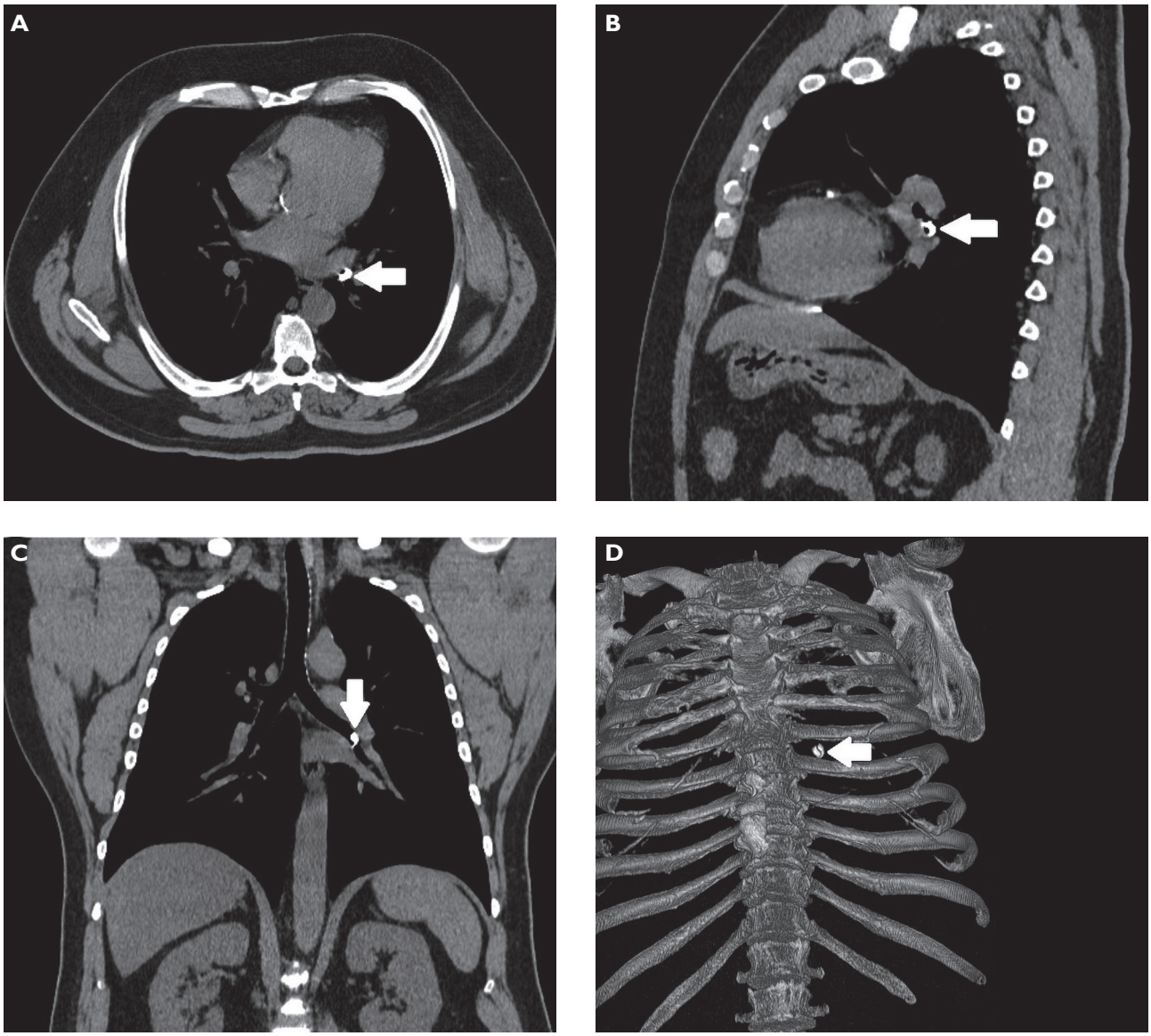

Figure 1: Computed tomography in the axial (A), sagittal (B) and coronal (C) sections, in addition to 3D reconstruction (D) demonstrating a dental crown in the left main bronchus (white arrows).

cases of foreign body in the left bronchus, even if this is not the most common (Bittencourt and Camargos, 2002).

CT scan reveals a foreign body as a dense structure within the bronchial lumen. Additionally, secondary changes such as volume loss, bronchiectasis, and hyperlucency due to air trapping are clearly visualized on a thoracic CT scan (Keny and Kakodkar, 2016). Fortunately, due to the prompt treatment of the patient in this case, none of these complications occurred. Bronchoscopy is the preferred method for diagnosing and removing airway foreign bodies because it is easy to use and typically requires only minimal general anesthesia. The bronchoscopy significantly reduces the mortality rate from aspiration from 50% to less than 1% (Jeon et al., 2021).

Conclusion

Foreign body aspiration, particularly of dental materials, poses a serious risk in geriatric patients, as it can mimic other respiratory conditions and lead to complications if not promptly identified and treated. This case of a 60-year-old man who aspirated a dental crown highlights the critical role of early imaging and intervention in preventing severe outcomes. Despite the left bronchus being less commonly affected than the right, this case reinforces the importance of vigilance in all bronchi, as swift diagnosis and bronchoscopy can prevent further complications such as pneumonia, tissue damage, and respiratory failure. Given that dental aspiration may occur during routine procedures and in patients with predisposing neurological conditions, health

professionals must consider foreign body aspiration in cases of unexplained respiratory symptoms. Prompt bronchoscopy remains the gold standard for foreign body removal, significantly reducing mortality and morbidity. This case underscores the need for increased awareness and preparedness in managing dental aspiration cases, especially in high-risk groups, to optimize patient outcomes.

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