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Case Report

Uncommon cause of chest pain: Case report of esophageal foreign body diagnosed by chest computed tomography scan ☆☆☆

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ABSTRACT

A 44-year-old man with a history of epilepsy presented with mild, persistent chest pain lasting 3 days, despite normal cardiac evaluations. A chest computed tomography scan revealed 3 artificial dental prostheses lodged in his esophagus, which the patient had inadvertently swallowed during a recent seizure. Endoscopic removal of the foreign bodies resolved his chest pain without complications. This case emphasizes the importance of considering esophageal foreign bodies as a differential diagnosis for persistent chest pain, particularly in patients with neurological conditions, and highlights the role of early imaging for accurate diagnosis and timely intervention.

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Introduction

Chest pain is a common complaint with various life-threatening causes. A comprehensive workup is crucial to rule out serious pathology before examining more benign causes. Interprofessional teams play a vital role in caring for patients with chest pain, ensuring they are treated effectively

and without complications [1]. Chest pain is a common emergency department complaint, affecting 5%-10% of adult emergency department visits [2]. Life-threatening causes include acute coronary syndrome, pulmonary embolism, pneumothorax, pericardial tamponade, aortic dissection, and esophageal perforation. Other common causes include gastrointestinal reflux disease, musculoskeletal causes, pneumonia/pleuritis, and herpes zoster [1,3].

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One of the scare causes of chest pain is esophageal foreign bodies. Esophageal foreign bodies are common in children and certain adult populations, including those with psychiatric disorders and alcohol dependence. Approximately 80% of cases occur in children, with 10% to 20% requiring intervention and 1% requiring surgery [4]. Timely diagnosis and early endoscopic evaluation can prevent potentially fatal complications like perforation, mediastinitis, and fistula formation [5]. Here we report a case of esophageal foreign body presented with persistent chest pain for 3 days.

Case presentation

A 44-year-old man presented to our emergency department with persistent mild chest pain that had started 3 days earlier. The chest pain was not associated with physical activity, respiration, nausea, vomiting, or dyspnea. The pain was continuous and was reported to be diffuse and vague in the middle part of the chest. During this period, he visited 3 medical centers where cardiac causes were investigated, including multiple electrocardiograms (ECGs) and serial cardiac enzyme tests, all of which returned normal results (troponin-negative numerous times).

The patient had no significant past medical history, except for a diagnosis of epilepsy, for which he was being treated with valproate sodium. His last seizure, which included a loss of consciousness and a generalized tonic-clonic event, occurred 8 days before this presentation. He reported no fever or dyspnea. On physical examination, his vital signs were stable. Cardiac and pulmonary auscultation revealed no abnormal findings. Given the continuation of his symptoms, a negative cardiac workup, and the lack of imaging investigations, an imaging study was conducted. A chest computed tomography (CT) scan revealed 3 artificial dental joints lodged in the middle esophagus (Fig. 1).

Upon further inquiry, the patient recalled experiencing a seizure 5 days prior, during which he lost consciousness on the street. He suspected that he had lost his dental prosthesis during this event but did not report any immediate symptoms of ingestion. Due to missing teeth, the patient has had to eat soup and soft foods for the last few days. The patient was consulted with the gastroenterology service, and the foreign body was successfully extracted through an endoscopic procedure (mucosal abrasion reported with no perforation) the same day without complications. The chest pain resolved about 12 hours later. The patient followed for 2 weeks after the procedure and no complications were reported.

Discussion

Esophageal foreign body (EFB) impaction is uncommon in adults but can result in significant morbidity if not promptly diagnosed and treated [6]. This case, involving a 44-year-old man with a history of epilepsy, underscores the need to consider EFBs in patients presenting with chest pain, especially when conventional evaluations fail to provide a clear diag-

nosis. Epileptic patients are at higher risk for ingesting foreign bodies during seizures, as occurred in this case where the patient accidentally swallowed his dental prosthesis bodies can present with symptoms mimicking more common causes of chest pain, such as cardiac, gastrointestinal, or pulmonary conditions. As this case demonstrates, a cardiac evaluation yielded no abnormalities, necessitating further investigation into other potential causes of persistent chest pain. Advanced imaging a chest CT scan, remains crucial for diagnosing EFBs, especially when plain radiographs do not reveal the foreign object. Chest computed tomography scan (CTs) was crucial in this case for several reasons. First, it was essential to seek further imaging after multiple normal cardiac evaluations, which did not explain the persistent chest pain. Additionally, CTs imaging helps exclude other potential causes of chest pain, such as aortic dissection or pulmonary embolism, by visualizing structures in greater detail. Chest CTs provides detailed cross-sectional images that can clearly identify esophageal foreign bodies. It also assesses for complications related to the foreign body, such as perforation or mediastinitis, guiding timely and appropriate management. CTs imaging successfully revealed the 3 dental prosthesis fragments lodged in the patient's mid-esophagus, facilitating timely treatment.

When evaluating EFBs, plain radiographs are often used initially, but their sensitivity is limited, particularly for non-radiopaque objects like dental prostheses [7]. Proper positioning during radiographs can enhance visualization but may still miss objects composed of plastic or organic material [8]. In contrast, CTs offers superior detection of EFBs and is particularly useful for identifying complications such as perforation or mediastinitis. CTs should be considered when radiographs are inconclusive, as it provides clearer imaging of both the foreign body and surrounding tissues [9].

The management of EFBs in adults typically depends on the type, size, and location of the object, as well as the duration of impaction and the patient's symptoms. Most esophageal foreign bodies are managed with endoscopic removal, which is the gold standard for treatment. Flexible endoscopy is preferred due to its high success rate and low complication rate. Early intervention is critical, especially for sharp objects or those causing symptoms, to prevent complications like esophageal perforation, mediastinitis, or fistula formation. Timing is crucial; foreign bodies impacted for over 24 hours significantly increase the risk of complications [10,11].

In cases where the object is not immediately life-threatening, spontaneous passage may be observed, particularly for small and blunt objects. For large or irregularly shaped objects, endoscopy should be performed within 24 hours of ingestion. If endoscopic removal fails or is contraindicated, surgical intervention may be required, though this is rare. Conservative management is reserved for asymptomatic patients or when the object has already reached the stomach and is expected to pass naturally [12,13].

Patients with EFBs frequently present to the emergency department with chest pain, a symptom that often overlaps with more common cardiac and pulmonary conditions. In this case, the patient visited multiple medical centers, where cardiac evaluations were prioritized, yet the true cause of his chest pain remained undiagnosed until advanced imaging was per-

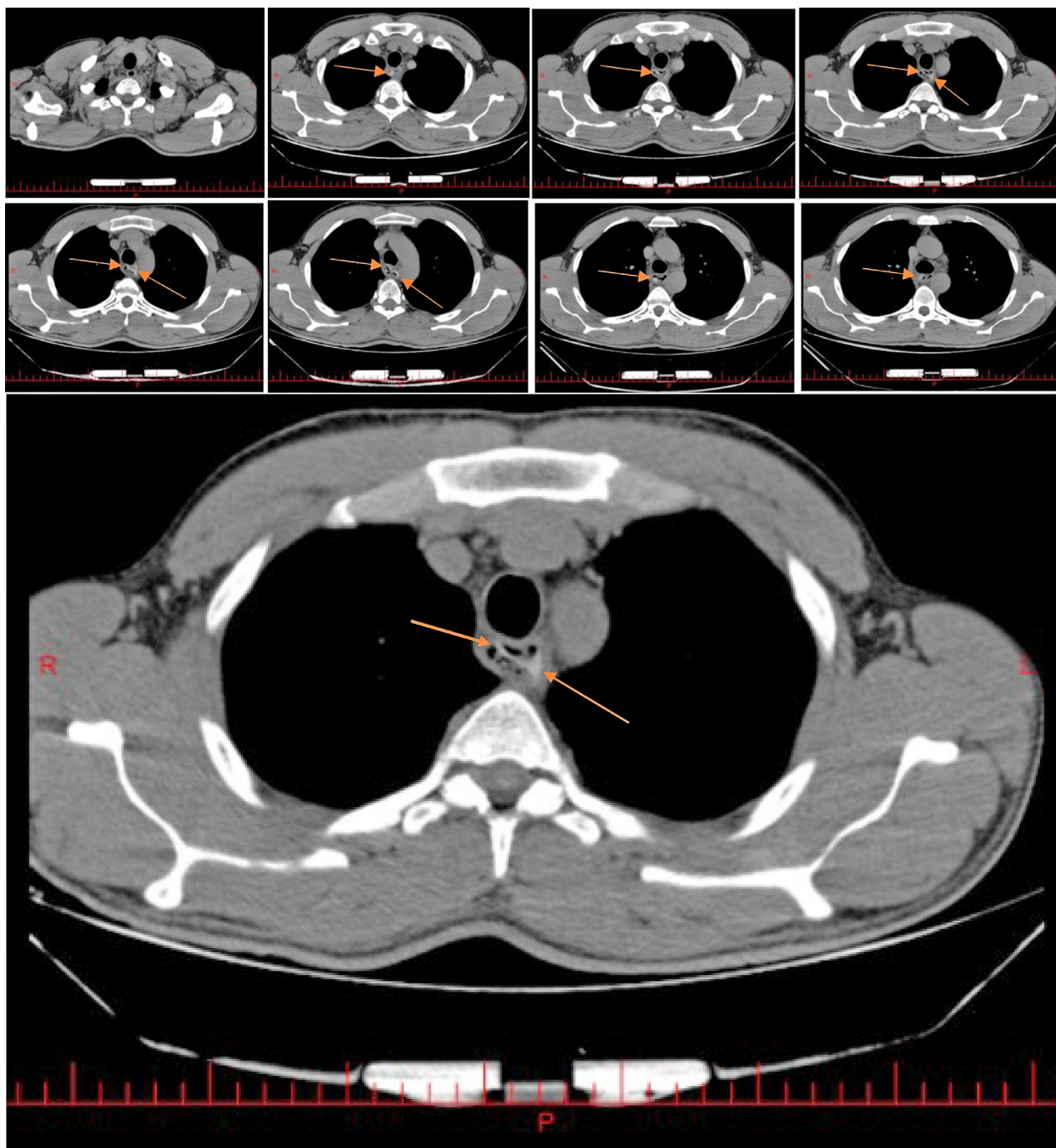


Fig. 1 – Chest computed tomography scan that showed foreign bodies (dentures) in the middle part of the esophagus (red arrows).

formed. This underscores the critical role of thorough history-taking and the inclusion of EFBs in the differential diagnosis, especially for patients with neurological conditions, such as epilepsy, that increase the risk of foreign body ingestion. A detailed history—such as recent seizures or dental prosthesis loss—combined with targeted imaging, like a chest CT scan, is essential to avoid diagnostic delays. This approach ensures timely intervention and prevents complications that might arise from undiagnosed esophageal foreign bodies, as demonstrated in this case.

Conclusion

This case emphasizes the need for a broad differential diagnosis when evaluating persistent chest pain, particularly in patients with neurological or psychiatric conditions. Esophageal foreign bodies should be considered, and early imaging is crucial for detection. Endoscopic removal remains the gold standard for treatment, with timely intervention being key to preventing complications. Future cases should continue to focus

on rapid diagnosis and management to ensure the best possible outcomes .

Author contributions

Taheriniya Ali: Conceptualization, Data Curation, Supervision. Chaghamirzayi Pouria: Writing- Reviewing and Editing, Project administration, Software. Safaie Hasan: Data curation, Writing- Original draft preparation. Karimi Rozveh Javad: Writing- Reviewing and Editing, Data curation. Azizmanesh Mohammad: Writing- Reviewing and Editing, Software. All authors read and approved the final manuscript.

Ethical statements

All authors and patients agreed to publish this article. Written informed consent was obtained from the patients to publish this case report and any accompanying images. A copy of the written permissions is available for review by the Editor-in-Chief of this journal. Ethical approval for this case report was not required as per the policies of the Ethics Committee of Alborz University of Medical Sciences. According to the institutional guidelines, case reports are considered exempt from ethical approval as they do not constitute research involving systematic investigation. This policy is in alignment with the guidelines of the Ethics Committee of Alborz University of Medical Sciences (IR.NREC.013.1395.12).

Availability of data and materials

All data generated or analyzed during this study are included in this published article (available).

Patient consent

All authors and patients agreed to publish this article. Written informed consent was obtained from the patients to publish this case report and any accompanying images. A copy of the written permissions is available for review by the Editor-in-Chief of this journal.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at [doi:10.1016/j.radcr.2024.09.122](https://doi.org/10.1016/j.radcr.2024.09.122).

REFERENCES

- [1] Johnson K, Ghassemzadeh S. Chest pain. StatPearls, Treasure IslandFL: StatPearls Publishing; 2024. Copyright © 2024, StatPearls Publishing LLC..
- [2] Kuhlman J, Moorhead D, Kerpchar J, Peach DJ, Ahmad S, O'Brien PB. Clinical transformation through change management case study: chest pain in the emergency department. *eClin Med* 2019;10:78–83.
- [3] Fruergaard P, Launbjerg J, Hesse B, Jørgensen F, Petri A, Eiken P, et al. The diagnoses of patients admitted with acute chest pain but without myocardial infarction. *Eur Heart J* 1996;17(7):1028–34.
- [4] Koyuncu N, Yilmaz S, Soysal S. An unusual cause of chest pain: foreign body in the oesophagus. *Emerg Med J* 2007;24(1):e1.
- [5] Pink K. The case of the missing dentures: a case report and review of esophageal foreign body as a cause of chest pain. *Cureus* 2022;14(7):e26898.
- [6] Triadafilopoulos G, Roorda A, Akiyama J. Update on foreign bodies in the esophagus: diagnosis and management. *Curr Gastroenterol Rep* 2013;15(4):317.
- [7] Aras MH, Miloglu O, Barutçugil C, Kantarci M, Özcan E, Harorli A. Comparison of the sensitivity for detecting foreign bodies among conventional plain radiography, computed tomography, and ultrasonography. *Dentomaxillofac Radiol* 2010;39(2):72–8.
- [8] Nadir A, Sahin E, Nadir I, Karadayi S, Kaptanoglu M. Esophageal foreign bodies: 177 cases. *Dis Esophagus* 2011;24(1):6–9.
- [9] Liu YC, Zhou SH, Ling L. Value of helical computed tomography in the early diagnosis of esophageal foreign bodies in adults. *Am J Emerg Med* 2013;31(9):1328–32.
- [10] Hong KH, Kim YJ, Kim JH, Chun SW, Kim HM, Cho JH. Risk factors for complications associated with upper gastrointestinal foreign bodies. *World J Gastroenterol* 2015;21(26):8125.
- [11] Zanchetta M, Monti E, Latham L, Costa J, Marzorati A, Odeh M, et al. Dental prosthesis in esophagus: a right cervicotomy approach. *Life (Basel)* 2022;12(8):1170.
- [12] Orji FT, Akpeh JO, Okolugbo NE. Management of esophageal foreign bodies: experience in a developing country. *World J Surg* 2012;36(5):1083–8.
- [13] Boo S-J, Kim HU. Esophageal foreign body: treatment and complications. *Korean J Gastroenterol* 2018;72(1):1–5.