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Perforation of the esophagus: an overlooked cause of chest pain as a complication of esophageal foreign bodies

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Chest pain is one of the most common complaints in the emergency department. Diseases of the heart, aorta, lungs, esophagus, stomach, mediastinum, pleura, and abdominal viscera can all cause chest discomfort (Gulati et al., 2021; Jiao et al., 2021; Lu et al., 2022). Clinicians in the emergency department are expected to immediately recognize life-threatening chest pain (Jiao et al., 2021). Delayed diagnosis further increases the risk of complications and mortality (Liu et al., 2021). In this case, we present an elderly Chinese female who had a history of myocardial infarction two years previously, with chest pain eventually found to be caused by ingestion of a duck bone.

A 67-year-old Chinese woman was presented to the emergency department of the First Affiliated Hospital, Zhejiang University School of Medicine (Hangzhou, China), with recurrent chest pain lasting 4 d. Considering that she had a history of myocardial infarction and had undergone a right distal coronary stent implantation performed two years earlier, she was admitted to the local hospital on the first day with an initial diagnosis of acute coronary syndrome. However, the laboratory tests (including myocardial enzyme spectrum, troponin, and cardiac ultrasound) did not reveal any significant abnormality. The electrocardiogram showed paroxysmal atrial fibrillation. Initially, no chest X-ray was performed. Despite receiving conservative treatment of antiischemic and antiplatelet therapy and ventricular rate control for atrial fibrillation to improve her heart symptoms, the patient still suffered from chest pain, accompanied by fever (the highest body temperature was 38.9 ℃) and mildly poor appetite, but no dysphagia or salivation. The laboratory tests showed a gradually increased level of C-reactive protein (101.74 mg/L). The patient was subsequently transferred to our hospital. After taking a comprehensive medical history, we found that she had eaten a cooked duck four days earlier. A computed tomography (CT) scan of the chest was then performed, and indicated a sharp foreign body at the lower end of the esophagus with perforation; there was also pleural effusion on both sides with collapsed lung tissue (Fig. 1a). An emergency endoscopy for esophageal foreign body (EFB) removal was performed under general anesthesia (Figs. 1b and 1d; Video S1) and a duck bone about 3 cm in length was removed from her esophagus (Fig. 1c). The patient's chest pain was greatly relieved after the operation. Considering the age of the patient and the esophageal perforation with pulmonary and pleural inflammation, we administered broad-spectrum antibiotics (linezolid and meropenem) intravenously for 3 d. The levels of inflammatory indicators gradually decreased and the chest pain disappeared. The patient was discharged 12 d after admission. At a one-month follow-up, the patient had a favorable outcome.

Ingestion of a foreign body can cause chest pain, and the esophagus is the most frequent site of obstruction in the gastrointestinal tract due to luminal narrowing. In cases of EFB ingestion, patients may experience life-threatening symptoms such as cervical abscesses, mediastinitis, aortoesophageal abscesses, tracheoesophageal fistulae, pneumonia, pneumothorax, or hemorrhage; these often occur in association with

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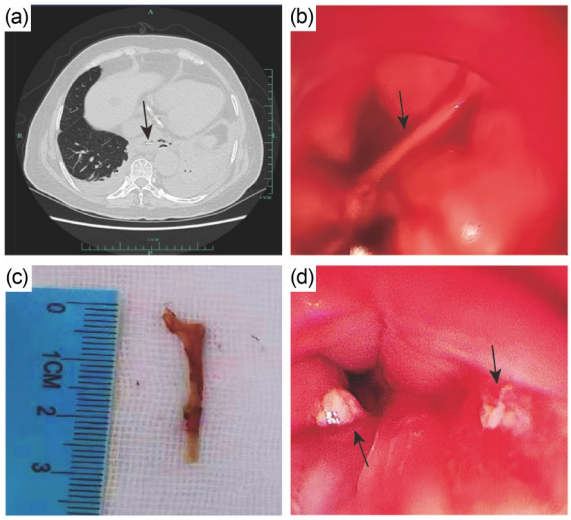

Fig. 1 Images of the esophageal foreign body. (a) The chest computed tomography (CT) suggested a foreign body at the end of the esophagus (indicated by the black arrow). Gas accumulation on the left side and perforation was found, along with bilateral pneumonia, bilateral pleural effusion, and partial distension of the left lower lobe. (b) A foreign body (indicated by the black arrow) was inserted into the wall of the esophagus at 35 cm of the esophagus from the incisor, and produced pus emission. (c) The esophageal foreign body: a duck bone approximately 3 cm in length. (d) The mucosa of the upper esophagus was swollen after removal of the foreign body.

aortic pseudoaneurysms, aortoesophageal fistulae, or aortic dissection (Zhao and Lu, 2014; Ruan et al., 2020), most of which are caused by esophageal perforation (Ruan and Lu, 2020). All EFBs should be removed within 24 h. Emergency endoscopy is preferably performed within 2–6 h on patients with complete esophageal obstruction, disk batteries, or sharp-pointed objects in the esophagus, since the risk of complications increases dramatically over time (Birk et al., 2016).

China has a diverse food culture, and many Chinese people are accustomed to gnawing on chicken, duck, and pork bones, greatly increasing the risk of EFBs in adults (Ruan et al., 2020). In this case, the patient's previous history of coronary artery disease and inflammatory manifestations interfered with the initial diagnosis. Therefore, it is of great importance for clinicians to ask detailed questions about disease onset, not only with regard to past medical history, but also diet. When a young clinician is faced with a patient with multiple clinical symptoms, he or she should follow the principle of monism whenever possible, meaning that they should attempt to explain two or more clinical manifestations as being caused by one disease or pathophysiological mechanism.

In conclusion, EFB is often overlooked by clinicians as a cause of chest pain due to less detailed etiological factors. Even if the patient has a history of heart disease, the possibility of EFB ingestion must be considered. Timely endoscopic intervention can prevent complications such as esophageal ulcers, esophagorrhagia, and pulmonary infection, leading to a better prognosis and a shorter hospital stay.

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Author contributions

Chengfan QIN studied the concept and prepared the first draft of the manuscript. Yunmei YANG made critical revisions to the article. Yuanqiang LU checked and confirmed the final version. All authors have read and approved the final manuscript.

Compliance with ethics guidelines

Chengfan QIN, Yunmei YANG, and Yuanqiang LU declare that they have no conflict of interest.

All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2013. Informed consent was obtained from the patient for being included in the study. This study protocol was approved by the Ethics Committee of the First Affiliated Hospital, Zhejiang University School of Medicine (Study ID: 20230164).

References

Birk M, Bauerfeind P, Deprez PH, et al., 2016. Removal of foreign bodies in the upper gastrointestinal tract in adults: European Society of Gastrointestinal Endoscopy (ESGE) Clinical Guideline. *Endoscopy*, 48(5):489-496. https://doi.org/10.1055/s-0042-100456

Gulati M, Levy PD, Mukherjee D, et al., 2021. 2021 AHA/ACC/ASE/CHEST/SAEM/SCCT/SCMR Guideline for the Evaluation and Diagnosis of Chest Pain: a report of the American College of Cardiology/American Heart Association Joint Committee on Clinical Practice Guidelines. *Circulation*, 144(22):e368-e454. https://doi.org/10.1161/CIR.0000000000001029

Jiao Y, Wang JH, Yang X, et al., 2021. Evaluation of the prognostic ability of serum uric acid for elderly acute coronary syndrome patients with diabetes mellitus: a prospective cohort study. *J Zhejiang Univ-Sci B (Biomed & Biotechnol)*, 22(10):856-865. https://doi.org/10.1631/jzus.B2000637

Liu CY, Chen SX, Zhang HF, et al., 2021. Bioinformatic analysis for potential biological processes and key targets of heart failure-related stroke. *J Zhejiang Univ-Sci B (Biomed & Biotechnol)*, 22(9):718-732. https://doi.org/10.1631/jzus.B2000544

Lu JQ, Liu JY, Li A, 2022. Roles of neutrophil reactive oxygen species (ROS) generation in organ function impairment in sepsis. *J Zhejiang Univ-Sci B (Biomed & Biotechnol)*, 23(6):437-450. https://doi.org/10.1631/jzus.B2101075

Ruan WS, Lu YQ, 2020. The life-saving emergency thoracic endovascular aorta repair management on suspected aortoesophageal foreign body injury. *World J Emerg Med*, 11(3):152-156. https://doi.org/10.5847/wjem.j.1920-8642.2020.03.004

Ruan WS, Li YN, Feng MX, et al., 2020. Retrospective observational analysis of esophageal foreign bodies: a novel characterization based on shape. *Sci Rep*, 10:4273. https://doi.org/10.1038/s41598-020-61207-8

Zhao XH, Lu YQ, 2014. Multiple embolisms resulted from a huge fishbone piercing the left atrium. *Intensive Care Med*, 40(4):621-622. https://doi.org/10.1007/s00134-014-3232-9

Supplementary information

Video S1