



(CASE REPORT)



## Pulmonary injury following foreign body perforation of the esophagus: A case report

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### Abstract

The ingestion of foreign bodies is a common emergency, particularly in children, but it can occur at any age. We report a case of 20-year-old patient with no medical history ingested a chicken bone during a meal, leading to unsuccessful endoscopic extraction at a local hospital. CT scanning revealed esophageal perforation at T4 level with erosion of the right pulmonary parenchyma near the azygos arch. A right posterolateral thoracotomy was performed, with successful removal of the bone fragment and closure of the esophageal perforation. Postoperative recovery was uneventful, and the patient discharged after 20 days and remaining stable at a 6-month follow-up. This case underscores the importance of prompt diagnosis and multidisciplinary management to prevent severe complications from foreign body ingestion.

**Keywords:** Esophagus; Foreign Body; Perforation; Surgery; Thoracotomy

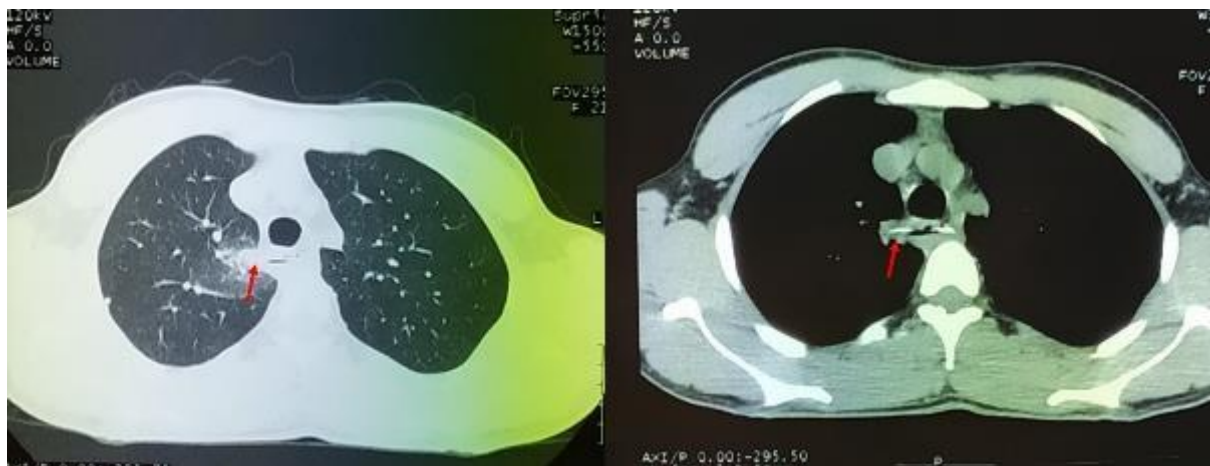
### 1. Introduction

The ingestion of foreign bodies is a common reason for consultation in pediatric emergency departments; however, this phenomenon can occur at any age [1]. In adult population, this condition is mostly associated with mental illness [2]. Eating habits condition certain types of foreign bodies and the age of patients, as children in the oral phase are at risk [3]. Although the development of endoscopy has considerably reduced mortality, ingested foreign bodies remain a source of morbidity in developing countries due to often inaccessible diagnostic resources and their frequency. Surgery is exceptionally required and is necessary when endoscopic extraction is impossible or in the event of complications such as perforation or mediastinitis [4].

### 2. Case Presentation

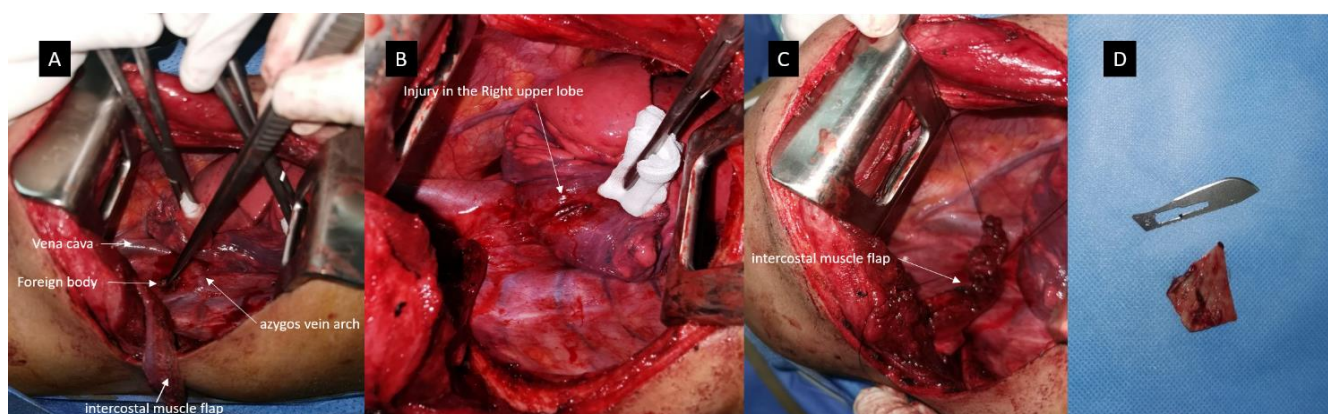
We report the case of a 20-year-old patient with no significant medical history who was admitted to the emergency department of the local hospital in his hometown after ingesting a foreign food body (chicken bone) during a meal. An attempt at endoscopic extraction was performed on-site without success, and he was subsequently transferred to our Department. Upon admission, he was hemodynamically stable but complained of retrosternal pain with dysphagia and sialorrhea. The blood tests demonstrated a normal hemoglobin rate with elevated C-reactive protein (CRP) and white blood cell count (WBC). CT scanning of the neck and chest revealed a foreign body perforating the esophageal wall at the T4 level with erosion of the adjacent right pulmonary parenchyma (Figure 1).

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**Figure 1** Chest CT scan showing a foreign body perforating the esophageal wall at the T4 level with erosion of the adjacent right pulmonary parenchyma.

The patient was taken to the operating room, where a right posterolateral thoracotomy with intercostal muscle flap harvest was performed. Surgical exploration revealed a protruding bone fragment through the posterior mediastinum just above the azygos vein arch, with a sharp end causing an injury to the mediastinal face of the adjacent pulmonary parenchyma. The foreign body was removed after dissection of the mediastinal pleura, and a nasogastric tube was placed by the anesthesiologist. The esophageal perforation was closed with two-layer sutures reinforced by the previously harvested intercostal flap (Figure 2).



**Figure 2** Intraoperative images showing the different stages of the foreign body removal and esophageal perforation closure: A: Protrusion of the foreign body through the mediastinum above the azygos arch. B: right upper lobe injury adjacent to the end of the foreign body. C: Transposition of the flap to the esophagus. D: the extracted bone fragment.

Immediate postoperative recovery was uneventful, aggressive antibiotic treatment was given from admission for total 14 days. Nasogastric tube feeding was gradually implemented on the 8th day, and 5 days later he could drink water from his mouth without discomfort. He was able to tolerate oral intake and was finally discharged after 20 days of admission.

His condition remained stable after 6 months of follow-up from the time of discharge.

### 3. Discussion

The population of patients ingesting foreign bodies is primarily pediatric, with 80% of cases, peaking in frequency between 6 months and 3 years (70%) and 30% between 3 and 12 years [2,3,5]. Alcoholics and patients with a history of malformations or digestive surgery are at risk, as well as edentulous and elderly adults [5,6]. Certain eating habits favor the accidental ingestion of foreign food bodies [3]. In our case, the foreign body was a fragment of chicken bone ingested during a meal.

In most cases, the diagnosis is made through patient history. However, in rare cases where the diagnosis is difficult, it is important to question the patient's entourage. Blockages typically occur at the cricopharyngeal muscle, the aortic arch, and the lower esophageal sphincter [3,5,7]. Ingestion is symptomatic in many cases, especially when the foreign body remains lodged in the esophagus for a long time or when it involves long or sharp objects that perforate the esophagus [8]. Symptoms can include retrosternal pain, dysphagia, odynophagia, sialorrhea, and sometimes vomiting for large and blunt objects that create an obstructive syndrome necessitating urgent extraction [6,7]. Bleeding and perforation occur with sharp, irritating, or perforating foreign bodies [1,7].

The majority of ingested foreign bodies are radiopaque and visible on an expanded chest radiograph including the neck and gastric cavity [4]. In the neck and chest, a lateral view confirms the posterior position of the esophageal foreign body relative to the anterior clear spaces of the larynx, trachea, and carina. Metallic foreign bodies are usually radiopaque; these include coins, batteries, needles, and pins. However, cartilage, bones, fishbones, plastic pieces, and sometimes glass or alloy may not always be radiopaque [4,5,9].

Endoscopy can be performed immediately in cases of suspected radiolucent foreign bodies, allowing for both diagnosis and gentle extraction to avoid complications. Management depends on the type of ingested object and its location. Sharp objects are an emergency if impacted in the esophagus due to the risk of perforation or hemorrhage [9]. Objects thicker than 2.5 cm and longer than 6 cm that create an obstructive syndrome require urgent extraction [7,10]. Endoscopic extraction attempts should be abandoned after 2 or 3 tries in favor of further imaging, such as a CT scan, to avoid iatrogenic injury [10]. In our patient, the diagnosis was confirmed by endoscopy, and extraction was attempted unsuccessfully due to the foreign body being lodged in the esophageal wall. Immediate CT scan revealed esophageal perforation with erosion of the adjacent pulmonary parenchyma.

Foreign bodies pass spontaneously in 80% to 90% of cases; 10% to 20% require non-surgical extraction maneuvers, and less than 1% require surgery [4,10]. In cases of esophageal perforation, surgery is often indicated, especially when the perforation leads to severe septic complications (mediastinitis, pleural empyema). Surgery addresses both the perforation and its septic complications, with the approach guided by the location of the foreign body and complications. Cervical esophageal perforations can be treated with simple suturing and drainage, potentially reinforced with muscle flaps from the infrahyoid, pectoralis major, or sternocleidomastoid muscles if the perforation is difficult to suture [11]. For thoracic esophageal perforations, classical surgical treatment includes minimal debridement of the perforation edges, suturing (potentially reinforced with a muscle or intercostal flap), debridement, and extensive drainage of the mediastinum and pleural cavities [12], sometimes supplemented by gastrostomy or jejunostomy for feeding. Medical treatment always accompanies surgical intervention and includes antibiotics effective against oropharyngeal and upper digestive tract germs, management of respiratory effects from the perforation (ranging from simple oxygen therapy to assisted ventilation), and nutritional support via parenteral or enteral feeding (gastrostomy, jejunostomy, or nasogastric tube) [13].

Complications from esophageal foreign bodies can be severe, mainly due to perforations and their septic complications (mediastinitis, empyema, pneumonia). The occurrence of complications depends on the nature of the foreign body, its location, the delay in management, patient cooperation, and also physician experience, and availability of technical resources [14].

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#### **4. Conclusion**

Ingestion of foreign bodies remains a significant concern in emergency medical practice, requiring prompt diagnosis and appropriate intervention to prevent serious complications. This case highlights the importance of multidisciplinary collaboration and the need for advanced diagnostic and therapeutic facilities to manage such emergencies effectively.

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#### **Compliance with ethical standards**

##### *Disclosure of conflict of interest*

No conflict of interest to be disclosed.

##### *Statement of informed consent*

Informed consent was obtained from all individual participants included in the study.

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