

## Challenging Diagnosis: A Fatal Case of Esophageal Perforation from Blister-Wrapped Pill Ingestion

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### Abstract

Foreign body ingestion is a common occurrence in clinical practice, affecting individuals across various age groups, with elderly individuals, prisoners, alcoholics, and those with mental health challenges being particularly vulnerable [1,2]. Most ingested foreign bodies pass through the gastrointestinal tract without complications or are successfully removed via endoscopy. However, in less than 1% of cases, sharp and solid foreign bodies can lead to serious complications, including esophageal and bowel perforations [3].

**Keywords:** Blister-Wrapped Tablet; Press Through Package; Esophagus; Esophageal Perforation; PTP; Ingestion

### Introduction

Esophageal perforation due to foreign body ingestion is a particularly grave condition, often presenting with atypical symptoms, making diagnosis challenging [4]. It accounts for about 8% of all esophageal foreign body ingestion cases [5] and is associated with a wide range of complications, including pneumothorax, pleural effusion, empyema thoracis, mediastinal abscesses, and mediastinitis, with an overall mortality rate of approximately 44% [5].

Early detection of esophageal perforation is critical for improving outcomes and reducing mortality, especially when diagnosis occurs within the first 24 hours of presentation [5]. Blister-wrapped pills are commonly used for pharmaceutical packaging, but there are a few reports in the literature of esophageal perforation due to their ingestion [6]. In this case report, we present a fatality resulting from esophageal perforation caused by the ingestion of a blister-wrapped pill.

### Case Presentation

A 52-year-old male with uncontrolled diabetes mellitus (DM) managed with oral hypoglycemic agents and bronchial asthma (BA) presented to the emergency department (ED) with a sudden onset of dyspnea and right-sided chest pain persisting for four days. The patient denied any history of trauma, exposure to sick individuals, or foreign body ingestion. On examination, the patient had a pulse rate of 130 beats per minute, blood pressure of 150/75 mm Hg, respiratory rate of 28 per minute, oxygen saturation of 84% on room air, and a temperature of 37°C. Chest examination revealed Hyper-resonant on the right side with absent breath sounds upon auscultation. A chest X-ray confirmed the diagnosis of right-sided pneumothorax with mediastinal shift (Figure 1A). A 28Fr intercostal tube (ICT) was inserted, draining 600 mL of turbid yellowish fluid (Figure 1B).



**Figure 1A and 1B:** 1A: CXR the blue arrow showing right sided pneumothorax with collapsed right lung and mediastinal shift to the left. 1B: Interval decrease of the previously noted pneumothorax and mediastinal shift with opacity seen involving the right lung as pointed in the yellow arrow.

The patient was admitted with a provisional diagnosis of pneumonia with pleural effusion and started on empirical antibiotics, including meropenem and vancomycin. Pleural fluid analysis revealed significantly elevated lactate dehydrogenase (LDH) at 2191 U/L (See table 1). Full pleural fluid analysis and cell count was done (See table 2). Despite treatment, chest tube output continued unabated, reaching 1200 mL over 14 days, with the fluid remaining turbid and foul-smelling. Cultures from the pleural fluid identified *Klebsiella* carbapenem-resistant *Enterobacteriaceae*.

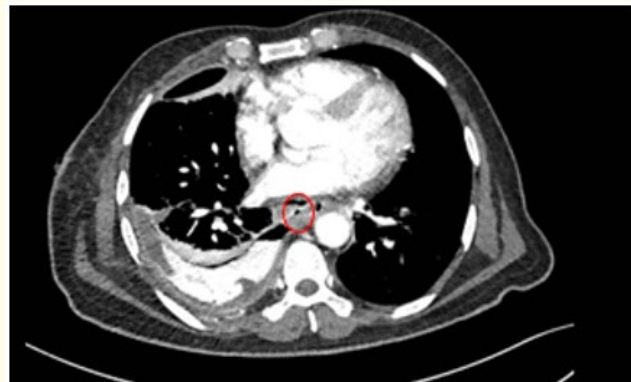
WBC	25.28 10 <sup>9</sup> /L
HBG	11.2 (g/dL)
RBC	4.56 10 <sup>12</sup> /L
PLT	560 10 <sup>9</sup> /L
PT	15.8 Seconds
PTT	51.7 Seconds
INR	1.15 Seconds
Na	134 mEq/L
K	6.48 mEq/L
UREA	7.8 µmol/L
LDH	900 units/L
Glucose	9.84 mmol/L
Creatinine	131 µmol/L
Total bilirubin	23.6 µmol/L
Direct bilirubin	1.1 µmol/L
Alanine transaminase	18.1 units/L
Alkaline phosphatase	277 units/L
Aspartate aminotransferase	60.7 units/L
Serum amylase	32 units/L
C-reactive protein	538.39 units/L
HGBA1c	8.29%

**Table 1:** Laboratory investigations for blood.

Appearance	Turbid
Quantity	3 ml
Color	Yellow
RBC	0.015
Polymorphic Cells	84.8%
Monomorphic Cells	15.2%
WBC	5.864
pleural Lactate dehydrogenase	2191 U/L
pleural Glucose	2.55
Pleural PH Level	6.9
Pleural Protein	9 g/dL

**Table 2:** Pleural fluid analysis and cell count.

Concerned about the lack of clinical improvement, the patient underwent an upper gastrointestinal endoscopy (UGIE), revealing blood clots in the lower third of the esophagus and a mural hematoma above the gastro-esophageal junction (GEJ). An abdominal CT scan with oral contrast was performed to rule out esophageal perforation, the contrast was opacifying the right pleural cavity indicating lower esophageal rupture with right-sided esophageal-pleural fistula. Pleural amylase was sent when esophageal perforation was suspected and showed to be as pleural amylase at 2787 U/L compared to a normal serum amylase level of 74 U/L.



**Figure 2:** The red circle showing oral contrast opacifying the right pleural cavity indicating lower esophageal rupture with right-sided esophageal-pleural fistula.

Subsequently, a repeat UGIE was performed to investigate the suspected esophageal perforation, revealing a foreign body consistent with a sharp tablet cover. The foreign body was successfully removed as seen in figure 3A and 3B. A 10 cm long, 24 mm diameter stent was placed using a stiff guidewire. A right-sided ultrasound-guided pigtail catheter was inserted to drain the pleural collection, which continued to yield positive cultures for *Klebsiella* carbapenem-resistant *Enterobacteriaceae*. The infectious diseases department was consulted, and the patient was started on tigecycline, amikacin, and antifungal fluconazole. After two days gastrografin study was done and there was no leak of the contrast as seen in figure 4A and 4B.



Figure 3A and 3B: A and B blister-wrapped tablet seen in endoscopy and then after extraction.

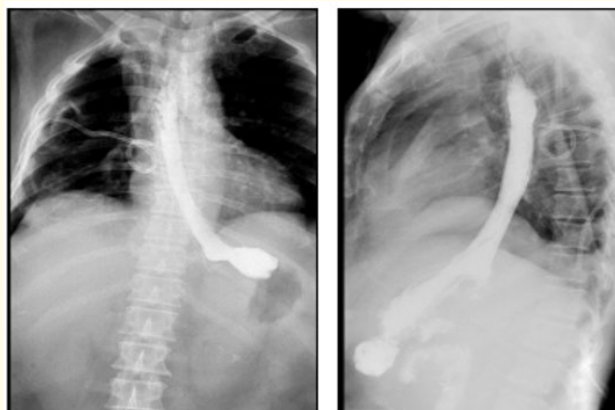


Figure 4A and 4B: A (Anterior posterior view), B (Lateral) demonstrating Free flow of the contrast reaching the stomach and the duodenum with no leak.

Unfortunately, the patient’s clinical status deteriorated further, characterized by a sudden decrease in consciousness, hypotension, and hypoglycemia (blood sugar 40 mg/dL). He was urgently transferred to the Intensive Care Unit (ICU), where Venous Blood Gases revealed severe metabolic acidosis (pH 7.08, lactate 19 mmol/L). Low-dose noradrenaline was initiated, and the patient was electively intubated and started on hemodialysis due to multisystemic organ failure from Septic shock.

Despite aggressive management in the ICU for nearly two weeks, the patient’s condition continued to deteriorate, culminating in a cardiac arrest that, unfortunately, proved fatal.

### Discussion

This case highlights the diagnostic challenges associated with esophageal perforation due to foreign body ingestion. The patient initially presented with respiratory distress and chest pain, which, in the absence of a clear history of trauma or foreign body ingestion, led to the consideration of infectious causes like pneumonia or tuberculosis. However, the subsequent development of pleural effusion

and the characteristics of the pleural fluid hinted at a more complex pathological process. This included significantly elevated levels of lactate dehydrogenase (LDH) and amylase in the pleural fluid.

The patient's lack of clinical improvement with antibiotics and the persistence of pleural effusion raised concerns about a possible esophageal perforation, eventually confirmed through upper gastrointestinal endoscopy (UGIE). Esophageal perforations, though rare, can lead to severe complications, including empyema, as observed in this case.

The added complexity in our case was the presence of a foreign body, a sharp tablet cover, in the esophagus, highlighting the necessity of prompt removal of such objects and the importance of using an esophageal stent for preventing further complications and promoting the healing of the perforation site.

The isolation of *Klebsiella* carbapenem-resistant *Enterobacteriaceae* from both the pleural fluid and blood cultures underscores the severity of the patient's infection and the significance of appropriate antibiotic therapy. A combination of antibiotics, including tigecycline, amikacin, and antifungal fluconazole, was employed to address this multidrug-resistant infection.

Despite the aggressive management provided in the ICU, the patient's clinical condition continued to deteriorate, culminating in severe metabolic acidosis, hemodynamic instability, and the need for hemodialysis. Given the grave prognosis, a decision was made to apply a "Do Not Resuscitate" (DNR) order.

Esophageal perforation is a serious condition associated with a significant mortality rate, which can range from 23% to 35% depending on various factors [5]. While such cases may not be common, they are more likely to occur in elderly individuals with mental impairments or children, as well as among alcoholics and prisoners seeking secondary gain [6]. Esophageal perforation can lead to mediastinitis, with a mortality rate that can be as high as 49% [7].

A comprehensive review conducted by Athanassiadi K., *et al.* examined 400 cases of esophageal foreign body ingestion. This study revealed that the majority of foreign bodies (57%) were located within the cervical esophagus, followed by 26% within the thoracic esophagus and 17% at the cardioesophageal junction. However, the specific numerical breakdown of each type of foreign body was not provided, and not all ingested objects were reported in most cases. Additionally, one case resulted in empyema thoracis following a perforation caused by the extraction of a chicken bone. Surgical intervention was necessary in only 3% of cases [8].

In a comprehensive review by Anquan Peng, *et al.* [4], a substantial cohort of 1,428 patients provided valuable insights into esophageal foreign body-related complications, particularly focusing on a subset of 121 patients. The study examined esophageal perforation due to foreign body ingestion, the location of foreign bodies within the esophagus, the nature of these foreign bodies, the duration of impaction, the age range of patient presentation, and the clinical manifestations exhibited.

It was observed that the majority of esophageal foreign bodies were primarily localized within the cervical esophagus (n = 88), with the remaining cases lodged in the thoracic esophagus. Most patients in this cohort fell within the age range of 50 - 69 years (n = 96). A consistent manifestation of clinical symptoms, including dysphagia, odynophagia, and polysialia, was observed in all 121 cases.

Among the various types of foreign bodies encountered, fish bones were the most frequently identified (n = 53), emphasizing the diversity of foreign bodies and their potential clinical implications. When exploring complications, cervical abscesses were the predominant concern within the cervical complications, comprising a total of 67 cases (n = 67). This observation highlighted the pronounced clinical significance of cervical abscesses.

Cervical and mediastinal abscesses were documented in 21 patients (n = 21), with the overall percentage of complications for this combined category calculated at 17.36%, underscoring the clinical relevance of these complications. The study also noted the presence of hemopneumothorax, a potentially life-threatening condition, in six cases (n = 6), emphasizing the clinical significance of this condition.

Of note, this case featured empyema thoracis, a condition not found in any of the cases examined in the study, indicating the diverse nature of complications associated with esophageal foreign bodies.

In a comprehensive review spanning from 1978 to 2023, a total of 49 cases of blister-wrapped pill or press-through package ingestion were analyzed. Among the 49 patients diagnosed with blister-pack ingestion, 20 (40.82%) were male, while 29 (59.18%) were female.

In terms of complications, specific patients encountered issues related to blister-pack ingestion. Esophageal perforation was observed in two cases, resulting in a complication rate of 4.17%. Similarly, esophago-pleural fistulas were identified in two patients, with an equivalent complication rate of 4.17%. Additionally, one patient presented with empyema thoracis alongside esophageal perforation, contributing to a complication rate of 2.08%. Another case exhibited an esophago-tracheal fistula, corresponding to a complication rate of 2.08%. In total, the cumulative risk of complications in cases of blister-wrapped pill ingestion was 12.24%.

The overall mortality rate within this patient cohort was recorded at 2.8%. These findings underscore the diverse array of complications associated with blister-pack ingestion, emphasizing the critical importance of comprehensive clinical management and vigilance in such cases [9-23] (See table 3).

Parameter	Total Number or Percentage
Period of Review	1978 - 2023 [9-23]
Total Cases Reviewed	49
Gender Distribution	
- Male	20 (40.82%)
- Female	29 (59.18%)
Complications	
- Esophageal perforation	2 (4.17%)
- Esophago-pleural fistulas	2 (4.17%)
- Empyema thoracis (with esophageal perforation)	1 (2.08%)
- Esophago-tracheal fistula	1 (2.08%)
Cumulative Risk of Complications	12.24%
Mortality Rate	2.8%

Table 3

### Conclusion

In conclusion, when managing patients with chest tube drainage that produces a significant amount of fluid, healthcare providers should remain vigilant in exploring alternative diagnoses beyond empyema. Such cases may necessitate a comprehensive re-evaluation to ensure that other underlying conditions, such as malignancies or esophageal perforation, are not overlooked. Additionally, special attention should be given to patients with low socioeconomic status, those who may face mental health challenges, or individuals with language barriers. In such instances, it is imperative to consider the measurement of pleural amylase levels, as this diagnostic tool can provide valuable insights into conditions like esophageal perforation, which may be overshadowed by empyema-like symptoms. Furthermore, in

cases where the diagnosis remains elusive or there are concerns about potential gastrointestinal involvement, a CT scan with oral contrast should be considered as part of the diagnostic approach with or without upper gastrointestinal endoscopy, as it can offer a clearer picture of the pleural cavity and its relationship to adjacent structures, enabling a more accurate diagnosis and targeted treatment.

### Conflicts of Interest

The authors declare they have no competing interests.

### Sources of Funding

No grants were obtained from any institutions for this case report.

### Ethical Approval

Since this is a case report, the ethical committee's approval is not required.

### Consent

Verbal consent was taken.

### Author Contribution

All the authors individually contributed to manuscript writing, data collection, and reviewing and did the final proofreading of the manuscript before submission.

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