

## Clinical Case

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# Chest Tube Insertion in the Delayed Esophageal Perforation Phenomenon: A Tragic or Beneficial Outcome?

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### Rezumat

***Insertia unui tub de dren toracic – procedură cu consecințe negative sau pozitive în cazul unei perforații esofagiene cu diagnostic întârziat?***

O pacientă în vârstă de 53 de ani, cu perforație esofagiană secundară ingestiei de corp străin, a fost inițial diagnosticată cu tromboembolism pulmonar. Tomografia computerizată toracică efectuată în cadrul spitalului către care a fost redirecționată pacienta a semnalat o hernie hiatală gigantă sau un abces pulmonar gigant. Pacienta a fost tratată pentru abces, iar după câteva zile s-a efectuat toracostomie cu inserția unui tub de dren la nivelul hemitoracelui drept. Ulterior, pacienta a dezvoltat fascită necrozantă a peretelui toracic. Cu o întârziere de 19 zile, s-a identificat o perforație de 5 cm la jumătatea segmentului toracic al esofagului în timpul toracotomiei, ce a fost rezolvată chirurgical. La 2 ani de la intervenție starea pacientei este bună. Această prezentare de caz descrie un caz unic de perforație esofagiană secundară prezenței unui corp străin la jumătatea segmentului toracic al esofagului, în care întârzierea în stabilirea unui diagnostic corect a avut consecințe severe.

**Cuvinte cheie:** corp străin, perforație esofagiană, empiem, diagnostic incorect

### Abstract

A 53-year-old woman with foreign body esophageal perforation, was first misdiagnosed as pulmonary thromboembolism. In referral hospital her chest computed tomography was reported as giant hiatal hernia or giant pulmonary abscess. She was treated for abscess, after several days, right hemithorax tube thoracostomy was performed. After that, she developed necrotizing fasciitis on the chest wall. After a 19-day delay, we found a 5-cm mid-thoracic esophageal tearing during thoracotomy and repaired it. After 2 years follow up the patient condition is good. This report describes a unique case of mid-thoracic foreign body esophageal perforation and rupture with a delay in diagnosis with a tragic course.

**Key words:** foreign body, esophageal perforation, empyema, misdiagnosis

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### Introduction

Foreign body esophageal perforations and rupture are rare and can be life threatening. Early diagnosis and treatment is

important because the mortality rate is higher (40%–60%) when the perforation time is increased and treatment is prolonged (1). Because of the rarity of the disease and its nonspecific presentations, a delay in the diagnosis and treatment occurs in more than 50% of patients, and the complications may be prevented by early diagnosis and treatment (12). Early diagnosis can be achieved by observing clinical signs and through imaging modalities such as chest X-ray or CT and esophagography. Contrast esophagography is the standard diagnostic procedure used to confirm and localize an esophageal perforation and rupture (3). In this article, a misdiagnosed esophageal perforation with tragic course is presented.

### Case report

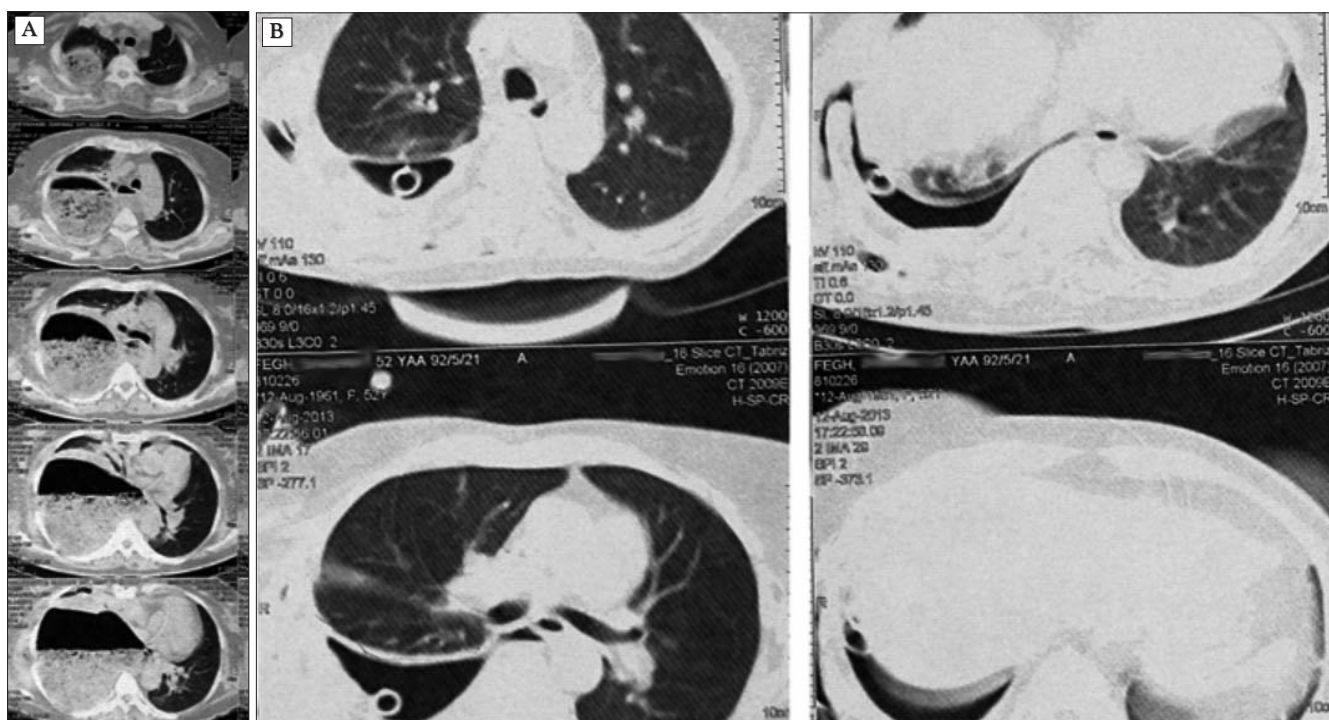
A 53-year-old woman with sudden onset chest pain and dyspnea, first was managed in small town primary care hospital as a pulmonary embolism. Because of getting worse, the patient was referred to referral Imam Reza teaching hospital in Tabriz, Iran. Computed tomography (CT) scan of thorax revealed a giant air fluid occupying space in the right hemithorax extended from the right hemidiaphragm to the apex of the lung (Fig. 1A). It was misreported as giant lung abscess or intrathoracic stomach filled with large amount of undigested food and air. So, with diagnosis of lung abscess, she was treated with antibiotics only, however the patient condition was deteriorating. Finally, with diagnosis of

thoracic empyema a chest tube was inserted to right hemithorax, with good drainage (Fig. 1B). However patient developed chest wall cellulitis and subcutaneous emphysema (Fig. 2), so a consultation with our thoracic surgery unit was performed.

The patient told us that her first chest pain occurred while she was eating chicken 19 days ago. She did not give any history of smoking, drug abuse, or neurological disease. When we examined the patient, her general condition was bad, and she had subcutaneous emphysema with cellulitis. There was purulent discharge from right sided chest tube. We made diagnosis of empyema secondary to esophageal perforation.

With diagnosis of necrotizing fasciitis, we performed emergency debridement and drainage. A large amount of undigested food and pus was expelled from the orifice of the chest tube insertion. Purulent secretion with food debris also was draining from chest wall layers. After debridement of chest wall, we also performed a limited anterior thoracotomy. We washed right hemithorax four consecutive days and the patient's condition improved and the signs of sepsis were suppressed.

Esophagography with water soluble contrast was performed on standing position. A large amount of contrast filled the right hemithorax (Fig. 3), with normal appearing esophagus mucosa. After controlling septic and toxic condition, we performed a standard exploratory thoracotomy. We found a 5-cm mid-esophageal tear and we repaired it with



**Figure 1.** (A) shows a large cavity with air and fluid level with shift of heart and mediastinum to left, it was interpreted a large herniation of abdomen or giant abscess Figure (B) shows after drainage with chest tube in place only pneumothorax with convexity of lung border to space



**Figure 2.** Shows right inhomogeneous fluid with shift of mediastinum, heart and trachea to left, and subcutaneous emphysema

delayed absorbable sutures. Thoracoplasty with resection of four ribs was also performed and we leave chest cavity open to make drainage. A feeding jejunostomy was also performed. Eight days after second surgery, the patient developed bleeding from intercostal vessels, and third operation was performed for controlling bleeding. The patient got better, and after two years follow up of the patient condition is well.

## Discussion

We present an esophageal perforation with tragic course. Most esophageal perforations are iatrogenic (4). The most common cause of non-iatrogenic esophageal perforation is spontaneous rupture, followed by foreign body ingestion, trauma, and malignancy (4). Foreign bodies can perforate the esophagus by direct puncture pressure or by attempted extraction. Adults usually have bones or portions of dentures stuck in the esophagus. Patients with clinical psychosis habitually swallow foreign bodies such as a pin. Early diagnosis of esophageal perforations is important, because the mortality rate is a function of the time between perforation and treatment. Our patient first was misdiagnosed as pulmonary embolism. Erdal et al. (5) reported esophageal perforation in a 73 year man, had undergone coronary angiography with misdiagnosis of acute coronary syndrome. On the end, their patient died because of complications of esophageal perforation despite delayed repair of esophagus. Most patients with thoracic perforations are septic and are thus readily diagnosed by signs such as pleuritic pain, fever, tachycardia, sepsis, and dyspnea. However, patients in whom the presentation of thoracic perforations is delayed often develop hypotension and septic shock (6). Signs of pleural effusion, pneumothorax, pneumomediastinum, and pneumopericardium have been reported on chest X-ray or CT. Most patients with low thoracic perforation have upper abdominal tenderness and guarding, which can confuse the physician (3,7).

CT findings of thoracic esophageal perforations include



**Figure 3.** Contrast esophagography, esophagus apparently normal, with contrast in lung

mediastinal emphysema, cavities adjacent to the thoracic esophagus, and the pleural space or mediastinum demonstrated a relation with the air or contrast filled by esophagus and adjacent mediastinal collection. CT occasionally reveals esophageal foreign bodies that may be missed by other imaging modalities. Contrast esophagography is a standard diagnostic procedure used to confirm and localize an esophageal perforation. Most radiologists prefer to use a water-soluble contrast agent to avoid mediastinal contamination with barium in the right and left decubitus position. Water-soluble contrast agents do not aggravate the reaction when present in the lung and mediastinum. In addition, if contrast aspiration occurs, the pulmonary inflammatory reaction may be severe. The standing state of the patient may not show the perforations (7). In the patient described here, esophagography was normal, which may have been due to the physical state of the patient at the time of the esophagography examination with water-soluble contrast. Water-soluble contrast examination may be negative, and if a perforation is highly suspected, barium esophagography should be repeated with a higher accuracy (8). This examination was not performed in this patient due to the fear of barium toxicity. If an esophagography examination is not useful, esophagoscopy can be indicated and may detect the perforations (7,8).

Despite significant advances in the treatment of esophageal perforations, it continues to be a diagnostic and treatment challenge (6). Treatment of esophageal perforations are dependent on some factors such as presentation of the patient,

location of the perforation, condition of the patient, the presence of underlying esophageal diseases, and time from the perforation. Identifying and suturing the perforation is secondary, and it is repairable in majority of thoracic perforations. Pleural debridement and decortications can be performed if required. Intercostal muscle flaps are most commonly used for covering the repaired esophagus. In delayed perforations, as observed in our patient, the disrupted suture phenomenon may occur later (9).

Platel published the conservative management of esophageal perforations and rupture, even in cases of delayed diagnosis, in 34 patients in a retrospective study (10). In a retrospective analysis Cheynel showed 33 of 40 thoracic iatrogenic perforations with poor prognosis and nonsurgical treatment with no value (11). They noted that esophagectomy can be the treatment of choice in cases of nonsuturable perforations in delayed diagnosis (9) (11). Moser's study showed 13 of 23 thoracic perforations of the esophagus had better results from conservative treatment and drainage (12). Rosiere et al. described the merit tissue flap reinforcement in the management of esophageal perforations following a delayed diagnosis. In the management of delayed esophageal perforations, some studies reported their experience with esophagectomy, but the results were not superior to the primary repair concurrent tissue flap reinforcement. Esophageal resection should be considered as a treatment option for perforations associated with intrinsic underlying esophageal disease e.g. cancer (9).

Juogon et al. published a successful primary repair strategy after the perforations in which 64% of their patients underwent surgical intervention for more than 24 h (13).

Contamination of the surrounding tissues and cavities, poor visualization of the esophageal perforations, and lack of the serous layer and late phase of empyema, trapping of the right lung are poor prognostic factors of the patient described here, and we had thus decided to repair the rupture and perform open drainage and obliteration of the pleural cavity by thoracoplasty.

Outcome of esophageal perforation is dependent on the interval between perforation and initiation of therapy, the presence of concomitant esophageal disease, the cause and the location of perforation (14). The overall mortality of esophageal perforation is near 20%, and more than 24 hours delay in treatment after perforation can result in a doubling of mortality (14). In conclusion, we present a patient with delayed diagnosis of esophageal perforation with tragic course. Chest tube for esophageal rupture may lead to tragic course with chest wall infection and fasciitis.

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