

# A Case of Esophageal Perforation Presenting as Cavitory Pneumonia: Diagnostic and Therapeutic Challenges

Feruzza Abraamyan<sup>1\*</sup>, Harpreet Singh<sup>1</sup>, Vishal Raj<sup>2</sup>, Inder M. Singh<sup>3</sup>

<sup>1</sup>Internal Medicine Department, Sutter Roseville Medical Center, Roseville, CA, USA

<sup>2</sup>Pulmonary Medicine Associates, Sutter Roseville Medical Center, Roseville, CA, USA

<sup>3</sup>Gastroenterology Department, Sutter Roseville Medical Center, Roseville, CA, USA

Email: \*fabraamyan@gmail.com

**How to cite this paper:** Abraamyan, F., Singh, H., Raj, V. and Singh, I.M. (2024) A Case of Esophageal Perforation Presenting as Cavitory Pneumonia: Diagnostic and Therapeutic Challenges. *Open Journal of Gastroenterology*, **14**, 241-247.  
<https://doi.org/10.4236/ojgas.2024.147027>

**Received:** June 27, 2024

**Accepted:** July 28, 2024

**Published:** July 31, 2024

Copyright © 2024 by author(s) and Scientific Research Publishing Inc.

This work is licensed under the Creative Commons Attribution International License (CC BY 4.0).

<http://creativecommons.org/licenses/by/4.0/>



Open Access

## Abstract

Esophageal perforation, a rare condition, can arise from iatrogenic, traumatic, or spontaneous origins. Even when therapy is initiated within the first 24 hours, it is associated with a mortality rate of up to 25%. Due to the varied initial presentation, treatment may be delayed, leading to poorer outcomes. Here, we present a unique case of a 27-year-old schizophrenic patient who initially presented with acute respiratory failure and septic shock and was ultimately diagnosed with cavitory pneumonia secondary to esophageal perforation.

## Keywords

Esophageal Perforation, Foreign Body, Esophageal Stent, Cavitory Pneumonia, Septic Shock, Respiratory Failure

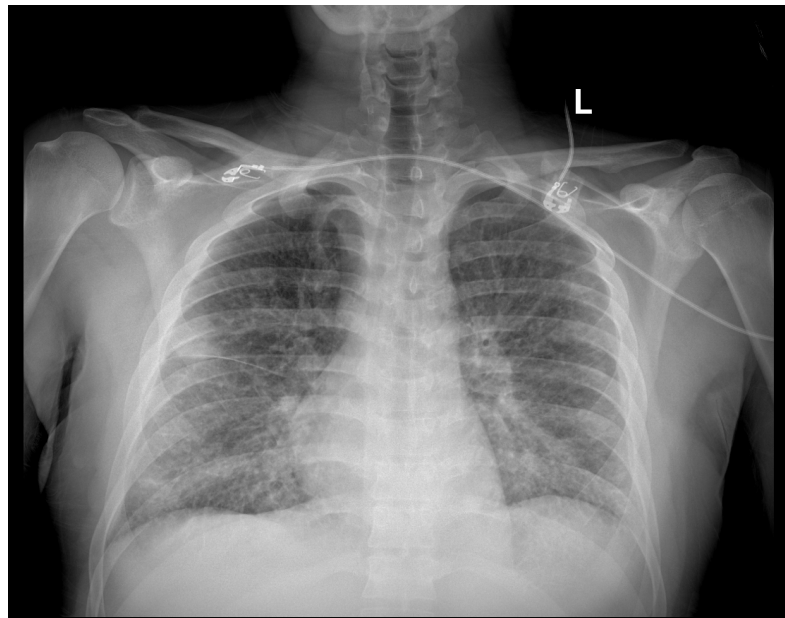
## 1. Introduction

While the frequency of esophageal perforation is rare, occurring 3 in 100,000 people in the United States, it remains a medical emergency with high morbidity and mortality rates [1]. Even though the most common cause is instrumentation, it can also happen spontaneously [2]. The outcome depends on the cause, location, underlying esophageal disease, and the timing of diagnosis [1] [3]. Several factors contribute to the high mortality associated with esophageal perforation, including the anatomical challenge posed by the location of the esophagus, the lack of a serosal layer, the unusual blood supply, and the proximity of vital organs [4]. If therapy is initiated within 24 hours, the mortality from esophageal perforation is 10% to 25%; however, it increases to 40% to 60% when treatment

is delayed. This case report describes a unique case of esophageal perforation initially presenting as cavitary pneumonia.

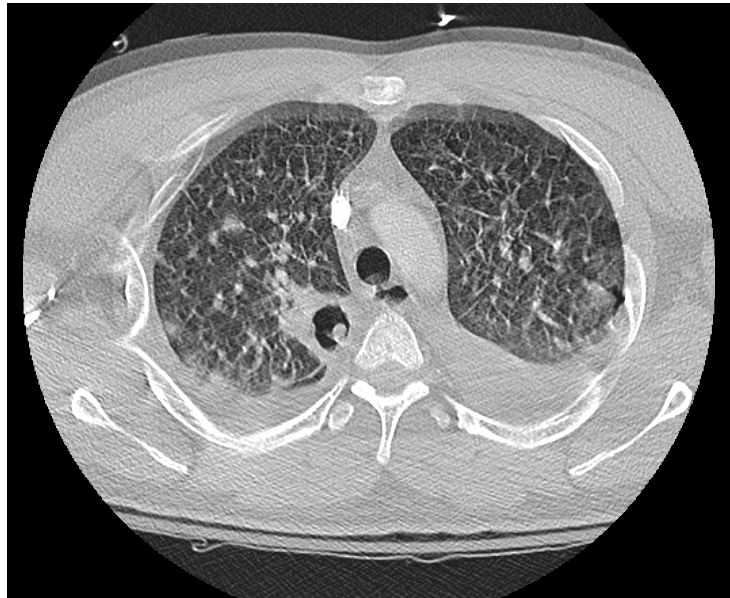
## 2. Case Presentation

**Initial presentation:** A 27-year-old male with a past medical history of schizophrenia presented to the emergency department with four days of subjective fever, chills, cough, and shortness of breath. The patient was tachycardic, tachypneic, and hypoxic, appearing acutely ill and lethargic; otherwise, the physical exam was nonrevealing. **Diagnostic workup** showed leukocytosis with white blood cell count of 40.0 K/uL with neutrophilic predominance; an anion gap metabolic acidosis with a lactic acid of 16.9 mmol/L; an acute kidney injury with blood urea nitrogen level of 44 mg/dL and creatinine level of 2.23 mg/dL; and mildly elevated liver enzymes with AST 53 U/L, ALT 122 U/L and alkaline phosphatase 211 U/L. EKG was unremarkable. Initial chest X-ray showed interstitial opacities with medial right upper lobe cavitation versus bleb (**Figure 1**).



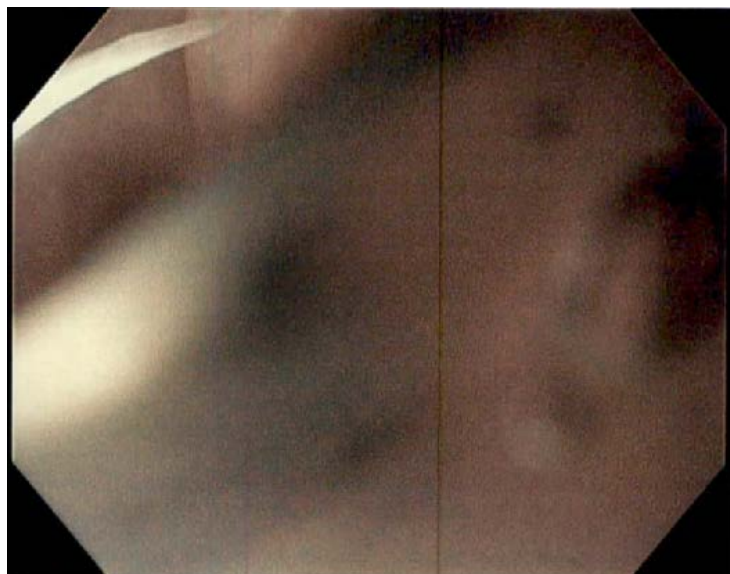
**Figure 1.** Nonspecific interstitial opacities with medial right upper lobe cavitation vs. bleb.

Within an hour of presentation, the patient became further hypoxic and in respiratory distress, requiring intubation and pressure support. **For management**, the patient was started on fluids and empiric antibiotics and admitted to the intensive care unit. CTA chest showed moderate bilateral pleural effusions, scattered nodular and consolidative airspace opacities, and thick-walled cavitations in the right lung, with the largest measuring 6.3 cm in the posterior medial right upper lobe (**Figure 2**). CT brain, abdomen, and pelvis showed no acute findings. The echocardiogram did not reveal abnormalities or vegetations. A bronchoscopy was performed and showed nonsignificant results.

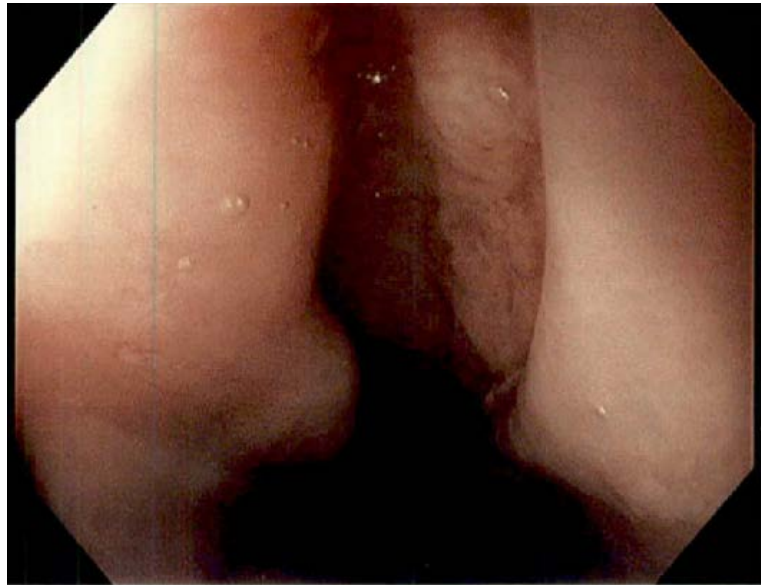


**Figure 2.** Thick-walled cavitation in the right lung with bilateral pleural effusions.

The patient was off pressure support the next day but had *Streptococcus viridans* bacteremia with **new anemia and melena**. The patient was started on continuous pantoprazole infusion and had prompt endoscopic evaluation (EGD), which revealed a sharp, foreign object penetrating through the esophageal wall with a tract to the chest wall (**Figure 3** and **Figure 4**). The object was removed and found to be a piece of wood resembling an incense stick (**Figure 5**). Multiple hemostatic clips were used to approximate and seal the mucosal injury, and a Boston Scientific Mantis closure device was deployed. A Dobhoff tube was placed down to the duodenum to avoid feeding from irritating the esophagus. Antimicrobials were broadened to include anaerobic and antifungal coverage.



**Figure 3.** EGD view with a wooden splinter in the upper left.



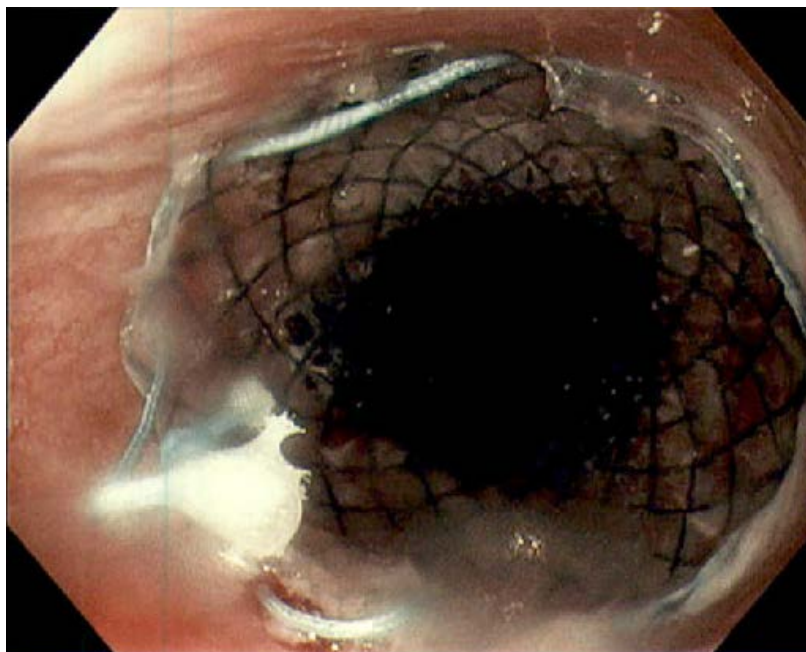
**Figure 4.** EGD with esophageal perforation.



**Figure 5.** Incense stick removed during EGD.

The patient was extubated by the next day and underwent bilateral thoracotomy with pigtail chest tubes inserted. Repeat CT chest showed the medial right upper lung cavity decreased to  $3.4 \times 3.8$  cm with a fistulous tract extending through the esophagus, shown by leakage of gastrografin contrast. The patient required endoscopic hemostatic clips, a covered esophageal stent (**Figure 6**), and a percutaneous gastrostomy tube placement a few days later. Unfortunately, repeat imaging showed the stent migrated into the stomach, so a third EGD was

done, which showed a patent, friable fistulous tract, so a new, fully covered stent was placed without clips.



**Figure 6.** Esophageal stent.

**Outcome:** Two weeks after admission, the patient was started on a clear liquid diet, with repeat imaging showing no extravasation of oral contrast. The percutaneous gastrostomy and esophageal stent were later removed, as the patient was eating normally again.

### 3. Discussion

Due to the spectrum of presentation, esophageal perforation can be challenging to diagnose, and the delay can lead to poor patient outcomes. A perforation entails gastrointestinal contents leaking into the mediastinum, which can lead to inflammation and necrosis, resulting in subcutaneous emphysema, pneumomediastinum, pleural effusions, pneumonia, gastrointestinal bleeding, and even bacteremia [5] [6]. Meckler's classic triad with pain, vomiting, and subcutaneous or mediastinal air was absent in our case. Melena and anemia led to endoscopic evaluation, revealing the underlying esophageal perforation. This diagnosis explained cavitory pneumonia, bacteremia, and septic shock in an otherwise healthy young male with no prior history of sharp foreign body ingestion.

The diagnosis of perforation usually starts with an upright chest X-ray, and the gold standard for diagnosis is esophagography with gastrografin. CT of the chest and abdomen should also be utilized to evaluate for formed intrathoracic and intraabdominal collections that may require further drainage [6]. In our case, the CT chest showed cavitations, opacities, and pleural effusions but no air in the mediastinum, so esophagography was not initially performed. History lat-

er provided by the patient's mother revealed that he had a poor appetite for two weeks preceding admission—this was likely when the incense stick was ingested and allowed time for the cavitory collections to form.

The intrathoracic esophagus and pericardium are situated in the posterior and middle mediastinum, respectively, with the esophagus attached to the parietal pericardium. If a tear in the esophagus allows its contents to contaminate the mediastinum, it triggers inflammation and infection in the mediastinum and pericardium. This mediastinal infection and potential formation of abscesses can lead to severe clinical conditions like sepsis and multiorgan failure, which can be fatal if not promptly treated [7]. The mortality rate for treated esophageal perforation ranges from 10% to 25% if treatment begins within 24 hours of detection. However, this rate can increase to 40% to 60% if treatment is delayed beyond 48 hours. In cases detected within 24 hours, primary closure of the perforation site and thorough drainage of the mediastinum are recommended. The management of delayed or missed esophageal ruptures remains unclear and controversial [1]. Esophageal fistulas diagnosed late cannot be treated with primary suturing because the tissues are contaminated [8].

Both nonoperative and operative treatment regimens exist for esophageal perforation, though no trials compare outcomes. Nonoperative management includes broad-spectrum antibiotics, parenteral nutrition, and temporary esophageal stenting with further removal within six weeks to avoid complications such as bleeding, stent fracture, and stent impaction [9]. Management of transmural perforation complicated by mediastinum involvement may need surgical intervention. In our case, the patient required three EGDs in attempts to close the perforation and place a fully covered esophageal stent. However, surgical intervention was avoided. Diet was slowly re-introduced when no further evidence of contrast extravasation was seen; it took nearly three weeks for the perforation to heal entirely and the cavitory lesions to resolve.

To summarize, the timely diagnosis of esophageal perforation remains challenging; however, broad differentials are crucial for appropriate treatment. This case demonstrates the complexity and varied presentation of esophageal perforation with cavitory pneumonia, pleural effusions, and bacteremia. In cases of bacteremia with oral microflora and severe cavitory pneumonia in immunocompetent patients and patients without aspiration risk, physicians should maintain a high suspicion for esophageal perforation to avoid complications and decrease mortality.

### **Declaration**

Informed patient consent has been obtained.

### **Conflicts of Interest**

The authors declare no conflicts of interest regarding the publication of this paper.

## References

- [1] Kaman, L., Iqbal, J., Kundil, B. and Kochhar, R. (2010) Management of Esophageal Perforation in Adults. *Gastroenterology Research*, **3**, 235-244.  
<https://doi.org/10.4021/gr263w>
- [2] Younes, Z. and Johnson, D.A. (1999) The Spectrum of Spontaneous and Iatrogenic Esophageal Injury. *Journal of Clinical Gastroenterology*, **29**, 306-317.  
<https://doi.org/10.1097/00004836-199912000-00003>
- [3] Jones, W.G. and Ginsberg, R.J. (1992) Esophageal Perforation: A Continuing Challenge. *The Annals of Thoracic Surgery*, **53**, 534-543.  
[https://doi.org/10.1016/0003-4975\(92\)90294-e](https://doi.org/10.1016/0003-4975(92)90294-e)
- [4] Søreide, J. and Viste, A. (2011) Esophageal Perforation: Diagnostic Work-Up and Clinical Decision-Making in the First 24 Hours. *Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine*, **19**, Article No. 66.  
<https://doi.org/10.1186/1757-7241-19-66>
- [5] White, R.K. and Morris, D.M. (1992) Diagnosis and Management of Esophageal Perforations. *The American Surgeon*, **58**, 112-119.
- [6] Kassem, M.M. and Wallen, J.M. (2023) Esophageal Perforation and Tears. In: *StatPearls [Internet]*. StatPearls Publishing.  
<https://www.ncbi.nlm.nih.gov/books/NBK532298/>
- [7] Kupeli, M. and Dogan, A. (2018) Successful Treatment of a Late Diagnosed Esophageal Perforation with Mediastinitis and Pericardial Abscess. *Journal of College of Physicians and Surgeons Pakistan*, **28**, 972-973.  
<https://doi.org/10.29271/jcpsp.2018.12.972>
- [8] Kircheva, D.Y. and Vigneswaran, W.T. (2017) Successful Primary Repair of Late Diagnosed Spontaneous Esophageal Rupture: A Case Report. *International Journal of Surgery Case Reports*, **35**, 49-52. <https://doi.org/10.1016/j.ijscr.2017.03.038>
- [9] van Heel, N.C.M., Haringsma, J., Spaander, M.C.W., Bruno, M.J. and Kuipers, E.J. (2010) Short-term Esophageal Stenting in the Management of Benign Perforations. *American Journal of Gastroenterology*, **105**, 1515-1520.  
<https://doi.org/10.1038/ajg.2010.104>