

Case Report

Treatment of Acute Mediastinitis Secondary Traumatic Esophageal Perforation by Naso-Mediastinal Drainage

Michael A Lopez¹, Jessica L Buicko^{2*} and Miguel A Lopez-Viego³

¹Department of General Surgery, University of Miami Palm Beach Regional Campus, Atlantis, FL, USA

²Department of Surgery, Weill-Cornell Medicine, New York, NY, USA

³Department of Surgery, Bethesda Memorial Hospital, Boynton Beach, FL, USA

Background

Mediastinitis secondary to esophageal perforation is a serious condition with potentially grave complications. Traditional treatment regimens involve open trans-thoracic mediastinal drainage procedures which have a high morbidity and mortality rate [1].

Surgical drainage options primarily include a trans-cervical or trans-thoracic approach. The decision of which approach to use is typically dependent on the extent of the disease process. If the disease process extends below the fourth thoracic vertebra, trans-cervical drainage is usually inadequate, and a trans-thoracic approach should be considered, or a combination of the two techniques [2].

In regard to the mortality of this condition, Corsten et al., showed a high mortality rate of patients undergoing trans-cervical drainage alone (47% mortality) versus a combined trans-cervical and trans-thoracic mediastinal approach (19% mortality, $p < 0.05$) [3].

A thoracic approach allows for great exposure of the entire mediastinum and permits more aggressive drainage and debridement. However, entering the chest is more invasive and could potentially lead to contamination of the pleural space. Contrary to Corsten et al., and Inoue et al., demonstrated that trans-cervical drainage for patients with localized necrotizing mediastinal infections was adequate with minimal morbidity and mortality [2]. Patients with extensive necrotizing infections were more likely to develop empyema and therefore require trans-thoracic drainage, but still had favorable outcomes with a mortality rate of 13% [2].

*Corresponding author: Jessica L Buicko, Department of Surgery, Weill-Cornell Medicine, New York, NY, USA, Tel: +1 518 2297711; E-mail: JBuicko@med.miami.edu

Citation: Lopez MA, Buicko JL, Lopez-Viego MA (2019) Treatment of Acute Mediastinitis Secondary Traumatic Esophageal Perforation by Naso-Mediastinal Drainage. *Archiv Surg S Educ* 1: 004.

Received: June 05, 2019; **Accepted:** June 25, 2019; **Published:** July 03, 2019

Copyright: © 2019 Lopez MA, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

We present the unique case of acute mediastinitis secondary to traumatic esophageal perforation treated by naso-mediastinal drainage.

Keywords: Esophageal Perforation; Mediastinitis; Thoracic Surgery; Trauma

Case Presentation

A 24 year-old female with a history of foreign body ingestions secondary to a psychiatric disorder forced a metal kitchen knife through her posterior esophagus into the posterior mediastinum. She developed chest pain and tachycardia. Her leukocyte count on admission was 20,000 cells/ μ L.

Plain chest radiography and CT scanning revealed the knife to be lodged in the mediastinum posterior to the esophagus (Figures 1A and 1B). Oral examination and flexible laryngoscopy confirmed that no part of the knife was present in the oropharynx or esophagus.



Figure 1A: AP Chest X-ray showing a metallic knife in the chest cavity.



Figure 1B: Lateral Chest X-ray showing a metallic knife in the chest cavity.

In the operating room the patient underwent trans-oral extraction of the knife under fluoroscopic guidance through a posterior esophagotomy. Upon removal of the knife, purulent drainage was observed from the extraction site.

The mediastinum was then drained with a 10 mm Jackson Pratt Drain that was secured to the patient's left nares. A nasogastric tube was inserted through the patient's left nares under direct visualization (Figure 2). The patient was treated with a course of piperacillin-tazobactam and vancomycin for seven days. Cultures eventually returned positive for *Streptococcus viridans* and the patient recovered uneventfully.



Figure 2: CT scan showing a 10mm Jackson Pratt drain secured in the posterior mediastinum.

Discussion

Penetrating injuries to the esophagus are rare but life-threatening [4]. Most esophageal injuries are iatrogenic. Cases of non-iatrogenic injuries are often due to spontaneous rupture or ingestion of a foreign body. These injuries are often misdiagnosed because presentation is often non-specific. Therefore, these injuries are associated with a significant morbidity and mortality due to injury to surrounding structure and infection.

Posterior cervical perforations are most common because of the thin posterior wall of the esophagus. Dissection of the retroesophageal space allows for bacterial spread through the mediastinum [5].

In a ten-year, multi-center study evaluating patients presenting to trauma centers with penetrating esophageal injuries, Asensio et al., found that of the 405 patients enrolled, the majority were male (88%) with an average age of 29. Furthermore, on presentation, 24% of patients were hypotensive with a systolic blood pressure less than 90 mmHg, 19% had subcutaneous emphysema and 7% had dysphagia [6]. Most patients presented with very minimal or no symptoms. This study also found the injuries were primarily to the cervical esophagus (56%) and that complications associated with esophageal injuries with or without surgical intervention were not uncommon. Of the 41% of patients in the study that developed complications, a majority were either abscess, mediastinitis or empyema [6]. Although uncommon, some patients developed esophageal leaks or tracheoesophageal fistulas. Timing of intervention appeared to be directly related to morbidity and mortality [6]. Early diagnosis and management are necessary to avoid these potential complications.

The diagnosis can be made using many different modalities. According to the Western Trauma Association's esophageal perforation guidelines, stable patients who have sustained a penetrating injury with a suspected trans-mediastinal trajectory should have a CT scan performed first rather than esophagography [7]. Esophagography using a water-soluble contrast can diagnose small esophageal perforations, however is underutilized because CT scanning can demonstrate air in the soft tissues of the mediastinum indicating perforation and can most times be performed more expediently [1].

Currently there have been many treatment options discussed in current literature, including both operative and non-operative modalities. Operative management includes primary closure, resection, T-tube drainage, exclusion and diversion, and intraluminal stenting [8]. All of these modalities require an incision in the lateral neck or through a thoracotomy.

Non-operative management includes the use of antibiotics, but still runs a high risk of pneumothorax, pneumomediastinum, septic shock and respiratory failure. Other minimally invasive modalities for treatment include percutaneous drainage via CT guided drain placement, but this technique has proved to be very difficult due to the surrounding anatomy.

Conclusion

The goal of treatment in the management of mediastinitis secondary to esophageal perforations is to control the enteric leak, effectively drain the mediastinum and medically treat the patient with IV antibiotics and nutritional support.

If this can be accomplished without a major operative intervention the patient's recovery and overall management should be greatly improved.

References

1. Jones WG 2nd, Ginsberg RJ (1992) Esophageal perforation: a continuing challenge. *Ann Thorac Surg* 53: 534-543.
2. Inoue Y, Gika M, Nozawa K, Ikeda Y, Takanami I (2005) Optimum drainage method in descending necrotizing mediastinitis. *Interact Cardiovasc Thorac Surg* 4: 189-192.
3. Corsten MJ, Shamji FM, Odell PF, Frederico JA, Laframboise GG, et al. (1997) Optimal treatment of descending necrotizing mediastinitis. *Thorax* 52: 702-708.
4. Pearse HE (1938) Mediastinitis following cervical suppuration. *Ann Surg* 108: 588-611.
5. Wheatley MJ, Stirling MC, Kirsh MM, Gago O, Orringer MB (1990) Descending necrotizing mediastinitis: transcervical drainage is not enough. *Ann Thorac Surg* 49: 780-784.
6. Asensio JA, Chahwan S, Forno W, MacKersie R, Wall M, et al. (2001) Penetrating esophageal injuries: multicenter study of the American Association for the Surgery of Trauma. *J Trauma* 50: 289-296.
7. Biffl WL, Moore EE, Feliciano DV, Albrecht RA, Croce M, et al. (2015) Western Trauma Association Critical Decisions in Trauma: Diagnosis and management of esophageal injuries. *J Trauma Acute Care Surg* 79: 1089-1095.
8. Urschel HC Jr, Razzuk MA, Wood RE, Galbraith N, Pockey M, et al. (1974) Improved management of esophageal perforation: exclusion and diversion in continuity. *Ann Surg* 179: 587-590.



- Journal of Anesthesia & Clinical Care
- Journal of Addiction & Addictive Disorders
- Advances in Microbiology Research
- Advances in Industrial Biotechnology
- Journal of Agronomy & Agricultural Science
- Journal of AIDS Clinical Research & STDs
- Journal of Alcoholism, Drug Abuse & Substance Dependence
- Journal of Allergy Disorders & Therapy
- Journal of Alternative, Complementary & Integrative Medicine
- Journal of Alzheimer's & Neurodegenerative Diseases
- Journal of Angiology & Vascular Surgery
- Journal of Animal Research & Veterinary Science
- Archives of Zoological Studies
- Archives of Urology
- Journal of Atmospheric & Earth-Sciences
- Journal of Aquaculture & Fisheries
- Journal of Biotech Research & Biochemistry
- Journal of Brain & Neuroscience Research
- Journal of Cancer Biology & Treatment
- Journal of Cardiology: Study & Research
- Journal of Cell Biology & Cell Metabolism
- Journal of Clinical Dermatology & Therapy
- Journal of Clinical Immunology & Immunotherapy
- Journal of Clinical Studies & Medical Case Reports
- Journal of Community Medicine & Public Health Care
- Current Trends: Medical & Biological Engineering
- Journal of Cytology & Tissue Biology
- Journal of Dentistry: Oral Health & Cosmesis
- Journal of Diabetes & Metabolic Disorders
- Journal of Dairy Research & Technology
- Journal of Emergency Medicine Trauma & Surgical Care
- Journal of Environmental Science: Current Research
- Journal of Food Science & Nutrition
- Journal of Forensic, Legal & Investigative Sciences
- Journal of Gastroenterology & Hepatology Research
- Journal of Gerontology & Geriatric Medicine
- Journal of Genetics & Genomic Sciences
- Journal of Hematology, Blood Transfusion & Disorders
- Journal of Human Endocrinology
- Journal of Hospice & Palliative Medical Care
- Journal of Internal Medicine & Primary Healthcare
- Journal of Infectious & Non Infectious Diseases
- Journal of Light & Laser: Current Trends
- Journal of Modern Chemical Sciences
- Journal of Medicine: Study & Research
- Journal of Nanotechnology: Nanomedicine & Nanobiotechnology
- Journal of Neonatology & Clinical Pediatrics
- Journal of Nephrology & Renal Therapy
- Journal of Non Invasive Vascular Investigation
- Journal of Nuclear Medicine, Radiology & Radiation Therapy
- Journal of Obesity & Weight Loss
- Journal of Orthopedic Research & Physiotherapy
- Journal of Otolaryngology, Head & Neck Surgery
- Journal of Protein Research & Bioinformatics
- Journal of Pathology Clinical & Medical Research
- Journal of Pharmacology, Pharmaceutics & Pharmacovigilance
- Journal of Physical Medicine, Rehabilitation & Disabilities
- Journal of Plant Science: Current Research
- Journal of Psychiatry, Depression & Anxiety
- Journal of Pulmonary Medicine & Respiratory Research
- Journal of Practical & Professional Nursing
- Journal of Reproductive Medicine, Gynaecology & Obstetrics
- Journal of Stem Cells Research, Development & Therapy
- Journal of Surgery: Current Trends & Innovations
- Journal of Toxicology: Current Research
- Journal of Translational Science and Research
- Trends in Anatomy & Physiology
- Journal of Vaccines Research & Vaccination
- Journal of Virology & Antivirals
- Archives of Surgery and Surgical Education
- Sports Medicine and Injury Care Journal
- International Journal of Case Reports and Therapeutic Studies

Submit Your Manuscript: <http://www.heraldopenaccess.us/Online-Submission.php>