

Intrathoracic oesophageal perforation: A case series

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SUMMARY

Intrathoracic oesophageal perforation is a surgical emergency which is associated with high morbidity and mortality rates. Early diagnosis and appropriate intervention are imperative to reduce the morbidity and mortality. However, the rarity of this condition and its nonspecific presentation led to diagnostic and treatment delay. The management depends on the cause of perforation, the integrity of oesophagus, location of perforation and the time between perforation and presentation to hospital. Here, we discuss on two patients with oesophageal perforation, from clinical presentation and establishing diagnosis to prompt surgical management and outcome.

INTRODUCTION

Intrathoracic oesophageal perforation is a potentially life-threatening condition. Early diagnosis and appropriate intervention are imperative to reduce morbidity and mortality. The management depends on the cause of perforation, the integrity of the oesophagus, the location of perforation and the time between perforation and presentations to hospital. Here, we discuss on two patients with oesophageal perforation, from clinical presentation and establishing diagnosis to prompt surgical management and outcome.

CASE PRESENTATION

Case 1

A 55-year-old man presented to emergency department at 3.30 am with complaints of pain upon swallowing and shortness of breath after accidentally ingested chicken bone. On examination, he was clutching his chest in pain. He was tachycardic and tachypneic with no episode of hypotension or fever. His blood investigation was unremarkable. The initial neck x-ray did not show a foreign body in the neck and, there was no sign of pneumo or hydrothorax on the chest x-ray image. He was reviewed by ear-nose-throat (ENT) specialist and underwent examination under direct laryngeal and rigid esophagoscopy. A foreign body was seen at the posterior wall of the oesophagus 18 cm from upper incisor. The foreign body could not be removed because it was progressively moving into distal oesophagus. He developed respiratory distress immediately after being extubated in the operation theatre. Urgent computed tomography (CT) Thorax was performed and showed left hydropneumothorax causing mediastinal shift with ipsilateral lung collapse. Left chest tube was inserted and drained 600 ml of haemoserous fluid and the patient was reintubated. After 20 hours of rigid esophagoscopy, decision was made for exploration. He

underwent emergency oesophagogastroduodenoscopy (OGDS) and exploration which showed perforated oesophagus at 33 cm from the incisor and a bone was seen in the stomach. Left video assistant thoracoscopy surgery (VATS) was performed immediately which showed perforation at left lateral wall of the lower oesophagus (Figure 1). Necrotic tissue was debrided followed by primary closure with interrupted 4.0 polydioxanone suture, approximating both mucosal and muscular layers. Post operation recovery was uneventful and contrast study showed no leak at repair site.

Case 2

A 48-year-old heroin chaser, presented to emergency department with severe epigastric pain and shortness of breath for 3 days. He had epigastric pain for 1 months associated with vomiting. On examination, he was found septic and tachypnoeic. His abdomen was tender over the epigastric region with no peritonitic sign. There was reduced air entry bibasally, more prominent on the right hemithorax. His chest x-ray showed pneumomediastinum and consolidation at the right lower zone. Computerized tomography (CT) abdomen and thorax showed extensive pneumomediastinum predominantly at the lower oesophageal region with bilateral hydropneumothorax and minimal pneumoperitoneum at the epigastric region. In view of clinical history and suspicious clinical findings, epigastric pain is more a sign in peptic ulcer pathology and less common sign of oesophageal perforation and while pneumomediastinum is major sign of oesophageal perforation, an urgent OGDS was performed and a perforation at lower oesophagus 35 cm from the incisor was seen. Right thoracotomy was performed immediately, revealing 1 cm perforation at the lower oesophagus and stage 2 empyema thoracis (Figure 2). Oesophageal perforation site was repaired primarily with interrupted 4.0 polydioxanone suture and right lung decortication was done. He had a stormy post operative recovery due to sepsis which required intensive care for more than a week. OGDS performed 1 week after surgery revealed healing with no defect seen at the repair site. Chest drain was removed after the OGDS.

DISCUSSION

Intrathoracic oesophageal perforation is a surgical emergency which is associated with high morbidity and mortality rates.^{1,6} About 10-15% mortality reported when therapy is initiated within 24 hours of perforation and 40-60% when treatment is delayed. There are several contributing factors lead to rapid deterioration in cases of intrathoracic oesophageal perforation compared with

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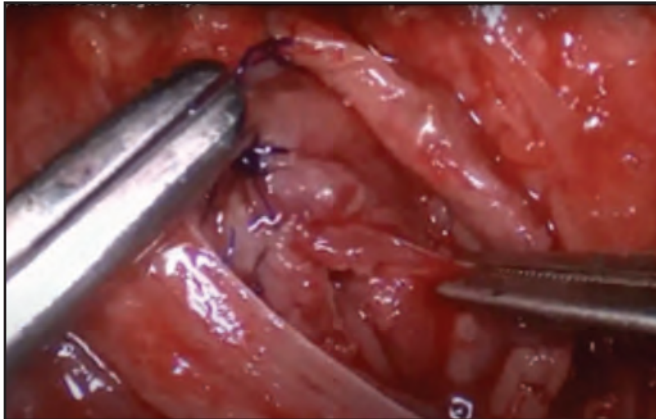


Fig. 1: Perforation at left lateral of lower oesophageal

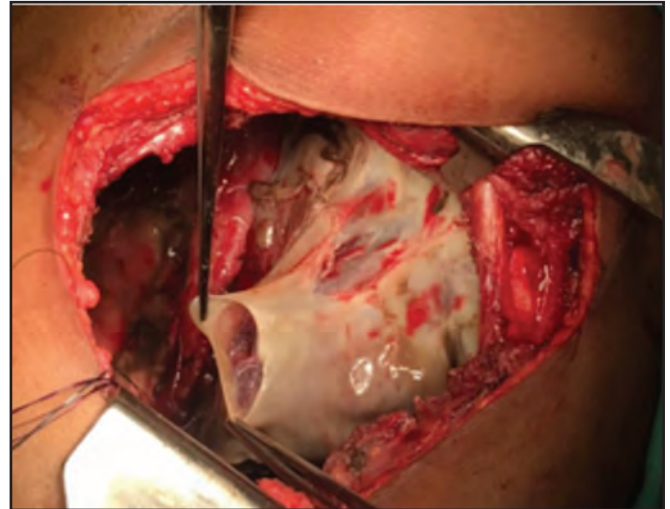


Fig. 2: Grade 2 lung empyema (Fibrinous cortex seen over the right lung)

cervical oesophageal perforation;^{6,7}

- 1) Anatomy of oesophagus; the mid oesophagus lies next to the right pleura while the lower oesophagus lies next to the left pleura. Once a perforation occurs, saliva, retained gastric contents or bile acid may enter directly to the respective pleural cavities and mediastinum.
- 2) Content of collection, gastric juice and bile acid which trigger a cytokine-mediated fluid sequestration leading to extensive inflammatory reaction and tissue destruction to pleural and mediastinum.
- 3) Contamination from oesophageal perforation allows bacteria access into the mediastinum and pleura cavity resulting lung empyema, mediastinitis and sepsis.

In both of our cases, patients deteriorated rapidly and progressed into sepsis. In case 1, patient developed respiratory distress immediately after rigid esophagoscopy while case 2, patient presented with sepsis and respiratory distress 3 days after complaining of epigastric pain which was a sign of oesophageal perforation.

The aetiology of oesophageal perforation is spontaneous (Boerhave syndrome), traumatic, iatrogenic or foreign bodies. In the era of advanced endoscopic therapies, iatrogenic perforation is the leading cause of oesophageal perforation which accounts for 70% of oesophageal perforation. Diagnostic OGDS reported a 0.03% risk of oesophageal perforation, and the risk increases when therapeutic procedure is performed endoscopically.

A total of 80% of patients presented with either chest or epigastric pain depending on perforation site. Epigastric pain can be misleading symptom with possibility of a perforated gastric ulcer.^{1,2,6} Other symptoms are vomiting, haematemesis, dysphagia, tachypnea, cough and fever.^{1,2} History of instrumentation or foreign body ingestion followed by the above symptoms should raise suspicion of oesophageal perforation.

In case 1, the clinical presentation was straightforward as it occurred directly after rigid oesophagoscopy. For case 2, the clinical presentation can be misleading with perforated gastric ulcer. However, the presence of pneumomediastinum and consolidation of right lung on chest x-ray had prompted us to re-evaluate the diagnosis. CT thorax and abdomen demonstrated extensive pneumomediastinum at lower oesophagus surrounded with fluid collection suggestive of oesophageal perforation. An urgent OGDS confirmed the diagnosis of oesophageal perforation.

The appropriate management of oesophageal perforation is controversial.¹⁻⁶ Early diagnosis within 24 hours of the incident is vital for good outcomes. Primary repair remains the preferred surgical treatment method in thoracic perforation. A successful outcome requires debridement of all necrotic tissue, vertical oesophagomyotomy to expose damaged mucosa, relief of distal obstruction in the case of strictures, two-layer tension-free closure and copious irrigation and drainage of the contaminated area.^{6,7,8} A VATS approach has been successfully implemented, but further studies are needed to clarify its role in primary repair in comparison with conventional thoracotomy.⁸ An on table OGDS is helpful to identify the site of perforation and guide the repair. If primary repair is not possible due to underlying oesophageal pathology, an oesophageal exclusion and oesophagectomy with delayed or immediate reconstruction can be considered. Oesophagectomy has the advantage of eliminating the source of infection and inflammation entirely, and restoring gastrointestinal continuity.^{7,8} In the case of unstable patient intraoperatively, a drain can be inserted into the perforation as a controlled fistula and a feeding jejunostomy for post op nutrition. Patient can be brought in for definitive surgery later when he is hemodynamically stable.

Both of our patients underwent surgical primary repair and decortication successfully once diagnosis was established. Compared to case 1, case 2 had a stormy recovery owing to late presentation thus higher morbidity. However, both recovered eventually.

CONCLUSION

The rarity of this condition and its nonspecific presentations lead to diagnostic and treatment delay. Prompt identification of perforation, resuscitation, and timely surgical intervention are keys to successful outcomes.

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COMPETING INTERESTS

The authors declare no competing interests.

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