Case Report

**Barotraumatic oesophageal rupture**

Rajesh Parameshwaran NAIR, Saurabh AGRAWAL

*Department of General Surgery, Kasturba Medical College, Manipal – 576104, Karnataka, India*

**Abstract**

Upper gastrointestinal perforations are usually iatrogenic following luminal scopies while investigating patients. Barotrauma is a rare cause of such perforations. Early clinical diagnosis and surgical intervention results in favourable outcome. Here we document a rare case of oesophageal perforation following barotrauma.

**Keywords:** esophageal perforation, esophagostomy, hydropneumothorax, gastrostomy.

**Introduction**

Most oesophageal perforations occur after endoscopic instrumentation for a diagnostic or therapeutic procedure. Oesophageal perforation following barotrauma is a rare entity and very few cases have been documented in literature (1). Clinical examination might reveal subcutaneous air in the neck or chest, shallow decreased breath sound, crepitus and tender abdomen. Diagnosis is usually confirmed by radiologic evaluation in the form of chest x-ray which would show hydropneumothorax, contrast oesophagogram with barium or contrast enhanced CT thorax which would show mediastinal air and fluid at site of perforation.

We describe a rare case of oesophageal perforation following barotrauma. A simple chest X-ray was done to confirm our diagnosis.

**Case Report**

A 32 year old gentleman presented with progressive breathlessness and heaviness in the chest following barotrauma, 48 hours after the incident (tyre tube burst). Clinical examination revealed tachycardia and decreased air entry and breath sounds on the right side of the chest on auscultation. Routine hematologic and biochemical investigations were normal. An expedited chest x-ray revealed right sided hydropneumothorax (Figure 1) for which an intercostal drainage tube (ICDT) was introduced into the right pleural cavity. It drained food particles and murky fluid. An urgent contrast enhanced computed tomography (CECT) of the thorax (Figures 2A & B) revealed oesophageal perforation at the level of T7-T8 along its right lateral wall causing right sided hydropneumothorax and collapse of the underlying lung, bilateral pulmonary contusions with left sided moderate pleural effusion with extensive subcutaneous emphysema and pneumomediastinum. He was taken up for emergency right thoracotomy with oesophageal perforation repair along with laparotomy, oesophageal exclusion with oesophagostomy and feeding gastrostomy (Figures 3A, B & C). Dependent salivary drainage was achieved using a nasogastric tube (Ryle’s tube) and serial oral suctioning from above the repair site and via the oesophagostomy from below.

Patient was on ventilatory support and showed clinical improvement over the next 48 hours. However, on the 2nd postoperative day he developed fever and developed left sided consolidation with minimal effusion (Figure 4). By the 5th postoperative day, the patient succumbed to systemic inflammatory response syndrome.
Discussion

Oesophageal perforations can occur either iatrogenically, spontaneously or post traumatic. Iatrogenic perforations are usually following endoscopic procedures with prognostic or therapeutic intent. Spontaneous perforations are seen following forceful retching and vomiting usually after alcohol consumption described as Boerhaave’s syndrome (2). Here we describe a rare case of lower oesophageal perforation following barotrauma.

A similar case of barotraumatic pneumothorax and pneumomediastinum associated with oesophageal perforation and orbital emphysema following blowout of a defective tyre has been reported in an 8 year old boy in literature (3). Computed tomography scan showed right pneumothorax and bilateral orbital emphysema. The child, in the former described case, underwent Stamm gastrostomy and tube thoracostomy along with a course of broad-spectrum antibiotics. Oral feeds were started after 23 days and the patient was discharged 50 days after injury.

In our case, the patient had presented 48 hours after the incident and since he was unstable at the time of assessment he was taken up immediately for exploration and definitive surgery. The earlier dictum of surgery within first 24 hours does not hold good since reports have shown that rather than duration since incident it is the amount of tissue that is present at the site of perforation that dictates primary closure versus proximal exclusion and drainage procedures (4, 5).

Adequate drainage may be the intervention of choice in these patients although there have been several studies to indicate benefits of primary repair, both in terms of survival and outcome regardless of the time between esophageal perforation and repair (6–9). Another recently published trial with 11 subjects with esophageal perforation concluded that delayed diagnosis should not preclude surgical repair in patients with esophageal perforation (10). Surgical intervention was chosen for our patient based on the aforementioned studies and the presence of frank mediastinitis. Proximal oesophageal diversion is an option, however our patient was unstable intraoperatively and the fact that the area being operated was the lower thoracic oesophagus, a distal diversion with adequate proximal diversion of secretions was performed.

Delayed diagnosis of oesophageal perforation is recognized with a high mortality rate (16–75%) and morbidity rate (35–66%). Management of oesophageal perforation has been a therapeutic challenge for the surgeons even with the availability of advanced treatment options (4). Therapeutic strategies include antibiotics, surgical debridement and repair. For some cases with delayed diagnoses, surgical repair is very difficult. The surgical strategy we applied here was followed by a very successful consequence because this management allowed low-pressure, isolated and adequately drained environment for an injured oesophagus to heal. In anticipation of the patient's need to remain without oral intake for a prolonged period of time, a secure method for delivery of nutrition (jejunostomy or gastrostomy) is best (5). If the treatment has been delayed, closure of the esophageal injury may be contraindicated; conservative measures can be used for this kind of patients (2, 8, 9, 11–13). The results are promising however in our case the endpoint was fatal due to concurrent systemic inflammatory response syndrome.

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Authors’ Contributions

Conception and design, provision of patient, analysis and interpretation of the data, drafting of the article: RPN
Administrative, technical, or logistic support: SA

Correspondence

Dr Rajesh Parameshwaran Nair
Academic qualitifacion
Dept. of General Surgery
Kasturba Medical College
Manipal – 576104
Karnataka, India.
Tel: +91-9008419401
Email: rajeshnair39@yahoo.com / neurodoc39@gmail.com

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Figure 1: Radiograph showing right sided hydropneumothorax.
Figure 2A: Contrast enhanced computed tomography (CECT) of the thorax showing nasogastric tube in the right pleural space (coronal cut).

Figure 3B: CECT thorax showing nasogastric tube in the right pleural space (axial cut).
Figure 3A: Intraoperative image showing nasogastric tube in the right pleural space (right lung retracted laterally).

Figure 3B: Intraoperative image showing nasogastric tube in the right pleural space through the lower thoracic oesophageal rent (note suture taken cephalad).

Figure 3C: Intraoperative image of primary oesophageal repair done over the nasogastric tube which has been advanced distally into the abdominal oesophagus.
Figure 4: Postoperative day 2 radiograph showing left sided consolidation with minimal effusion (left Intercostal drainage tube (ICDT) was inserted, note - right ICDT in situ).