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## External air compression: A rare cause of blunt esophageal injury, managed by a stent



Mohammed Muneer<sup>a</sup>, Husham Abdelrahman<sup>b,\*</sup>, Ayman El-Menyar<sup>c,d</sup>, Ibrahim Afifi<sup>b</sup>, Ammar Al-Hassani<sup>b</sup>, Ammar AlMadani<sup>b</sup>, Rifat Latifi<sup>b,e</sup>, Hassan Al-Thani<sup>b</sup>

<sup>a</sup> Department of Surgery, Hamad Medical Corporation, Doha, Qatar

<sup>b</sup> Trauma Surgery Section, Hamad General Hospital, Doha, Qatar

<sup>c</sup> Clinical Research, Hamad General Hospital, Doha, Qatar

<sup>d</sup> Weill Cornell Medical College, Doha, Qatar

<sup>e</sup> Department of Surgery, Arizona University, Tucson, AZ, United States

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### ABSTRACT

**INTRODUCTION:** Blunt esophageal injuries secondary to external air compression of anterior chest and abdomen complicated with esophageal perforation are uncommon events associated with worse outcomes.

**PRESENTATION OF CASE:** We reported a rare case of esophageal perforation following an external air-compression injury along with the relevant review of literatures. The patient presented with chest pain and shortness of breath and was managed with tube thoracostomy, followed by thoracotomy and eventually with temporary endoscopic stenting.

**DISCUSSION:** In such trauma case, the external pressurized air forms a shock wave which usually directed to the hollow viscus. Patients with external air-compression injury presented with chest pain and pneumothorax should be suspected for esophageal perforation.

**CONCLUSION:** High index of suspicion is needed for early diagnosis of esophageal perforation after blunt trauma. Appropriate drainage, antibiotic and temporary endoscopic esophageal stenting may be an optimal approach in selected patients, especially with delayed diagnosis.

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## 1. Introduction

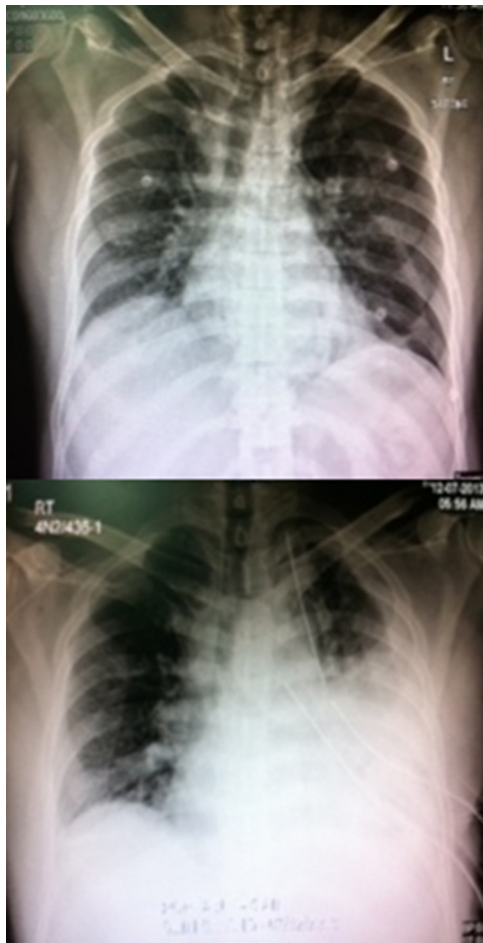
Although, esophageal injuries are uncommon, patients with esophageal perforation may have significant complications with worse outcome.<sup>1</sup> Therefore, high index of suspicion is needed for early diagnosis and timely management of such injuries. Overall blunt esophageal perforation is rare event. This hollow viscus structure is susceptible to damage by external blast wave compression and the risk of perforation is greater at points where tissue density changes.<sup>2</sup> However, the incidence of external air compression of the anterior chest wall causing esophageal perforation is an uncommon event that can be missed initially. Herein, we report a rare case of esophageal perforation following an external air-compression injury along with the relevant review of literatures.

## 2. Case presentation

A 38-year-old male worker who mistakenly tried to dismantle a cylinder which was a full of nitrogen gas, suddenly a high pressure gas released and hit his chest at a distance of 30 cm. The patient was transferred immediately to the trauma unit with a complaint of chest pain and shortness of breath. On the initial examination, he was found to have normal vital signs and his chest X-ray revealed large left sided pneumothorax (Fig. 1, upper panel) that was managed by chest tube insertion. On the third post-injury day, the chest tube drained 1500 ml of foul smelling cloudy fluid. Cultures were obtained and patient was started empirical intravenous antibiotics. However, due to continued drainage, anaerobic growth with *Methicillin-resistant Staphylococcus aureus* (MRSA) on culture of pleural effusion, and increased white blood cells, a left anterior–lateral thoracotomy with decortication was performed on the 7th day (for removal of empyemic membrane) and 2 chest tubes were inserted (Fig. 1, lower panel). Postoperatively, the patient continued to accumulate large milky effusion. As the physician was suspecting chylothorax, oral methylene blue test was performed. The blue color of the dye was observed inside the chest tube within 15 min (Fig. 2) suggesting the presence of esophageal

\* Corresponding author at: Trauma Surgery, Hamad General Hospital, P.O. Box 2210-2612/© 2014 The Authors. Published by Elsevier Ltd. on behalf of Surgical Associates Ltd. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/3.0/>).

E-mail address: [traumaresearch@hmc.org.qa](mailto:traumaresearch@hmc.org.qa) (H. Abdelrahman).

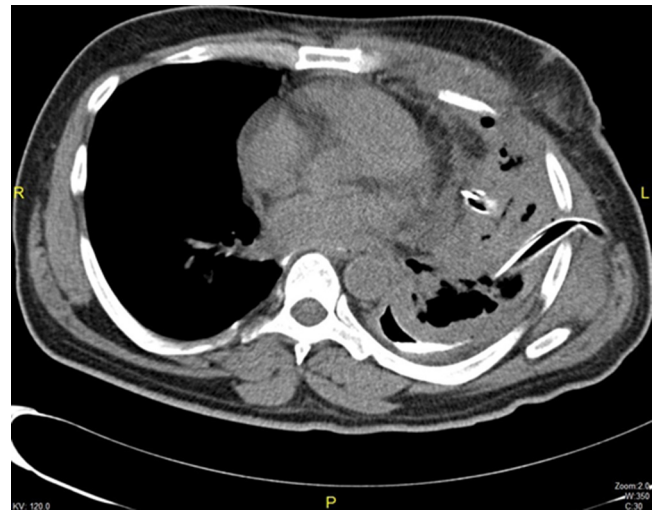


**Fig. 1.** The initial chest X-ray showing pneumothorax (upper panel) and after chest tubes insertion after thoracotomy and developing effusion (lower panel).

leak into the pleural cavity and hence, chylothorax was excluded. Injury in the lower third of the esophagus was subsequently confirmed on chest CT scan with oral contrast and gastrografen study (Figs. 3 and 4). The patient underwent endoscopic placement of a temporary esophageal expandable covered stent (Fig. 5). Patient was kept on parental nutrition and within 2 weeks, repeated endoscopic and gastrografen study revealed healing of the esophageal injury. The stent had migrated in the stomach and was successfully



**Fig. 2.** Chest tube drainage of yellowish fluid then blue colored fluid after using oral methylene blue.



**Fig. 3.** Post-thoracotomy chest CT scan showing chest tube, empyema, oral contrast leak into the pleural cavity.

retrieved endoscopically. Patient condition improved and was discharged to home.

**3. Discussion**

Blunt esophageal injuries are uncommon particularly, post-external air-blast trauma which has been reported in <0.01% of the esophageal perforation cases.<sup>2</sup> In such trauma cases, the external pressurized air forms a shock wave which usually directed to the hollow viscus including esophagus through the mouth.<sup>3</sup> We were able to identify 19 published cases with variable anatomical distribution.<sup>3–5</sup> Injuries to the lower, middle and upper esophagus were reported in 12, 4 and 4 cases, respectively. Previously, we have reported a case of blunt trauma due to fall of heavy object that resulted in injury to the middle esophagus requiring surgical repair through the right thoracotomy.<sup>6</sup> The low incidence of esophageal injuries is attributed to its protection by hard shell



**Fig. 4.** X-ray showing the esophageal fistula after using oral gastrografen.

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