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Case Report

Late presentation of sub-carinal esophageal perforation due to blunt trauma to chest: case report and review of literature

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ABSTRACT

An esophageal perforation due to blunt trauma to chest is extremely rare and most often associated with road traffic accidents at high speeds. Symptoms and signs associated with esophageal perforation are non-specific and easily confused with other injuries common in polytrauma patients. The condition carries a significant morbidity and mortality and any delay in diagnosis further worsens the prognosis for the patient. We report a case of late presentation of post-traumatic esophageal perforation present below the level of carina in a young male who was managed conservatively.

Keywords: Esophageal perforation, Sub-carinal, Late presentation, Blunt trauma chest

INTRODUCTION

Esophageal perforation following blunt trauma to chest is an extremely rare event and sub-carinal perforation even more so.[1,2] It requires a high degree of clinical suspicion on the part of the treating physician to timely diagnose the condition, since misdiagnosis can be disastrous for the patient.[3,4] There are no standard guidelines regarding the diagnosis and management of the condition.

We report a case of a young male who had late presentation of an esophageal perforation following blunt trauma to the chest.

CASE REPORT

A 19-year-old male had a road traffic accident at high speed when his motorcycle collided into the rear of a truck. He sustained maximum impact of the collision to his chest and head.

On admission patient was conscious and oriented, albeit distressed and complained of difficulty in breathing and pain in upper part of his chest. Primary survey revealed that the patient had tachypnea and tachycardia with a low blood pressure. Patient was found to have a lacerated wound over the forehead, and a segment showing paradoxical respiratory movements just lateral to the sternum on the left side.

Detailed examination revealed reduced air entry on left side of the chest with subcutaneous emphysema and fracture of the sternum. Breath sounds were normal on right side of the chest. There was a dull note on percussion on the entire left hemithorax and an intercostal drain was placed on the left side with a clinical diagnosis of hemopneumothorax. Air along with 1 liter of blood was drained immediately upon insertion of the intercostal drain.

Patient was subsequently resuscitated adequately with intravenous fluids and blood products. He was subjected to further investigation upon stabilization. Chest X ray showed evidence of hemopneumothorax on the left side; however the right side had clear CP angles (Figure 1).

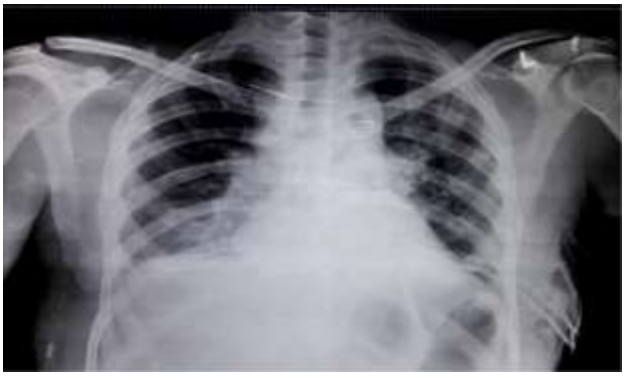

Figure 1: Chest X ray taken after insertion of left side intercostal drain at presentation. Pneumothorax present on the left.

Patient also underwent contrast enhanced computed tomography on the first day of admission, which showed subcutaneous emphysema, mild pneumothorax along with pleural effusion on the left side of the chest. Mild pneumopericardium and pneumomediastinum were also noted. Minimal effusion was seen on the right side along with fracture of sternum. No esophageal perforation was reported (Figure 2, 3).

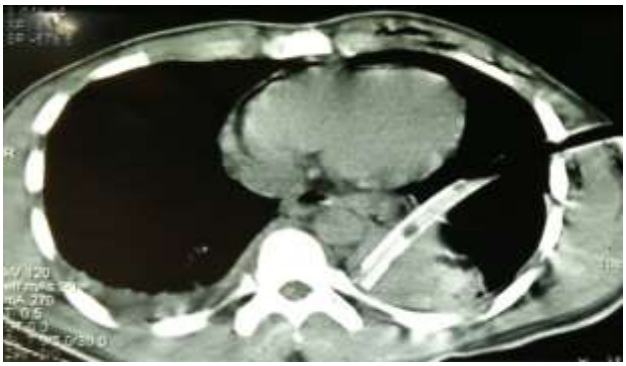

Figure 2: CT Chest showing pneumomediastinum and intercostal drain on left side.

Figure 3: CT Chest showing fracture of sternum and subcutaneous emphysema.

During his hospital stay, the patient was allowed orally on the second day of admission. He continued to have tachycardia and developed fever on the 3rd day of admission. This was accompanied with reduced breath sounds and blunting of CP angles on Chest X-ray on the right side (Figure 4). Eventually, an intercostal drain was placed on the right side on the 5th day of admission and nearly 1 liter of serous fluid was drained from the right intercostal drain immediately upon insertion. The intercostal drain on the left was removed on the 6th day of admission (Figure 5).

Figure 4: Chest X ray showing intercostal drain on left side, alongwith blunting of CP angles on right side suggestive of pleural effusion.

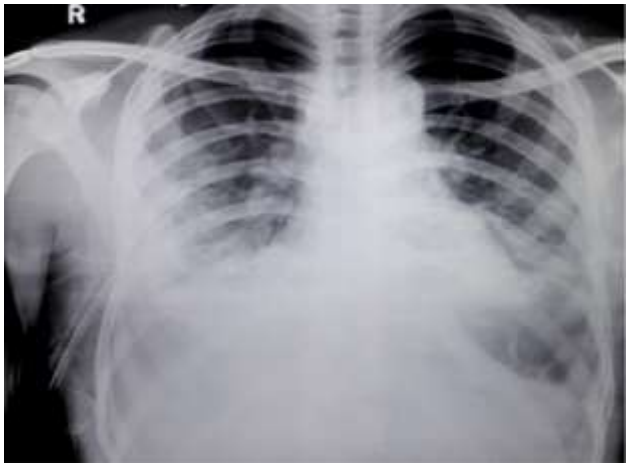

Figure 5: Chest X ray showing intercostal drain inserted on right side of chest.

Patient continued to take orally during this period.

On the 8th day of admission, food particles were first noticed in the contents of the drain.

An upper GI endoscopy done on the same day revealed a large esophageal perforation nearly 36 cm from the incisors, on the right posterolateral aspect of the esophagus (Figure 6).

Figure 6: Upper Gastro-Intestinal Endoscopy image showing perforation in the esophagus in the Right posterolateral aspect.

A nasojejunal feeding tube was placed under endoscopic guidance to aid nutrition.

Patient was continued on conservative management and eventually referred to higher center for further management on his 10th day of admission.

DISCUSSION

Esophageal perforation following blunt trauma to chest is an exceedingly rare occurrence and since the 1900s nearly 100 cases have been reported, with road-traffic accidents at high speeds being the most common cause.[1,2]

Most of the blunt esophageal injuries are seen in the cervical esophagus and they are rarely intra-thoracic and a recent review by Monzon et al found only 16 previously reported cases of blunt intra-thoracic esophageal rupture.[3] Furthermore, most of the intra-thoracic blunt esophageal injuries are seen above the level of carina, and thus infra-carinal blunt esophageal injuries are extremely rare and have a nearly 70% rate of delayed presentation.[4]

While the mechanism of injury is poorly understood in blunt esophageal injuries, it is usually attributed to sudden rise in intra-esophageal pressure due to sudden expulsion of air from the stomach into the esophagus against a closed glottis, as seen in Boerrhave's syndrome. Some authors also attribute esophageal injuries to compression between the sternum and vertebrae.[1,3]

Not only is intra-thoracic esophageal perforation, in case of blunt trauma, a rare occurrence, the most common symptoms include pain, dyspnea, fever and crepitus which are non-specific and usually attributed to bilateral rib fractures, thus making esophageal perforation an unlikely diagnosis which usually requires a high degree of suspicion on part of the treating physician.[5]

Pain in esophageal perforation usually radiates to the back and left shoulder followed by vomiting and dyspnea, thus forming the Mackler Triad.[6]

Examination often reveals tachycardia, fever and other markers of systemic inflammation response syndrome and as the subsequent mediastinitis progresses patients may even have cardiovascular collapse and multiorgan failure.[7]

Therefore esophageal perforation is a life threatening event and carries a very high mortality rate of 5-30%.[8] Even with urgent surgical repair taken up within first 24 hours of the event the mortality remains a staggering 12%. These patients are considered critically ill and any delay diagnosis can be life threatening.

Owing to the non-specific nature of presenting symptoms diagnosis of oesophageal perforation is largely dependent on radiological investigations.

A plain chest X-ray can provide indirect signs of esophageal injury such as pneumomediastinum, pleural effusion, subcutaneous emphysema, hydrothorax, pneumothorax, etc. While these findings can raise a doubt of esophageal perforation in the setting of iatrogenic injury or spontaneous esophageal perforation, in the setting of polytrauma they are often attributed to multiple rib fractures.[6]

However use of a water soluble contrast medium (if the patient is able to swallow) can reveal a contrast leak in most cases of esophageal perforation. Previous reports have shown that if initially negative, this study can be repeated after 4-6 hours.[6] However a negative study is not reassuring since the false negative rate of contrast swallow in these conditions may be as high as 40%.[9]

On computed tomography the indirect markers are much the same as those seen on a plain chest X-ray, however these findings are not of much clinical significance in the setting of trauma since they are commonly attributed to other injuries seen in polytrauma patients such as multiple rib fractures. Another indicator of esophageal injuries include thickening of wall of esophagus and occasionally a tract may be identified, however these findings are often masked by edema and hemorrhage.[10] Therefore CT remains a poor investigation to detect the presence or site of esophageal perforation. However it is very useful in illustrating sequelae of perforation such as mediastinal collections and abscesses.[11]

If contrast swallows and CT findings remain inconclusive, flexible endoscopy can provide a safe and effective method for both detection and exclusion of esophageal injury. While the exact role of flexible endoscopy remains undefined, a study by Flowers et al found it to have a sensitivity of 100%, specificity of 96% and accuracy of 97%. Flexible endoscopy can comment on presence as well as location and size of perforation.[12]

If the patient is suspected to have esophageal perforation, he/she should be kept nil per oral and started on

intravenous fluids, broad spectrum antibiotics and analgesics.[13]

Definitive management of esophageal injuries have gradually shifted towards initial non-operative approaches such as percutaneous drainage of pleural effusions, collections or abscesses, especially if there is delayed presentation and minimal sepsis as was seen in our case.[14,15]

Non-operative management includes management in intensive care units, with adequate resuscitation and intra-venous antibiotics while ensuring appropriate nutrition via parenteral or enteral routes.

However large perforations with extensive contamination often warrant cervical esophagostomy, decompressive gastrostomy or gastro-esophageal stapling and mediastinal debridement.

In our case esophageal perforation was not suspected initially, and was only diagnosed on delayed presentation. In blunt trauma there may devitalisation of the wall of esophagus which may gradually undergo necrosis leading to a delayed presentation.

CONCLUSION

Early diagnosis of esophageal perforation can be possible with high degree of clinical suspicion considering the severity of associated injuries and if contrast swallow and flexible endoscopy are routinely included in investigation protocol in cases of severe blunt trauma to chest. However a negative contrast swallow at the time of presentation does not rule out a delayed presentation of esophageal perforation.

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