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Case study

Delayed post-traumatic hemothorax

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ABSTRACT

Intrathoracic bleeding may occur following blunt chest trauma, and can be classified as minimal, moderate or massive, according to the amount of blood present. The diagnosis of hemothorax is established by clinical examination, plain chest radiograph or, more recently, by ultrasound of the chest [1]. Computed tomography of the chest helps to define the nature of the chest injury but is not indicated in all patients because of lack of availability, radiation dose and expense [2]. Significant intrathoracic bleeding following chest trauma going unrecognized for more than 2–3 days is highly unusual [3]. A trauma patient who presented with symptomatic massive hemothorax 12 days post-injury is herein reported.

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CASE HISTORY

A 38-year-old man presented with left-sided chest pain after a fall in the bathroom at home, striking his left side. Physical examination detected tenderness over the left lower postero-lateral chest wall. The initial chest x-ray demonstrated fractures of the left tenth and eleventh ribs with no evidence of hemothorax. The hemoglobin recorded was 15 g/dl. The patient was under observation for 24 h and was discharged the next day following a repeat chest x-ray which showed no change.

Twelve days later the patient presented with increasing chest pain and tachypnea. Chest x-ray showed near total opacification of the left hemithorax (Fig. 1). Computed tomography (CT) of the chest and abdomen confirmed a massive effusion and left lung collapse (Fig. 2). There were no abdominal injuries identified.

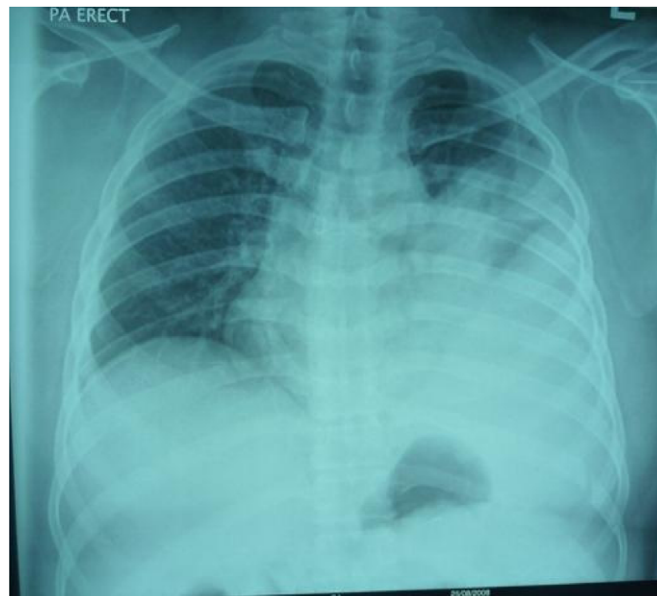


Figure 1. Chest x-ray at time of return to hospital showing massive left hemothorax.

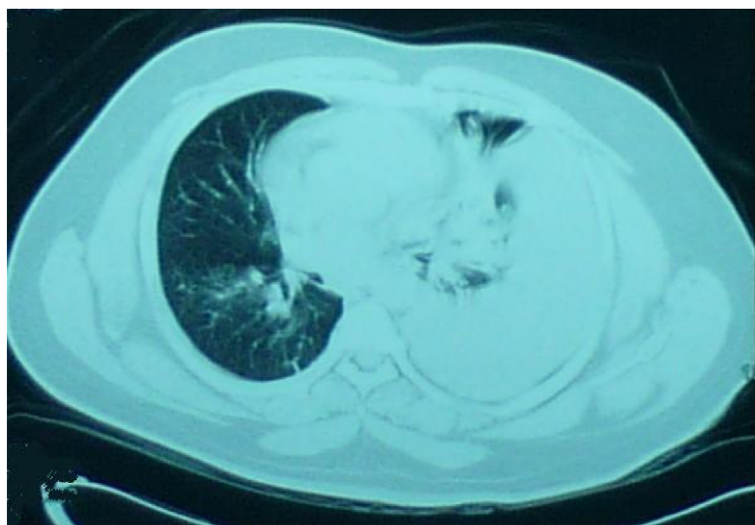


Figure 2. Chest CT defining dimension of intra-pleural blood and near total compression of the left lung.

Tube thoracostomy produced an uninterrupted return of 1300 cc of blood. Hemoglobin was 11 g/dl. The chest tube continued to drain diminishing amounts of blood for four days, the output then ceased and the tube was removed. However, a further chest x-ray showed residual changes, and a

pulmonary status that did not return to baseline despite analgesia and incentive spirometry. A follow-up chest CT showed high-density fluid within the left plural sac consistent with residual hemothorax, collapse of the posterior basal segment of the lower lobe of the left lung, and multiple atelectatic bands restricting the left lung. Combined video-assisted thoracoscopy and mini-thoracotomy were required to free the entrapped lung and evacuate the pleural space. The patient improved rapidly following the procedure and was discharged three days later.

DISCUSSION

Hemothorax occurring after hospital discharge can cause serious consequences. It is one of several chest injuries, including uncomplicated and complicated rib fractures, injuries to the diaphragm, sternal fractures, and rupture of the thoracic aorta, which may go unrecognized. Some cases of hemothorax are serious and life-threatening while others create symptoms without long term consequences. Other cases may be picked up in an asymptomatic patient, especially when routine thoracic CT scanning is performed according to protocol [2]. Simon et al. described twelve cases that presented with delayed hemothorax 18 h to six days after severe blunt chest trauma associated with rib fractures [3]. The authors characterized delayed hemothorax as a potentially lethal complication unique to displaced rib fractures following blunt chest trauma. It is clear from the literature that fatal consequences of chest trauma are not all immediate [4]. Sharma et al. reported an incidence of 5% for delayed hemothorax, defined as hemothorax occurring after discharge from the hospital [5]. These patients were found to be less severely injured, and initially were confined for shorter periods in the hospital. Rib fractures were present in 75% of cases. In 2006, Chilma et al. reported delayed massive post-traumatic hemothorax in a patient without rib fractures [6]. At operation, it was found that the site of hemorrhage was the internal mammary artery.

The patient reported here presented after a relatively minor injury mechanism (fall at home), and the diagnosis of rib fractures was established at the time of initial presentation. There were no clinical findings to suggest the catastrophic hemorrhage which followed. Upon return, the patient did not present in shock, which is consistent with sustained slow blood loss with compensation. The patient was however found to be suffering significant respiratory distress. These findings are consistent with those of other authors [3,6]. Nonetheless, volume resuscitation is the initial therapy followed by tube thoracostomy to evacuate the pleural space. Close monitoring of the chest tube output is essential to exclude ongoing hemorrhage.

The failure of tube thoracostomy to completely evacuate the pleural space and allow lung re-expansion in this patient was not unexpected. After 12 days of slow intrapleural bleeding, clotting, even early clot organization and adhesions were anticipated. It can be debated whether minimally invasive thoracoscopy should have been employed earlier, but the patient initially improved. Thus, similar chest trauma management principles should apply whether rib fractures with associated hemothorax are recognized early on during a patient's initial presentation or at a later date. Most of these cases need close observation, repeated physical examination, and hospitalization. Hemothorax complicating blunt chest trauma is treated with a chest tube as it was in this cases.

Thoracotomy is rarely needed unless the massive hemothorax causes hemodynamic instability or the tube thoracostomy is ineffective, for example, in the presence of organized hemothorax, empyema, or persistent collapsed lung. Minimally invasive techniques offer an attractive alternative to thoracotomy in the stable patient.

CONCLUSION

Delayed bleeding following blunt chest trauma is uncommon but can be massive, affecting pulmonary function and hemodynamic status. In this report, a patient presented with a massive hemothorax 12 days post-injury. The duration of intra-pleural retained blood reduces the likelihood of successful management by tube thoracostomy alone. Early follow-up CT can define the ineffectiveness of tube thoracostomy and lead to early use of therapeutic minimally invasive thoracoscopy.

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