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IMAGING IN MASSIVE PULMONARY HAEMORRHAGE: A RARE COMPLICATION AFTER SEVERE TRAUMA.

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ABSTRACT Trauma is one of the most common causes of mortality and morbidity in young adults worldwide. A blunt force to the chest causes pulmonary contusion (PC), which is defined as destruction of lung parenchyma. Massive pulmonary haemorrhage (MPH) is caused by pulmonary vascular injury after severe trauma. It is a rare form of pulmonary contusion that is associated with significant mortality if not recognised early and treated promptly. Here is a case series on the imaging appearance of MPH.

KEYWORDS : Pulmonary contusion, Massive pulmonary haemorrhage, Ground-glass opacities, Consolidation.

INTRODUCTION

Severe injuries continue to be the most common cause of mortality and disability worldwide, regardless of age, sex, and ethnicity. A pulmonary contusion is the result of blunt trauma to the chest.

There will be destruction of the pulmonary parenchyma and alveolar haemorrhage of varying degrees[1]. 10 to 30% of cases of injuries present with PC. More than 20% involvement of the lung is considered significant.

The most common presentations of patients with PC are chest pain, breathlessness, and hemoptysis. Massive pulmonary haemorrhage is a rare but severe form of pulmonary contusion that occurs due to vascular injury. Bleeding into the alveolar space or the bronchi can cause severe airway obstruction, resulting in hypoxemia and respiratory failure. If not treated promptly, MPH can lead to rapid deterioration and death[2]. Chest radiography is a simple and widely available investigation that can be used to screen patients with severe trauma and can aid in the early recognition of severe pulmonary contusions. A helical computerized tomography(CT) scan of the thorax is a highly sensitive modality for identifying and quantifying various pulmonary pathologies, and in the setting of severe trauma, its role is invaluable in rapidly identifying life-threatening complications. Early identification of the MPH, restoration of the airways, and halting the active haemorrhage are the keys to reducing mortality. The use of assisted ventilation with bronchoalveolar lavage has proven to be an effective treatment strategy, and extracorporeal membrane oxygenation (ECMO) has further improved the outcome in such patients[3].

CASE SERIES

Case 1: An 18-year-old male with a history of falling from a building was brought to the emergency room (ER) with loss of consciousness; his oxygen saturation was 78%. After primary assessment and effective resuscitation, the patient underwent chest radiography, which showed bilateral pulmonary opacities; following that, a CT scan scan of the thorax was performed, which revealed bilateral large pulmonary consolidations. There was no hemo or pneumothorax. Patient was admitted to the intensive care unit (ICU) and was put on mechanical ventilation, but his condition deteriorated and became critical after 2 days; unfortunately, he succumbed to his injuries on day 3.

Case 2: A 24-year-old male came to the ER after a motor vehicle collision (MVC) with complaints of breathlessness and coughing with blood in his sputum. Initially, his chest radiograph revealed alveolar opacities, and the CT scan showed ground glass opacities. The opacities were scattered in both lungs in the central location. There was a small pleural effusion and no pneumothorax. Few lower thoracic ribs showed non-displaced fractures. He was later transferred to a critical care unit, where he was treated with oxygen therapy and was placed on a ventilator on day 2 after his oxygen saturation started declining. He was monitored for 10 days, showed rapid recovery, and was discharged after 15 days. A follow-up radiograph after a month showed significant clearing of the opacities.

Case 3: A 33-year-old gentleman was brought to the ER with a history of coughing up blood-tinged sputum and chest pain after falling from a tree. A chest radiograph revealed poorly defined pulmonary opacities in both lung fields. A CT scan of the chest showed extensive consolidations in both lungs and ground glass attenuation in both lungs. The distribution of consolidation was predominantly central and bilaterally symmetrical. The patient showed significant hypoxia on arrival, was intubated, and mechanical ventilation was immediately initiated. Patient didn't show improvement, and on day 4, a tracheostomy was performed and mechanical ventilation was continued; later, he was shifted to a centre with an ECMO facility

DISCUSSION

Trauma is one of the leading causes of death and disability in young adults. Pulmonary involvement of varying degrees is a common occurrence in patients with severe acute trauma. The lung contusion is one of the main determinants of clinical outcome, and significant parenchymal damage is associated with a poor prognosis. Massive pulmonary haemorrhage is a rare but severe form of pulmonary contusion. The cause of MPH is pulmonary vascular damage after severe blunt-force trauma to the chest. Most commonly, patients present with dyspnea, hemoptysis, and low blood oxygen saturation. Rarely, patients may be asymptomatic for a few hours following the initial insult, only to deteriorate later as the disease progresses.

Chest radiography is a widely available investigation that is inexpensive and can be performed rapidly in an emergency setting. The most common pattern of appearance of PC is ill-defined opacities, infiltrates, and scattered areas of consolidation in one or both lung fields. In MPH, chest X-rays can demonstrate extensive fluffy opacities and large areas of consolidation in both lungs. Serial chest radiographs are also helpful in determining the disease course andresponse to treatment.

A CT scan of the thorax with and without contrast enhancement plays a crucial role in identifying the condition. The common pattern of lung involvement is extensive symmetrical ground-glass attenuation or consolidation occurring predominantly in the central location. Contrast-enhanced CT scan can help in the localization of areas with active bleeding. MPH is a critical illness that can progress rapidly, causing respiratory failure and circulatory compromise; hence, it becomes essential to recognize the condition early and treat it aggressively to prevent mortality and minimize morbidity. This is a first case series of imaging appearance in MPH to our knowledge.

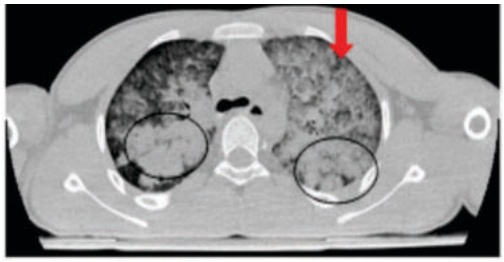

Fig: A- Axial CT scan of the thorax in lung window through carina showing ground glass opacities (red arrow) and consolidations (oval).

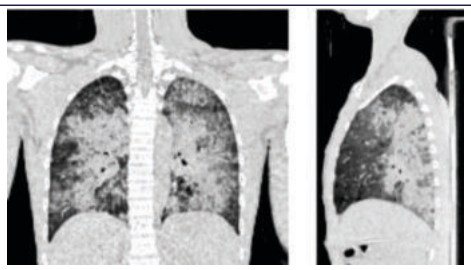

Fig B &C: CT Coronal and sagittal reconstruction showing centrally and posteriorly distributed massive consolidation.

CONCLUSION

MPH is a rare but fatal complication after severe trauma. Early detection of MPH by CT scans is crucial for the initiation of effective management early in the course of the disease, which significantly lowers mortality.

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