

The Rare Traumatic Pneumomediastinum in An Unfortunate Biker

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INTRODUCTION

Pneumomediastinum following a blunt thoracic trauma is rare. It was reportedly occurred in 2-10% of overall cases. Most of cases are self-limiting but requiring closed monitoring since it may occasionally lead to a disastrous and life threatening condition. We share a case of post traumatic chest injury in unfortunate young biker who had hit a lamp post and developed pneumomediastinum which subsequently admitted to our centre for further treatment.

CASE DESCRIPTION

The unfortunate 22-year-old gentleman was rushed to our Emergency Room (ER) after had a motor vehicle accident. He was a motorbike rider who hit a lamp post which fall towards him. It was believed that there was a car skidded and hit the lamp post prior to the event. Upon arrival, he was complaining of severe bilateral chest pain and his upper abdomen. Primary survey showed superficial abrasion wound and bulging over lower central chest which more obvious on straining with tenderness over bilateral lower chest and crepitus over entire left chest region. Lung auscultation revealed reduced air entry over left chest. He was tachycardic with heart rate of 125/minute and blood pressure of 125/75 mmHg. FAST scan showed free fluid at Morrison Pouch and spleno-renal area. Extended FAST showed no pleural effusion while bed side echocardiographic and lung ultrasound both showed poor window due to extensive subcutaneous emphysema. Urgent chest radiograph showed lucency over right perihilar region suspicious of pneumomediastinum. ECG showed neither ischaemic nor rhythmic pathologies. CECT Thorax and Abdomen showed following: left pneumothorax with lung contusion, pneumomediastinum communicating with overlying anterior chest wall subcutaneous emphysema, irregularity at the right myocardial wall suspicious of myocardial contusion, features suggestive of left mammary artery injury with no CT evidence of haemorrhage. Multiple left costal cartilage fracture, liver injury AAST grade III with splenic injury AAST grade I. Left tube thoracostomy was inserted and then patient was admitted to Surgical High Dependency Unit (SHDU) for closed monitoring and observation. In the ward formal echo was done and revealed no evidence of cardiac contusion. Patient was remained stable and was discharged home after a week of admission without any surgical intervention.

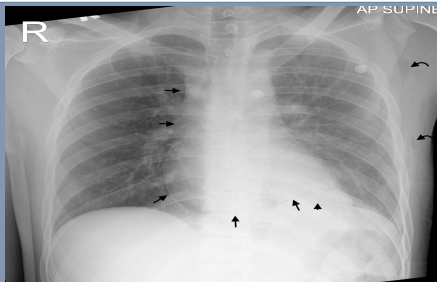


Figure 1: Arrows shows lucent line surrounding the heart border extending to upper mediastinum. Short arrow shows loss of silhouette of retrocardiac lung parenchyma and medial end of left hemidiaphragm. Bend arrow indicate subcutaneous emphysema

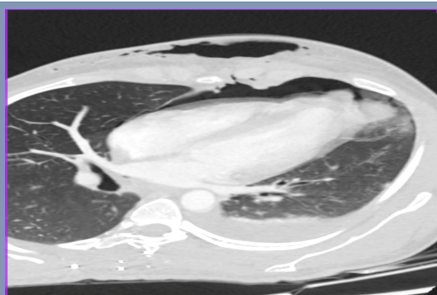


Figure 2: Reconstructed lung window CT image at 4 chamber cardiac plane shows communicating pneumothorax, pneumopericardium, pneumomediastinum and subcutaneous emphysema at the anterior chest wall. Inferior lingula and left posterior basal contusion with hemothorax.

DISCUSSION

Traumatic pneumomediastinum in this case is believed likely due to Macklin effect which is nowadays mostly accepted explanation as there was no other injuries such as facial trauma or perforated viscus (1). Furthermore there is sign pleural effusion which might suggestive of associated aerodigestive injury. Clinical examination might be normal in 30% of case while 60% of cases will presented with neck or precordial subcutaneous emphysema. In the case of tension pneumomediastinum, there will be distended neck vein which denote impairment of venous return (2). Bedside ultrasound is now readily available and highly used in most ER during primary survey of every traumatic case. Sonographic sign like air gap sign which refer to echogenic interface anterior to the heart that may obscure the cardiac structure explained the poor cardiac window in this case (2). Detection of this rare entity can be elicited radiologically with plain chest x-ray in 25% of cases and CT scan in the rest of cases (3). CT findings associated with the traumatic pneumomediastinum that found in this case are subcutaneous emphysema, pneumothorax, rib fracture and pulmonary contusion (4). Isolated pneumomediastinum is usually benign but in the case with concurrent haemothorax, posterior pneumomediastinum or presence of air in all mediastinum carry high rate of mortality, longer length of ICU stay, hospital stay and ventilator days (4). Traumatic pneumopericardium must be excluded as there are case of concurrent pneumomediastinum and pneumopericardium in 1.5% of overall cases (5) and those patients should be admitted to ICU with continuous ECG and blood pressure monitoring because of the risk of cardiac tamponade, arrhythmias and heart failure (6). Trauma centres nowadays are equipped with ultrasonography machine and FAST became very popular. In certain pre hospital care setting, this sonography procedure is performed at before arrival to ER (7). Correlating with the current case, non-visualisation of cardiac due to poor echo windows should be taken seriously as it may signifies presence of air at non-anatomical location such as pneumomediastinum, pneumopericardium or subcutaneous emphysema. In this condition, the negative result produce positive predictive values as air is a strong ultrasound wave reflector (8). The next step of examination performed was chest radiography. Identification and differentiation of pneumomediastinum from pneumopericardium on chest radiograph equally important. This may determine which organ are involved, severity, patient management thus contribute to survival. Anatomically, cardiac is enveloped by visceral pericardium that adhere to myocardium which separated by parietal pericardium by minimal pericardial fluid approximately about 15-50ml (9). Both layers meet at the proximal part of great vessels. Thus, the incidence of pneumopericardium, technically limit at proximal part of the great vessel. In contrast, the pneumomediastinum may extend to the upper mediastinum space (10, 11). Furthermore, contrast enhanced multidetector CT give clearer picture on differentiating both of this condition with extra values on prediction myocardial contusion, tamponade, vessels injury and obscured non displaced fractures (12). The game plan will always rely on good clinical judgement and communication among the managing team

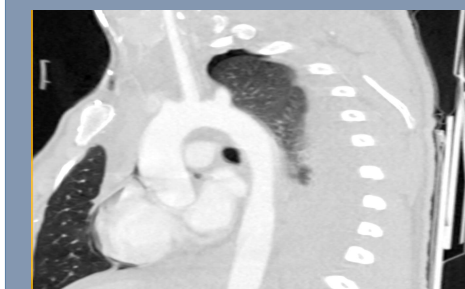


Figure 3: Reconstructed image viewing the arch of aorta plane or "Hockey Stick" plane shows upper limit of pneumopericardium at transverse sinus and proximal ascending aorta just above the sino tubular junction.

CONCLUSION

Traumatic pneumomediastinum is rare pathology found in chest trauma. Even though benign it may lead to serious complication and carry high mortality rate. High clinical suspicious with help of radiological imaging and bed side ultrasound will improve detection and proper management of case.

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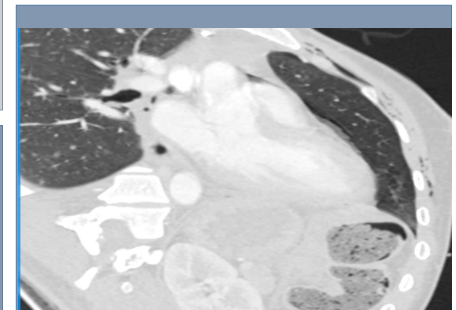


Figure 4: Reconstructed image at LVOT view in pulmonary window show presence of air limited at proximal ascending aorta and distal pulmonary vein