

Hepatic Injury Secondary to Misplaced Chest Tube: A Case Report.

Dr. Kommuru Suhas¹, Dr. NLN Moorthy², Dr. G. Ramesh Goud³

¹(Radio-diagnosis, Apollo institute of medical sciences and research, India),

²(Radio-diagnosis, Apollo institute of medical sciences and research, India),

³(Radio-diagnosis, Apollo institute of medical sciences and research, India),

Abstract: Chest tube placement is an invasive bedside procedure that is commonly used by different specialty physicians. Malposition of the chest tube is considered the most common complication of chest tube placement. Here we present a rare case where in a 32-year-old male who had an alleged history of road traffic accident. CT chest revealed that the chest tube was in the liver. Complications of misplaced chest tube include malposition, infection, organ injury. Malpositioning of chest tube causing injury to abdominal organs like stomach, spleen, liver is rare. And therefore position should always be confirmed with a bedside AP radiograph. Whenever in doubt, CT provides invaluable information about the position and complications that might be present due to misplaced chest tube.

Keywords: Chest tube; pleural effusion; liver; radiograph; computed tomography.

Date of Submission: 02-12-2021

Date of Acceptance: 16-12-2021

I. Introduction

Chest tube placement is an invasive bedside procedure that is commonly used by different specialty physicians. Indications include pneumothorax, gross pleural effusion, hydro-pneumothorax secondary to thoracic injury. In the emergency department, more than 50% of patients presenting with a thoracic injury require thoracostomy(1). Complications of chest tube placement occur in 30% of cases which commonly include lung lacerations, chest wall bleeding, improper position of tube, subcutaneous emphysema and so on(2). Malposition of the chest tube is considered the most common complication of chest tube placement. Malpositioning can be intra parenchymal, inter fissural, mediastinal and abdominal. Intra abdominal injury is rare and include injury to stomach, spleen, liver(3).

II. Case details

Here we present a rare case where in a 32-year-old male who had an alleged history of road traffic accident. The patient was taken to a peripheral healthcare centre for treatment. Patient was stabilised. Vitals were normal. Preliminary chest radiograph revealed that the patient had a fracture involving the scapula, multiple right sided rib fractures and a right hydro-pneumothorax. Chest tube was placed. The drain showed blood and it was thought to be hemothorax secondary to trauma. Post-procedure vitals were normal and the patient was discharged.

Two days later the patient presented to our emergency room with severe pain at the chest tube site and in the right hypochondrium. Vitals were normal. On physical examination chest tube was found to be in the sixth intercostal space. There was no movement of air column. Around 60ml blood was collected in the chest tube bag. Chest compression test was positive. There were decreased breath sounds on the right side. Abdomen was tense and there was tenderness in the right hypochondrium. Blood investigations revealed that haemoglobin was 13 g/dl.

Chest radiograph showed fracture in the sub-glenoid region of right scapula. There were multiple rib fractures involving posterior part of second, seventh and ninth ribs on the right side and right sided moderate pleural effusion. Chest tube appears coiled and was not in position (fig.1). This raised suspicion of a misplaced chest tube. Ultrasound abdomen showed a hyper echoic tubular structure in segment VII of right lobe of liver. No evidence of ascites. CT chest revealed that the chest tube pierced the right dome of diaphragm and was appearing to be in the segment VII of right lobe of liver (Fig. 2a, 2b, 2c). There was no local haematoma/fluid collection. There was right moderate pleural effusion with segmental collapse of lower lobe of right lung (Fig 3a, 3b). The patient was admitted in ICU.

Surgeon decided to place another chest tube in the 4th intercostal space. Immediate Chest radiograph post procedure revealed that the newly placed chest tube was in situ and drain was serosanguinous in content

(Fig.4). It was also decided that the misplaced chest would be retracted 1cm per day. Interval ultra sound scan of the abdomen on day 3 showed no significant abnormality while the pleural effusion was resolving. On day 6, the misplaced chest was completely retracted and ultrasound scan of the abdomen showed no significant abnormality. On day 7, there was near total resolution of the pleural effusion and complete expansion of the collapsed segments of right lower lobe. The newly placed chest tube was also removed (Fig.5). Patient was discharged and was completely normal on follow up.

III. Discussion

Complications of misplaced chest tube include malposition, infection, organ injury. Malpositioning is the most common complication of chest tube placement. Malpositioning can be intra thoracic or extra thoracic. Intra thoracic malpositioning can be intraparenchymal, intrafissural and mediastinal(4). And extra thoracic malpositioning include injury to abdominal organs secondary to misplaced chest tube. Malpositioning of chest tube causing injury to abdominal organs like stomach, spleen, liver is rare. Injury to the liver can cause complications like sub capsular haematoma, intra hepatic haematoma, vascular injury or biliary disruption, devastating hemoperitoneum and therefore care and proper techniques while placing a chest tube are paramount to preventing such complications(5). Common clinical manifestations include abdominal distension, severe pain or hypovolaemic shock, sudden deterioration of general condition of the patient. Any of the following clinical features following chest tube placement should alarm the physician about a misplaced chest tube. And immediate bedside AP radiograph is valuable in assessing the position of the chest tube. CT scan provides great insight on whether or not a chest tube is malpositioned but should be reserved only for problematic cases. Criteria for non-operative management for penetrating liver injury as in for our case include patients who are haemodynamically stable, no peritoneal signs and do not require any acute blood transfusions. CT scan is accurate in localising the site and extent of liver injury providing vital information for treatment in patients.

IV. Conclusion

Misplaced chest tube can cause devastating complications. And therefore position should always be confirmed with a bedside AP radiograph. Whenever in doubt, CT provides invaluable information about the position and complications that might be present due to misplaced chest tube. Imaging guidance whenever available should be used while placing chest tube. And proper training of chest tube placement is of utmost importance. This minimises the risk of complications and significantly reduces morbidity in patients that might arise due to misplaced chest tube.

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LEGENDS:



Fig.1: Chest radiograph AP view: Shows fracture in the sub-glenoid region of right scapula. Multiple rib fractures involving posterior part of second, seventh and ninth ribs on the right side and right sided moderate pleural effusion. Chest tube appears coiled and not in position.



Fig.2a.

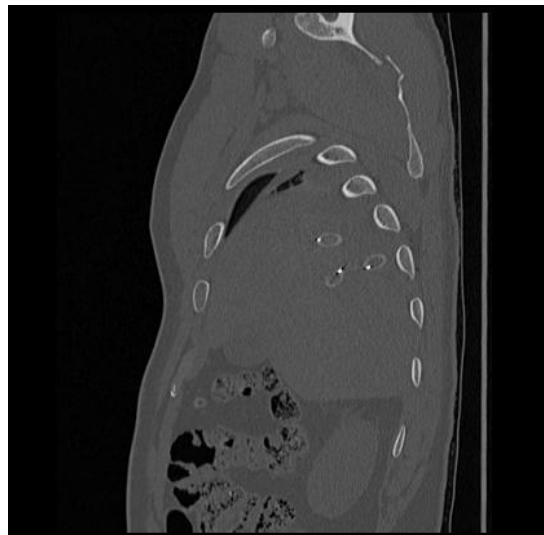


Fig.2b.



Fig.2c.

Fig.2a, 2b, 2c chest CT images: Axial (Fig.2a), sagittal (Fig.2b), coronal (Fig.2c) plain chest CT images show the chest tube piercing the right dome of diaphragm and appearing to be in the segment VII of right lobe of liver.

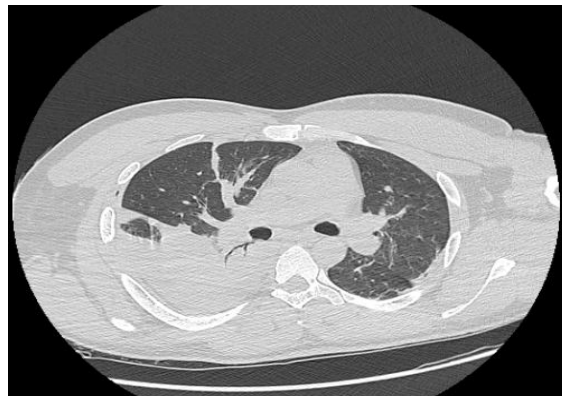


Fig.3a, 3b: Axial CT images: Mediastinal window (Fig.3a) and lung window (Fig.3b) showing right moderate pleural effusion with segmental collapse of lower lobe of right lung.

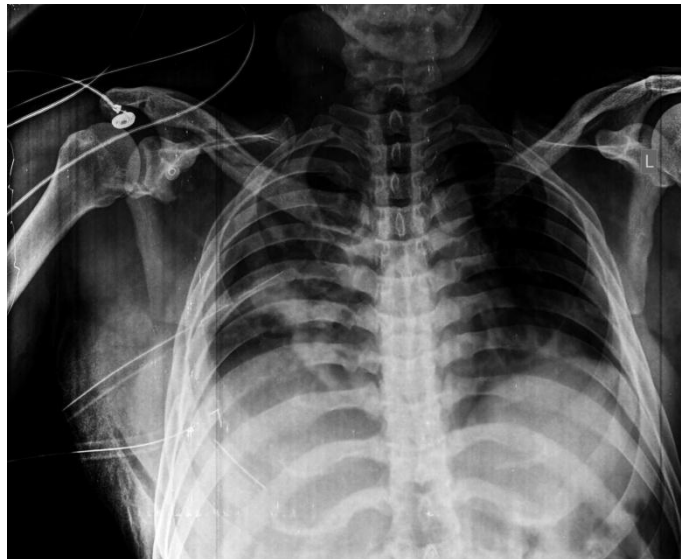


Fig.4: Chest radiograph AP view: Immediate post procedure chest radiograph shows that the newly placed chest tube was in situ.



Fig. 5: Chest radiograph AP view: Radiograph on day 7 shows near total resolution of the right pleural effusion and complete expansion of the collapsed segments of right lower lobe. The newly placed chest tube also removed.

Dr. Kommuru Suhas, et. al. "Hepatic Injury Secondary to Misplaced Chest Tube: A Case Report." *IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)*, 20(12), 2021, pp. 30-34.