

Case Report

Post traumatic right sided diaphragmatic rupture with liver injury: A case report.**Authors:****¹Dr. Deepti Chanjotra (PG Resident), ²Dr. Rajni Bhardwaj (Assistant Professor)**^{1,2}Department of Surgery, GMC Jammu, J&K

Corresponding author: Dr. Deepti Chanjotra, Department of Surgery, GMC Jammu, J&K

Article Received: 11-08-2022**Revised:** 01-09-2022**Accepted:** 21-09-2022**ABSTRACT:**

Right sided diaphragmatic hernia is an uncommon injury following blunt torso trauma. Abdominal organ herniation through the right hemidiaphragm is rare due to protective function of the liver. High morbidity and mortality of this condition requires early diagnosis and rapid treatment. A rare case of post traumatic diaphragmatic rupture with liver injury is being presented as this case required high suspicious for its diagnosis and strict monitoring of patient's vitals and watch over symptoms and signs of distress. The patient presented with a history of fall from tree with polytrauma. Chest skiagram and CECT abdomen showed elevated right hemidiaphragm. Diaphragmatic hernia was detected on laparoscopy and open surgical repair was done. No complications were observed in the postoperative and follow up period.

Keywords: *traumatic diaphragmatic rupture, hemidiaphragm, pneumomediastinum, skiagram, haemothorax, FAST, AAST grade 3 liver injury, subcutaneous emphysema, polytrauma, pulmonary contusion, laparotomy.*

Clinical History:

A 41 years old female presented to surgery emergency with alleged history of fall from tree with blunt trauma chest one day back for which she was admitted in district hospital and two ICCT were inserted on right side of the chest for NCCT Chest documented right sided mild pneumothorax with accompanying haemothorax, mild pneumomediastinum and multifocal consolidation due to contusion in right lung with right sided rib fractures and surgical emphysema along right chest wall. Patient was referred to GMC Jammu for further management as she could not maintain saturation at room air and was hemodynamically unstable. One unit blood transfusion was given at peripheral hospital as 800cc blood drained stat on ICCT insertion. On examination: GCS was E4V5M6, patient was pale, tachypnoeic and tachycardia was present, BP within normal limits, SpO₂ 90% at room air. Subcutaneous emphysema was present along right chest wall anteriorly and air entry was decreased on same side. Both ICCT water seal bags contained 200cc blood in each bag. Patient had a few abrasions over chest wall anteriorly on both sides.

Course in hospital: USG FAST was done which was negative on admission. An anteroposterior skiagram of chest showed blunting of right CP angle and irregular contour of right hemidiaphragm, 3rd and 4th rib fractures on right side with subcutaneous emphysema

and showing 2 ICCT in situ, the lower one kinked. Patient was shifted to operation theatre where the kinked lower ICCT was removed and the upper one was manipulated in anticipation of lung injury. Patient was kept on oxygen support via ventimask, nebulisation and spirometry was started and patient maintained SpO₂ 96% on ventimask. USG FAST repeated next day showed minimal free fluid in right CP angle and minimal free fluid in POD. CECT abdomen and chest was done which documented AAST Grade 3 liver injury with multiple contusions and lacerations and free fluid in gallbladder fossa, perihepatic region and right paracolic gutter with diaphragmatic eventration on right side with no obvious diaphragmatic rent and liver pushed into right hemithorax. Right hydropneumothorax, passive atelectasis of right middle and right lower lobes, fractures of 3rd and 4th ribs, contusions in right upper lobe and pneumomediastinum were noted. Patient was kept on oxygen support for 5 days with continuous monitoring of vitals following which she was weaned off from oxygen support and maintained 98% oxygen saturation at room air and was later shifted to oral diet on 7th day of admission and oral medication was started on 8th day. On 14th day of admission, the patient had respiratory distress and was planned for exploration and underwent laparoscopy followed by open repair of right sided diaphragmatic hernia with

reduction of hernial contents [right lobe of liver, gallbladder and hepatic flexure of colon] with right ICCT insertion. Patient was kept in ICU for 2 days and then shifted to general surgical ward for the rest of the

hospital stay. ICCT was removed on 6th post op day. Further post op period was uneventful and the patient was discharged on 10th post op day and followed up in OPD.

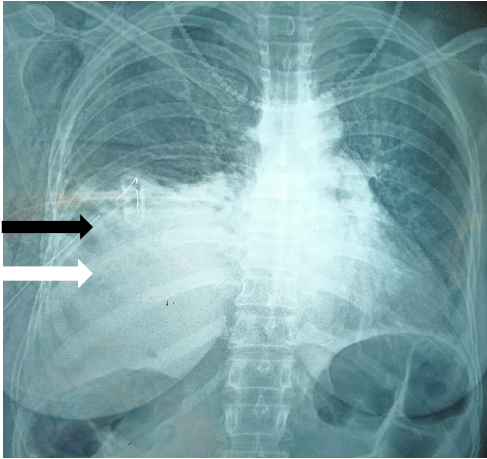


Image 1: CXR film showing 2 ICCT(upper black arrow & lower white arrow) on right side.Lower ICCT is kinked.



Image 2: CECT abdomen film showing elevated hemidiaphragm on right side with right ICCT in situ (white arrow).

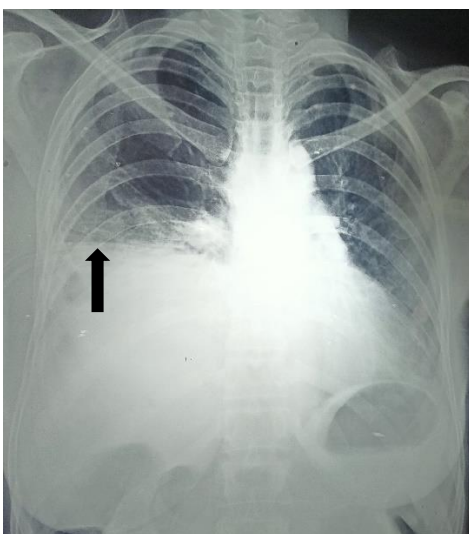


Image 3: CXR film at 10th day of treatment(black arrow showing ICCT in situ).

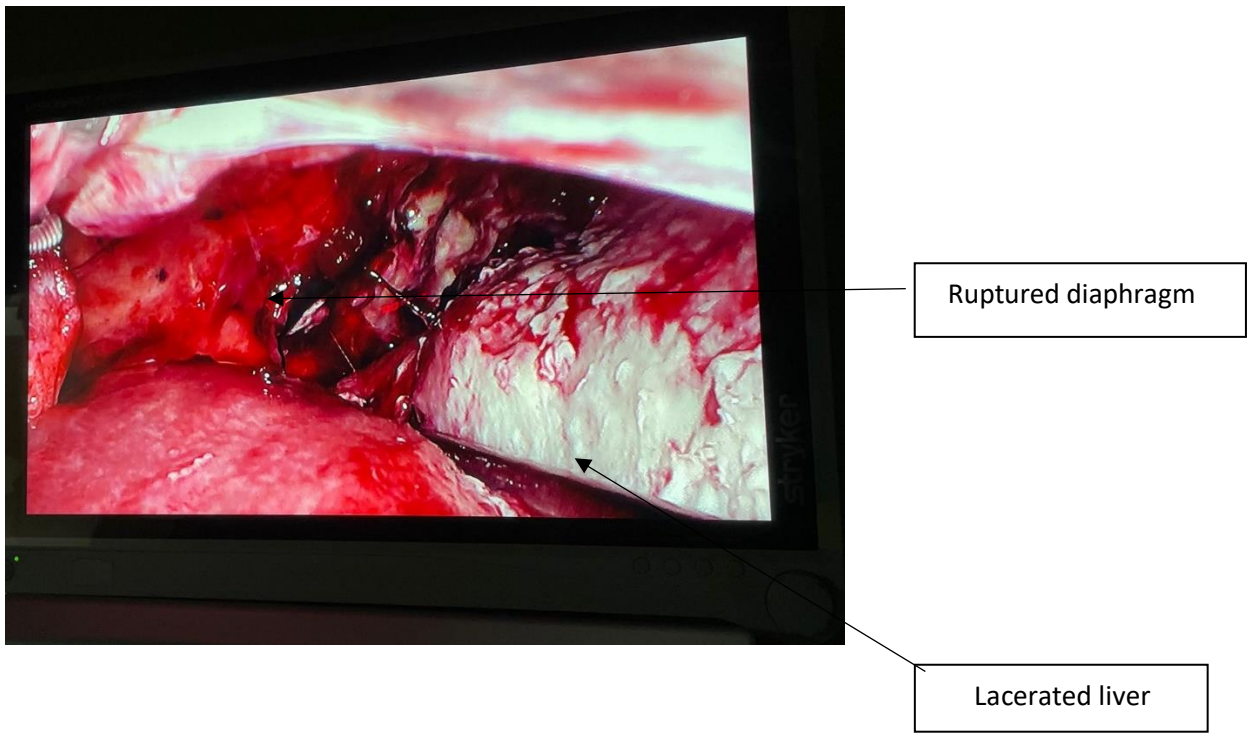
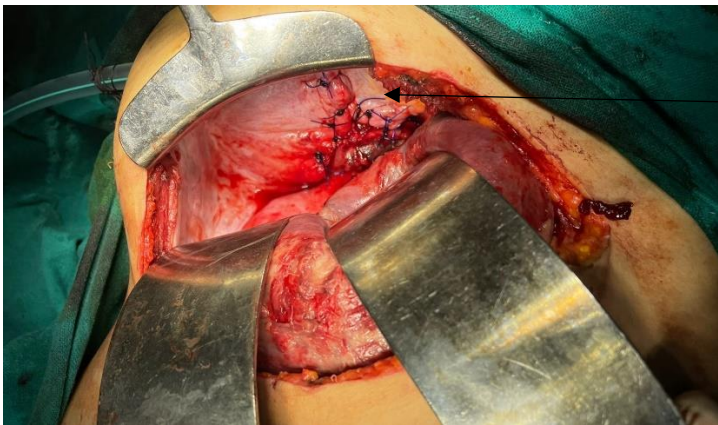


Image 4: Laparoscopic view showing adhesions between herniated liver and diaphragm.



Image 5: Intraoperative view of diaphragmatic rupture showing torn edge of diaphragm (white arrow) and herniated right lobe of liver (black arrow).



Suture repair of diaphragmatic rent

Image 6: Repaired diaphragmatic rupture.



Image 7: Postoperative chest radiograph after diaphragmatic hernia repair.

DISCUSSION:

Traumatic diaphragmatic rupture is a rare injury occurring secondary to both blunt and penetrating torso trauma and is associated with a mortality of around 19%. Classically, there has been a predominance of lesions of left hemidiaphragm, with a ratio of 25:1. However, most modern studies balance this data and show that right hemidiaphragm injuries can represent almost 35% of all diaphragm injuries. This pattern may explain why the liver develops a protective cushioning pressure, although some authors believe that right hemidiaphragm injuries are associated with increased mortality, so would be undiagnosed, and for this reason, would be found in equal proportion at autopsy. A chest radiograph is a common initial investigation performed in the setting of trauma. The signs on a chest radiograph may be

subtle and easily missed. The loss of normal diaphragmatic contour may be due to pulmonary contusion, haemothorax, pleural effusion, elevated hemidiaphragm or lower lobe collapse. However, only 25% to 30% of initial chest roentgenograms are diagnostic for diaphragmatic rupture. The presence of intrathoracic bowel gas shadows and the tip of the nasogastric tube in the chest may be diagnostic. The role of ultrasound has been described by a few studies. The absence of diaphragmatic movements on one side or the use of M-mode can help predict injury. It is also useful in predicting solid organ injury. The striking problem with traumatic diaphragmatic injuries is the frequent difficulty in making the diagnosis. It is a common diagnosis in the severely injured patients and one made most often at exploratory laparotomy. Careful visual and manual inspection of the entire

diaphragm is necessary to avoid missed diaphragmatic defects. Additional imaging modalities such as CT and MRI may play a role in studying the stable traumatized patient with a persistent abnormality on standard chest radiography. Optimal treatment consists of early repair through an abdominal approach with careful attention given to associated injuries. The outcome is dependent almost entirely on the severity of these associated injuries.

CONCLUSION:

Blunt diaphragmatic rupture leads to important morbidity and mortality. The high frequency of associated injuries combined with the 70% chance of missing the diagnosis on a routine chest radiograph point to the need of a high index of suspicion to avoid the sequelae of missed injuries. The general measures for management of polytrauma patients must be applied. Surgery at the time of diagnosis should restore continuity.

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