Rare Case of Liver -Gall Badder Herniation - Post Traumatic Diaphragmatic Hernia

Shah Harshil M.¹, Chauhan Vineet F.², Chauhan Anuya V.³

¹Third year resident in department of General surgery, B. J. Medical College, Civil Hospital, Ahmedabad, India
²Assistant professor in department of General surgery, B. J. Medical College, Civil Hospital, Ahmedabad, India
³Assistant professor in department of Pediatrics, B.J. Medical College, Civil Hospital, Ahmedabad, India

Abstract: Post-traumatic diaphragmatic hernia in adults is usually caused by blunt trauma and may remain asymptomatic and undiagnosed for many years. Right-sided tears are significantly less likely than left-sided tears because of the protective effect of the liver however if they occur, they are associated with high mortality and morbidity. The rupture of the right side of the diaphragm and the presence of a gallbladder in the thoracic cavity are rare. It should be suspected in symptomatic patients and/or with unusual shadows in the thoracic region after recently sustained injury or with a history of injury. We report a case of 55 year old female asymptomatic patient with post traumatic rupture on the right side of her diaphragm and herniation of her liver and gallbladder into the thorax. Diagnosis was made with abdominal thoracic CT scan and definitive management required surgery through trans abdominal route. Reduction of herniating liver and gall bladder into abdominal cavity and repair of defect with synthetic non absorbable sutures and reinforced with non absorbable mesh.

Keywords: Blunt chest trauma, Right diaphragmatic hernia, liver -gall bladder herniation

1. Introduction

Rupture of diaphragm and herniation of abdominal viscera though uncommon is a well recognized result following blunt or penetrating injuries to lower chest and upper abdomen. The incidence is however rising because of the increasing number of road traffic accidents in the last few years, together with better pre-hospital and hospital resuscitation of severely injured patients and improved diagnostic facilities. High index of clinical suspicion is required because of the missed diagnosis and potential for delayed presentation. We report a case of an poly-trauma patient who did not have respiratory complaints but was diagnosed with a rupture on the right side of her diaphragm with herniation of her liver and gallbladder into the thorax during her hospital stay.

2. Case Presentation

A 55 year old female, presented with history of poly trauma due to road traffic accident, admitted to the emergency department. The patient was vitally stable, fully conscious oriented with no signs of head injury. Her respiratory rate was 20 per minute with absence of respiratory sounds in right middle and lower zones of right chest however she was maintaining 95 to100 percent oxygen recorded on pulse oximeter. Clinically her abdominal examination did not suggest any abdominal internal injury. There was palpable fracture of right radio-ulna and right femur. The patient was initially stabilized after which she underwent the following investigations.

Chest X ray was suggestive fracture of right side 10th 11th 12th rib on postero-lateral aspect with blunting of right costophrenic angle (Fig.1) with under lying collapse of right lung. An inter costal drainage tube inserted on right side through 5th inter costal space in mid axillary line for right hemothorax immediately.500cc of hemorrhagic fluid was drained.

Abdominal thoracic ultrasound examination revealed liver contusion. Since patient was haemo-dynamically stable and had no significant abdominal findings she was kept conservative. Extremity X ray : Right radio-ulnar fracture and right fracture femur. Splinting of her right forearm for right radius ulna fracture and S.T. pin insertion and traction of right lower limb for right sided femur fracture done.

Daily intercostal drainage tube was monitored for output, column movement and air leak. Inter costal drainage output decreased from approximately 250 cc(sero-hemorrhagic) per day to about 50cc (serous) per day by the tenth post trauma day.

On post trauma day ten: Patient was maintaining 95 to 100 percent oxygen saturation with no respiratory distress . There was absent breath sounds on right middle lower zones. X Ray Chest suggested a persistence abnormal shadow in right thoracic cavity which was reported as lung contusion by radiologist (Fig.2).

Figure 1: Chest X-ray showing blunting of right costo phrenic angle and rib fracture.
Since in doubt about persisting abnormal shadow, computed tomography of abdomen and thorax done. **Computed tomography**: suggested 5.7 x 7.8 cm sized defect in anteromedial aspect of right dome of diaphragm with herniation of liver and gall bladder into right thoracic cavity. CT also revealed 3.5 x 6 x 3.7 cm sized laceration in segment VI of liver and ill defined contusion in lower lobe of right lung. (Fig.3)

The patient underwent surgical intervention via an abdominal approach. Intra operative findings confirmed that gallbladder and 70 percent of liver had herniated into the thoracic cavity. (Fig.4) Liver was made free of attachments and organs were placed back into the abdominal cavity. The defect in the diaphragm, measuring approx 8 X 8 cm in anteromedial aspect was repaired primarily with prolene no 1-0 interrupted sutures and reinforced with a 15 x15 prolene mesh graft. (Fig.5,6) A right-sided chest tube drain and an abdominal drain in morrison's pouch were kept. During mobilization of liver into abdominal cavity, patient developed intra operative hypotension for which she was managed with ionotropic support intra operatively and in immediate post operative period. Postoperative recovery was uneventful. The chest drain was removed once output decreased to less than 50 ml and lung was fully expanded by the 5th postoperative day. (Fig.7). Patient underwent definitive surgery for orthopaedic problems on post operative day 10 by the orthopaedic department.
defect.19 The surgical approach could be either trans
of hernia reduction, pleural drainage and repair of the
The operative treatment for diaphragmatic rupture consists
respiratory complications had we not done a CT scan of
symptoms, patient would have presented late with
herniation occurs or when problems arise from the hernia
time of the injury becomes clinically evident only when
presence of the liver and gallbladder can be explained by
gallbladder in posttraumatic diaphragmatic hernia.12-17 In our
gasric incarceration and perforation after apparently minor blunt trauma. CJEM 2004,

3. Discussion
Injuries of the diaphragm were first described in 1541 by
Sennertus and the initial repair was performed by Riolfi in
1886.2 Diaphragmatic hernia is often initially overlooked in
the acute setting and is only correctly diagnosed in 30 to 40
percent of cases.3,4 In our case, diaphragmatic injury was
diagnosed after 10 after the injury. It would have been
missed had there not been a high index of suspicion
regarding the abnormal shadow in chest X-Rays. A rupture
of the right side of the diaphragm is uncommon.
Approximately 69 percent of hernias are left-sided, 24
percent are right-sided, and 15 percent are 'bilateral.6
Although autopsy studies have revealed equal incidence of right-
and left-sided diaphragmatic ruptures, ante mortem
study reports suggest 88 to 95 percent of them occur to the
left side.5,9 Right-sided tears are significantly less likely than
left-sided tears because of the protective effect of the liver.
They are associated with high mortality and morbidity.10,11

Prolapse of the liver with gallbladder is rare. There are just a
few articles that report the presence of the liver and
gallbladder in posttraumatic diaphragmatic hernia.12-17 In our
case, an impeded presentation of the ruptured diaphragm and
the presence of the liver and gallbladder can be explained by
the hypothesis of delayed detection. The 'delayed detection'
hypothesis assumes that a diaphragmatic defect created at
the time of the injury becomes clinically evident only when
herniation occurs or when problems arise from the hernia
contents.2,3,10 In our case although there were no respiratory
symptoms, patient would have presented late with respiratory complications had we not done a CT scan of
thorax and abdomen.

The operative treatment for diaphragmatic rupture consists
of hernia reduction, pleural drainage and repair of the
defect.19 The surgical approach could be either trans
abdominal or trans thoracic, or both. However, laparoscopic
surgery, thoracoscopy, or artificial patches have become
very popular in recent years. Our patient underwent a trans
abdominal approach, primary diaphragmatic repair with
prolene sutures and prolene mesh repair. The mesh
decreases the risk of a recurrence of the hernias, which is
caused by the shearing of a stretched membrane and
avulsion of the diaphragm from its points of attachments due
to a sudden increase in intra-abdominal pressure, transmitted
through the viscera.20

4. Conclusions
Right side post traumatic diaphragmatic hernia with prolapse
of liver and gallbladder is a rare entity. Diaphragmatic
hernia should be considered as a possible diagnosis in
patients of blunt chest and abdominal trauma. As patients
with this injury may remain without symptoms for a long
period, a high index of suspicion should be kept for
diagnosis of diaphragmatic hernia at the time of presentation.
It should be suspected in symptomatic patients and/or with unusual shadows in the thoracic region after
recently sustained injury or with a history of injury.
Abdominal thoracic computed tomography should be
advised in all suspected cases as the investigation of choice
and the treatment of choice being surgical repair with
meshplasty.

References
presentation of a patient with a ruptured diaphragm
complicated by gastric incarceration and perforation
after apparently minor blunt trauma. CJEM 2004,
[3] Faul JL: Diaphragmatic rupture presenting forty years
[5] Hejmdal A, Dakhil A, Boel T: Diaphragmatic hernia-
admitted under the gallstone diagnosis. Ugskr Laeger
90:955–968.
[7] Disler DG, Deluca SA: Traumatic rupture of the
diaphragm and herniation of the liver. Am Fam
[8] Launey Y, Geeraerts T, Martin L, Duranteau J: Delayed
traumatic right diaphragmatic rupture. Anesth Analg
E: Dislocation of three segments of the liver due to
hernia of the right diaphragm: report of a case and
hemi-diaphragm with complete dislocation of the right
hepatic lobe: report of a case. Surg Today 1998,
[12] Neef H: Transthoracic cholecystectomy and
choledochus revision in chronic rupture of the right
K: A case of traumatic hernia of diaphragm showing
prolapse of liver with abnormal lobulation into pleural
cavity. Nippon Kyobu Geka Gakkai Zassi 1993,
41:2131–2135.


**Author Profile**

**Dr. Harshil M. Shah**, Third year resident in department of general surgery, B. J. Medical College, Civil Hospital, Ahmedabad

**Dr. Vineet F. Chauhan**, Assistant professor in department of general surgery, B. J. Medical College, Civil Hospital, Ahmedabad, India

**Dr. Anuya V. Chauhan**, Assistant professor in department of pediatrics, B. J. Medical College, Civil Hospital, Ahmedabad, India