

A delayed traumatic right diaphragmatic hernia with heptothorax

Authors: Gati Ebrahimi, Frank W. Bloemers

Location: VU medical centre, Amsterdam, Netherlands

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ABSTRACT

A traumatic right diaphragmatic rupture is an uncommon condition, as it occurs in 0.8-3.6% after blunt trauma. It is challenging to find the diagnosis immediately and is illustrated by the incidence of 12-66% initially missed diagnosis (1).

Most blunt traumatic diaphragm ruptures are an indication for early aggressive surgical intervention by way of thoracotomy, laparotomy, or both if it is necessary. Delayed diagnosis and treatment of diaphragm rupture is associated with increased rates of morbidity and mortality. Therefore, diagnosis of diaphragmatic injury requires a high index of suspicion. We report a case of a 37-year-old man with right diaphragmatic rupture after blunt injury 31 years prior to admission.

INTRODUCTION

A traumatic right diaphragmatic rupture as the result of blunt trauma is a rare condition. It is generally considered to be a marker of severe trauma. The overall incidence of diaphragmatic rupture after blunt trauma is 0.8-3.6% (1). Most injuries are due to vehicular-related incidents (79.5%) and falling from a height (15.9%) (2). Right-sided tears are significantly less likely than left-sided tears, 27.3% and 68.2% respectively (3). The correct diagnosis of diaphragmatic injury is initially missed in 12%-66% (1). Therefore the diagnosis of a diaphragmatic injury requires a high index of suspicion. Delayed diagnosis and treatment of diaphragm rupture is associated with increased rates of morbidity and mortality. In our case we treated a patient 31 years after a blunt trauma.

CASE REPORT

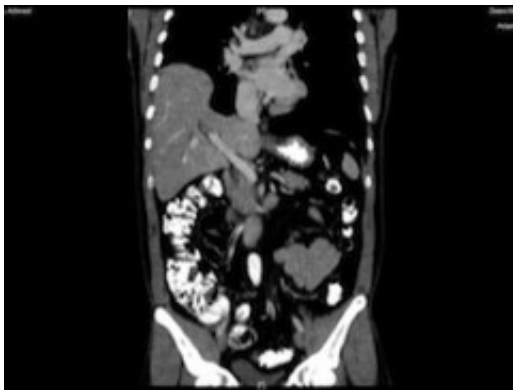
On our outpatient clinic, a 37-year-old man was presented with 31 years before a fall from a wall of 3 meters on his right side. This fall was complicated by multiple rib fractures. Next to this major event the man was involved in a moped -car accident with only his face wounded, 18 years ago. During his life he never had clinical symptoms of dyspnoea or pain until one year ago. The medical history showed nephrolithiasis in 2006.

The patient presented to us with primary complaints of progressive, stabbing pain in the upper right abdomen and right lower thorax with simultaneous periods of dyspnoea. The symptoms

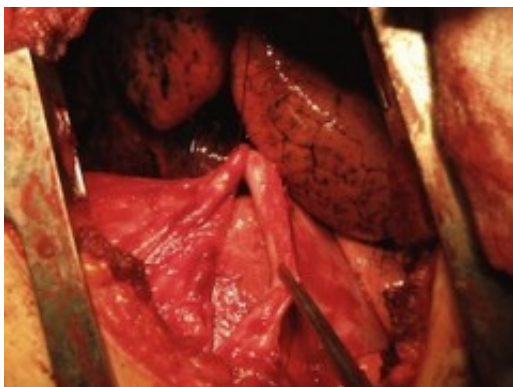
worsened over a year, eventually leading to shortness of breath during rest. Beside this presentation the patient had right upper abdominal pain while eating spicy food.

On admission, his vital signs were stable and colour was fair. The dyspnoea was not severe, as the patient could talk in full sentences. Pulmonary examination revealed diminished breath sounds at the basal right hemithorax and the diaphragm was determined to be higher on the right by percussion.

The diagnosis was confirmed by thoracic-abdominal X-rays and computerised tomography (CT) imaging, which revealed intra-thoracic displacement of the liver and also the gallbladder (figure 1).



An elective thoracotomy in the sixth intercostal space was performed with repairing the diaphragmatic hernia (figure 2). The liver with gallbladder was replaced in the abdominal cavity, after adhesiolysis of the lung from pleura and diaphragm, whereupon the diaphragm was closed tensionless by running technique with non-absorbable sutures. Two drains were left behind, one near the diaphragm and one in the right upper thorax. The patient recovered postoperatively well and left the hospital in 5 days.



DISCUSSION

Right sided diaphragmatic rupture with consequently hepatothorax is a rare condition. Blunt traumatic diaphragm rupture is an absolute indication for early surgical intervention (4). A delay could result in increased rates of morbidity and mortality (5). In case of hepatothorax, hypovolemic shock can occur, because of possible kinking of the inferior vena cava with obstruction of the blood.

In this case there was a lateral impact on the chest, which distorted the chest wall and sheared the diaphragm. There remains doubt about the cause of delayed diagnosis and treatment of this diaphragm injury, since it could occur as the result of either delayed rupture or delayed detection. Even if the herniation did not take place initially it would result in herniation eventually, because of the significant discrepancy between the intra-thoracic pressures and higher intra-abdominal pressure. Most of the diaphragmatic ruptures occur on the left side, because the right diaphragm is congenitally stronger than the left. Moreover the liver partially protects the right side as the impact can be spread over a large area.

Pain in the upper abdomen and lower thorax, dyspnoea, cyanosis and hypotension are typical symptoms of diaphragmatic injury, but if the rupture is small the patient can remain symptom free for a long time.

The true incidence of traumatic diaphragm rupture is unknown because in 12-66% (1) of major trauma victims, the diagnosis is missed. This is particularly true for ruptures of the right hemidiaphragm. Right sided ruptures are often associated with severe injuries and greater haemodynamic instability. There is no consensus yet, on the gold standard of imaging technologies to diagnose diaphragm rupture. Based on the literature, diagnosis of diaphragmatic injury requires a high index of suspicion regardless whether you make an X-Ray or CT.

The choice of surgical approach includes thoracotomy, laparotomy, or both if it is necessary. The decision to repair the diaphragm either way is dictated by the stability of the patient and the presence of other associated organ injuries.

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