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Unusual repair in a rare case of hepatothorax due to right-sided diaphragmatic rupture: case report

F. QUADROZZI[1], P. FAVORITI[2], M. FAVORITI[3], G. COFINI[3]

SUMMARY: **Unusual repair in a rare case of hepatothorax due to right-sided diaphragmatic rupture: case report.**

F. QUADROZZI, P. FAVORITI, M. FAVORITI, G. COFINI

Intra-thoracic herniation of abdominal organs following diaphragmatic rupture represents an unusual clinical occurrence with great diagnostic difficulty.

The authors present a case of right diaphragmatic rupture related to peritonitis due to perforated duodenal ulcer in previous (1 year before) thoraco-abdominal trauma with complete intra-thoracic herniation of the liver, gallbladder, ascending and transverse colon and lung collapse.

The preoperative diagnosis has been based on clinical, chest X-ray, and ultrasound examination. The patient, because of very serious respiratory and hemodynamic distress, immediately underwent surgery (thoraco-laparotomic approach) with reduction of the liver, gallbladder, ascending and transverse colon in the abdominal cavity, perforated duodenal ulcer suture and repair of diaphragmatic tear using an unusual repair mode: suture of autologous fascia lata graft to the diaphragm. Postoperative chest radiography showed the normal location of right diaphragmatic border.

KEY WORDS: Right diaphragmatic rupture - Hepatothorax - Perforated duodenal ulcer - Fascia lata.

Introduction

The incidence of diaphragmatic rupture after thoraco-abdominal trauma is 0,8-5%, and up to 30% diaphragmatic hernia present late. A systemic review of the literature shows 13 cases of right sided diaphragmatic rupture and herniation of the liver occurred in only 6 cases and literature suggests that delayed rupture at 24 hours to 50 years following trauma. Non traumatic diaphragmatic rupture is extremely rare, approximately 1% of all rupture. We present a case of acute right diaphragmatic rupture related to perforated duodenal ulcer and previous thoraco-abdominal trauma happened one year before and at that time clinically silent, with negative imaging (CT); which resulted in displacement of the liver, gallbladder, ascending and transverse colon and omentum into intrathoracic cavity with lung collapse.

Case report

A 32-year old male patient presented to the emergency room reported an abdominal pain occurred suddenly two hours before and a previous thoraco-abdominal trauma occurred about one year before without clinical and anatomical consequences. Of note, he denied any relevant past medical history and any medications use. At the time of admission the patient complained of severe epigastric pain and physical examen revealed a rigid abdomen with both tenderness and rebound tenderness odserved troughout the abdomen. His vital signs were extremely unstable, blood pressure 90/60, heart rate 120 beats per minutes, oxygen saturation 82%, body temperature 38,5°C, presence of cyanosis and tachypnea: a severe hemodynamic instability and a serious respiratory distress. The chest radiograph revealed no visualization of the right emidiaphragm border and bowel intrathoracic gas and lung collapse. X-ray of abdomen revealed air-fluid levels and pneumoperitoneum. Abdominal and thoracic US reveled the intrathoracic presence of the liver and fluid collection in peritoneum. Immediately, the patient underwent surgery; surgical approach was done through a thoraco-laparatomy. A peritonitis due to perforated duodenal ulcer was found. First repair of duodenal perforation was performed, and subsequently the li-

[1] Surgical Department, University L'Aquila, Italy
[2] Department of Surgical Sciences "Sapienza" University, Rome, Italy
[3] Surgical Department, Hospital of Avezzano (AQ), Italy

Corresponding author: Guido Cofini, e-mail: gdcofini@gmail.com

ver, the colon and omentum were replaced into the abdominal cavity. It was performed a suture of autologus fascia lata graft to the diaphragm. Autologus fascia lata graft was harvested from the right thigh of the patient with an incision placed at the line that connects the lateral tibial epicondyl and the femoral greater trochanter. Postoperative X-ray showed the normal profile of right diaphragm and the complete pulmonary re-expansion. After surgery the patient was sent to the intensive care unit and was discharged in post-operative day 10 with no further complications.

Discussion

Diaphragmatic rupture is a rare complication of the abdominal and/or thoracic trauma, reported in 1-5% of mayor blunt trauma patients and in 10-15% of penetrating trauma patients. Approximately 1% of all diaphragmatic ruptures occur spontaneously, often resulting by a sudden increase of abdominal pressure secondary to heavy physical effort, sudden twisting movements, childbirth and severe coughing. The patient had late history of thoraco-abdominal trauma (one year before), therefore we believe that leacked digestive juice may have eroded the diaphragm already partially damaged by previous trauma and when this occurred the abdominal muscle tension, due to peritonitis, may have increased the abdominal pressure, thus prompting the diaphragm rupture. We cannot determine the exact order of these incidents, with any certainly, we believe, however, that the perforated duodenal ulcer seems to have acted as the precipitating event for the diaphragmatic rupture.

The initial clinical diagnosis can be very difficult, the initial diagnostic tool is conventional chest X-ray, currently CT is most helpful for emergency diagnosis. In the case we observed the very serious clinical picture of respiratory and hemodynamic alterations have led us to an urgent surgery. After a suspected clinical diagnosis confirmed by X-ray and US, we would have lost too much time to performed a CT knowing that the mortality is mostly influenced by the time elapsing between trauma and surgery. Surgical repair is usually done through thoracotomy or laparatomy, because of the size of the defect and the weack diaphragmatic wall thikness for a primary repair to be performed. Prosthetic mesh was necessary, but mesh infection was a significant concern due to thoraco-abdominal contamination by bowel perforation, therefore we didn't use the mesh but we have resorted to an unusual repair mode: suture of the autologous fascia lata graft to the diaphragm. We used this unusual diaphragmatic repair because of bacterial contamination of the thoracic and abdominal cavity (no mesh), the smallest thickness of diaphragm and the large size of defect in the rupture site (possible poor seal of direct suture). The postoperative, six months and one year after chest X-ray showed a normal diaphragmatic border.

Conclusion

Here we present a rare case of hepatothorax due to right diaphragm rupture in a patient with peritonitis by perforated duodenal ulcer and late thoraco-abdominal trauma. We describe the symptoms and the diagnostic process indicating an unusual diaphragmatic repair mode to which we had resort for a contingent need, but it turned out a right decision to the clinical and radiographic control during the time. We know that the reparation of the diaphragmatic defect has always been conducted through a laparatomic or thoracotomic approach but in this case the critical condition of patient, in peril of one's life, led us to thoraco-laparatomy approach.

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