

MEETING ABSTRACT

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7 years-delayed presentation of a traumatic diaphragmatic rupture: laparoscopic repair

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Summary

Post-traumatic diaphragmatic hernias (PDH) are possible complications of blunt and penetrating thoracic or abdominal trauma. These hernias may be diagnosed at the time of the initial trauma, but are sometimes recognized only after several months or years during examinations for their related symptoms. We here present the case of a patient in which diagnosis was obtained only after 7 years from the accident and for which a successful laparoscopic repair of the hernia was performed.

Introduction

Traumatic diaphragmatic rupture is a possible life-threatening condition that occurs up to 5% of major thoraco-abdominal traumas. This kind of injury is sometimes diagnosed at the time of the initial trauma referral due to its acute presentation, but sometimes it can escape detection, especially if occurring as an isolated injury. Symptoms such as dyspnea, non-cardiac chest pain, and vasovagal symptoms may start the workup, but PDHs are sometimes discovered incidentally in apparent complete wellness. We here report the case of a massive PDH discovered incidentally during examination for an apparently not related condition.

Case report

A 70-year old male was involved in a motorcycle accident in the year 2005. After the trauma protocol examination in the emergency unit, the patient was dismissed with no reported damage to the diaphragm or any other organ. The patient reported no symptoms over the next 7 years. In September 2012, due to the presentation of

dyspnea after climbing the stairs, he performed a chest x-ray and discovered the presence of a massive left diaphragmatic hernia with dislocation of the colon in the thorax (Figure 1); only after a precise anamnestic investigation the patient admitted a change in his intestinal transit with an evolution to constipation and related chest pain. The patient then practiced a computed tomography (CT) scan that demonstrated a voluminous left diaphragmatic hernia with great part of the left hemithorax occupied by abdominal fat and intestinal loops (left colic flexure and descending colon) (Figure 2). The fat reached and passed an axial plan containing the aortic arch; consensual pulmonary atelectasy was also present. The left postero-lateral defect of the diaphragm had a major axis of 54mm; signs of past rib fractures were present.

On the 26th October 2012 the patient was admitted to our tertiary hospital. Routine preoperative testings (laboratory and ECG) didn't show any abnormal values. A preoperative spirometry and hemogas analysis was requested by the anesthesiologist: the exams showed normal values (only FEF50% and FEF75% were lightly reduced). To complete the assessment of the diaphragmatic defect an RM scan was performed (Figure 3); the post-traumatic diaphragmatic defect was confirmed in dimensions but was characterized by close relations with the spleen that had been dislocated behind the stomach.

Due to the possible life-threatening complications for this type of hernia, operative repair was recommended. The patient underwent exploratory laparoscopy on the 6th November 2012. The descending colon, the left colic flexure and the greater omentum were herniated through the diaphragmatic tear. The spleen had intimate relations with the tear. After reduction of the hernia content, a large defect of the left diaphragm was observable. Due to its large size we decided to discard the primary closure

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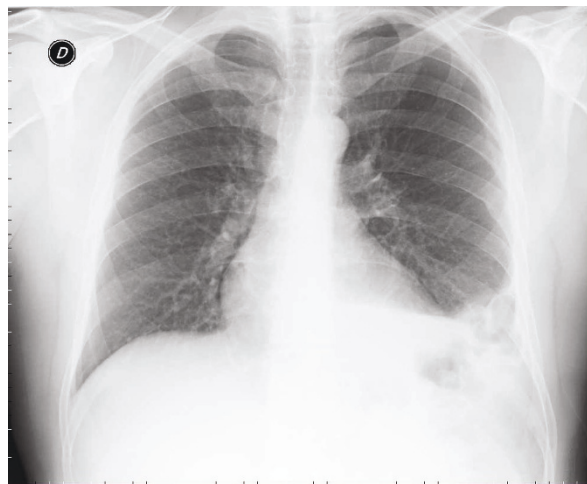


Figure 1 pre-operative chest X-ray

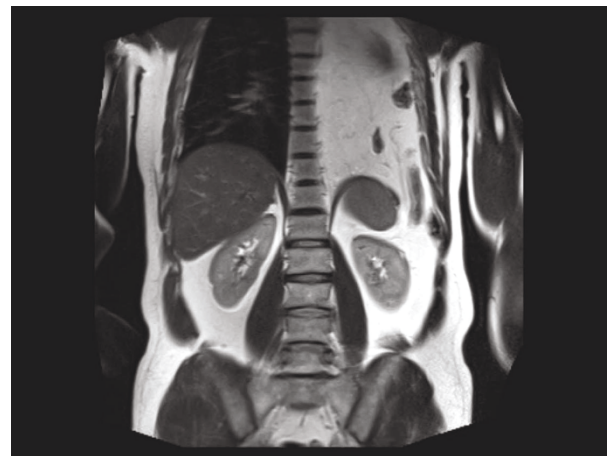


Figure 3 Pre-operative RMI

option. After an accurate adhesiolysis, the defect was reduced with a few non absorbable separate sutures and bridged with a 10x15 cm Parietex Composite mesh (Covidien. All rights reserved). The mesh was blocked with absorbable tacks (AbsorbaTack™ 5mm. Covidien. All rights reserved). Two 12 mm trocars and three 5mm trocars were necessary to complete the procedure (12-sovrumbelicale e ipocondriosn, 5-ipocondrio dx, sottotifoideo e filiacasn.); duration 3 hr. (Figure 4).

There was no early postoperative morbidity but we preferred to transfer the patient in the resuscitation unit for a 24 hr-observation. The patient was retransferred to

our surgery unit after controlled extubation and a post-operative chest x-ray (Figure 5). The patient was discharged from the hospital on the sixth postoperative day and reports no complications up to now. A postoperative CT scan was performed 1 month after the operation to check the results (Figure 6).

Discussion

Traumatic diaphragmatic rupture can go unrecognized at the initial injury and present, in a delayed case, months or even years after the event. Left-sided diaphragmatic ruptures occur three times more frequently than right-sided ruptures, since the left diaphragm is structurally weaker, as it originates from the pleuro-peritoneal membrane. Right-sided rupture is seen less frequently because of the buffering effect of the liver. There is no radiologic gold standard to diagnose a traumatic diaphragmatic rupture.

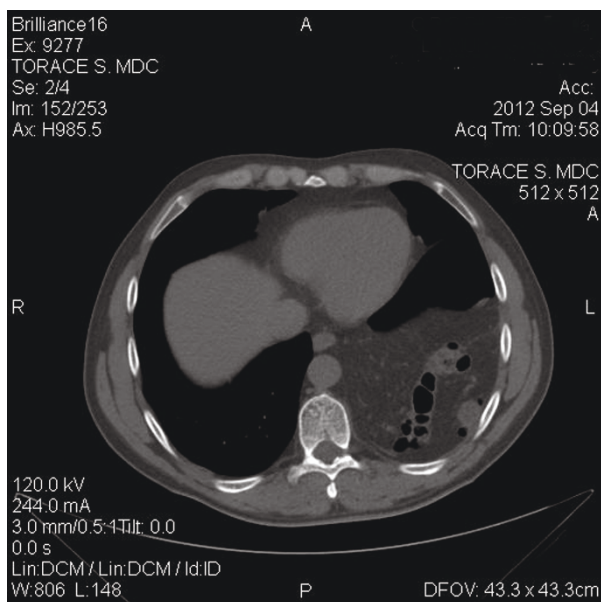
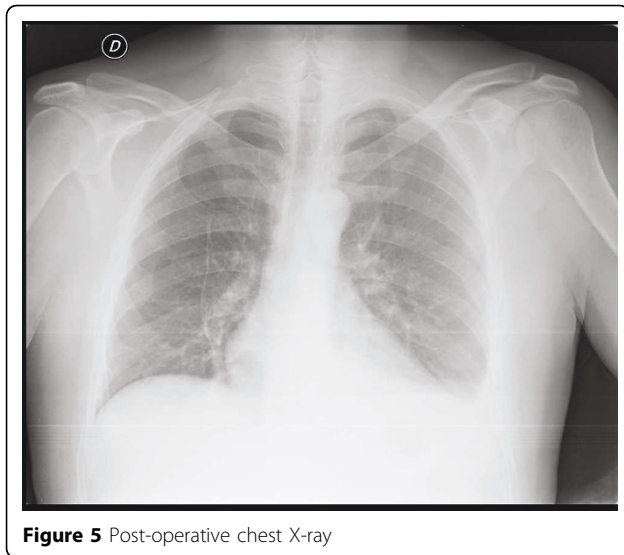


Figure 2 Pre-operative CT-scan



Figure 4 Laparoscopic repair The appearance of the repaired defect with Parietex Composite mesh and Absorbatacks.



Chest X-rays may show obliteration of the diaphragmatic shadow or elevation of the diaphragm, but up to 50% of the initial chest X-rays can be non-diagnostic. CT scan is the preferred diagnostic modality in cases of suspected diaphragmatic rupture with a 61% sensitivity and 87% specificity. Other diagnostic techniques such as ultrasound and upper gastrointestinal (GI) contrast study are not used routinely.

The first successful diaphragmatic repair was reported by Riolfi in 1886. The surgical treatment includes hernia reduction, pleural drainage, and repair of the diaphragmatic tear. Diaphragmatic repair may be performed either via

laparotomy or thoracotomy or via laparoscopy or thoracoscopy. Due to the hemodynamic and respiratory stability of the patient we preferred laparoscopy for the repair of the diaphragmatic rupture in the presented case. Most authors recommend closing of the diaphragmatic defect with non-absorbable sutures or with a patch for large defects. We chose a combined approach to the diaphragmatic rupture (sutures plus mesh); no pleural drainage was applied.

Conclusion

Diaphragmatic rupture may be a not very uncommon complication of significant thoraco-abdominal trauma. Clinical presentation may be subtle, delayed and non-specific. Although plain chest radiography may be helpful in establishing diagnosis in most cases, computed tomography (CT) is a better diagnostic choice; MRI may add important details of the diaphragmatic defect. The potential life-threatening complications of massive diaphragmatic hernia mandate a prompt repair. A trans-abdominal approach is preferred for surgical closure, as it provides good access to the tear in the diaphragm. The treatment consists of closing the defect with non-absorbable sutures or a patch. Our experience demonstrates laparoscopy as a safe procedure.

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