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Post-traumatic Diaphragmatic Hernia Revealed by a Tension Fecopneumothorax (A Case Report)

J. Lamghari[1*], M. Bouali[1], A. El Bakouri[1], F. Z. Bensardi[1], K. El Hattabi[1] and A. Fadil[1]

[1]Department of Visceral Surgical Emergency, University of Hassan II Casablanca, CHU Ibn Rochd, Casablanca, Morocco.

Authors' contributions

This work was carried out in collaboration among all authors. Author JL designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors JI and MB managed the analyses of the study. Author JL managed the literature searches. All authors read and approved the final manuscript.

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Case Study

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ABSTRACT

The occurrence of a traumatic diaphragmatic hernia is a classic complication of abdominal trauma. Unknown in almost half of the cases during the initial trauma, the diagnosis was made at the time of a complication. The left diaphragmaticdome is the most frequently affected. Tension fecopneumothorax following diaphragmatichernia perforation in the pleural cavityisa rare but particularly aserious complication. A 29-year-old man was admitted for acute intestinal obstruction with respiratory distress. A history of a violent thoraco-abdominal traumatism due to a stabbing injury on the left hemithorax six years before was noted. The chest X-ray showed a medium abundance hydropneumothorax and the thoraco-abdominals can revealed medium abundance effusion in the left hemithorax, with a small intestinehernia and the omentum intrapleural. An emergency laparotomy discovered tension feco pneumothorax secondary to intrathoracic perforation of the small intestine through a left hemidiaphragmd efect. The surgical treatment consisted of reducingthe hernia, pleural drainage, ileostomy and fixing the diaphragmaticd efect. The possibility of diaphragmatic hernia should be kept in mind in case of

**Corresponding author: E-mail: jihad.lamghari@gmail.com;*

violent blunt thoraco-abdominal traumatism or basi thoracic wound. In this way, complications such as tension fecopneumothorax that could threaten the functional and vital prognosis may be prevented.

Keywords: Diaphragmatic hernia; tension fecopneumothorax; surgery.

1. INTRODUCTION

Post-traumatic diaphragmatic hernia (PTDH) from blunt or penetrating trauma is difficult to detect in the acute setting and, if missed, canresult in significant morbidity and mortality in the future. The diagnosisis then made on the occasion of a complication [1].Tension fecopneumothorax due to perforation of a hollow viscera in the pleural cavityis a rare, but particularly serious complication of PTDH, which can affect the functional and vital prognosis [2]. We report the case of tension fecopneumothorax due to perforation of PTDH.

2. CASEPRESENTATION

A 29-years-old man admitted for generalized abdominal pain with vomiting progressively installed for a week, followed by complete occlusive syndrome with respiratory distress. It was noteda violent blunt thoraco abdominal traumatism resulting from stab wounds the left hemithorax six years ago. On admission, the Glasgow coma scalewas15/15, pressure : 130/80 mm Hg, pulse : 75 bpm, respiratory rate : 28 cpm, temperature: 37,5°C, an abolition of lefthydroaeric noise at auscultation, sensitivity in the left upper quadrant and an abdominal meteorism and the hernia areas were free, rectal examination without any particularity.

The chest X-ray showeda medium abundance hydropneumothorax and the thoraco-abdominal CT scan revealed a medium abundance effusion in the left hemithorax, and a left diaphragmatic hernia with the small intestine and epiploic contents (Fig. 1).

An emergency laparotomy was is performed under general anaesthesia, it demonstrated a 4cm left diaphragmatic hernia containing a strangulated, perforated loop of the distal small intestine (Fig. 2) causing gross left intrathoracic faecal contamination but no intra-abdominal contamination. The left pleural cavity was extensively wash out out, chest drain was placed, and the diaphragmatic hernia was closed by separated stitches in X with the non-absorbable thread No. 2.Then, anileostomy was carried out after abundant peritoneal lavage.

Subsequently, the post-operative recoveryas well with a resumption of normal respiratory function, good clinical and radiological progress and a postoperative discharge on day 15. Three months later, Intestinal continuity was restored and the recovery was also uneventful.

3. DISCUSSION

The PTDH corresponds to a muscular breach of the diaphragmatic dome which could be complicated by an intrathoracic issue of the abdominal viscera in the vicinity. They constitute particular trauma injuries. They often reflect the severity of the trauma but remain mostly

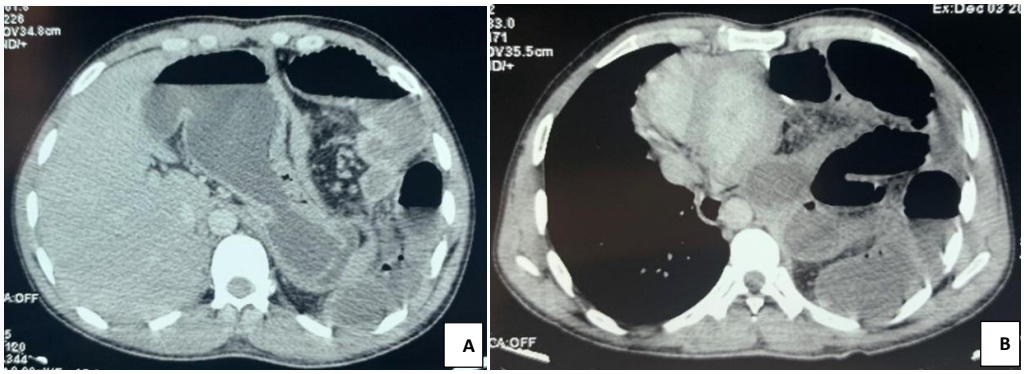

Fig. 1. The thorax and abdominal CT scan in axial sections
A.Fluid pleural effusion with digestive hydroaeric image in intrathoracic
B.Bowel distension with hydroaericlevels

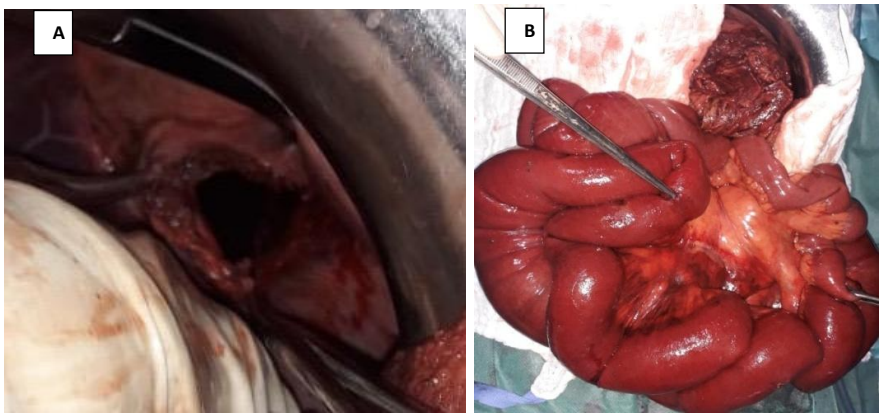

Fig. 2. Intraoperative view
A. Left diaphragmatic hernia after repositioning of the herniatedorgans in the abdomen.
B. The small intestine withsuffering and necrotized tissue

unknown among the lesions [1]. The etiologies of HD are dominated by polytrauma and thoraco-abdominal wounds; It is rarely difficult labor, a crash or a postoperative hernia [3-8]. The tension fecopneumothorax remains one of the most serious complications of PTDH [2]. However, the occurrence of this complication remains particularly rare, with only 14 cases so far reported in the literature [7-9].

Pathologically, the seatis the left diaphragmaticdome in 70 to 90% of cases, given the protective role of the right liver. The hernial content is variable, the organsmost frequently found in these hernias are in decreasing order of frequency: stomach (31.8%), colon (27.2%), omentum (15.9%), small intestine (13.6%), spleen (6.8%) and liver (4.5%) [10].

Pathophysiologically, tension fecopneumothorax is due to the perforation of the necroticintestine in the hemithorax. This necrosisis secondary to is chemia of the intestinal segment volvulated or strangled at the diaphragmatic defect.

Diagnostically, vital emergency due to polytrauma often delays diagnosis and, in half the cases, HD is ignored [10], like our patient who had been the victim of a very severe abdomin othoracic trauma six years ago following a basi thoracic wound. Thus, the revelation may be late on the occasion of complications such as strangulation or occlusion and major risk in this case, as in our observation, is perforation of hollow viscera herniated into intrathoracic Clinically, tension fecopneumothorax can be manifested as an association of acute occlusive syndrome, chest pain and acute respiratory distress [7,9], which is our patient's case.

The paraclinical called first line on chest radiograph which finds a hydropneumothorax with an intrathoracic digestive loop image [11]. However, it seems that CT scans for transverse and coronal images, as well as three-dimensional images, remains the best examination in this context. This technique reveals the hernia, but also shows the complications induced on the herniated organs [12].

Therapeutically, tension fecopneumothorax requires an extreme emergency surgery [13,14]. Laparotomyis the mostcommon approach used. It allows the reduction of hernia, intestinal resection of necrotic segment and trans-diaphragmatic pleural lavage. Curingthe diaphragm must becarried out by separated stitches with a non-absorbable thread [4]. However, in the event of a major defect in the diaphragmaticdome, the prosthetic or biological mesh may prove useful for closing or reinforcing the defect. However, non-resorbable implants are contra-indicated in a septic context, it is preferable to use absorbable implants [9].The laparoscopic and thoracoscopic approach has never been described for this procedure.

The postoperative course was marked above all by the appearance of septic complications. Empyema is the most common complication that can secondarily require decortication [15]. Mortality remains high despite immediate surgical care. It can reach 25 to 66% [13].

In terms of prevention, the best way to make an early diagnosis of HD and avoidits complications is to evoke it systematically if violent thoraco-abdominal trauma, as it can go unnoticed before the emergency vital and due to the poor clinical exam.

4. CONCLUSION

In light of our experience and review of the literature, the possibility of occurrence of diaphragmatic hernia should be systematically taken into account in case of basi thoracic wound to prevent complications, including tension fecopneumothorax. This may initiate a functional and vital prognosis.

CONSENT

As per international standard or University standard written patient consent has been collected and preserved by the authors.

ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the authors.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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