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A Diaphragmatic Rupture Simulating Pneumothorax

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ABSTRACT

Post-traumatic diaphragmatic rupture is an uncommon condition. This diaphragmatic breach can create a hernia of the abdominal viscera under the effect of intrathoracic or abdominal pressure. The clinical signs of this condition are non-specific and may simulate other conditions. We report a case of left diaphragmatic hernia simulating pneumothorax.

Observation: Mrs. SA 38 years old is admitted to resuscitation 24 h after a public road accident for acute respiratory distress syndrome. Upon admission, the clinical examination revealed a clinical anemia, a closed fracture of the right humerus, a polypnea with intercostal and suprasternal circulation and a gaseous pleural effusion syndrome. The diagnosis of a pneumothorax is made and thoracic drainage is carried out urgently. In view of the persistence of respiratory distress and the failure of thoracic drainage, a chest scanner is carried out and concluded to a left diaphragmatic rupture with ascent of the handles and spleen in the thorax. The indication of a laparotomy is placed and carried out then the patient transferred in digestive surgery to post-operative J4.

Conclusion: Diaphragmatic ruptures remain serious lesions with high morbidity and mortality. The diagnosis can sometimes be difficult to establish because the signs are non-specific. The chest scanner currently makes it easy and fast to make the positive and differential diagnosis of diaphragmatic rupture.

Keywords: Diaphragm rupture, Trauma, Pneumothorax, Computed tomography

INTRODUCTION

Traumatic diaphragmatic rupture is defined as a continuity solution involving the three tunics of the diaphragm. It can deliver passage to the abdominal viscera attracted by chest aspiration. In a traumatic context, diagnosis can sometimes be difficult to establish because clinical signs can simulate other affections.

We report a case of left diaphragmatic rupture with ascension of the colon in the thorax reminiscent of a pneumothorax. We want to emphasize through this clinical case the importance of computed tomography in the lesional balance of any polytraumatized.

OBSERVATION

Mrs. SA 38 years old is admitted to intensive care unit 24 h after an accident of the public road for acute respiratory distress. Upon admission the clinical examination highlights:

- Clinical anemia, normal consciousness.
- TA at 120/80 mm hg, FC at 98 beats/mn.
- Polypnea at 24 cycles/mn with flutter of the nose wings, intercostal pull, SPO2 at 92% in ambient air.
- Left gaseous pleural effusion syndrome.

A closed fracture of the left arm

An ex-sufflation puncture is performed urgently that brings air without amendment respiratory distress.

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The chest X-ray performed after ex-sufflation shows a disappearance of the left diaphragmatic dome, an avascular light occupying the left pulmonary field with deviation of the mediastinum from the contralateral side **(Figure 1)**.

Figure 1. Chest X-ray showing a disappearance of the left diaphragmatic dome.

The hypothesis of a post-traumatic diaphragmatic hernia was established and confirmed by the chest scanner **(Figures 2 and 3)**.

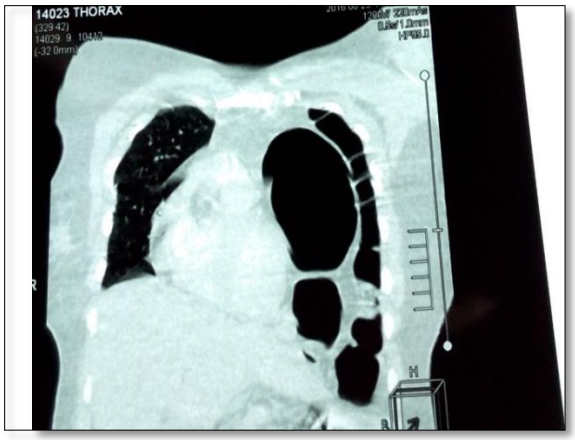

Figure 2. Chest lung scan showing the ascension of the colon in the chest.

Figure 3. Chest CT scan in sagittal section.

The patient is admitted to surgery for an emergency laparotomy. Perioperative exploration allowed to objectivate a left diaphragmatic tear greater than 10 cm **(Figure 4)** with ascent of the left colic angle, transverse, epiploon and spleen in the thorax. In addition there was also a capsular lesion of the spleen with spontaneous hemostasis by thrombus. There was no perforation of the viscera. The gestures made were a reintegration of the viscera into the abdominal cavity with diaphragm print. The post-op suites were simple. At post-operative J2 after a normal radiographic check **(Figure 5)**, the patient is transferred to post-operative visceral surgery at J4.

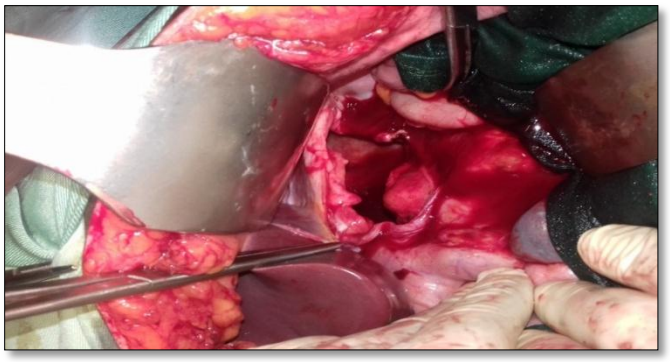

Figure 4. Left diaphragmatic breach about 10 cm.

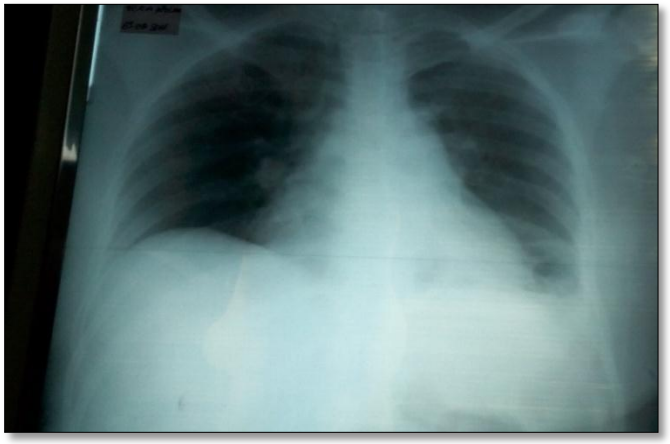

Figure 5. Post-operative J2 chest x-ray showing lung re-expansion and recurrence of right diaphragmatic dome.

DISCUSSION

The incidence of post-traumatic diaphragmatic rupture is fairly low in recent studies (from 1.2% to 5%, up to 16.2%) [1]. The main etiology of ruptures of the diaphragm is represented by road accidents (80%) [2]. The mechanism of occurrence would be indirect, explained by a sudden increase in the trans-diaphragmatic pressure gradient by intra-abdominal hyper pressure during trauma [2,3].

In our case, the break-up was on the left, the most common form representing more than 65% of the cases in the literature. The bilateral break is exceptional. On the right, the liver acts as a buffer, the left hemidiaphragm being weakened by the presence of the hiatal orifice and the lombo-costa trigone [4].

Diagnosis of diaphragm rupture is often delayed and difficult because clinical signs are inconsistent and non-specific. An unrecognized rupture can be very late, up to 50 years after the trauma, either through imaging for another pattern, or through non-specific epigastric or thoracic pain. More rarely, it is discovered during strangulation [5]. Diagnosis occurs in 20 to 40% of cases during laparotomy performed for another lesion [6]. However, it can be evoked at an early stage in front of early indications: digestive (abdominal pain, vomiting), respiratory (chest pain, dyspnea, cough) and more rarely cardiac (palpitations, pseudoangina pain) [7].

In the case of our patient, the respiratory signs were at the forefront with dyspnea and gaseous pleural effusion syndrome. This made us think of a pneumothorax, main differential diagnosis that could lead to chest drainage with risk of perforation of the viscera.

At the paraclinical level, chest X-ray has a relatively low sensitivity, but remains a screening tool with suggestive diagnostic results only in 17-40% of patients [8]: A large aerial image or multiple aerial images from the left base pushing the lung upwards and the mediastinum to the right are very characteristic. Ascended handles can look like a

pneumothorax. The fine-cut abdominal chest scanner, allowing for coronal and sagittal reconstructions is the reference examination for recent and old ruptures. It recognizes 80% of left and 50% of right failures [9]. The most relevant scannographic signs are the intrathoracic migration of digestive structures, the sign of the neck, corresponding to the impression of diaphragmatic rupture on the herniated organ, the "dependent-viscera sign", corresponding to the contact of an intra-abdominal organ with the posterior pleura in the absence of a diaphragmatic boundary and finally the discontinuity of the diaphragm [10-12].

Treatment of diaphragm rupture is surgical. This is an emergency when Ascended organs cause respiratory problems.

The approach was abdominal. This is the reference route for emergency surgeries. It allows the exploration and treatment of abdominal viscera [9].

The evolution in our case has been favorable. Mortality is most often related to associated lesions and delay in management that promotes complications [13,14].

CONCLUSION

Post-traumatic diaphragmatic hernia is an infrequent surgical condition. Its non-specific clinical signs can mislead the diagnosis. It should therefore be searched for by a radiological assessment including at least one chest X-ray and confirmed by a thoracic CT scan in front of any thoraco-abdominal trauma with abdominal hyper pressure mechanism.

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