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Post-Traumatic Diaphragmatic Hernia: A Rare Surgical Emergency in Children: A Case Report from Mohamed V Hospital, Tangier, Morocco

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Abstract | **Case Report**

Traumatic ruptures of the diaphragmatic dome are rare in children and are generally related to a road accident. However, they can be life threatening. We report a new case of diaphragmatic rupture hospitalized in the department of pediatric surgery at the Mohammed V Hospital in Tanger. The case involved a 3-year-old boy who was admitted to the emergency room of the Mohammed 5 Hospital in Tanger for thoracic contusion and multiple skin lesions following a traffic accident. The child remained conscious. His hemodynamic status was stable, SO_2= 96% on room air without chest deformity. The diagnosis was suspected on the chest X-ray and confirmed by the thoraco-abdominal CT scan. After clinical stabilization, the child underwent a surgical cure. The evolution was favorable. The diagnosis of the diaphragmatic hernia is difficult and requires a CT scan. The surgical treatment allows the reintegration of the herniated organs and the suture of the breach. The prognosis is in most cases favorable.

Keywords: Diaphragmatic hernia, abdominal pressure, diaphragm, surgery, child.

INTRODUCTION

Post-traumatic diaphragmatic hernia is a rare surgical emergency in children but can be life threatening. Diaphragmatic rupture can go unnoticed in the acute phase. Its diagnosis is essentially radiological. We report the case of a child with a post-traumatic left diaphragmatic rupture, whose diagnosis was established on admission to the emergency room.

OUR OBSERVATION

This is a 3-year-old boy, received in the emergency room of Mohammed 5 Tanger hospital on 14/08/2020 for thoracic contusion and multiple skin lesions following a public road accident. The child was hit by a car with crushing of the thorax. This mechanism of thoracic hyperpressure was accompanied by intense and diffuse thoracic and abdominal pain. The child remained conscious. His hemodynamic status was stable, SO2= 96% on room air, no chest deformity.

A chest X-ray showed a hypodense image of the left pulmonary hemichamber with digestive clarity occupying almost the entire left hemithorax with a deviation of the mediastinum (Fig 1).

2 hours after admission, minor respiratory distress occurred with clinical examination finding the child polypneic 40 cycles per minute with 97% saturation on 3 L/min oxygen with oxygen goggles.

The thoraco-abdominal CT scan confirmed the diagnosis, showing the ascension of the stomach and left colon intrathoracically (Fig 2).

The hypothesis of a post-traumatic diaphragmatic rupture was evoked, thus posing the operative indication. On 17/08/2020 After clinical stabilisation the surgical approach was transverse supra-umbilical performed under general anaesthesia with orotracheal intubation. The procedures performed were a reduction of the stomach and the digestive tract, a suture of the diaphragmatic breach of 12 cm in length located on the centre of the left cupola in single separate stitches with non-resorbable thread (Fig 3).

Figure 1: Preoperative chest X-ray

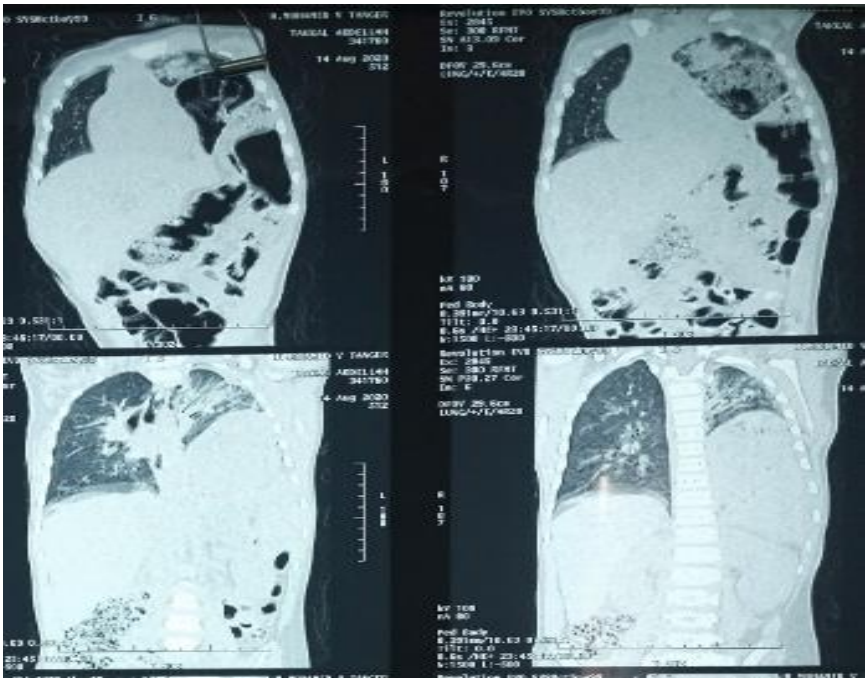

Figure 2: Preoperative chest CT scan

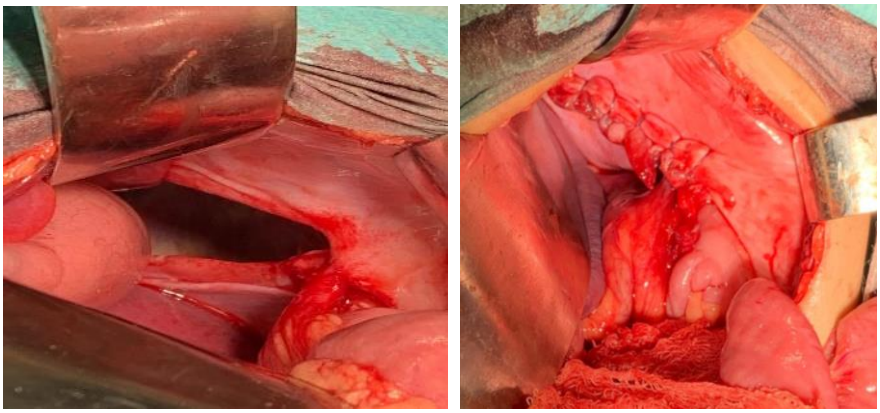

Figure 3: Intraoperative view showing the right diaphragmatic tear before and after surgical suture

DISCUSSION

Diaphragmatic damage, less common in children (elasticity of tissue), is severe in infants (primary respiratory muscle), and acute gastric dilatation secondary to any trauma in children can aggravate respiratory distress. The mechanism may be extrinsic force applied directly or indirectly by deceleration, or abdominal with transdiaphragmatic shock wave [1].

Severe trauma causes abdominal hyperpressure to breach the diaphragm and impair its function, with abdominal organs passing through the breach and causing elevated intrathoracic pressure and consequent impeded venous return, pulmonary compression and mediastinal displacement [2].

Diaphragmatic hernia is known for its extreme variation in presentation. Patients may present with symptoms that range from minor; malaise, chest pain, abdominal cramps to ischaemic and occlusive symptoms with strangulated hernias [3]. Our patient presented only with abdominal pain at the beginning and it was only secondarily that minor respiratory distress was associated with the clinical examination finding a polypnic child 40 cycles per minute with 97% saturation on 3 L/min oxygen.

The pathognomonic monkeys of diaphragmatic trauma are still contentious and the diagnosis of an uncomplicated form remains difficult [3].

Confirmation of the diagnosis is provided by imaging. In general, the initial assessment of patients with a traumatic injury involves a chest X-ray and abdominal ultrasound. Only if there is a suspected abnormality on the chest X-ray, a chest CT scan would be performed [3]. As in our case, the chest X-ray is sometimes sufficient to make the diagnosis.

CT scans, and in particular the multiplanar reconstructions made possible by multi-slice CT, are much more effective in diagnosing diaphragmatic rupture. They look for the same signs as in chest radiography, i.e. viscera in an intrathoracic position with narrowing during their intradiaphragmatic passage [1]. As in our case, the thoraco-abdominal CT scan confirmed the diagnosis, showing the ascension of the stomach and left colon into the intrathoracic position.

Surgically, diaphragmatic ruptures are approached by two routes, abdominal or thoracic. The choice reflects the experience of the management unit and the surgeons.

Nowadays, minimally invasive surgery with thoracoscopy is more frequently used [4]. However, this type of treatment was not possible in our case, as our technical facilities did not allow it. Several authors agree on the closure of the diaphragmatic dome, performed by simple suture in overjet or in separate stitches using absorbable or non-absorbable threads [5]. In our case, we performed a tension-free suture of the diaphragmatic tear in single separate stitches with non-absorbable suture.

CONCLUSION

Traumatic rupture of the right diaphragmatic dome is a rare lesion in the paediatric setting, most often occurring as a result of polytrauma.

The preoperative clinical diagnosis is difficult because of the symptoms which are rarely specific. The most common clinical signs are dyspnoea with diffuse chest pain. Diagnosis is difficult and requires a CT scan.

Surgical treatment allows the reintegration of the herniated organs and the suture of the breach. The prognosis is in most cases favourable.

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