IMAGE

Case 17

Caso 17

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CASE

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Term male newborn (NB) through vaginal birth. He was revived in the delivery room due to apnea and heart rate less than 100 bpm. Received positive pressure ventilation with a self-inflating balloon and tracheal cannula. Apgar 1':2; 5':9. He was presented to parents and forwarded to the neonatal unit of progressive care (UNCP). Upon examination, he expressed decreased breath sounds on the left side, excavated abdomen, and convex thorax. Inadequate prenatal care, with three appointments at the health center, with one ultrasound examination in the first trimester without alterations. Chest and abdomen x-ray were requested and performed in bed at the UNCP.

What is the most appropriate conduct on this condition?

- surgical approach via thoracotomy in an emergency regime;
- thoracentesis in the second left intercostal space on the hemiclavicular line;
- inhalation therapy with surfactant and control of acid-basic disorders;
- hemodynamic stabilization with control of acid-basic disorders and subsequent surgical approach.

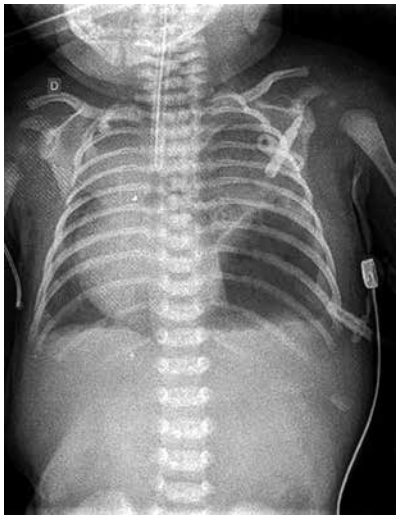

Figure 1 - Thorax and abdomen X-ray in AP.

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IMAGE ANALYSIS

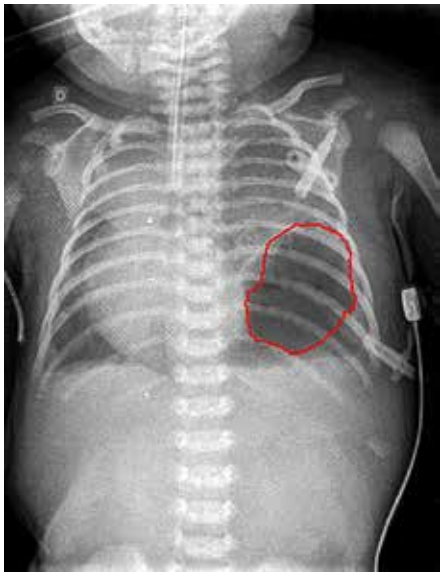

Figure 2 - Thorax and abdomen X-ray demonstrating a rounded hypotransparent formation with air-fluid level in the lower half of the left hemithorax (circled in red) consistent with the gastric bubble. Opacity is associated in the upper half of this hemithorax and deviation of mediastinal structures to the opposite side. The opacity, present in the upper half of the left hemithorax, may correspond to atelectasis or pulmonary hypoplasia.

DIAGNOSIS

The clinical picture of respiratory failure associated with the physical examination findings of excavated abdomen, convex thorax, and x-ray evidence of gastric bubble suggests the diagnosis of congenital diaphragmatic hernia.

In the decade of 1980, the emergency surgical approach was considered the most appropriate conduct. Currently, the previous hemodynamic stabilization of the patient and possible control of acid-basic disorders, secondary to hypoplasia and pulmonary hypertension, which are usually associated with a diaphragmatic hernia, are indicated.

Thoracentesis is indicated in cases of hypertensive pneumothorax, whose diagnosis must be clinical. The radiographic findings are contralateral mediastinal deviation and ipsilateral hyper transparency, this latter not shown in the patient's image exam. It must be suspected in patients submitted to ventilation with positive pressure who presents sudden respiratory and hemodynamic instability.

Surfactant therapy is indicated especially in cases of respiratory distress syndrome that affects pre-term NBs due to pulmonary immaturity, which does not apply to the case in question.

DISCUSSION OF THE CASE

The congenital diaphragmatic hernia (CDH) consists of a defective diaphragm leading to herniation of abdominal viscera into the thorax, 87% of which occurring on the left and 2% bilaterally. It affects one in 2,200 newborns, and in 50% of cases is associated with other anomalies such as chromosomal changes, congenital heart disease, and neural tube defects.

The herniation occurs during a critical period of lung development and the compression of this organ by the abdominal viscera can lead to pulmonary hypoplasia, which is more severe when it is ipsilateral to the hernia but can also occur on the contralateral side. The manifestations can range from severe acute respiratory failure at birth, which is the most common framework, to minimal symptoms or even absence of them. Newborns with CDH have increased risk of developing persistent pulmonary hypertension, which is a syndrome characterized by severe and refractory hypoxemia from decreased pulmonary blood flow and right-left shunt formed from the oval and/or arterial foramen canal. The degree of respiratory distress varies according to the severity of pulmonary hypoplasia and development of persistent pulmonary hypertension.

The NB with CDH can present, at the physical examination, barrel-shaped thorax and excavated abdomen according to viscerae dislocation into the thorax, and the absence or decreased breath sounds, ipsilateral to the defect. When the herniation happens on the left side, the heartbeats are best heard on the right side as a function of heart displacement.

The diagnosis can be made during the prenatal care by ultrasonography; in this case, the NB must be readily intubated at birth with low O_2 peak pressure to prevent lung damage. When the diagnosis is not performed intra-uterus, it should always be suspected in NB with respiratory failure at birth, especially in the absence of breath sounds. The diagnosis is confirmed with the thorax x-ray, which demonstrates a herniated abdominal content usually with air or fluid in the hemi thorax. Other findings include contralateral displacement of the heart and other structures in the mediastinum, in addition to lung contralateral compression.

The most appropriate treatment is controlling hypoplasia and pulmonary hypertension for a subsequent corrective surgical approach (Figure 3). Ideally, the NB must be hemodynamically and from the point of view of respiration stable, and with the acid-basic status controlled to be referred to surgery.

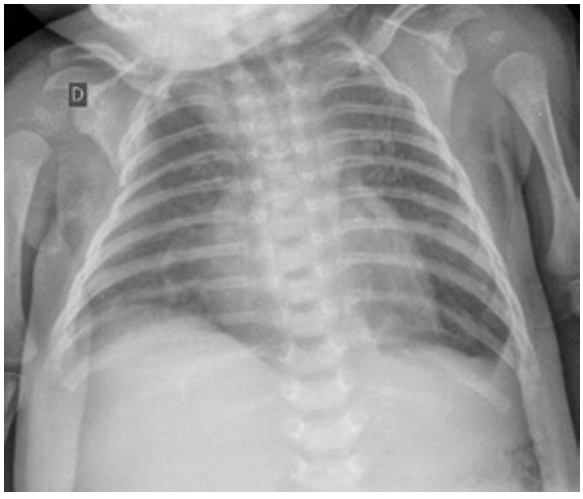

Figure 3 - Thorax X-ray in AP after surgical correction of the diaphragmatic hernia with no apparent abnormalities.

RELEVANT ASPECTS

- congenital diaphragmatic hernia: a congenital defect of the diaphragm with herniation of abdominal viscerae into the thorax;
- pulmonary hypoplasia and pulmonary hypertension usually associated with CDH;
- the diagnosis can be made during the prenatal care by ultrasound;
- acute and severe respiratory failure is the most common framework;
- thorax x-rays associated with the clinical picture establishes the diagnosis;
- treatment: stabilization for posterior surgery.

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