CASE REPORT

Post-traumatic intercostal lung hernia

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Introduction

Intercostal lung herniation constitutes a poorly described condition and most reported cases are caused by thoracic trauma. Its coexistence with other more common complications, like pneumothorax, haemothorax and subcutaneous emphysema may delay its diagnosis, which can be determined by the contribution of chest computed tomographic scan. Even though complications like tension pneumothorax, incarceration and strangulation of the lung parenchyma are uncommon, surgical treatment of the hernia should be considered in any case.

Case report

An 82-year old man was admitted to the emergency department one hour after being run over by a car with a speed of <5 km/h. There were crepitations over the right chest wall due to subcutaneous emphysema. The patient was haemodynamically unstable with BP: 90/50 mmHg and HR: 120 min⁻¹. A CT scan of the chest demonstrated multiple comminuted fractures of the right upper ribs, bilateral pneumothorax (more evident on the right), a right haemothorax with a slight shift of the mediastinum to the left and a severe right subcutaneous emphysema. Lung parenchyma ruptures were found in the right upper and lower lung fields, as well as a small protrusion of the lung parenchyma through the ribs fractures (Fig. 1A). An abdominal CT scan showed no abnormal findings. He had a heart rate of 92 beats/min and respiratory rate of 22 breaths/min. Arterial blood gas measurement showed pH = 7.3, \( P_{O_2} \): 65 mmHg, \( P_{CO_2} \): 45 mmHg, \( HCO_3^- \): 18 mEq/L. He had an Injury Severity Score (ISS) of 16\(^1,5\) and his predicted death rate was 22.7%\(^4\).

Two chest tubes were placed (right and left). The patient was intubated and transferred to the Intensive Care Unit (ICU). His condition improved and 5 days later he was weaned from the ventilator. A second CT scan of the chest showed that the lung hernia had completely resolved, as well as the previously coexisting bilateral haemopneumothorax (Fig. 1B). Unfortunately, 30 days after the accident the patient developed septic shock and died.

Discussion

Extrathoracic lung herniation is defined as the protrusion of pulmonary tissue through an abnormal
opening of the thoracic wall. Based upon aetiology, lung herniations are classified as congenital or acquired. The latter are more common and are further distinguished in spontaneous, post-traumatic and pathological. Pathological are the most uncommon lung herniations occurring on a neoplastic substrate or following an inflammatory chest wall process. Spontaneous herniations usually result from increased intrathoracic pressure, and are associated with heavy coughing. Post-traumatic intercostal hernias may present immediately after the injury, or follow a period of months or even years. Traumatic hernias arise more often from penetrating than blunt injuries and may result from multiple costal fractures, direct sternal injury, and clavicle-sternal or costal-sternal dislocation. Lung hernias can also be classified according to the location as diaphragmatic, thoracic or cervical through a defect in Sibson’s fascia.

A good percentage of lung hernias remain asymptomatic. During clinical examination a palpable, crepitant mass may be discovered on the thoracic wall, the size of which changes with respiration and increases with coughing and Valsalva maneuver. Additionally, in case of incarceration and strangulation pain and haemoptysis may be present. Usually chest X-ray can miss the diagnosis. Oblique or tangential views are more helpful. Chest computed tomographic scan (CT) and especially helical CT, is the diagnostic procedure of choice. It designates the location and size of the thoracic wall lesion and the presence of escorting defects. Furthermore, it sets the indication of surgery in case of strangulation. However, in case of cervical lung hernias, CT without Valsalva maneuver can lead to false-negative results.

Treatment of pulmonary hernias remains controversial. Although most patients remain asymptomatic, surgical repair may become necessary in case of a large pulmonary hernia. According to Francois et al., in case of intercostal hernias where broken costae create a narrow neck, surgical treatment is usually recommended. In these cases, direct sutures or a prosthetic patch, if the thoracic lesion is too large, may be used. On the contrary, supraclavicular pulmonary hernias due to clavicle-sternal dislocation may be treated conservatively, with serial radiographic follow-up including chest CT scan.

References