



Spontaneous Pulmonary Hernia: Case Report and Literature Review

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Abstract

Pulmonary hernia is defined by the protrusion of the lung parenchyma through a defect in the chest wall. It is classified according to etiology (congenital or acquired) and anatomical location (cervical, thoracic or diaphragmatic). It may be asymptomatic or present with acute chest pain after coughing or sneezing or even hemoptysis. The diagnosis is clinical, but a tomography is necessary to confirm and characterize it. There is debate between conservative and surgical management. There is no standard surgical technique to treat this type of protrusion. A 78-year-old male patient, with no history of smoking, trauma or known respiratory disease, with a personal history of obesity. He consulted due to a bulging in the right thoracic region after an episode of worsening chronic cough. Upon inspection, intercostal protrusion was observed during respiratory movements and Valsalva maneuvers. A chest CT scan was requested, which showed a posterior lateral pulmonary hernia between the 8th and 9th right rib measuring 22 mm. Repair of the hernia defect was performed through right thoracotomy. Lung hernias, although rare, must be taken into account. Lung hernia due to cough is related to a combination of 2 processes: Weakness of the boundaries of the thoracic cavity and increased intrathoracic pressure. Clinical and radiological findings confirm the diagnosis. The final treatment must be surgical.

Keywords: Lung hernia; Cough; Surgical intervention

Introduction

A hernia is defined as a protrusion of an organ or tissue through an abnormal opening. There are different types of hernias.

Pulmonary Hernia (PH or pneumocele) is defined as the protrusion of the lung parenchyma through a defect in the chest wall. In most patients they are secondary to an injury or trauma, although there are other causes. They differ from eviscerations that correspond to the exteriorization of the lung parenchyma through a wound.

The appearance of hernial protuberances of the lung is extremely rare and the literature on this topic is scarce. PH was first described by Dr. Roland in 1499. The most accepted classification is Morel's-Lavallee based on both the etiology (congenital or acquired) and the anatomical location (cervical, thoracic or diaphragmatic).

Most congenital hernias are detected in childhood, as an incidental finding on a chest X-ray, although they can sometimes remain asymptomatic and manifest later in life. However, approximately 80% of reported cases of pulmonary hernia are acquired [1].

Acquired hernias can be classified as traumatic, spontaneous or pathological when they occur after neoplastic or inflammatory processes [2].

Traumatic hernias may appear immediately after the injury or be delayed for years; they are the result of trauma to the chest (penetrating or blunt) or a previous surgical procedure with inadequate closure of the chest wall [1].

Spontaneous intercostal hernias are the least common form of PH caused primarily by coughing efforts, a sneeze, or even a "false movement," without evidence of prior trauma [3].

Usually, its location is in the parasternal region due to the lack of external intercostal muscles, especially in the lower intercostal spaces. The next most common position appears to be lateral, and the rarest position is posterior. This is due to anatomical conditions; in fact, the anteroinferior part of the thorax has much less muscular support than the rest of the thorax and the lower costal

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cartilages are more separated than the rest [1]. An acquired or congenital decrease in the resistance of the chest wall may be the first cause of herniation of the lung [2].

PH can be asymptomatic. However, the classic clinical history is acute chest wall pain after coughing or sneezing or even hemoptysis after incarceration or strangulation of the lung parenchyma [3].

Patients at greatest risk for pulmonary herniation appear to be those with elevated intrathoracic pressure, such as the morbidly obese or those with end-stage chronic obstructive pulmonary disease. Other risk factors include tissue weakness or poor healing from malnutrition, steroid use, diabetes, or other comorbidities [1].

Management, by conservative or surgical approach, depends on the clinical status of the patient, the characteristics of the hernia and the existence or not of complications [3].

This work describes a case of pulmonary hernia in a patient with chronic cough and a brief review of the literature.

Case Presentation

A 78-year-old male patient, with no history of smoking, trauma or known respiratory disease, Obesity (BMI 30 kg/m²), HTN, CKD, Renal leiomyosarcoma, Bilateral hip arthropathy. And Surgical history of bilateral THR, cholecystectomy, inguinal hernioplasty, left nephrectomy, without history of thoracic intervention.

Patient initially consulted due to a worsening of his chronic cough, accompanied by an episode of profuse pain with local hematoma and after 3 months he began to observe bulging in the right thoracic region. Due to the COVID-19 pandemic, he suspended his controls and returned to the consultation after 3 years, with a greater bulging, fluctuating with breathing. Patient denied weight loss and history of trauma. On clinical examination, intercostal protrusion with paradoxical breathing was observed (Figure 1).

A chest CT scan showed posterior lateral pulmonary hernia in the right 8th intercostal space, with thinning of the soft tissues (Figure 2).

It was decided to perform repair of said hernia. Through selective intubation, patient in left lateral decubitus position (Figure 3), right thoracotomy over the defect area, posterolateral incision ± 15 cm. The latissimus dorsi muscle was dissected and the serratus anterior muscle was mobilized, without the need for section (Figure 4).

Hernia defect was identified, no signs of rib fractures were found. Diaphragmatic eventration was also observed, so it was decided to perform plication (Figure 5).

Thoracic closure is performed, pleural drainage is placed. Stitches are closed with non-absorbable suture, achieving a correct



Figure 1: Right hemithorax. Intercostal depression during inspiration. Bulging during expiration.

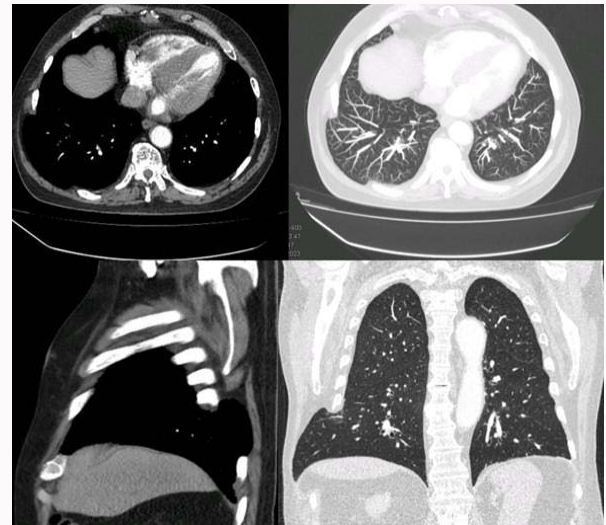


Figure 2: Thorax tomography. Different sections that show the presence of lung hernia in the 8th Intercostal Space.



Figure 3: Patient position. Patient in left lateral decubitus with selective intubation.

approximation between ribs, closing the wall defect, without requiring mesh. Closure of muscle planes, subcutaneous cellular tissue and skin is performed (Figure 6). Control X-ray is performed (Figure 7).

Surgery without complications, postoperative course in the general room, the drainage was removed after 72 h.

Postoperative management with high-impact analgesia in the first 24 h. Patient was discharged with oral analgesics and use of a girdle. Control was carried out after 7 and 30 days.

Discussion

Cases of spontaneous PH are scarce in the international literature, with few reports. Approximately, 18% of pulmonary hernias are congenital, 52% post-traumatic, 29% spontaneous and 1% pathological, that is, associated with infectious or tumor involvement of the chest wall. Spontaneous PH is the result of a protrusion of the lung parenchyma through an area of weakness in the chest wall between the ribs [3,4]. It is an entity that should be kept in mind as a

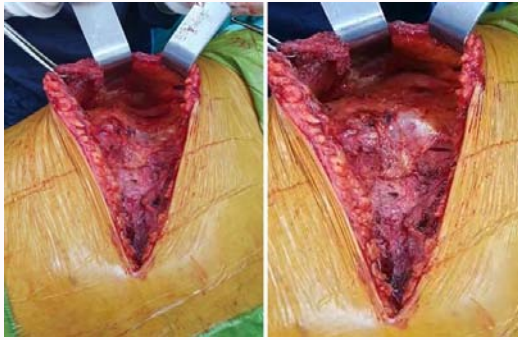


Figure 4: Hernial defect with protruded lung parenchyma.



Figure 5: Diaphragmatic eventration. Diaphragm plication.



Figure 6: Placement of pleural drainage and closure by planes.

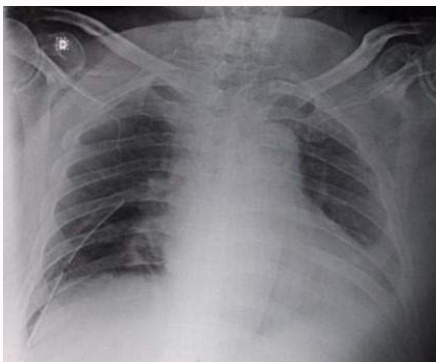


Figure 7: Chest X-ray immediate postoperative control.

diagnosis in a patient with a history of chronic cough who consults for pain intense post-cough or Valsalva maneuver and subcostal hematoma.

PH due to cough is related to a combination of 2 processes: Weakness of the boundaries of the thoracic cavity and increased intrathoracic pressure [5].

The diagnosis should be confirmed by a functional respiratory examination and imaging studies of the chest; multiplanar reconstruction tomography scans in the axial, sagittal and coronal planes better define the exact location and size of the thoracic parietal defect, as well as the dimensions of the herniated lung parenchyma, which is extremely useful for assessing the extent of disease, which is critical for surgical planning and treatment [2].

Regarding the treatment of H.P., there is still debate between conservative and surgical management. We opted for surgical treatment since it was a large hernia [4]. When these are large and/or produce symptoms, surgical repair should not be delayed since it prevents the risk of strangulation; it is a simple intervention with very favorable functional and aesthetic results.

Although surgery is the most common treatment, there is no standard surgical technique to treat this type of pathology. This consists of repairing the defect, restoring continuity and wall strength [4].

Other surgical alternatives to our way of resolution. They are multiple and they include the use of wires, soft synthetic patches, and sliding staples. The soft prosthetic patches have fewer restrictions on normal thoracic mechanics compared to more rigid implants. Bioprosthetic implants reduce the risk of infection [3]. Other authors report that HP can be corrected by video thoracoscopy, although this is not a well-established technique, or even a combination of both approaches [4]. Most cases treated thoracoscopically are hybrid in nature, and the important repair/reconstruction procedure is performed under direct visualization, *via* a minithoracotomy with thoracoscopic guidance. A 15 cm × 15 cm polypropylene mesh is introduced overlapping the center of the defect and fixed to the parietal wall with absorbable straps [6-8].

Finally, in addition to surgical treatment, management must be comprehensive, including smoking cessation, cough control, changes in eating habits, and functional rehabilitation [3].

Conclusion

Lung hernias, although rare, must be taken into account. The different causes must be investigated and smoking cessation achieved if present. In this case, the patient came after evidence of bulging in the chest wall after an episode of exacerbated chronic cough. Clinical and radiological findings indicated that the patient had a pulmonary hernia. The surgical approach must be carried out in order to avoid complications such as lung incarceration. The conventional approach is a good route although thoracoscopic approaches should be considered as an alternative in complex centers.

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