

Spontaneous Intercostal Lung Herniation: An Unusual Entity

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ABSTRACT

An elderly male in seventies, diabetic, hypertensive and asthmatic, presented with chest pain, cough, dyspnea and a chest wall swelling in left posterior axillary line for 4 months. His X-ray chest showed left sided pleural effusion. A diagnosis of possible empyema necessitans was made by the treating physician and a pigtail catheter was inserted. The drain was however non-purulent, and the swelling remained unresolved. He was therefore referred to our institute. On examination, there was a large smooth round chest wall swelling in left posterior axillary line with no skin erythema and a strong impulse on coughing. On further imaging and investigations, it was diagnosed to be a chest wall herniation of the lung. Intraoperatively, it was found that only a very thin muscle layer existed in the entire left seventh intercostal space. It was repaired with a mesh. Patient is doing well after the surgery with no recurrence.

Keywords: Herniation, Intercostal muscles, Mesh, Pleural effusion, Congenital

Introduction

Lung hernia refers to a part of a lung pushing through a tear or bulging through a weak spot in the chest wall or rarely in the cervical region (through the Sibson's fascia) or diaphragm. Lung herniation most commonly occurs through the intercostal spaces (72-80%), cervical region (20 to 28%) and very rarely through the diaphragm.¹ Each of the above types can be congenital or acquired. Acquired hernias are either due to trauma to the chest wall or post thoracotomy leading to the weakening of the chest wall muscles, whereas spontaneous hernias are relatively rare.² Spontaneous defects seem to occur with vigorous coughing or sneezing (any activities that increase the intrathoracic pressure abruptly), especially in patients with asthma and COPD. We hereby present a case of spontaneous chest wall hernia in an elderly male, with no history of trauma, surgeries, or any known defects of the chest wall.

Case Presentation

An elderly non-smoker male in his seventies, a well-controlled case of diabetes and hypertension for past 10 years and perennial asthmatic since 4 years, came with complaints of chest pain, cough, sputum and breathlessness along with a painful swelling in the left posterior axillary line since 4 months. He was initially treated as asthma exacerbation but had no relief with treatment. The chest wall swelling was initially thought by his primary physician to be a muscular sprain. His Xray chest

done later showed left sided moderate pleural effusion. Due to the co-existence of a chest wall swelling and pleural effusion a diagnosis of empyema necessitans was suspected by the treating physician. He was treated with antibiotics and his pleural cavity was drained using a 16F pigtail catheter. He drained one liter of non-purulent hemorrhagic fluid over 5 days. His chest wall swelling however did not decrease in size. He was therefore referred to our institute for further evaluation and management. On examination he had a swelling on the chest wall in the posterior axillary line in the left 7th intercostal space with a strong impulse on coughing, but it was not completely reducible. His respiratory examination revealed few crepitations and occasional rhonchi. His vitals were normal and oxygen saturation was maintained.

Investigations

The pleural fluid that drained after the pigtail insertion was exudative with low Adenosine Deaminase (ADA) levels and was negative for malignant cytology, aerobic culture, and for mycobacteria by Cartridge Based Nucleic Acid Amplification Test (CBNAAT). His chest X-ray showed mild left pleural effusion with an adjacent chest wall swelling. His contrast enhanced CT scan thorax (Figure 1 and Figure 2) showed few alveolar opacities in posterobasal and lateral segments of the left lower lobe, residual pleural effusion and non-homogenous air densities that were extending from left lung in to the posterior chest wall through 7th intercostal space. This suggested an intercostal lung herniation. An ultrasound of the chest confirmed the connection of the chest wall swelling to the pleural cavity through a gap in the 7th intercostal space.

Differential Diagnosis

On initial presentation, a diagnosis of empyema necessitans made by the local physician was possible. However, it was ruled out by absence of fever and non-purulent nature of the fluid. A presentation of a chest wall swelling with adjacent pleural effusion is also not uncommon with chest wall cold abscess travelling from Pott's spine along the intercostal nerve. It was ruled out by MRI screening of the spine. It also helped to rule out additional defects in the chest wall on both sides. A possibility of chest wall hernia in the absence of trauma or prior thoracic surgery in an old man is rare and was indeed the least expected differential diagnosis for his primary physician.

Treatment

Cardiovascular thoracic surgery consult was done for the lung herniation and the patient was taken up for surgery. During surgery, the hernia sac was dissected, and it was found that there was a very thin and poorly developed layer of intercostal muscles in the 7th intercostal space which had given way leading to herniation of the lung into the chest wall. The hernia sac was identified with the adherent left lower lobe which was reduced back into the thoracic cavity. The intercostal defect was repaired with a proline mesh of about 30 cm in length to cover the entire intercostal space, which was then anchored to the underlying ribs using non absorbable sutures (Figure 3).

Outcome And Follow-Up

Patient tolerated the procedure well and is doing good with no development of significant complaints or recurrence of swelling over next one year in spite of two exacerbations of asthma causing coughing.

Discussion

Lung herniation was first described in 1499 by Roland as a protrusion of pleura-covered pulmonary parenchyma through an abnormal weakness or defect of the thoracic wall.³ The classification for lung hernias was first proposed in 1845 and it divides lung herniations by location (cervical, thoracic, or

diaphragmatic) as well as etiology, either congenital or acquired.⁴ Approximately 80% of the lung hernias are acquired and they are further classified into traumatic, spontaneous, and pathologic. Congenital hernias most commonly present in infancy and they result from the depletion of the endothoracic fascia. They occur either at the thoracic inlet or at the intercostal spaces, where weakness of the fascia is usually combined with absence of the intercostal muscles.⁵ Traumatic lung hernias are a result of either trauma to the chest (penetrating or blunt) or from preceding operative procedure with inadequate closure of the chest wall. Traumatic hernias may appear immediately after injury or can be delayed for years.⁶ Spontaneous lung hernia due to coughing has been related to the combination of elevated intrathoracic pressure and weakness of an area of the thoracic cavity. Many among them have resulted from particularly forceful cough, though weightlifting and playing wind instruments have also been described as precipitating factors.⁷ The pathologies associated with lung hernias include malignancy, chest wall abscess, empyema, rib osteomyelitis or tuberculosis.⁸ On examination, there is usually a chest wall crepitus and a smooth swelling which increases with cough or valsalva maneuver. Ecchymosis and pain may or may not be present. Symptoms may be intermittent and indistinct in nature. The current imaging modality of choice is CT scan, as herniation can be difficult to differentiate from other lung masses. Also, CT can identify any associated abnormalities like fracture ribs or any other chest wall abnormalities. In our case, the increase in intrathoracic pressure due to the pre-existing asthma might have precipitated the probable congenital weakness in the chest wall leading to lung herniation. The pleural effusion was probably due to mechanical trauma to the pleura caused by recurrent herniation through the chest wall dent and it probably prevented further lung herniation that could have caused rupture of the lung parenchyma.

Take Home Messages

- Lung hernia in the absence of trauma and at late age is very rare.
- Good knowledge and clinical correlation is necessary to make a rare diagnosis.
- Thorough investigation before intervention with a chest wall catheter would have prevented further trauma to the chest wall defect.

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Figure 1: CT scan of thorax showing basal pleural collection and lung herniation

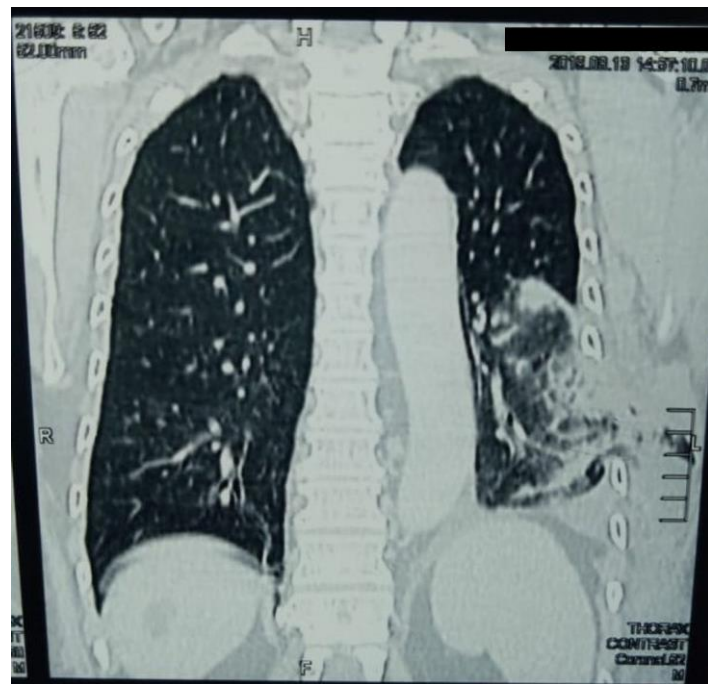


Figure 2: CT scan of thorax showing the lung herniation



Figure 3: Mesh being placed to close the defect