

Conservative Management of Traumatic Intercostal Lung Hernia: A Case Report

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ABSTRACT

Pulmonary herniation is an uncommon phenomenon. It has been described sporadically in obscure case reports and rare case series. Owing to its sparse occurrence, a calibrated algorithm for its management does not exist. Even then, the popular consensus advises surgical management comprising prosthetic mesh repair. Hereby, authors report a case of a 24-year-old male, who developed left lung herniation after blunt trauma to the chest wall. Non Contrast Computed Tomography (NCCT) of chest revealed herniation of left lung through 3rd intercostal space, a hernia defect of 1.8 cm and a small left pneumothorax. Patient was managed conservatively with intercostal drainage and was discharged on day 5 of admission. This case report aims to delineate the conditions where conservative management of lung hernias can be undertaken successfully.

Keywords: Blunt trauma chest, Intercostal chest drainage, Pulmonary herniation, Subcutaneous emphysema

CASE REPORT

A 24-year-old male patient presented in Surgical Emergency with a history of blunt trauma to left side of the chest wall. Patient sustained this injury a day prior, gave history of being hit by a bull's horn on the left precordial area. He also complained of a swelling which appeared on coughing at site of injury [Table/Fig-1a,b]. The patient was anxious about this swelling but did not complain of any dyspnoea or pain on deep breathing.

Patient's vitals were stable with blood pressure of 110/60 mmHg, pulse rate of 80 pulse/min, respiratory rate of 14/min and SpO₂ was 98% on room air. On examination, a solitary abraded wound of 2x1 cm was seen, around 3 cm superior and medial to the left nipple. The wound was neither discharging nor bleeding. On coughing, a soft, smooth, reducible swelling of 5x4 cm was noted to appear from the thoracic wall, and it disappeared spontaneously once cough subsided. Subcutaneous emphysema was palpable around the swelling. A diagnosis of intercostal lung herniation due to chest wall injury was suspected.

On auscultation, air entry was equal in both lungs with no basal crepitation, or other abnormal respiratory sounds were heard. The patient was given adequate analgesia. Plain radiograph of chest Posterior Anterior (PA) view showed mild pneumothorax on left side but no rib fractures were noted [Table/Fig-2]. Non Contrast Computed Tomography (NCCT) imaging showed defect in intercostal space, pneumothorax and subcutaneous emphysema [Table/Fig-3].

The patient underwent Intercostal Chest Drainage (ICD). Post ICD insertion X-ray showed adequate left lung expansion.

There was no evidence of any ongoing bleed in ICD and hernia settled on day 5 of admission, hence the chest drain was removed and patient was discharged in a stable condition. On follow-up at the institute four weeks post injury patient has no residual complaints, there was no herniation of lung on coughing and chest X-ray revealed no abnormality [Table/Fig-4].

DISCUSSION

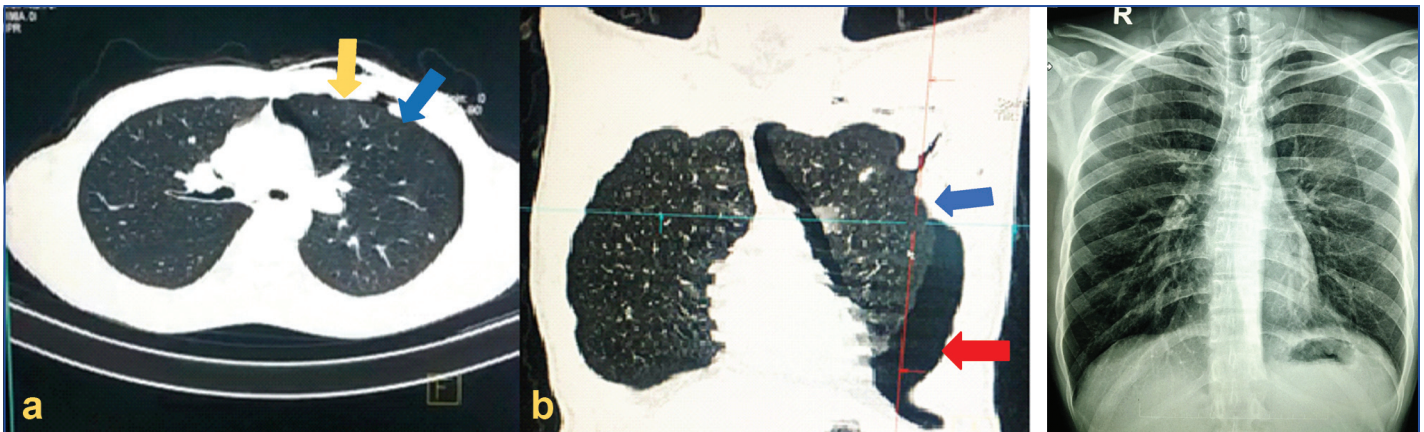
Lung herniation is defined as protrusion of lung tissue covered by visceral pleura or skin, through an abnormal defect in the chest wall, diaphragm or mediastinum [1]. Morel Lavallée first classified lung hernias according to aetiology and anatomical location back in 19th century. The modified Morel Lavallée classification [Table/Fig-5] is the most widely used classification even today [2].

Intercostal hernia generally presents with a bulging, reducible mass in the chest, associated with coughing or Valsalva manoeuvre. On examination, a defect may be palpable in the chest wall through which the mass protrudes [3]. It may be associated with chest tenderness, ecchymosis or subcutaneous emphysema due to underlying rib fractures [4]. It may be associated with haemoptysis, if entrapped lung segment undergoes strangulation. Large hernias with unstable chest wall and pulmonary infarction will be associated with respiratory distress, enlarging size of hernia and increased requirement of positive pressure ventilation [4].

A plain radiograph of chest shows pulmonary herniation as well as circumscribed area of subcutaneous air [5]. Sometimes



[Table/Fig-1]: a) An abraded wound at left chest wall; b) Swelling appeared on coughing indicating lung herniation. **[Table/Fig-2]:** Chest X-ray Posterior Anterior (PA) view showing left pneumothorax (red arrow). (Images from left to right)



[Table/Fig-3]: Non Contrast Computed Tomography (NCCT) chest a) Axial view of showing subcutaneous emphysema (yellow arrow) at left thoracic wall and herniation of left lung through 3rd intercostal space (blue arrow); b) Coronal view showing hernia defect measuring 1.8 cm at the left chest wall (blue arrow) and left pneumothorax (red arrow).

[Table/Fig-4]: Follow-up X-ray chest after 4 weeks of intercostal chest drainage removal. (Images from left to right)

Classification of lung hernias	
According to anatomic location	Cervical
	Thoracic
	Diaphragmatic
	Mediastinal
According to aetiology	Congenital
	Acquired
	- Traumatic
	- Spontaneous
	- Pathological
	- Postsurgical

[Table/Fig-5]: Modified Morel Lavallée Classification of lung hernias [2].

standard oblique and lateral films may be required to visualise the radiolucent area with visible bronchovascular markings projecting outside the boundaries of thoracic cage. A computed tomography scan is gold standard for diagnosis of lung herniation; it will identify any pulmonary tissue herniating outside the boundaries of bony chest wall, along with any bony defect or anomaly of surrounding musculature. If the lung tissue in hernia sac seems well aerated, possibility of strangulation can be ruled out [6]. Postprocedural follow-up imaging in form of serial X-rays or NCCTs are crucial to detect any continuing bleed, persistent lung collapse or parenchymal strangulation [4]. In children, to avoid radiation exposure, instead of a NCCT chest a chest ultrasound may suffice [6].

Much controversy exists regarding the appropriate management of an asymptomatic small pulmonary hernia. A large number of authors recommended surgical repair in all cases [2,5]. They believe that failing to operate early leads to risks of strangulation and necrosis of the lung due to entrapment or bleeding of lung due to injury to lung parenchyma from the sharp edges of broken rib fragments [5].

In children, successful conservative management of small asymptomatic pulmonary hernias is an established practice [3,6,7]. Experts believe asymptomatic childhood lung hernias warrant watchful observation in order to decrease the risks of surgery in form of recurrent infections, deformities and reoperations [8]. In adults with supraclavicular hernias, conservative management has been advised as a favourable approach in lieu of these hernias having a wide neck [1]. In fact in the era where NCCT chest is easily available, the incidence of small asymptomatic lung hernias is increasing, which necessitates to redefine the treatment protocols to a more prudent conservative approach [4]. Thus, in absence of

complicating factors such as intractable pain, unstable chest wall deformity, lung strangulation or incarceration or bleeding or necrosis; a watchful observation may help patient escape a major surgery and its complications.

Follow-ups with radiological investigations are very crucial part of treatment assessment as failure of symptoms to abate, warrants operative intervention [4]. There has been a case report where conservative management failed at 3rd month and needed surgical intervention due to involvement of abdominal organs in transthoracic hernia [9].

All patients with large hernia defects, infarction of lung, chronic pain, respiratory failure, and involvement of other organs in hernia require surgical management. Surgical repair entails primary suture closure of the defect after reducing hernia sac. Use of prosthetic mesh may be warranted for larger defects with or without concomitant bony stabilisation [5]. Complications like fistula formation, seroma, and infection have been reported with the use of meshes. Minimally invasive approach using Video Assisted Thoracic Surgery (VATS) has also been described recently [10].

CONCLUSION(S)

Incidence of lung herniation is on the rise with increase in blunt traumas and motor vehicle accidents. In absence of clear scientific guidelines, management should be performed on a case to case basis. Conservative management of small, uncomplicated hernias may sometimes suffice; instead of undertaking the arduous thoracic wall repair.

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