

Case report



Unexpandable lung in an elderly Nigerian woman

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Received: 01 Jul 2020 - **Accepted:** 24 Jul 2020 - **Published:** 10 Aug 2020

Keywords: Lung entrapment, pleural manometry, trapped lung, unexpandable lung

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Cite this article: Adebola Oluwabusayo Adetiloye et al. Unexpandable lung in an elderly Nigerian woman. PAMJ Clinical Medicine. 2020;3(166). 10.11604/pamj-cm.2020.3.166.24730

Available online at: <https://www.clinical-medicine.panafrican-med-journal.com//content/article/3/166/full>

Unexpandable lung in an elderly Nigerian woman

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Abstract

Unexpandable lung is a complication of lung diseases resulting in the inability of the lung to expand to the chest wall due to a variety of lung parenchymal and pleural pathologies. We present the case of an elderly woman with chronic empyema thoracis with failure of lung re-expansion following chest tube drainage.

Introduction

The appropriate management of pleural infection is important to prevent the development of unexpandable lung which often present diagnostic and therapeutic challenges [1]. Unfortunately, this complication is commonly seen following pleural infections associated with infectious lung parenchymal diseases such as Pneumonia and Tuberculosis in developing countries [2,3]. Improper management of unexpandable lung may lead to additional complications as failed thoracentesis, pneumothorax, prolonged hospital stay and waste of limited resources [1]. This article aims to highlight some of the problems we encountered during the management of the index case and pragmatic approach from literature search to better understand and manage patients with unexpandable lungs.

Patient and observation

A 73-year-old woman presents with recurrent cough, dyspnea and chest pain of 6 months. Five days prior to admission, she developed fever and worsening dyspnea. Chest X-ray showed pleural effusion without significant mediastinal shift (Figure 1). Thoracentesis revealed an exudative effusion (Table 1). Pleural aspirate yielded *Klebsiella pneumoniae* while sputum GeneXpert was negative for Tuberculosis. Chest computerised tomography (CT) scan (Figure 2) revealed pleural effusion, partial lung collapse, some parenchymal fibrosis and pleural thickening. Pleural fluid cytology showed reactive mesothelial cells while pleural biopsy showed no evidence of malignancy. Empyema thoracis was diagnosed with commencement of antibiotics and chest tube drainage. However, patient developed intractable cough and worsened chest pain within 48hrs of starting chest tube drainage. Repeat chest CT scan showed hydropneumothorax with failure of lung re-expansion. Unexpandable lung was diagnosed and patient referred to surgeons for decortication.

Discussion

This patient developed unexpandable lung from chronic empyema thoracis based on clinical finding, pleural fluid analysis, and imaging features. Unexpandable lung is a mechanical complication in which the normal apposition between the two pleural layers is impaired leading to a lung does not expand to the chest wall [4]. It may be due to the presence of pleural disease, atelectasis or severe parenchymal disease with massive fibrosis [1]. These etiologies may occur individually or in combinations as seen in the index case. Trapped lung and lung entrapment are two types of pleural diseases resulting in unexpandable lung. In lung entrapment, the lung cannot expand fully because of an active disease such as infection while in trapped lung, the lung cannot expand fully because of a remote inflammatory process that has created a mature fibrous membrane [1]. Both pleural diseases represent the continuity of the same process, that is, lung that is becoming entrapped require necessary therapeutic measures which if suboptimal or neglected will result will be a trapped lung [4]. In this instance, the patient had chronic respiratory symptoms with no history of antibiotic use or therapeutic interventions prior to presentation. Although, the pleural fluid analysis suggests ongoing active pleural inflammation, the occurrence of worsening chest discomfort and pneumothorax during the course of chest tube drainage, which may be due to parenchymal-pleural fistulas developing from reduced pleural pressure, gave a clue to the diagnosis of trapped lungs [5-7]. Pleural manometry, although not utilized in this case due to unavailability, might have helped in making this diagnosis earlier and instituting appropriate management. In the index case, surgical decortication may be an effective therapeutic option after other causes of incapacitating dyspnea are excluded [8].

Conclusion

Unexpandable lung is a sequel of many pathologies of the lung and its overlying pleurae. Development of cough, chest pain and pneumothorax during chest tube drainage and chest imaging findings are important clues to diagnosis. Pleural manometry may be invaluable in making a prompt diagnosis, avoiding complications such as failed thoracocentesis, post-thoracocentesis pneumothorax, prolonged hospital stay and waste of limited resources. It also facilitates instituting timely and appropriate definitive management.

Competing interests

The authors declare no competing interests.

Authors' contributions

All the authors have read and agreed to the final manuscript.

Table and figures

Table 1: pleural fluid biochemistry

Figure 1: chest X-ray showing pleural effusion without significant mediastinal shift

Figure 2: chest CT scan showing pleural effusion, partial lung collapse, some parenchymal fibrosis and pleural thickening

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Table 1: pleural fluid biochemistry

Parameters	Pleural fluid (PF)	serum	PF/Serum
Protein	38g/L	72g/L	0.52
LDH	514U/L	184U/L	2.79
Glucose	2.0 mmol/L	7.2mmol/L	

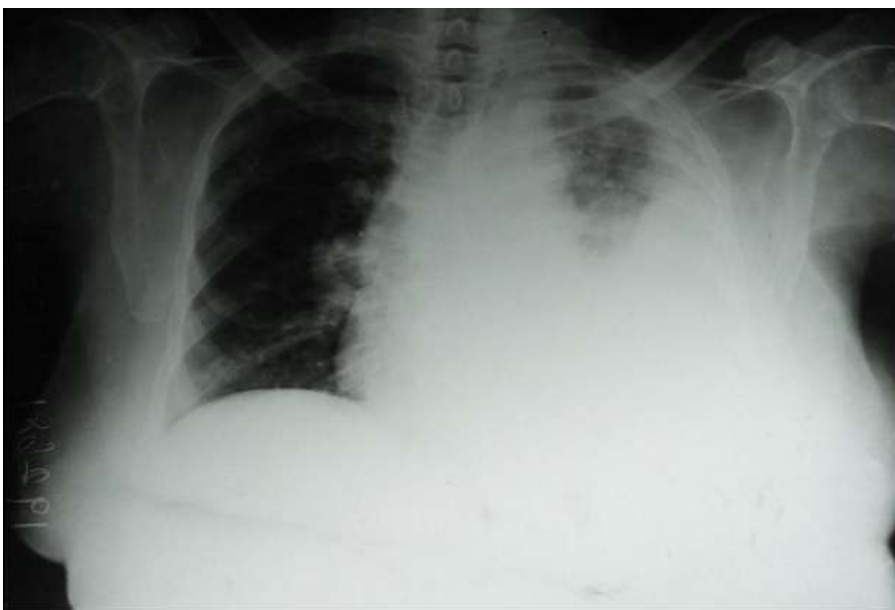


Figure 1: chest X-ray showing pleural effusion without significant mediastinal shift



Figure 2: chest CT scan showing pleural effusion, partial lung collapse, some parenchymal fibrosis and pleural thickening