



A CASE OF UNILATERAL PULMONARY EDEMA DUE TO LUNG RE-EXPANSION FOLLOWING SIMPLE ASPIRATION FOR SPONTANEOUS PNEUMOTHORAX

Medical Science

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ABSTRACT

Reexpansion pulmonary edema (RPE) is an important cause of unilateral pulmonary edema that rarely occurs following the drainage of pleural effusion or pneumothorax. Most patients are symptomatic within an hour of lung expansion. The presentation is usually rapid and may be fatal at times. The duration of lung collapse more than 3 days, large-size pneumothorax, rapidity of lung expansion, and application of negative pleural suction are well-known risk factors for the development of RPE. It should be considered in case of hypoxemia following the insertion of a chest tube or aspiration. The exact pathophysiology leading to this complication is not known. Risk factors for Reexpansion pulmonary edema should be evaluated and considered prior to the insertion of chest tubes. Treatment is supportive.

We present here a 34 year old young male with no comorbidities who presented with a large right sided pneumothorax and developed RPE shortly after simple aspiration.

KEYWORDS

Pneumothorax, Aspiration, Reexpansion, Pulmonary edema

INTRODUCTION

Reexpansion pulmonary edema (REPE) is a clinical syndrome characterized by the development of clinical and radiographic evidence of pulmonary edema, most commonly seen after large volume (>1.5 L) therapeutic thoracentesis. REPE can develop following pneumothorax decompression and is associated with a mortality rate of up to 20%.¹

The exact pathophysiology for this complication is unknown. Mechanical distress on the alveoli or oxygen radicals might be a contributing factor. Oxygen radicals are produced during the hypoxemia in the collapsed lung. The activity of different cytokines such as interleukin 8 and monocyte chemoattractant protein 1 (MCP-1), or the activity of xanthine oxidase have been implicated in the pathogenesis of REPE.^{2,3} Several risk factors have been associated with REPE: younger age (<40 years), longer duration of lung collapse (>4 days), large pneumothorax (>30% of a single lung) and timing of lung reexpansion.^{2,3}

CASE PRESENTATION

A 34 year old male patient presented with right-sided chest pain and breathlessness for 2 days without any further associated symptoms. His medical history was unremarkable. The patient was in good general health with respiratory rate (16/min) and oxygen saturation (96% in room air). On physical examination there was absent breath sounds on the right side and hyper resonant on percussion. Chest X-ray confirmed the clinical suspicion of a right sided spontaneous pneumothorax. (Fig 1) A simple aspiration was attempted in local anesthesia in the right midaxillary line without complication. A total of 600 ml air was aspirated. 4 hours after the procedure, the patient complained of dyspnea and increasing pain in the right chest. Chest auscultation revealed right sided inspiratory crackles. Oxygen saturation decreased to 85%. He was initiated on BiPAP. A second chest X-ray demonstrated an expanded right lung, but also an ipsilateral pulmonary edema. (Fig 2)



Fig 1



Fig 2

The patient's further hourly clinical observation was unremarkable over the course of 1 day. Finally, the patient was in a good condition without requiring any additional oxygen. A third chest X-ray showed a completely reexpanded right lung and a decreased pulmonary edema. (Fig 3) The patient was discharged without any further complications.



Fig 3

DISCUSSION

We report a case of a REPE after simple aspiration for a spontaneous pneumothorax. Our patient suffered from this rare complication but showed a benign clinical course. He was successfully treated with administration of oxygen via face mask. His oxygen saturation improved steadily and normalized after 2 days. Usually Reexpansion Pulmonary edema is self-limited and can even be asymptomatic. However, a mortality rate as high as 20% has been described. This rare complication and the treatment of REPE should be known by clinicians and particularly considered when a patient's condition declines after initial improvement. Treatment is supportive, mainly consisting of the administration of supplemental oxygen. Lateral

decubitus on the affected side is also recommended in unilateral cases, which contributes to reduction in the pulmonary shunt and improving oxygenation. Occasionally, non-invasive continuous positive pressure ventilation or even mechanical ventilation are required to provide adequate oxygenation. In severe cases – i.e. failure of mechanical ventilation – differential lung ventilation might be a treatment alternative.^{1,4}

CONCLUSION

Reexpansion pulmonary edema is a rare complication with high mortality rate occurring after thoracic drainages for pneumothorax or pleural effusions. Clinicians should be familiar with this complication and the associated risk factors.

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