

An Occult Pneumothorax In A Patient With An Exacerbation Of Asthma

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Background: An occult pneumothorax is defined as a pneumothorax which is identified through computed tomography but which has been missed in the clinical examination and plain radiography (1). Occult pneumothoraces are typically seen in cases of trauma or mechanical ventilation and are thought to complicate up to 5% of trauma registry patients (2). A search of the literature on EMBASE and Medline has revealed no previously published account of an occult pneumothorax in an asthmatic patient.



Figure 1: Initial Chest radiograph

Imaging: Initial chest radiograph showed no evidence of pneumothorax (Figure 1). A CT was performed to rule out a pulmonary embolism in this patient. No emboli were identified but she was found to have an anterior pneumothorax visible on the axial images extending to the mid coronal line (Figures 2).

Case study

Presenting complaint: A 57 year old asthmatic female presented with a 3 day history of wheeze, dry cough, pleuritic chest pain and shortness of breath. Her past medical history included hypertension, angina and osteoarthritis for which she had a right sided total knee replacement 45 days previously. Her asthma was normally well controlled with salbutamol and symbicort inhalers.

On examination she was afebrile, tachycardic (110bpm) and tachypneic (28/min). Her PEFR was 56% predicted. She had a widespread polyphonic expiratory wheeze and a swollen, tender right calf.

Investigations: ECG showed sinus rhythm. Blood tests and chest radiograph were unremarkable (figure 1).

Treatment : The patient was treated as an exacerbation of asthma. However she remained unwell after 10 hours of regular nebulisers, hydrocortisone and magnesium sulphate.

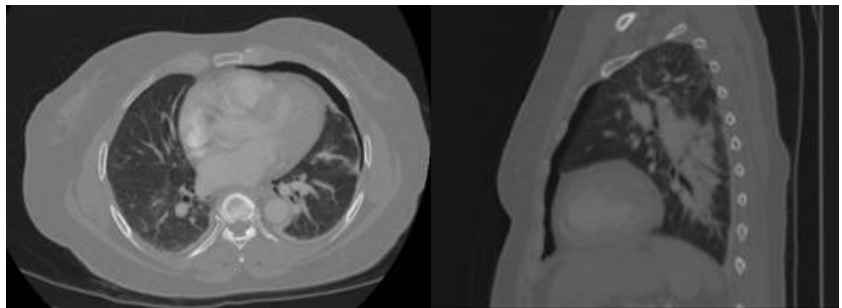


Figure 2: CT showing occult anterior pneumothorax.

Management of occult pneumothoraces: A prospective study conducted by Wolfman et al (2013) on the management of occult pneumothoraces categorised them into miniscule, anterior and anterolateral based on CT findings. The study found that miniscule and anterior pneumothoraces can be managed with close observation provided that positive pressure ventilation is not immediately required (3). A tube thoracostomy can be inserted in cases where conservative management is not successful. The patient in our study recovered with four days of steroids and regular nebulisers.

Frequently missed radiological signs of pneumothoraces:

In the supine film air collects anteriorly and basally which can result in deepening of the costophrenic angles leading to what has been described as the 'deep sulcus sign'. Other frequently missed signs of a pneumothorax include sharpening of the cardiac silhouette, missed pleural lines, a double diaphragm sign and subcutaneous emphysema (5).

References:

- 1- Wall SD, Federle MP, Jeffrey RB, Brett CM. CT diagnosis of unsuspected pneumothorax after blunt abdominal trauma. *American journal of roentgenology.* [online] 1983;141(5):919-21.
- 2- Ball CG, Kirkpatrick AW, Feliciano DV. The occult pneumothorax: what have we learned? *Canadian journal of surgery.* [online] 2009;52(5):E173-E179.
- 3- Wolfman NT, Myers WS, Glauser SJ, Meredith JW, Chen MY. Validity of CT classification on management of occult pneumothorax: a prospective study. *American journal of roentgenology.* [online] 1998;171(5):1317-20.
- 4 - Kong, A. The deep sulcus sign. *Radiology.* [online] 2003;228(2):415-16.

*Consent has been obtained from the patient for the images used

Summary

- Occult pneumothoraces are defined as pneumothoraces present on CT scan but missed on initial plain radiography.
- We suggest that occult pneumothoraces be considered as a differential diagnosis in a patient presenting with an exacerbation of asthma failing to respond to conventional treatment