Pneumothorax or Skin Fold?

Mind the Gap

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Introduction

A 73-year-old man with unresectable, advanced dedifferentiated retroperitoneal liposarcoma on palliative chemotherapy was admitted with early satiety, poor oral intake, dehydration and ascites. A routine chest radiograph showed features of bilateral pneumothorax (Figure 1 A). However, at the time of the presumed radiological diagnosis, the patient was neither breathless nor desaturating and was hemodynamically stable. Computed tomographic scan done suspecting an extra thoracic shadow, like skin fold, showed well expanded lungs without any evidence of pneumothorax (Figure 1B). The patient and the relatives were reassured and no intervention was done. Consent was obtained from the patient to publish the details regarding his illness and radiology images.

Comment

The curved shadow of skin folds can mimic the visceral pleural margin and can often be misinterpreted as a pneumothorax leading to unnecessary interventions.1 The area lateral to this sharp margin can often be perceived darker than the lung medial to it.2 Optical illusions like Mach band effect are often helpful in demarcating the boundaries of anatomic structures with different optical densities on radiographs.3 However, they sometimes can also be mistaken for disease as in
our case where a negative Mach band effect near a skin fold suggested pneumothorax. Pseudo-
pneumothorax is usually seen when the film cassette is kept behind a patient with loose skin in
sitting or supine position. The features differentiating this artefact includes, a broader opaque
density that fades medially, not following the expected border of the separated visceral pleura,
terminating abruptly, extending beyond the pleural space over the chest wall, and may be more
than one skinfold with two or more parallel lines. The absence of lung markings beyond this sharp
curvilinear line as a differentiating feature may at times be limited as in our case. Repeating the
chest radiograph or a thoracic ultrasound are useful tools, but may not always resolve the dubious
radiographic findings. The radiograph may still show the artefact and the ultrasound is accurate
only when used by skilled operators. Computed tomography of the chest is the most sensitive and
specific test for diagnosis of pneumothorax. In addition to the skin folds, the pleural line also can
be mimicked by clothing or bed sheet folds, oxygen reservoir masks, elevated hemidiaphragm, rib
or scapular borders, lung blebs, and colonic interposition. These artifacts when misinterpreted as
pneumothorax can lead to unnecessary and often catastrophic interventions and should be ruled
out before any therapeutic procedure, especially when the clinical suspicion is low.

Authors’ Contribution
All the authors were involved in the patient care. JB wrote the initial manuscript draft and finalized
the submission. AJ, SM and JA contributed to the literature review. All the authors reviewed and
approved the final version of the manuscript.

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Figure 1 A. Chest radiograph showing features suggestive of pneumothorax bilaterally with curvilinear lines (arrows) mimicking collapsed lung borders.
Figure 1 B. Computed tomography of the chest showing fully expanded lungs without any evidence of pneumothorax.