SUBMITTED 16 NOV 21
REVISION REQ. 9 JAN 22; REVISION RECD. 17 JAN 22
ACCEPTED 2 FEB 22
ONLINE-FIRST: FEBRUARY 2022
DOI: https://doi.org/10.18295/squmj.2.2022.015

Pneumothorax or Skin Fold?

Mind the Gap

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Accepted Article

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

32 our case where a negative Mach band effect near a skin fold suggested pneumothorax. Pseudo-
33 pneumothorax is usually seen when the film cassette is kept behind a patient with loose skin in
34 sitting or supine position. The features differentiating this artefact includes, a broader opaque
35 density that fades medially, not following the expected border of the separated visceral pleura,
36 terminating abruptly, extending beyond the pleural space over the chest wall, and may be more
37 than one skinfold with two or more parallel lines.[4] The absence of lung markings beyond this sharp
38 curvilinear line as a differentiating feature may at times be limited as in our case. Repeating the
39 chest radiograph or a thoracic ultrasound are useful tools, but may not always resolve the dubious
40 radiographic findings. The radiograph may still show the artefact and the ultrasound is accurate
41 only when used by skilled operators.[4] Computed tomography of the chest is the most sensitive and
42 specific test for diagnosis of pneumothorax. In addition to the skin folds, the pleural line also can
43 be mimicked by clothing or bed sheet folds, oxygen reservoir masks, elevated hemidiaphragm, rib
44 or scapular borders, lung blebs, and colonic interposition. These artifacts when misinterpreted as
45 pneumothorax can lead to unnecessary and often catastrophic interventions and should be ruled
46 out before any therapeutic procedure, especially when the clinical suspicion is low.
47

48 **Authors' Contribution**

49 All the authors were involved in the patient care. JB wrote the initial manuscript draft and finalized
50 the submission. AJ, SM and JA contributed to the literature review. All the authors reviewed and
51 approved the final version of the manuscript.
52

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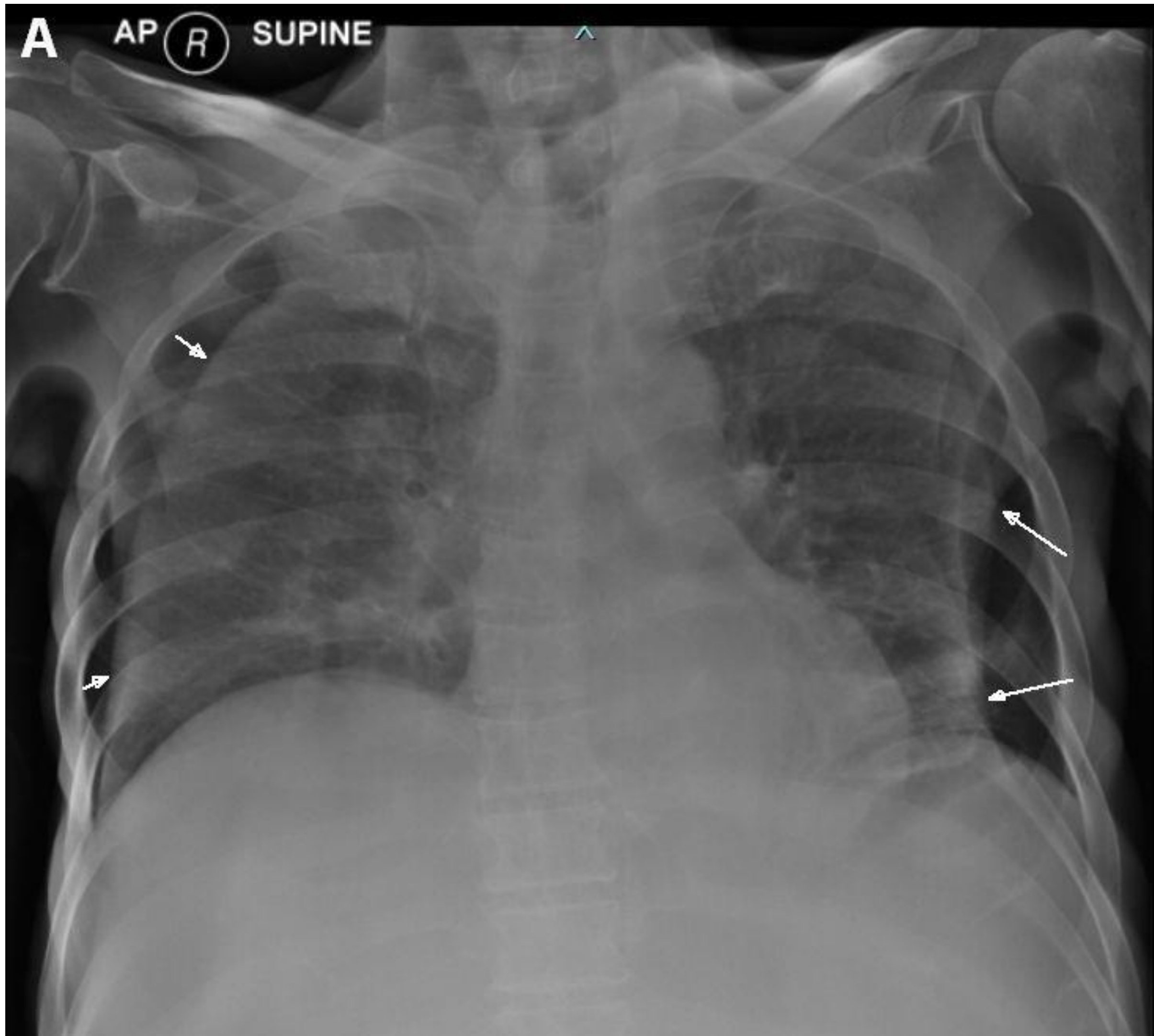

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65 **Figure 1 A.** Chest radiograph showing features suggestive of pneumothorax bilaterally with
66 curvilinear lines (arrows) mimicking collapsed lung borders
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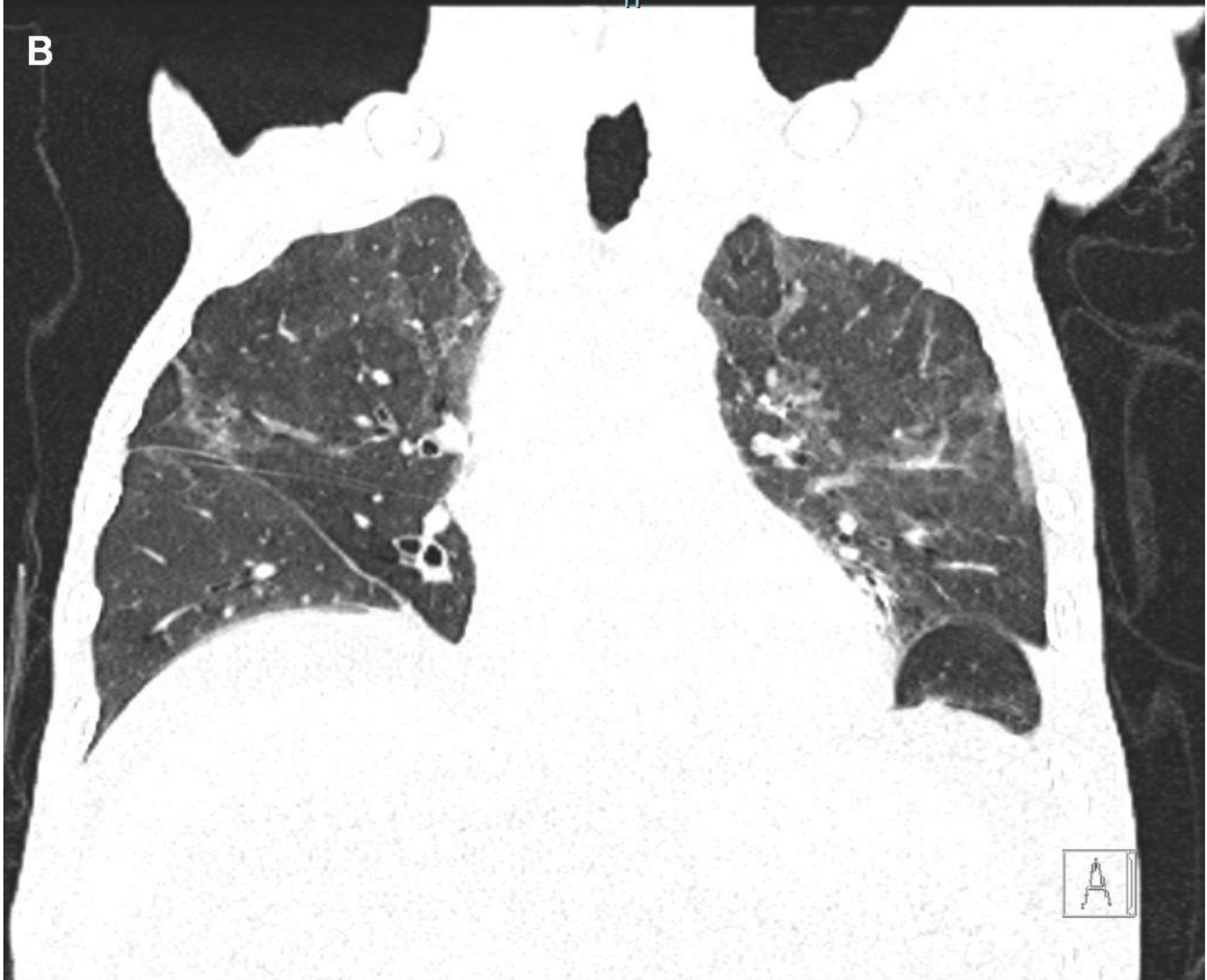

69 **Figure 1 B.** Computed tomography of the chest showing fully expanded lungs without any

70 evidence of pneumothorax

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