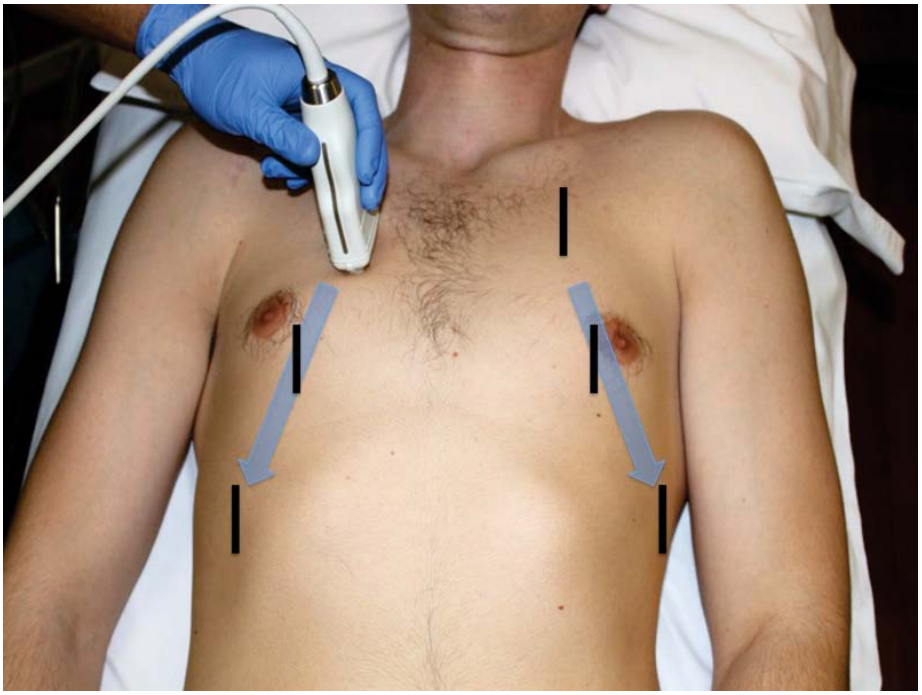
RESPIRATORY

THORACIC ULTRASOUND - PNEUMOTHORAX

Probe

A high frequency linear probe should be used.

Probe positioning

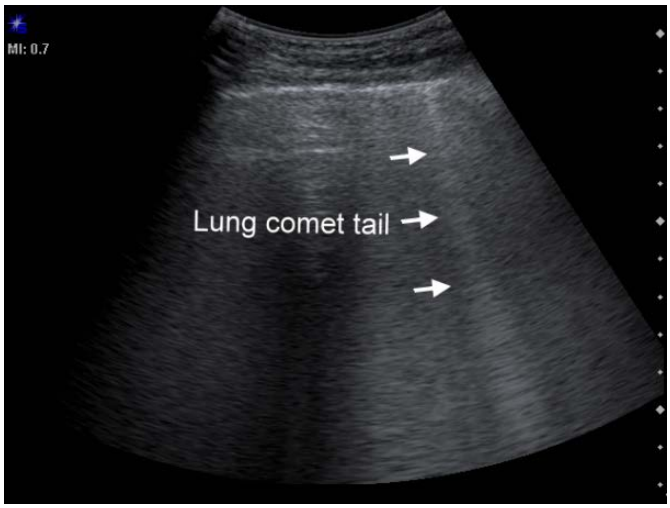


The linear ultrasound probe is placed in the intercostal space with the marker pointing towards the head. The ribs produce artefacts in the form of anechoic shadow images (black). In the intercostal space there is a hyperechogenic line > 0.5cm deeper to the probe. This line is the interface between the soft tissues of the chest wall and the lung (the pleural line).

Place the probe in the 3 positions shown and observe for at least 1 respiratory cycle. In the supine patient, a free pneumothorax usually collects in the anterior, non- dependent area.

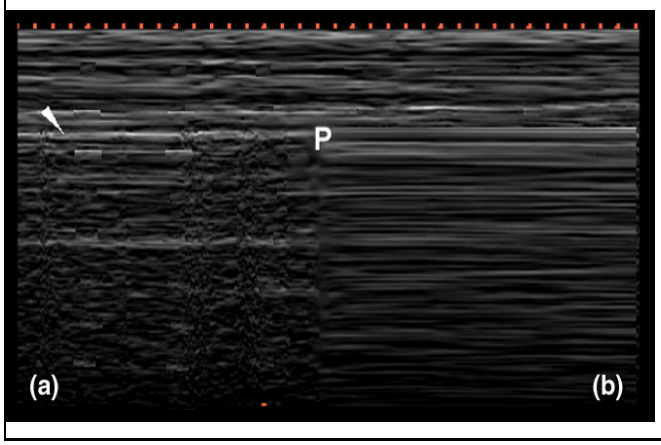
Signs of pneumothorax

1. **Absence of lung sliding**
   Lung sliding presence rules out a pneumothorax. Beware loculated posterior, mediastinal and apical pneumothoraces that can be missed.
   Lung sliding is demonstrated as fleeting dots arising from the pleural line in association with lung movements during the respiratory cycle.
2. **Absence of comet tails**
   This is not specific for pneumothorax, however the presence of comet tails rules out a pneumothorax.
   Comet tails are vertical lines that arise from the pleural line and spread uninterrupted up to the edge of the screen. They are mobile during the respiratory cycle.



3. **The lung point**
   The air in the pleural space normally moves anteriorly and the lung collapses to a dependent position posteriorly, therefore there is a point where the lung and air may be visualized in the same view. When moving the ultrasound probe from the anterior chest wall laterally, a pneumothorax pattern gives way to the appearance of a normal pleural pattern in a particular location of the chest wall. The lung point is produced at the transition area between healthy and pathological parenchyma. It is best revealed in M-mode ultrasound.

M mode with lung point (P)



a) Normal lung with pleural sliding
   SEASHORE
b) Pneumothorax with lack of pleural sliding
   BARCODE