Ultrasound for Critical Care Physicians: Lung Sliding and the Seashore Sign

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A 70-year-old Native American woman was having increasing difficulty with ventilation. She had an extensive past medical history including quadriplegia after a motor vehicle accident in 2009, chronic mechanical ventilation since the accident, end-stage renal disease, and diabetes mellitus. A feeding tube had recently been inserted. A portable chest radiograph was performed (Figure 1).

Figure 1. Portable chest radiograph.

A lung ultrasound was performed (Figure 2).

Figure 2. Lung ultrasound of the left lung (left panel) and of the right lung (right panel).

M-mode images of the ultrasound are shown in Figure 3.

Figure 3. M-mode image of the left lung (panel A on left) and the right lung (Panel B on right).

Which of the following are **true** regarding the images presented?

1. The chest x-ray shows the feeding tube in the right lung
2. The M-mode image shows the seashore sign on the left suggestive of a pneumothorax
3. The ultrasound shows an absence of lung sliding on the right suggestive of a pneumothorax
4. 1 and 3
5. All of the above

Correct!
4. 1 and 3

The chest radiograph shows the feeding tube in the right lung (Figure 4).

Figure 4. Portable chest x-ray showing feeding tube looped in the right lung (arrows).

Small bore feeding tubes can often be inserted into the lung and have been associated with a pneumothorax (1). Supine chest radiography has low sensitivity for pneumothorax (2). Several studies have demonstrated high sensitivity and specificity for thoracic ultrasound for the detection of occult pneumothorax in critical care (3). Lung sliding is a normal finding. Absent lung sliding suggests pneumothorax, but can occur in the presence of multiple other conditions such as mainstem intubation, acute respiratory distress syndrome, or pleural adhesions (4).

The M-mode image shown in Figure 3A demonstrates a linear, laminar pattern in the tissue superficial to the pleural line (Figure 5A, arrow) and a granular or “sandy” appearance deep to the pleural line. This phenomenon, known as the “seashore sign” is a normal finding. However, the M-mode image in Figure 3B demonstrates a linear, laminar pattern in the tissue superficial to the pleural line (Figure 5B, arrow) and a similar linear pattern deep to the pleural line. This phenomenon, known as the “stratosphere sign” or “barcode sign” is highly suggestive of a pneumothorax (3).

Figure 5. M-mode showing the normal "seashore" sign (Panel A on left) and the "stratosphere" or "barcode" sign (Panel B on right). In both panels the white arrows show the pleural line.

References

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