Why Look for Artifacts Alone When the Original Is Visible?

To the Editor:

The study concerning the relevance of lung ultrasound in the diagnosis of acute respiratory failure by Lichtenstein and Mezière in CHEST (July 2008) raises a few basic questions. First of all, there is a technical problem: modern ultrasound systems work on the basis of noise reduction. As a result, one sees fewer artifacts. Artifacts are a fundamental component of ultrasound imaging, for instance, the sonic shadow in the case of gallstones. However, the value of the method lies in its visualization of parenchyma, for instance, that of the liver. On chest ultrasonography, the presence of artifacts permits the diagnostician to confirm or rule out a pneumothorax (the absence of gliding, a large number of horizontal reverberations, and lung point) with a high accuracy. However, comet tails are found in a large number of interstitial lung processes, ranging from lung edema of various causes to fibrosis. One sees that the lung is diseased, but the spectrum of the etiologic characteristics of disease is very wide.

Second, one should not confine oneself to alveolar consolidations. It is a well-known fact that subpleural consolidations can be differentiated on the simple ultrasound B-mode image. Pneumonias can be directly visualized with a sensitivity of 90% and lung embolisms with an accuracy of 80%. Why select the anterior access alone when the largest portions of the lung are seen by access alone when the largest portions of the lung are seen by the dorsal access? Why look for artifacts alone when the original is visible?

Referring to horizontal and vertical reverberations as A and B lines by way of terminology may well be meaningful for teaching purposes. However, further abbreviations would make the decision trees unnecessarily complex in terms of thought and action.

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Response

To the Editor:

We appreciate Dr Mathis’s interest regarding the BLUE protocol in our article published in CHEST (July 2008). We would like to make a few comments in return. Dr Mathis writes that modern systems suppress artifacts. In fact, artifacts are generally considered of little value because physicians do not find them of interest, which we, however, have demonstrated. Suppressing artifacts would deprive lung ultrasonography of half its potential. Dr Mathis states that artifacts allow physicians to determine the presence of pneumothorax. Note that the number of horizontal artifacts is not considered in our criteria. Dr Mathis states that comet-tails are found in (many) interstitial processes. In acute respiratory failure, lung-rockets indicate pulmonary edema. If comet-tails are found in a large number of interstitial diseases, we no longer use the term “comet-tail artifact,” because it involves not only the B-line but also many meaningless artifacts (E-line, Z-line, and so forth).

He asks, why anterior access alone? Because the anterior access is sufficient in >50% of cases for immediate diagnosis, and also because the consideration of posterior elements alone would have decreased the BLUE protocol’s accuracy (see our response to Drs Reissig and Kroegel in CHEST [December 2009]).

Why look for artifacts alone when the original is visible? If Dr Mathis understands anatomic images (pleural-based consolidations) to be original, we answer: because the original is not so original. These lesions are usual in most cases of acute respiratory failure (see our response to Drs Reissig and Kroegel). In addition, in the case of an A-profile, typically there is no original. Dr Mathis’s remark is untrue. We use both artifacts and anatomic data, according to the profiles. For pulmonary edema, only anterior artifacts are necessary. For certain pneumonias, the diagnosis is based on anterior artifacts plus posterior lesions. Regarding their comment that further abbreviations would make decision trees complex, for nearly 20 years the main artifacts have been A-lines and B-lines, so it is unlikely that new signs, merging from observation, decrease lung ultrasound simplicity.

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REFERENCES

