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Why the magnitude of lung sliding matters: moving beyond a binary interpretation in lung ultrasound

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Dear Editor,

Lung sliding has traditionally been assessed in a binary manner – present or absent– primarily to exclude pneumothorax in point-of-care lung ultrasound. However, emerging evidence suggests that this qualitative approach may overlook clinically meaningful information contained in the magnitude of pleural motion itself. Recent studies increasingly indicate that the amount of lung sliding, rather than its mere presence, reflects underlying lung mechanics and regional ventilation patterns.

In mechanically ventilated patients, quantitative assessment of lung sliding amplitude has been shown to vary systematically with anatomical location and ventilatory settings. Briganti *et al.* demonstrated that lung sliding amplitude is significantly lower at the lung apex compared to the lung base and can be measured reliably using both B-mode and Doppler techniques, with excellent inter-observer agreement.[1] These findings suggest that sliding amplitude follows predictable physiological gradients and may help distinguish pathological absence of sliding from physiologically reduced motion, thereby improving diagnostic specificity.

More recently, Şirin *et al.* provided evidence that lung sliding amplitude is sensitive to changes in tidal volume within the same patient and correlates with lung compliance in basal lung regions.[2] Importantly, their findings imply that pleural motion amplitude may serve as a surrogate marker of regional lung distensibility and potentially reflect harmful ventilatory conditions. The observed association between reduced basal sliding amplitude and mortality further highlights its potential prognostic relevance, moving lung ultrasound beyond a purely diagnostic role toward functional monitoring.

Complementary to sliding amplitude measurements, elastography-based studies have explored pleural strain as a quantitative marker of regional pulmonary deformation. Girard *et al.* demonstrated that ultrasound-derived pleural strain parameters increase in a dose-dependent manner with rising tidal volumes and can be

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measured with good to excellent reproducibility.[3] Although pleural strain and sliding amplitude are distinct metrics, both capture dynamic pleural behaviour during ventilation and underscore the feasibility of bedside quantification of lung mechanics using ultrasound.

Taken together, these studies support the concept that quantifying pleural motion provides additional physiological and potentially prognostic information beyond conventional qualitative lung ultrasound. Incorporating lung sliding amplitude into routine assessment may enhance the interpretation of lung ultrasound findings, aid in individualized ventilatory management, and reduce diagnostic uncertainty in critically ill patients. Further multicenter and outcome-oriented studies are warranted to define standardized measurement protocols and clinical thresholds.

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