Influential Factors for Assessing Endobronchial Ultrasound Elastography

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Dear Editor,

We read the article by Verhoeven et al. [1] with great interest and appreciate the authors' efforts in investigating the diagnostic accuracy rate (DAR) of endobronchial ultrasound elastography (EBUS-E) with strain values (≥115) that can be evaluated in real-time. They showed that DAR increased when size (≥8 mm) and ^{18}F-fluorodeoxyglucose positron emission tomography (FDG-PET) findings were considered. The results may help bronchoscopists perform efficient EBUS-guided transbronchial needle aspiration for accurate staging in patients with lung cancer.

The lack of sufficient descriptions of patients' characteristics that might have influenced the EBUS-E results raises concerns regarding their results. EBUS-E can capture images of distortion of lymph nodes (LNs) and evaluate their stiffness. Several studies have suggested that pneumoconiosis and tuberculosis, which often show LN hardening, give false-positive results (e.g., the EBUS-E image suggests malignancy but the final diagnosis is benign) on EBUS-E [2–4]. Imaging tests, such as FDG-PET, cannot clarify whether lymphadenopathy is due to malignancy, pneumoconiosis, or tuberculosis. One prospective study showed that anthracosis coexistence worsens the diagnostic test parameters, except for the negative predictive value of EBUS-E [5]. Furthermore, the influence of a patient's history of medical and occupational exposure on EBUS-E should not be ignored, as the characteristics of patients may vary across countries and regions. Therefore, the bronchoscopist should interpret the EBUS-E results with careful consideration of the patient's background.

We recently conducted a retrospective study of EBUS-E for radiologically normal-sized hilar and mediastinal LNs. We used the stiffness area ratio (SAR) for the quantitative analysis of EBUS-E. Our results showed that all patients with an SAR of ≥0.6 have a history of pulmonary tuberculosis and/or apparent inhalation exposure to mineral dust such as coal or asbestos [4]. Eight of 16 (50%) patients with false-positive EBUS-E results in our study had a background that could explain LN hardening. Only 2 of the patients were diagnosed with pneumoconiosis before EBUS-E. Although our EBUS-E evaluation criteria were different from those of Verhoeven et al. [1], considering the principle of EBUS-E, a patient's background can greatly influence the strain values on EBUS-E. The LNs in patients with a history of occupational exposure and without a diagnosis of pneumoconiosis may be hardened, and are likely to give false-positive results on EBUS-E. Accordingly, a detailed interview about the occupational and exposure histories before EBUS-E evaluation is necessary. According to Figure 3 in the manuscript by Ver-

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hoeven et al. [1], the positive predictive value was 73% when using strain values, size, and the FDG-PET mentioned above. However, 27% of cases were false-positive; we would therefore like to know if these false-positive cases included patients with a history of tuberculosis and/or occupational dust exposure.

In conclusion, a patient's medical and exposure history affect EBUS-E findings. These are important factors to consider when interpreting the results, but only a few reports have studied them in detail. Conducting a detailed and comprehensive assessment is indispensable for the proper evaluation of EBUS-E results, and further studies on how each patient's exposure and clinical historical background influence the EBUS-E results are desired.

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

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Author Contributions

All authors contributed to the concept of the letter. The first draft was written by K. Uchimura and revised by K. Yatera. The final version was approved by all authors.

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