

RADIOFREQUENCY (RF) SPECTRAL ANALYSIS OF ENDOBRONCHIAL ULTRASONOGRAPHY (EBUS) FOR PERIPHERAL LUNG LESIONS

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Background: We previously reported the utility of histogram-based quantitative evaluation of EBUS B-mode images, but these images are based on reconstructed RF signals. Hence, the analysis of radiofrequency (RF) signals are more precisely reflected to the lesion's ultrasound information.

Objective: RF spectral analyses of endobronchial ultrasonography (EBUS) were conducted to differentiate benign and malignant peripheral lung lesions.

Methods: In a prospective study, 76 images were obtained with 54 lung cancers and 22 inflammatory diseases. We imported RF data into an analysis software program and compared RF spectrum characterizations by the following three parameters; slope (dB/MHz), midband fit (dB) and y-intercept (dB).

Results: Categorizing benign and malignant lesions into six subgroups (inflammation: acute/chronic, lung cancer: Ad/Sq/La/Sm), significant differences were observed for slope and y-intercept in acute inflammation and chronic inflammation, and acute inflammation and adenocarcinoma.

Conclusion: RF spectral parameters provide a method to quantitatively differentiate not just benign and malignant lesions, but also possibly the duration for inflammatory diseases.