ARTICLE
Diagnostic Accuracy of Endobronchial Optical Coherence Tomography for the Microscopic Diagnosis of Usual Interstitial Pneumonia. Am J Respir Crit Care Med. 2021 Nov 15;204(10):1164-1179. PMID: 34375171

CLINICAL QUESTION
Can endobronchial optical coherence tomography (EB-OCT) be used as a minimally invasive microscopic assessment tool to aid in the diagnosis of ILD?

SUMMARY
Accurate diagnosis of interstitial lung disease (ILD) informs prognosis and therapeutic approach. High-resolution computed tomography has limited resolution, while surgical lung biopsy (SLB) carries risks of morbidity and mortality. Endobronchial optical coherence tomography (EB-OCT) is a low-risk, bronchoscope-compatible modality that images large lung volumes in vivo with microscopic resolution of approximately 10 microns and penetration depth of up to 3mm.

In this study EB-OCT was performed immediately before SLB in ILD patients with low confidence clinical-radiologic diagnosis. The resulting EB-OCT images and histopathology were interpreted by blinded, independent pathologists. Clinical diagnosis was obtained from the treating pulmonologists after SLB, blinded to EB-OCT. Primary endpoints were EB-OCT sensitivity/specificity for diagnosis of the histopathologic pattern of usual interstitial pneumonia (UIP) and clinical IPF. The secondary endpoint was agreement between EB-OCT and SLB for diagnosis of the ILD fibrosis pattern. Twenty-seven patients were included in the analysis (16 men, average age: 65.0 yr): 12 were diagnosed with UIP and 15 with non-UIP ILD on histopathology. Sensitivity and specificity of EB-OCT was 100% (95% confidence interval, 75.8–100.0%) and 100% (79.6–100%), respectively, for both histopathologic UIP and clinical diagnosis of IPF. There was high agreement between EB-OCT and histopathology for diagnosis of ILD fibrosis pattern (weighted κ: 0.87, (0.72-1.0)). The study also demonstrated that EB-OCT procedural and interpretation skills can easily be acquired by physicians who are unfamiliar with EB-OCT with minimal training.

This study supports EB-OCT as a low-risk, minimally invasive method for the microscopic diagnosis of ILD, as an adjunct to high-resolution computed tomography and an alternative to SLB. Future, multicenter studies are needed to further validate the findings of this study.
EB-OCT is a safe, minimally invasive technique to diagnose histopathologic UIP with high sensitivity and specificity. EB-OCT procedural and interpretation skills can easily be acquired with minimal training. EB-OCT is a very promising complement to HRCT and potential surrogate for surgical lung biopsy. A larger sample size may help to determine diagnostic accuracy for non UIP ILD. A large multicenter trial is currently planned to validate these findings.

**On behalf of the National Jewish Health ILD Program Providers:**
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