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Title: In vivo probe-based confocal laser endomicroscopy in chronic diffuse parenchymal lung diseases

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Body: Diagnosis of diffuse parenchymal lung diseases (DPLDs) is challenging and requires a multidisciplinary approach. Probe-based confocal laser endomicroscopy (pCLE) enables microimaging of the distal lung in vivo. Objective: to describe pCLE features in DPLD patients. Methods: pCLE was performed in 52 DPLD patients and 21 healthy volunteers (HV). Results were compared between HV and each of the pathologic groups, blindly to the diagnosis (Fisher's exact test and Bonferroni correction). The association between the pCLE and CTscan features was assessed using multivariate analysis. Results: 9 of the 17 pCLE descriptors were significantly more frequent in DPLD patients than in HV (131 areas). pCLE differed in sarcoidosis (16 patients, 105 areas) by the presence of fluorescent bronchiolar cells, convoluted acinar elastic fibers, alveolar nodules; in idiopathic pulmonary fibrosis (n=8, 36 areas) by interalveolar septal fibers and a rigid acinar elastic network; hypersensitivity pneumonitis (n=6, 34 areas) by bronchiolar and alveolar cells; non-specific interstitial pneumonia (n=6, 38 areas) by fluorescent bronchiolar cells, septal fibers and a rigid network; asbestosis (n=10, 72 areas) by alveolar mouths <200 µm, axial fibers >20µm, septal fibers, and a rigid and dense acinar elastic network; systemic sclerosis (n=6, 38 areas) by fluorescent alveolar cells, septal fibers and a rigid network. HRCT honeycombing was associated to pCLE large alveolar mouths and a disorganized elastic network; both interlobular septa thickening and cysts were associated to the presence of septal fibers using pCLE Conclusion: pCLE could be added to the multidisciplinary discussion for the etiological diagnosis of DPLD.