

# European Respiratory Society Annual Congress 2013

**Abstract Number:** 3669

**Publication Number:** P2352

**Abstract Group:** 1.5. Diffuse Parenchymal Lung Disease

**Keyword 1:** Interstitial lung disease **Keyword 2:** Imaging **Keyword 3:** Lung function testing

**Title:** 3D-simulation in an integrated assessment of the dynamics in patients with disseminated pulmonary lesions (DPL)

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**Body:** In the absence of objective criteria for measuring the volume of lesions, DPL are clinically difficult problem not only in the differential diagnosis of the etiology of the disease, but in assessing the dynamics of the patient on the therapy. Objective: To evaluate the informativeness of 3-D simulation of the lungs for dynamic assessment in patients with DPL. Material and Methods: To test the capabilities of the method we have patients with DPL (n = 12) (pulmonary sarcoidosis). To assess the dynamics in patients on the treatment the scale of three common treatments states was used: progression, regression and stable state. For decision making, data of following methods: expert clinical method, computed tomography (CT), the evaluation of lung diffusion capacity (DLCO), and 3-D simulation based on package DICOM images (3DS). Results: For every patient, a visual model of lung, volume and the precise amount of dissemination over time, which correlated ( $r = 0.2$ ;  $p > 0.05$ ) with the clinical findings of the course of the disease, CT, and according to the DLCO ( $r = 0.2$ ;  $p > 0.05$ ). Also found a full match expert assessments of the dynamics of the patient based on CT images and 3DS ( $r = 1$ ). 3DS enabled visual estimation of the volume and dynamics of destruction by expert and objective measurement for it in units, voxels or milliliters of volume. Conclusions: The use of 3-D simulation models introduced objective criteria for measuring lung tissue damage in patients with DPL in dynamics on the background of the treatment, and in combination with conventional methods, allows timely adjustments to therapy.