

Multivolume proton-magnetic resonance imaging (¹H-MRI) in lung transplant recipients: comparison with low dose computed tomography (CT).

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The lung transplantation (LT) follow-up required several computed tomography (CT) controls. The radiological risk is disappointing in patients treated with immunosuppressive drugs and with young age. Regional intensity variations between different lung volumes acquired by CT (Aliverti et al, ERJ 2013) and by MRI (Pennati et al, Rad 2014) can be used to estimate the regional ventilation. The aim of this transversal study is to compare maps of CT-density difference (Δ HU) with the corresponding maps of proton-density difference (Δ ¹H-MRI) after LT. CT and ¹H-MRI of the lungs were scheduled on the same day at full inspiration (INSP) and full expiration (EXP). Corresponding slices at six lung levels were selected at EXP, INSP. EXP images were registered onto INSP by optical flow, and maps of Δ HU and Δ ¹H-MRI were obtained with pixel-by-pixel subtraction (Figure1). Difference maps were compared by computing the linear correlation between the median values of Δ HU and Δ ¹H-MRI in six corresponding regions at the six lung levels. Ten consecutive patients were recruited; the Δ HU and Δ ¹H-MRI correlation coefficient was $R^2=0.56$, $P<0.0001$. Multivolume CT and ¹H-MRI demonstrate good correlation after LT. The multivolume MRI may be a valid non-ionizing imaging alternative to CT to describe the ventilation distribution in the follow-up of lung transplanted patients.

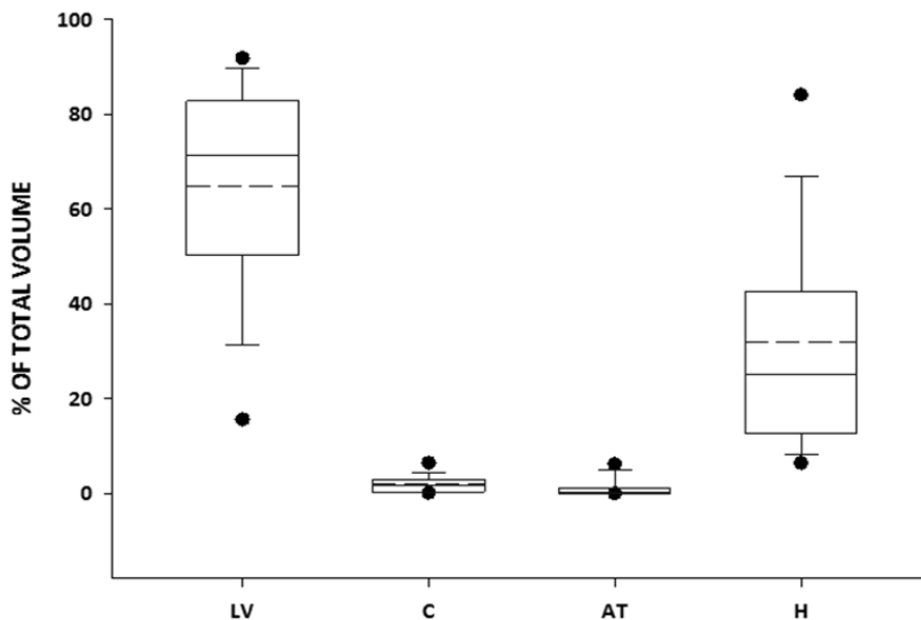


Figure 1. Relative volume of low ventilation (LV), consolidation (C), air trapping (AT) and healthy (H) regions in 20 patients.

Session:

Evaluating lung function, dyspnoea and related respiratory diseases (Poster Discussion)

Date/Time:

Tuesday, September 12, 2017 / 14:45-16:45

Room:

Blue 2 (North)

Category:

Clinical Respiratory Physiology, Exercise and Functional Imaging

Keywords:

Transplantation, Imaging, Biomarkers