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INNER SPACES

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Quantification in Diffuse Lung Diseases

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Most diffuse lung diseases whether they are interstitial lung diseases or obstructive diseases (COPD) are imaged with radiographs and/or CT scans. Till date, in most instances, the interpretation has generally been visual.

In interstitial lung diseases, there has been developing interesting in quantification of fibrosis and lung involvement. The extent of involvement allows initial prognostication and change on follow-up also determines response to treatment, further prognostication and eventual survival. Lung texture analysis (LTA) using CALIPER (Imbio, USA), a partly AI based tool is a validated software that allows precisely this (Fig. 1). Retrospective analysis of prior scans is also possible if the scans are acquired correctly.

In airway diseases and COPD, another version of the same software allows us to measure lung volumes, to look at the fixed emphysematous areas as well as to quantify the extent of air trapping (Fig. 2). Forced vital capacity (FVC) measurement on pulmonary function tests (PFT) is notoriously unreliable in patients with COPD and quantification using CT scan is slowly becoming an acceptable alternative for diagnosis, prognostication and triaging management.

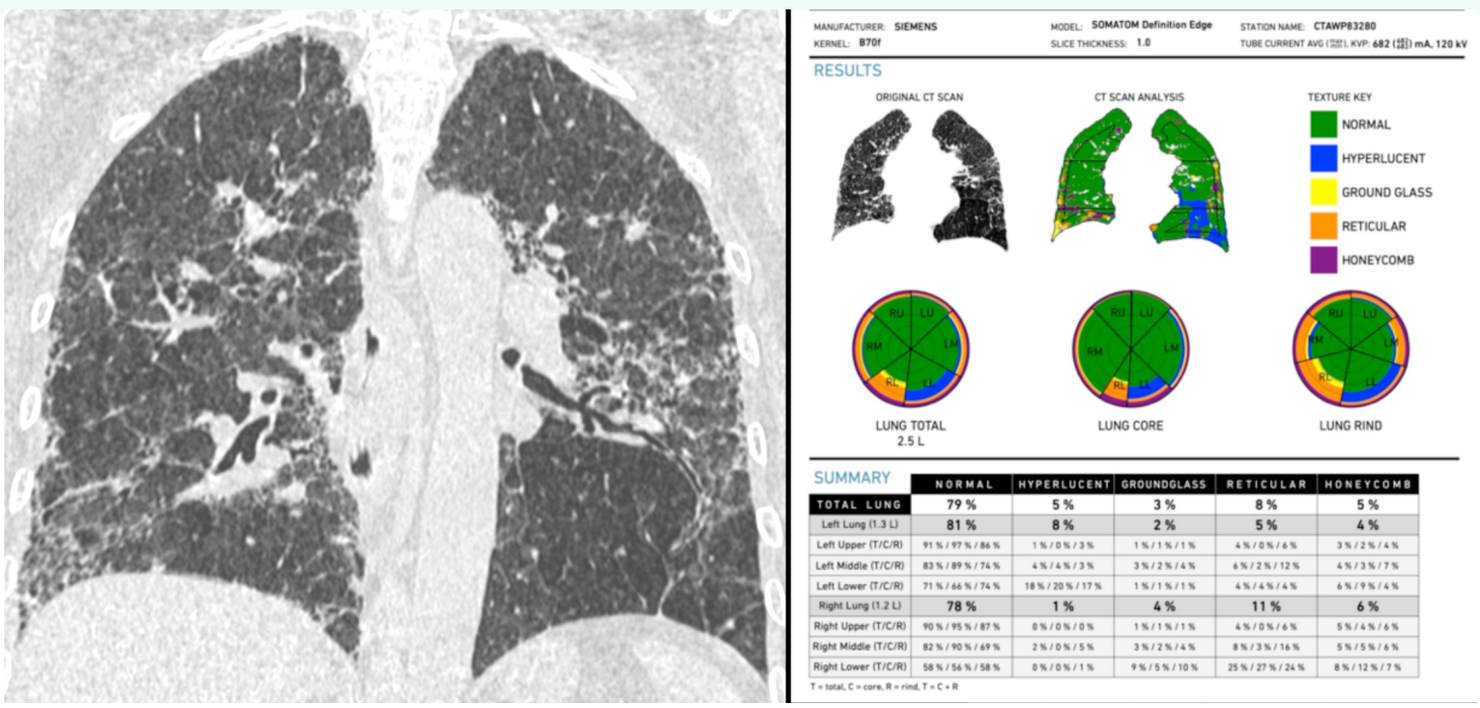

Fig. 1 (A, B): Chronic hypersensitivity pneumonitis. This 60-years old woman has a typical appearance on the coronal image (A). The LTA shows 16% lung involvement by a combination of ground glass, reticular opacities and honeycombing.

Quantification in Diffuse Lung Diseases

At a glance

- Quantification in diffuse lung diseases allows more objective assessment of disease extent and prognosis
- Lung texture analysis using CALIPER allows evaluation of the extent of fibrosis and helps track change over time.
- Functional analysis using CALIPER allows evaluation of the extent of emphysema, air trapping and helps with initial evaluation and follow-up

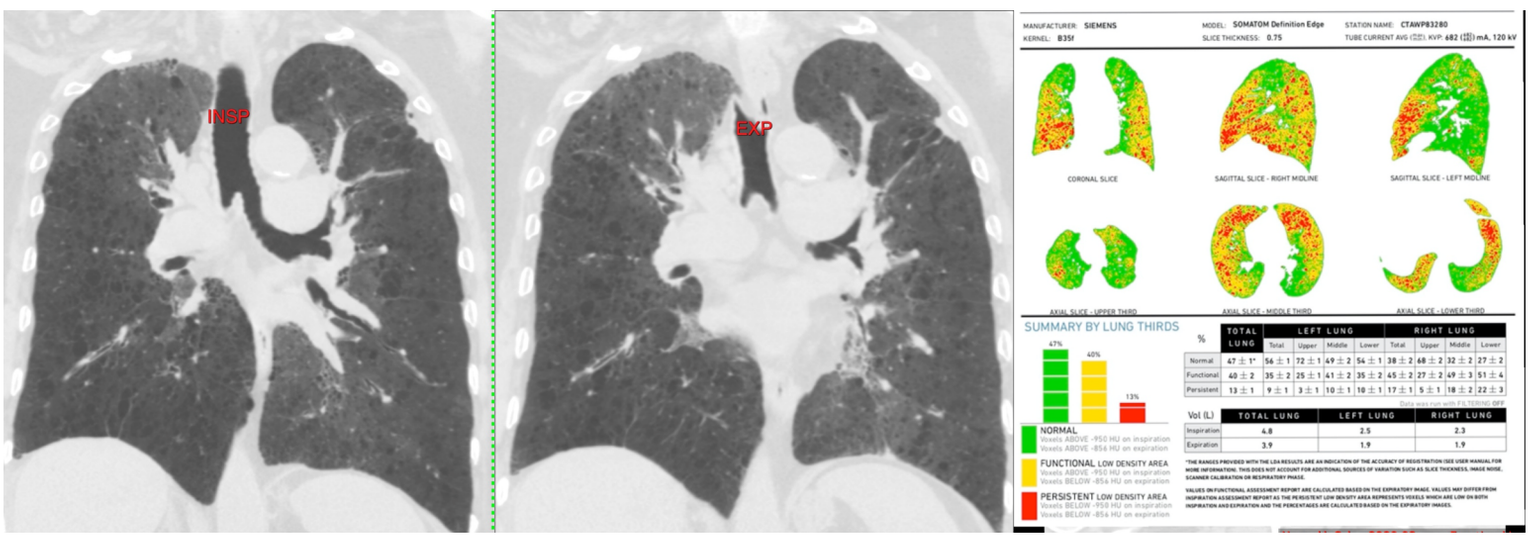

Fig. 2 (A-C): COPD. This is a 68-years old smoker. The inspiratory (A) and expiratory (B) coronal images show extensive overinflation and air-trapping. The functional analysis (C) that combines the inspiratory and expiratory scans shows 13% of the lung to be emphysematous, while another 40% is abnormal, showing air trapping on the expiratory images. Thus 53% of the lung is overall abnormal.

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