

Emphysema: diagnosis, classification, quantification and treatment planning

Enfisema: diagnóstico, classificação, quantificação e planejamento terapêutico

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In this volume of *Radiologia Brasileira*, our readers can find an interesting paper from Koenigkam-Santos et al.⁽¹⁾. The study from the department of Prof. Kauczor and Prof. Heussel describes the results of their research on the pre-operative assessment of the completeness of the lung fissures and pre and post operative quantification of lung volumes and emphysema in a group of patients submitted to endobronchial valves (EBV) implantation for palliative treatment of emphysema. Their results report that EBV implantation benefit is most likely in patients who have complete interlobar fissures and develop lobar atelectasis. This study confirms previous data concerning the validity of pulmonary fissure integrity and response to non-pharmacological treatment of emphysema⁽²⁾. The confirmation of these data is particularly important because recent studies have reported that in some non-pharmacological treatment of emphysema the pulmonary fissure integrity has a minor influence⁽³⁾. Their study is a good example of the practical application of years of dedication to the understanding and testing of new modalities in the imaging analysis of chronic obstructive pulmonary disease. The paper also reflects the current trend on imaging studies, which has been moving from a purely anatomical interpretation to a combined anatomical and functional assessment of lung diseases.

Prof. Nestor Müller first introduced the concept of quantifying emphysema using CT densitometry^(4,5). This process is known as density mask, in which the lung areas with density or attenuation values below a chosen threshold are masked by a solid color, so the observer can promptly identify the areas of abnormal lung density or emphysema. In 1995, Prof. Gevenois and his group suggested the threshold set at -950 HU for the quantification of emphysema⁽⁶⁾, which is the most frequently used threshold. With the advent of the helical scanning, it was possible to calculate the actual volume (cm³), rather than area (cm²) and Prof. Kauczor's paper from 1998⁽⁷⁾, introduced volumetric CT quantification of emphysema. These techniques have provided increasingly early diagnosis and monitoring of these patients⁽⁸⁻¹⁰⁾.

The work of these pioneers has inspired many other authors to expand the clinical application of the CT, beyond a subjective anatomical analysis of the anatomical aspects of the images. It is now recognized that CT densitovolumetry is more accurate and sensitive than the traditional pulmonary function tests (PFT), and it is considered as the method of choice for the non-invasive and accurate assessment of pathological changes in emphysema, showing good correlation with histopathology⁽¹¹⁾. Prof. Kauczor and his group are also among the pioneers in the investigation of lung magnetic resonance imaging, and we are very proud to have their work referred for publication on our **Brazilian Radiology**.

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