

## Clinical evaluation of $^{99m}\text{Tc}$ -Technegas SPECT in thoracoscopic lung volume reduction surgery in patients with pulmonary emphysema

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$^{99m}\text{Tc}$ -Technegas (Tcgas) SPECT is useful for evaluating the patency of the airway and highly sensitive in detecting regional pulmonary function in pulmonary emphysema. The aim of this study is to evaluate regional ventilation impairment by this method pre and post thoracoscopic lung volume reduction surgery (LVRS) in patients with pulmonary emphysema. **Methods:** There were 11 patients with pulmonary emphysema. The mean age of patients was 64.1 years. All patients were males. LVRS was performed bilaterally in 8 patients and unilaterally in 3 patients. Post inhalation of Tcgas in the sitting position, the subjects were placed in the supine position and SPECT was performed. Distribution of Tcgas on axial images was classified into 4 types, A: homogeneous, B: inhomogeneous, C: hot spot, D: defect. Three slices of axial SPECT images, the upper, middle and lower fields were selected, and changes in deposition patterns post LVRS were scored (Tcgas score). **Results:** Post LVRS, dyspnea on exertion and pulmonary function tests were improved. Pre LVRS, inhomogeneous distribution, hot spots and defects were observed in all patients. Post LVRS, improvement in distribution was obtained not only in the surgical field and other fields, but also in the contralateral lung of unilaterally operated patients. In 5 patients some fields showed deterioration. The Tcgas score correlated with improvements in  $\text{FEV}_{1.0}$ ,  $\text{FEV}_{1.0}\%$  and  $\%\text{FEV}_{1.0}$ . **Conclusion:** Tcgas SPECT is useful for evaluating changes in regional pulmonary function post LVRS.

**Key words:**  $^{99m}\text{Tc}$ -Technegas, SPECT, pulmonary emphysema, lung volume reduction surgery, thoracoscopic surgery