

Summary

Correlation of Pulmonary Perfusion Volume Analysis with Pulmonary Function in Emphysema

Tomohiro KANETA*, Tetsuro YAMAZAKI*, Shin MARUOKA**, Yoetsu ABE***,
Yoshihiro TAKAI*, Shoki TAKAHASHI* and Shogo YAMADA*

**Department of Radiology, Tohoku University School of Medicine*

***College of Medical Sciences, Tohoku University*

****Department of Radiological Technology, Tohoku University Hospital*

Pulmonary perfusion single photon emission tomography with ^{99m}Tc MAA was performed on 13 pulmonary emphysema patients and 6 controls. We calculated perfusion volume with lower 10%, 20%, 30%, 40% and 50% of the highest counts/boxels in the lung cut-off. And perfusion index (PI) was defined as follows; $\text{PI} = ((\text{A}\% \text{ cut-off volume}) - (\text{B}\% \text{ cut-off volume})) / (\text{A}\% \text{ cut-off volume})$; A and B take 10 to 50, $\text{A} < \text{B}$. The correlation of each PI and pulmonary function test results (FEV_1 , $\text{FEV}_1\%$, VC, VC%, FVC, FVC%, PaO_2 and PaCO_2) was examined. There were significant correlation between every PI and FEV_1 or $\text{FEV}_1\%$ ($p < 0.05$), and any PI had no significant cor-

relation with other functional results. When $\text{A} = 10$ and $\text{B} = 40$, the PI showed the best correlation with FEV_1 ($r = 0.680$) and $\text{FEV}_1\%$ ($r = 0.830$). And the PI showed an increasing tendency along with the rise of the emphysema severity. The PI may have the clinical utility of the evaluation of pulmonary function. Moreover, we showed the lung CT painted the area where the uptake counts/boxels was more than 10% and less than 40% of the highest counts/boxels. This makes it easy to understand the severe emphysematous area.

Key words: Perfusion volume, Emphysema, Pulmonary function, MAA SPECT, Superimposed image.