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UTILIZATION OF GATED CARDIAC BLOOD POOL SCAN USING SPECT WITH STROKE COUNT IMAGE AND REVERSE STROKE COUNT IMAGE. T.Ohtake, T.Watanabe, T.Momose, N.Kosaka and M.Iio. University of Tokyo, Tokyo.

In recent days, SPECT has been used for gated cardiac blood pool scan. After reconstructing tomograms of end-diastolic image and end-systolic image, tomograms of stroke count image are obtained by subtracting end-systolic image from end-diastolic image and tomograms of reverse stroke count image are gained by subtracting end-diastolic image from end-systolic image.

These functional images can be used for the evaluation of regional wall motion, the measurement of regurgitant fraction of left-sided valvular regurgitation and the measurement of the Qp/Qs ratio of atrial septal defect and patent ductus arteriosus.

The evaluation of regional wall motion can be performed by the detection of hypokinesia and akinesia as defects in the stroke count image and the visualization of dyskinesia in the reverse stroke count image. Regurgitant fraction and the Qp/Qs ratio can be obtained by calculating the stroke count ratio of the left and right ventricles from the stroke count image.

These can be performed by functional images of SPECT more accurately than planar imaging.

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FUNCTIONAL IMAGING OF LUNG. M.Furudate. Hokkaido University, School of Medicine Sapporo.

1) Regional pulmonary functional image using positron labelled gases.

In this study several functional images were made to evaluate the regional pulmonary function using positron labelled gases ($^{11}\text{CO}_2$, ^{11}CO , and $^{13}\text{N}_2$). Sequential dynamic images were photographed by scintillation camera equipped with a high energy collimator for positron and simultaneously the data were collected by computer. From the sequential images, functional images of clearance rate were made with the aid of computer. These functional images of positron labelled gases are useful for the regional pulmonary functions. In addition to that, factor analysis of these studies are useful methods for distinguish the pulmonary area from the cardiovascular regions.

2) Glucose metabolic image of lung cancer using F-18-FDG.

F-18-FDG was accumulated by brain, heart, and tumor reflecting the high glycolytic rate and excreted rapidly from liver, lung, kidney, and others. In lung cancer, the uptake of F-18-FDG increased with time after injection and that the tumor to lung ratio was high enough after about one hour to detection for the tumor localization. Therefore factor analysis of F-18-FDG accumulation is useful for the detection of lung cancer.

3) RI-tomographic image of ventilation / perfusion (V/Q) ratio.

Transaxial, coronal, and sagittal imaging of the distribution of V/Q ratio were produced with SPECT system. The images of ventilation were obtained with continuous breathing of Kr-81m gas and then the images of perfusion were obtained with intravenous administration of Tc-99m-MAA at same position. The V/Q ratio were calculated pixel by pixel. The image of V/Q ratio decreased from the anterior to the posterior side in the normal lung, whereas in pulmonary diseases this showed specific irregular pattern corresponding to the pulmonary diseases.