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ESTIMATION OF EXERCISE MYOCARDIAL SCINTIGRAPHY USING SINGLE PHOTON EMISSION COMPUTERIZED TOMOGRAPHY (SPECT) IN DETECTION OF MYOCARDIAL ISCHEMIA. T. Nishimura, M. Kimura, T. Uehara, K. Hayashida, H. Ohmine, M. Hayashi, Y. Yamada, T. Kozuka, M. Saitoh, K. Kanno and T. Sumiyoshi. National Cardiovascular Center. Osaka.

SPECT was applied to exercise myocardial scintigraphy and the detectability of myocardial ischemia by ECT images was compared with that by planar images in normal 16 cases and 21 cases with effort angina pectoris. Sensitivity and specificity to detect the ischemia by ECT images (91%, 94%) was superior to those by planar images (76%, 89%). The projections to compare exercise and redistribution myocardial images were limited in planar method, on the contrary the transaxial, longaxial and shortaxial tomography obtained by ECT method enabled us to observe the site and extension of ischemic area three-dimensionally.

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QUANTITATIVE DIAGNOSIS OF MYOCARDIAL INFARCTION USING SINGLE PHOTON EMISSION COMPUTERIZED TOMOGRAPHY (SPECT). T. Uehara, T. Nishimura, K. Hayashida, H. Ohmine, M. Kimura, Y. Yamada, M. Hayashi and T. Kozuka. National Cardiovascular Center. Osaka

Myocardial long-axial and short-axial tomograms of 10 clinical normal cases were analyzed by quantitative circumferential profile analysis, and mean value and standard deviation of each segment of myocardial tomograms was calculated and normal pattern of profile curves was obtained. In quantitative analysis, normal range was decided as 2 SD. of mean profile curve.

On the other hand, in order to analyze the detectability of myocardial perfusion defect in visual diagnosis, ROC analysis was performed. As the result, the detectability corresponded to the experience and skillfulness of observers in planar diagnosis but not in ECT diagnosis. ECT diagnosis was superior to planar diagnosis in every observer.

Quantitative analysis was significantly useful in cases difficult to diagnose visually.

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EMISSION COMPUTED TOMOGRAPHY USING ROTATING GAMMA CAMERAS FOR Tl-201 MYOCARDIAL IMAGING (CLINICAL ASSESSMENT FOR QUANTITATIVE ANALYSIS). K. Takeda, H. Maeda, T. Nakagawa, N. Yamaguchi, M. Taguchi, T. Kitano, M. Hamada and Y. Futagami. Mie University School of Medicine. Tsu.

The purpose of this study is to evaluate clinical usefulness of quantitative analysis of emission computed tomography (ECT) for Tl-201 myocardial imaging.

After bolus injection of 2.5m Ci of Tl-201, ECT imaging was performed with the subject prone. Ninety projection data over 360° were collected with a total acquisition time of 6 minutes of opposed dual cameras' rotation. Transaxial images were reconstructed with a convolution method and attenuation correction was performed with modified Chang's method using various attenuation coefficients of lung, heart, vertebrae, thoracic wall and ECT bed. And then, myocardial uptake ratio (MUR) of Tl-201 was calculated by dividing total counts of the myocardium by injected doses in the syringe.

The values of MUR at rest were distributed between 3 and 5% in non-cardiac subjects (n=5) and those in patients with cardiomyopathy (n=5) and valvular heart disease (n=1) were greater. Those with exercise showed more than two-fold increase in non-cardiac subjects, but did not increase so much in patients with coronary artery disease, especially with multi-vessel disease.

It is concluded that this method is clinically useful in estimating myocardial blood flow.

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ECG-GATED SINGLE PHOTON EMISSION COMPUTED TOMOGRAPHY FOR THALLIUM-201 MYOCARDIAL IMAGING IN PATIENTS WITH HYPERTROPHIC CARDIOMYOPATHY. Y. Futagami, T. Konishi, M. Hamada, T. Nakano, H. Takezawa, K. Takeda, and H. Maeda.\* First Department of Internal Medicine and \*Department of Radiology, Mie University School of Medicine, Tsu, Japan

The purpose of this study is to evaluate the clinical usefulness of ECG-gated single photon emission computed tomography for Tl-201 myocardial imaging (SPECT) in the diagnosis of hypertrophic cardiomyopathies. Using a rotating dual-gamma camera system (TOSHIBA GCA-70-A-S), SPECT was performed in 23 HCM and 8 normal cases, including 12 and 2 cases with ECG-gated acquisition, respectively. After i.v. injection of 3.0 mCi of Tl-201, gated-SPECT data were collected for total sampling time of 45 to 60 minutes by MUGA method for 6-10 frames/cardiac cycle, and thereafter non-gated SPECT data were collected for 6 minutes. Transaxial tomographic image was reconstructed and the oblique angle tomographic imaging along the LV long axis was also done according to Borrello's method. Location and extent of localized LV wall thickening were clearly visible, especially by gated-SPECT. LV cavity form in gated-SPECT image was highly coincident with that of LVG.

In summary, despite rather long acquisition time (45 to 60 minutes), our gated-SPECT method was available for clinical use to diagnose hypertrophic cardiomyopathy.