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COMPARISON WITH SINGLE PHOTON EMISSION CT AND MULTIPLANAR GAMMA CAMERA IMAGE OF THE MYOCARDIAL INFARCTION WITH THALLIUM-201 MYOCARDIAL SCAN. A.Tada,T.Maeda,H.Matsuda,H.Bunko,K.Nakajima and K.Hisada. Shiritsu Tsuruga Hospital and Kanazawa University School of Medicine. Tsuruga and Kanazawa.

Sectional myocardial image with single photon emission CT(ECT) of Tl-201 was compared to multiplanar gamma camera image, (anterior, LAO30°, LAO60°, L-lateral) for the myocardial infarction to decide perfusion defect and abnormal low perfusion. At rest Tl-201, 2mCi was injected, after gamma camera study, 3-5 slices, 1cm interval were done.

Normal middle-heart section showed ring shape and its distribution of the activity as almost more than 70% of the peak activity, but importantly the range of normal limit in the anterior part of the wall was about 60% of the peak. The normal cardiac base section showed horse-shoe shape, and homogenous activity more than 70% of the peak was observed. In the 26 patients of myocardial infarction, 7 patients were shown no remarkable findings at gamma camera images, but 4 patients of the 7, was provided perfusion defect and abnormal low activities from the ECT image. Another 4 patients were shown only small obscure finding at gamma camera images. All that cases ECT sectional images defined abnormal lesions and differentiated low activity from small perfusion defect. Two in the 15 patients, that perfusion defect was detected at gamma camera image, consist of pure inferior infarction, could not evaluate from ECT images.

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SINGLE-PHOTON EMISSION CT OF MYOCARDIAL PERFUSION IMAGES USING A ROTATING GAMMA CAMERA. N.Tamaki,Y.Yonekura,K.Yamamoto,T.Mukai,T.Fujita,Y.Ishii,K.Torizuka,K.Miwa,A.Yoshida,H.Kambara and C.Kawai. Dept.Radiology and Nuclear Medicine and Third Div.Dept.Internal Medicine, Kyoto University Hospital, Kyoto.

Single-photon emission CT (SPECT) of Tl myocardial imaging using a rotating gamma camera (G.E. Maxi 400T) was evaluated in comparison with the tomography using 7-pin-hole collimator (7P).

7P method required 10min for sampling and 5min for reconstruction, whereas SPECT required longer time (20 min. for sampling and 10 min. for reconstruction). The phantom study of SPECT demonstrated clearly improved spatial resolution (FWHM 15 mm), however the resolution of 7P method markedly decreased in the distant plane from the collimator, so that quantitative study was more feasible in SPECT. Both modalities increased the sensitivity in detecting myocardial perfusion defect in comparison with the planar imaging. Choice of selection for tomographic section was limited in 7P method, however, in SPECT we could select the most suitable plane, either transaxial, frontal, or sagittal section, in order to see the lesion tangentially. This fact potentiated the accuracy in detecting the ischemic region.

In conclusion, SPECT of myocardial perfusion imaging, although it is rather time-consuming at present, will add complimentary information to other tomographic modalities and improve the accuracy in the evaluation of ischemic heart disease.

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CHARACTERISTICS OF ECT BY A GAMMA CAMERA. T.MUKAI,K.MINATO,K.YAMAMOTO,N.TAMAKI,Y.YONEKURA,T.FUJITA,H.ITOH,Y.ISHII,R.MORITA and K.TORIZUKA. Kyoto Univ. Hospital, Kyoto.

We have attempted to reconstruct single photon ECT using a rotating gamma camera (400T, GE) in a form not only of transaxial, but also frontal and sagittal tomographic expression to emerge up abnormarities of interest in a pertinent expression. A gamma camera rotates around the body in a stepwise of at every 32, 64, 128 views. Total counts amounting to 200,000 were proved to be sufficient to reconstruct section images, which, for example, took less than 10 min. collecting time for Tc-phytate liver scintigraphy, 20 min. for Tl myocardial image and more than 40 min. for ECG gated heart studies using Tc-RBC as well as Tl-201. Filtered back projection algorithms using Chesler's filter were used for reconstruction. The processing time took 50 sec/slice for 64 views collection. An attenuation correction was done using Sorenson's method. Phantom studies revealed that 1.5 cm of FWHM at every slices unrelated to depth could be achieved. Single photon ECT using rotating gamma camera proved to be practical method, and can be a superior alternative to the conventional scintigraphy to examine organ of interest in adequate tomographic presentation which is hardly visualized so far.

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THE APPLICATION OF RI COMPUTED TOMOGRAPHY (RCT) TO Tl-201 MYOCARDIAL IMAGES. T.TSUDA, T.YOSHIZAKI, H.HAMA*, T.MITANI*. The First Department of Internal Medicine, Niigata University School. *Kido Hospital, Niigata.

RCT has been applied to Tl-201 myocardial images. The clinical usefulness was evaluated in ischemic patients and in Fantom. Data were obtained by rotation of a patient in front of a detector. An Informatek Simis III (32KW) Computer System was used for data collection. Acquisition of 40 projections in every nine degrees was reconstructed along a 360° rotation. It took 20 min.

The program of filtered back projection technique with Fourier transform was used for the three dimensional reconstructions. Following an injection of 4mCi of Tl-201, tomography was obtained for Transverse, Coronal and Sagittal Section, and compared with the conventional images. The former was found to be valuable in the detection of ischemic regions, exp. in basic, apical, and anterior wall.

In Fantom's test, 1 cm of defect could be discernible.