

303

SIMULTANEOUS SPECT WITH Tc-99m PYP AND Tl-201 IN PATIENTS WITH ACUTE MYOCARDIAL INFARCTION. K.Uozu, K.Akeda, Y.Yamaguchi, S.Tokunaga, S.Tamaki, T.Hashimoto, T.Fudo and H.Kambara. Takeda Hospital and Kyoto University Medical School.

Myocardial SPECT with Tc-99m PYP (PYP) or Tl-201 (Tl) is useful for detection and localization of acute myocardial infarction (AMI). These two types of scintigraphy have never been performed simultaneously. Previous studies were difficult to compare PYP images with Tl images because of inaccurate superimposition of the two images and time differences between two studies. We attempted a new method of dual energy SPECT (Toshiba GCA-90B system) with cardiac phantom and in 25 patients with AMI. On phantom study, the counts in simultaneously acquired images were about 1.2 times higher than those in independently acquired images. But the quality of images with two techniques were similar. Twenty-two of 25 patients had abnormal uptakes on PYP imaging (88%), and 24 patients had perfusion defects on Tl imaging (96%). Nineteen of 22 patients, sites of PYP uptake agreed with Tl perfusion defects. In two cases with multiple Tl defects, acute myocardial necrosis and other ischemic conditions were detected by superimposition of both dual energy SPECT. In one case there was no definite perfusion defect on Tl imaging in spite of PYP uptake. Additional benefit of this technique is a shortening of examination time.

Thus, the simultaneous SPECT with PYP and Tl seemed to be useful for evaluation of AMI.

304

EVALUATION OF LOCALIZATION AND MAGNITUDE OF INFARCTION IN ACUTE MYOCARDIAL INFARCTION USING RAO LONG-AXIS THALLIUM EMISSION TOMOGRAMS. T. Miyao, S. Nishikawa, Y. Kawaguchi, Y. Takayama and K. Kosuga. Hikone City Hospital, Hikone.

Rest thallium-201 emission tomography was performed in 8 normal subjects and 30 cases with acute myocardial infarction, and the long-axis tomograms from the right anterior oblique view (RAO long-axis ECT) were reconstructed. The sensitivity for the RAO long-axis ECT to detect the diseased vessel as segmental perfusion defect was 93%. The circumferential profile curves were generated and the lower limit of the normal range (LL) were made as MEAN-2SD of the normal subjects. The ratio of the area of the patient profile beneath LL to the overall area beneath LL were calculated as %Tl defect. This parameter showed good correlation against the ejection fraction (EF) ($r = -0.61$, $P < 0.01$), the ratio of abnormally contracting segments in contrast left ventriculography (%ACS) ($r = 0.80$, $P < 0.001$), and the peak serum creatine phosphokinase (CPK) ($r = 0.72$, $P < 0.001$). Thus RAO long-axis ECT were considered to be useful in assessment of localization and magnitude of infarction except for the cases with posterior wall involvement.

305

QUANTITATIVE EVALUATION OF MYOCARDIAL INFARCTION (MI) BY CONCENTRIC CIRCULAR DISPLAY (CCD) OF Tl-201 SPECT (TL-SP). O.Doi, S.Yamamoto, K.Mitsudo, T.Fujino, K.Matsunaga, Y.Nishihara, J.Awa, T.Goto, T.Hase, M.Kim, K.Kadota, K.Yoshii, T.Sakamoto, M.Toda, Y.Kawahara and M.Shigeyasu. Kurashiki Central Hospital, Kurashiki.

We have developed and reported CCD, a new method analyzing TL-SP. Circumferential profile analysis was performed on the short axial slices from the apex to the base. Derived profile curves were changed into nine ones by interpolation. The data were displayed on 9 concentric circles. The utility of CCD in evaluating MI size was examined in 65 pts performed TL-SP 1-3 month after onset (LAD MI 35, RCA & LCX MI 30). Severity index (SI) was defined as the sum of the differences from normal limits (mean-2SD) ($NLi\theta$) of the point ($Mi\theta$) below $NLi\theta$, $\sum (NLi\theta - Mi\theta) \times 100 / NLi\theta$ ($i=1, 2, \dots, 9$, $\theta=0, 10, \dots, 360$). SI was compared with ECPK, ECPK-MB and LVEF. There were significant correlation ($r < 0.80$, 0.71 and -0.75 respectively, $p < 0.01$). SI of LAD MI was correlated better with ECPK and ECPK-MB than that of RCA & LCX MI. In conclusion, SI correctly determined MI size and therefore may be useful in evaluating the course of MI and the effects of interventions attempting to decrease MI size.

306

Evaluation of Thallium-201 myocardial emission computed tomography (ECT) based on a comparison with postmortem findings.

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The correlative study of Tl-201 myocardial ECT with the pathological finding of the heart was performed in 13 autopsied cases. In 8 cases with myocardial infarction (MI), 9 perfusion defects were observed, that was, 4 in anteroseptal wall, 1 in anterolateral wall and 4 in posterior wall on the images of SPECT. Eight MIs were observed at autopsy corresponding to perfusion defect on SPECT images. In one myocardial perfusion defect at posterior portion on SPECT, a non-transmural MI was found at anteroseptum. In one case with aortic valve stenosis a false positive result was obtained at posterior wall where neither myocardial necrosis nor fibrosis was obtained at autopsy. The ventricle was divided into 16 segments in each of 4 short axial images to evaluate extent of MI. SPECT for extent of MI showed sensitivity of 81%, specificity of 96% and accuracy of 92%. False negative segment was apt to be observed at the basal half of LV, while false positive segment was at posterior portion of basal half. It is concluded that myocardial ECT was useful for evaluation of the site and extent of MI.