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QUANTITATION OF INFARCT SIZE BY Tl-201 MYOCARDIAL EMISSION CT USING POLAR MAP. M.Naka, S.Nanto, K.Komamura, T.Ohara, K.Kodama, T.Fuzioka, J.Sasaki, and Y.Miura. Cardiovascular Division of Osaka Police Hospital and Shimadzu S.D.,Osaka

In order to quantitate the infarct size, three indexes were used (defect volume, DV; mean defect severity, MDS; defect severity index, DSI), and to evaluate these indexes, the relations between these indexes and sigma CPK were studied in 41 patients with acute myocardial infarction.

These indexes were measured from polar map made from Tl-201 myocardial emission CT images which were divided into 192 segments (6 slices x 32 segments per slice). The segments whose %Tl-uptake fell below 2SDs of this mean normal value were defined as abnormal. DV was calculated from the number of abnormal segments and the volume of each segment. MDS was the average of the difference of %Tl-uptake between the object and normal subjects in the abnormal segments. MDS, multiplied by the DV, defined DSI.

MDS and DSI correlate with sigma CPK ($r=0.63$ and $r=0.62$ respectively), however, weak correlation was obtained between DV and sigma CPK ($r=0.46$). DSI correlated with sigma CPK in anterior or inferior infarction ($r=0.66$ and $r=0.71$ respectively), however, in lateral infarction there is no correlation between them. It is concluded that these indexes are useful to quantitate the infarct size.

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DETECTION OF CORONARY ARTERY DISEASE USING EXERCISE MYOCARDIAL SCINTIGRAPHY - THE UTILITY OF BULLSEYE WASHOUT ANALYSIS. K.Kihara, T.Nishimura, T.Uehara, K.Hayashida, T.Shimonagata, S.Hamada, T.Sumiyoshi and M. Saito. National Cardiovascular Center, Suita, Osaka.

The detection of coronary artery disease was performed using exercise and redistribution myocardial scintigraphy. Thirty patients and ten normal controls were analysed with qualitative and quantitative analysis by planar, SPECT and Bullseye. Washout rate method was also used as quantitative analysis. In single vessel disease, qualitative and quantitative analysis showed same results, but in multiple vessel disease, quantitative analysis was more useful than qualitative analysis. In triple vessel disease, Bullseye with washout analysis was most useful. Sensitivity, specificity and accuracy of Bullseye washout analysis was 83%, 93% and 88%, respectively.

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QUANTITATIVE ANALYSIS OF EXERCISE STRESS Tl-201 MYOCARDIAL SPECT: THE USEFULNESS OF POLAR MAP REPRESENTATION FOR THE DETECTION OF CORONARY ARTERY DISEASE. M.Narita, T. Kurihara, K.Murano, M.Usami, M.Honda, M. Tomonobu, K.Kanao. Sumitomo Hospital, Osaka.

To assess the ability of quantitative analysis of stress-redistribution Tl-201 rotational tomography (SPECT) to detect and localize coronary artery disease (CAD), we studied 17 normal subjects and 88 patients with CAD. After low-pass filtering, images were reconstructed into short-, vertical long- and horizontal long-axis tomograms. Both at exercise stress and at redistribution, the maximum-count circumferential profiles for each short-axis cuts were generated from apical to basal cut and they were expressed into two-dimensional polar coordinate functional maps to represent myocardial Tl distribution. Similarly, Tl washout rates of the entire left ventricle were expressed as a two-dimensional polar map. Normal limits of myocardial Tl washout rates were established using normal subjects (< 30%). The polar map representation was useful for the detection of multivessel CAD and it improved the detection of triple vessel disease from 27% (visual inspection only) to 47%.

In this study, as all tomographic data from the study (including washout rate) can be displayed in functional maps, extent and severity of myocardial ischemia can be detected more easily and accurately.

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THE COMPARISON OF BULLSEYE POLAR MAP WITH SIDE BY SIDE DISPLAY IN LOCALIZING ISCHEMIC AREA OF EXERCISE Tl-201 MYOCARDIAL TOMOGRAPHY. Y.Eki, M.Okano, F.Ohsuzu, S.Maie, S.Yanagida, H.Yukitake, S.Katsushika, H.Seguchi, N.Aosaki, H.Nakamura, T.Hoshina, T.Shishido, S.Sueoka, H.Takanashi, E.Takenaka. National Defense Medical College, Saitama.

To determine the accuracy of tomographic thallium-201 imagings in localizing coronary artery disease (CAD: $\geq 50\%$ stenosis), exercise and normalized delayed studies were evaluated visually and quantitatively (q) in side by side display (SSD) and bullseye polar map (BPM) in 26 pts with angina pectoris (AP: 10 pts with OVD, 3 pts with 1VD, 8 pts with 2VD, 5 pts with 3VD). In 26 AP pts with or without CAD, visual evaluation had very high sensitivity (st) for detection of CAD, but very poor specificity (sp) disturbed its clinical utility. However, the overall st and sp of q-SSD were 67% and 69%, and those of q-BPM were 41% and 85%. Results of AP in localization with q-SSD were:

	LAD	LCX	RCA
st(%)	75	55	70
sp(%)	45	100	56

These results suggested that q-SSD could be a sensitive technique for detecting the presence of CAD and those using the BPM might be a highly specific but poorly sensitive method for detection of CAD.