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COMPARISON OF 180° AND 360° DATA COLLECTION TECHNIQUE FOR EVALUATING THE UNIFORMITY OF TL-201 SPECT IMAGES OF CARDIAC PHANTOM.

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The purpose of this experimental study is mainly to find the difference in uniformity of Tl-201 myocardial SPECT images between 180° and 360° data collection technique. SPECT images were obtained without attenuation correction and then three short axis images (basal, medial, and apical sections) were selected for the quantitative analysis using circumferential profile method. Although, there was no significant difference in uniformity of SPECT images between 180° and 360° technique, a decreased activity area was sometimes noted in 180° data collection image, but not in 360° image. This artificial decreased activity area may result in a false positive in a clinical setting. In addition locating the defect (1cm and 2cm diameter) on the anterior wall of the phantom, it could be detected with both techniques. Therefore, we concluded that the 360° data collection method is appropriate for Tl-201 studies to avoid a false positive finding.

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SEMIQUANTIFICATION OF STRESS TL-201 SPECT

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Two-dimentional semiquantitative representation of Stress Tl-201 SPECT was developed. This method used Concentric Circular Display (CCD). Left ventricle was devided into 9 short-axis slices from apical to base. Each maximum counts of 324 pixel in 9 slices, as 36 pixel per slice was calculated. Count values were normalized to 324 pixel analyzed with maximum counts of 324 pixel, and circumferential profile curves was drawn. The mean maximum counts and S.D. per pixel was mesured from 20 normal studies 36 spaced radiuses, 10 degrees each were projected from the center of 9 short-axis slices to create 324 pixel and 36 sectors on the CCD. %CCD was represented as percent count values per pixel of Tl-201 distribution to the maximum counts of the pixel in the entire heart. Count values decreased from the corresponding pixel of each slices from all 20 normal cases were devided by S.D. on stage CCD. Pixels below 2 S.D.s of the normal value were considered abnormal on the defect CCD, and defect score was calculated from the number of abnormal pixel. This method clearly expressed the extend and the degree of ischemic region of the heart and whether transient or persistent.

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SEMIQUANTIFICATION OF STRESS TL-201 SPECT

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Stress Tl SPECT has improved scintigraphy to detect and localize myocardial ischemia. Evaluation of regional myocardial perfusion from stress/redistribution by visual interpretation is in need of objective and quantitative analysis. This paper describes the semiquantitative analysis converting 3-dimensional data into 2-dimensional representation (CCD). Analysis with CCD was compared with visual interpretation (VA) on clinical basis. Patients studied were 37 with angina pectoris(MI(-)), 32 with myocardial infarction (MI) and 19 normal. Sensitivity for detecting angina pectoris with CCD and VA was 76% and 73%, respectively, and for detecting MI, 97% and 94% respectively. Specificity for detecting both angina pectoris and MI was 84% with CCD and 79% with VA. In detecting LAD disease, sensitivity with CCD was 61% and 56% with VA, and specifity was 61% with CCD and 78% with VA. In case of RCA.CX disease, sensitivity with CCD was 76% and 78% with VA, and specificity with CCD was 60% and 75% with VA. Sensitivity in the case of multiple vessel disease was low in both method. In conclusion, analysis with CCD was almost equal to that with VA, and semiquantitation by CCD is useful for quantitative and objective assessment of myocardial vessel disease.

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RELATIONSHIP OF LEFT VENTRICULAR FUNCTIONS BY MULTIGATED FORWARD AND BACKWARD DATA COLLECTION AND SEVERITY OF CORONARY ARTERY LESION IN EXERCISE MYOCARDIAL SCINTIGRAPHY

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To asses the clinical usefulness of radionuclide-determined changes in left ventricular relaxation at rest in patients with coronary artery disease, multigated forward and backward data collection was performed and compared with severities of coronary artery lesions in $Tl-_{201}$ exercise myocardial scintigraphy. We analysed high-resolution time-activity curves obtained from multigated radionuclide angiography. Peak LV filling rate(PFR) at rest was abnormal and reduced according to perfusion abnormalities provoked by $Tl-_{201}$ exercise myocardial scintigraphy. Pulmonary uptake index and washout ratio had good correlations with resting PFR and defect scores calculated by three directions(ANT, LAO45°, LAT). These data suggest that the rate of LV relaxation is impaired in patients with CAD and the extent of impairment is related to the severities of coronary artery lesions shown by $Tl-_{201}$ exercise myocardial scintigraphy and that resting PFR was sensitive and easily obtainable parameter of the diastolic dysfunction associated with CAD.