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A STUDY OF THE USE OF Tl-201-MYOCARDIAL SCINTIGRAPHY AND RI-ANGIOCARDIOGRAPHY IN THE EVALUATION OF MYOCARDIAL INFARCTION. T. Shiraishi, K. Akagi, T. Hasegawa, K. Lee, K. Harima, T. Murata, A. Kasahara, A. Kobavashi, Y. Tanaka, Y. Watanabe, I. Seo, A. Sakai. Department of Radiology and Internal Medicine, Kansai Medical University, Osaka.

Performing Tl-201-myocardial scintigraphy on 25 cases of myocardial infarction diagnosed clinically, quantitative analysis of the infarction size and RI uptake was performed and these values were compared with the cardiac functional indexes of RI-angiograms and chest X-rays. Result: 1) It was possible to quantitatively evaluate the area of infarction from the myocardial scintigram's isodensity display and the degree of the defect and the size of the infarction correlated. 2) Infarction covering more than 25% of the circumference of the myocardium lowered myocardial function. 3) Tl-201 uptake in the lungs and the degree of pulmonary congestion according to chest X-rays were proportional. 4) Myocardial scintigraphy, RI-angiography, ECG and VCG diagnoses agreed satisfactorily for the anterior and lateral walls but did not agree for the posterior and septal walls.

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STUDY IN STRESS Tl-201 MYOCARDIAL SCINTIGRAPHY IN SPECIAL REFERENCE TO CARDIAC RESERVE IN PATIENTS WITH ISCHEMIC HEART DISEASE. Y. Nakashima, K. Minamiji, Y. Toki, H. Kurogane, K. Kobayashi, K. Maeda, H. Fukuzaki, S. Nishiyama, Y. Inoue, R. Takahashi, \*\* \*Department of Internal Medicine Division I, \*\*Department of Nuclear Medicine, Kobe University School of Medicine. Kobe.

In order to evaluate the usefulness for diagnostic method using Stress Thallium-201 myocardial scintigraphy in patients with IHD, myocardial to background ratio (M/B) in exercise image (Ex) and redistribution image (Rd) obtained 3 hours later, were compared with coronary angiographic findings and left ventricular ejection fraction (EF). 71 patients with IHD were differentiated from normal subjects, by the change of M/B ratio from redistribution to exercise image and old MI was differentiated from angina pectoris by difference in M/B ratio at the redistribution image. Scintigraphic and coronary angiographic findings were correlated with each other fairly well (Sensitivity 85%), even though there were some discrepancies between them (Specificity 50%). Rd M/B was correlated with EF ( $r=0.61$ ,  $p<0.001$ ), as well. These findings suggest that Serial exercise and redistribution myocardial scintigraphy with Tl-201 is useful as a noninvasive diagnostic method and the change of M/B by exercise represents the degree of regional myocardial perfusion and using this index, it is possible to evaluate the coronary vascular reserve in patients with IHD.

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EVALUATION OF LIVER/HEART ACCUMULATION RATIO AS AN INDEX FOR Tl-201 MYOCARDIAL UPTAKE. H. Bunko, K. Nakajima, N. Tonami and K. Hisada. Department of Nuclear Medicine, School of Medicine, Kanazawa University, Kanazawa.

Purpose of this study is evaluation of liver/heart (L/H) Tl-201 accumulation ratio as an index of myocardial Tl-201 uptake. The study includes visual evaluation of liver and myocardial Tl-201 accumulation in anterior view myocardial scan and quantitative evaluation of L/H ratio by densitometry using following equation;  $L/H=10\text{Exp}(-D/D_0)$ ,  $D=D_H-D_L$ . L/H ratio derived from 133 patients showed higher values in the patients with myocardial infarction, angina, congestive cardiomyopathy (CCM), acute myo-pericarditis and lung diseases (0.74-0.82), and lower values in those with hypertrophic cardiomyopathy (HCM), pacemaker implantation and other non-ischemic heart diseases (0.51-0.68). In 4 angina patients with coronary bypass surgery, L/H ratio decreased from  $0.86\pm 0.12$  (S.D.) before surgery to  $0.74\pm 0.14$  (S.D.) after surgery, however the difference was not significant. In the patients with HCM, L/H ratio was significantly lower ( $0.51\pm 0.06$ ) than those with CCM ( $0.82\pm 0.23$ ) ( $p=0.01$ ). L/H ratio derived from densitometry could be used as an index for Tl-201 myocardial uptake and useful for evaluation of whole myocardial perfusion as well as evaluation of myocardial hypertrophy.

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FUNCTIONAL SIGNIFICANCE OF CORONARY COLLATERALS IN EFFORT ANGINA AS STUDIED BY EXERCISE MYOCARDIAL SCINTIGRAPHY. Y. Ishida, K. Kimura, M. Inoue, M. Tada, M. Fukushima, K. Sato, H. Matsuo and H. Abe. 1st Department of Medicine and Nuclear Medicine, Osaka University Medical School, Osaka.

In order to evaluate the effects of coronary collaterals on protection of myocardium from ischemia during exercise, symptom-limited multistage exercise tests combining Tl-201 myocardial scintigraphy were done in 37 patients of effort angina with severe coronary stenosis ( $\geq 90\%$ ) who had no history of myocardial infarction. From rest and exercise image, to estimate regional myocardial perfusion quantitatively, the regional myocardial/background (M/B) ratios of anterior, inferior and posterior wall were calculated by using minicomputer (TOSHIBA DAP-5000N).

When effects of exercise on regional M/B ratios were examined in the regions with severe coronary stenosis, this ratios increased significantly during exercise in the regions with collaterals supplied by intact donor arteries; no increase in the ratios was seen in the regions without collaterals and in those supplied by stenotic donor arteries.

This results suggest that coronary collaterals could improve the regional myocardial perfusion and increase the exercise capacity in effort angina but their efficacy may be restricted by stenosis of the donor arteries.