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VALUE AND LIMITATION OF SEGMENTAL ANALYSIS OF THALLIUM MYOCARDIAL SCINTIGRAM FOR LOCALIZATION OF CORONARY ARTERY DISEASE. M. Fukumoto, Y. Kawamura, J. Yamazaki, T. Morishita 1st Internal Medicine of Toho University, Tokyo.

The purpose of this study was to determine the value of thallium-201 myocardial scintigram for identifying disease in the individual coronary arteries. For this study thallium-201 myocardial scintigraphy was performed in 100 patients, with arteriographically proved coronary artery disease and 5 control subjects. The data was processed by an on line minicomputer system and myocardial wall was automatically classified into 8 segments. Then segmental up take index was computed.

Result:

- Sensitivity for identifying individual vessel disease were 50% for LAD, 51% for RCA and 21% for LCX disease (narrowings >75%).
- Coronary collaterals reflected in 20% of false negative cases.
- With regional wall motion by radionuclide cardioangiography, the sensitivity for detecting coronary artery lesions more increased than with myocardial image alone.

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QUANTITATIVE ANALYSIS OF MYOCARDIAL ISCHEMIC AREA BY EXERCISE TL-201 MYOCARDIAL SCINTIGRAPHY — COMPARING WITH CORONARY ANGIOGRAPHY.

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In order to detect myocardial ischemic area by exercise Tl-201 myocardial scintigraphy, we evaluated the change in counts in several segments of the image. Eight subjects of normal coronary and 16 patients with angina pectoris were studied by bicycle ergometer stress test. Tl-201 2mCi was injected 30 seconds before the end of test. Two images of myocardium (RAO 30° and LAO 60°) were obtained 10min and 3hr after exercise. RAO view was divided into three segments (Anterior, Apical and Inferior). LAO view was divided into two segments (Anteroseptal and Posterior). We calculated the percentage change of average counts in each segments between 10min and 3hr after exercise, and compared with coronary angiography. In normal subjects, the percentage change were 33.9% in LAD perfusion area, 33.2% in RCA area and 35.4% in Cx area. The percentage change was 21.0% in 10 patients with severe stenosis of LAD (>90%) in coronary angiography, and this value is significantly different from the normal ($P < 0.001$). In the area of RCA and Cx, we were also able to observe the tendency towards lower value in the case of severe stenosis.

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SEMIQUANTITATIVE ASSESSMENT OF STRESS Tl-201 MYOCARDIAL SCINTIGRAM IN PATIENTS WITH ISCHEMIC HEART DISEASE. K. Kaneko, T. Kondo, Y. Kogame, H. Teshigawara, S. Ohashi, K. Hiraiwa, M. Wada, Y. Miyagi, M. Nomura, S. Okajima, H. Hishida, Y. Mizuno, K. Ejiri, K. Kawai, F. Sasaki, A. Takeuchi, and S. Koga, Department of Internal Medicine and Radiology, Fujita-Gakuen University, Toyoake, Aichi.

To assess the stress Tl-201 myocardial scintigram objectively, a semiquantitative method was developed. Left ventricular myocardium was divided into 7 segments: antero-septal (AS) anterior (ANT), anterolateral (AL) apical (AP) posterolateral (PL), inferior (I) and posterior (P). The material consisted of 33 patients who underwent coronary angiography. First, perfusion rate (PR) of each ROI was obtained by: mean count in each ROI / mean count in total LV. Then difference of perfusion ratio (DPR) was calculated by: PR after exercise PR at rest. In the group of 7 patients (pts) with non-significant (<50%) coronary stenosis (NSC), DPR of all segments were similar to that in the group of 6 normal subjects. In the group of 21 pts with LAD stenosis, DPR of AS, ANT, AL and AP segments were smaller than in normal, while in the group of 10 pts with RCA stenosis, DPR of I and P segments were low. These findings suggest that DPR can become a useful and objective tool for assessment of stress Tl-201 myocardial scintigram.

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CLINICAL EVALUATION OF DISCREPANCY OF STRESS ECG, TL SCAN IN CAD PATIENTS.

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It has been accepted that stress Tl scan has high sensitivity and specificity than stress ECG in order to detect the CAD patients. In 80 patients with CAD who underwent coronary angiography, sensitivity and specificity of Tl, ECG were (73, 90%), (69, 60%), respectively.

In this study, the discrepancy of Tl and ECG were investigated by three factor affecting the accuracy of Tl scan; 1) physiologic factor, 2) technical factor, 3) image interpretation.

In normal cases, significant ST depression with normal CAG such as syndrome X has normal Tl imaging. In AP cases, numbers of vessels, site of vessels, degree of stenosis and collateral were main factor of discrepancy and in MI cases, reciprocal ST charges and redistribution to the infarcted area were thought to be the cause of discrepancy.

For image interpretation, computer analysis of Tl scan increased sensitivity, but diminished specificity.

In conclusion, thallium interpretation should be determined in addition to the clinical findings.