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INVESTIGATION OF SPECT ON CASES OF ACUTE MYOCARDIAL INFARCTION.

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In order to discuss a clinical usefulness of Tl-201 myocardial scintigraphy, planar images and SPECT was compared to the other clinical data in 27 patients with acute myocardial infarction admitted in CCU of our hospital. Myocardial scintigraphy was taken within 3 weeks after onset. The evaluation of scintigraphy were done visually by 3 radiologists, and the results were compared to ECG, coronary angiogram, left ventriculogram and cardiac pool scintigram. SPECT had a higher sensitivity than planar images. The abnormal locations judged by SPECT generally corresponded to those of ECG and left ventriculogram. The ejection fraction on cases with anteroseptal or anterolateral defects analyzed by SPECT are significantly lower than that of other portions. Grading score for detecting the localization, extension and intensity of defects on SPECT is well correlated with ejection fraction, while relatively poor with Forrester classification or maximum LDH. It was concluded that SPECT on acute phase of myocardial infarction is useful to estimate a location, extend and clinical severity.

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STRESS THALLIUM-201 DYNAMIC STUDY OF MYOCARDIAL IMAGING USING A WHOLE-BODY RING-TYPE SPECT.

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Stress thallium-201 dynamic study of the myocardium was performed using a whole-body ring-type SPECT (Shimadzu: SET-030W). This SPECT device has 3 detector rings with 128 NaI detectors in each ring, providing 3 slice sections at 30 mm intervals. High resolution or high sensitivity modes can be selected by application of different collimators. In the high resolution mode, it has high resolution (14mm in FWHM) and high sensitivity (6kcps/uCi/ml). This high sensitivity SPECT permits serial dynamic study of the stress myocardial imaging to analyze tracer washin and washout from the myocardium.

Following intravenous injection of 2mCi of thallium-201, SPECT images were obtained every 5 minutes for 30 minutes. Each tomographic images showed the left ventricular myocardium clearly, containing 250-300 kilo counts. In normal myocardial segments, thallium-201 washin and washout were rapid, whereas, in infarct as well as ischemic segments, they were rather slow.

We conclude that this whole-body ring-type SPECT permits serial dynamic study of myocardial imaging, which may be applied for various tracer kinetics of the heart.

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QUANTITATIVE ANALYSIS OF MYOCARDIAL ISCHEMIA BY EXERCISE MYOCARDIAL SCINTIGRAPHY - COMPARISON OF DIAGNOSTIC ACCURACY BETWEEN PLANAR AND SPECT IMAGE -

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In order to estimate the diagnostic accuracy of exercise Tl-201 myocardial scintigraphy, the coronary artery lesion and Tl-201 myocardial perfusion were compared. The detectability of lesion of single vessel disease was superior to that of multiple vessel disease, and the cause of underestimation of lesion having more than 90% stenosis in single vessel disease was almost the inadequate exercise. As a result, the SPECT diagnosis was superior to the planar diagnosis. In order to evaluate the advantage and disadvantage of the SPECT and planar diagnosis, the discordant cases were investigated. In SPECT diagnosis, the whole region of myocardium could be seen, so the diagonal and left circumferential artery region, which scarcely could be seen by the planar image, could be observed by the SPECT image. The differential diagnosis, whether the lesion was responsible to only left anterior descending artery (LAD) or responsible to both LAD and right coronary artery, was easy by the SPECT diagnosis. As concerned with multiple vessel disease, the quantitative analysis was very useful and indispensable. The problem of SPECT diagnosis was false positive (over-diagnosis) by the artifacts.

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QUANTITATIVE EVALUATION OF REDISTRIBUTION IN EXERCISE TL-201 MYOCARDIAL SCAN

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In exercise testing with Tl-201 scan, a phenomenon of redistribution (RD) is helpful for detection of ischemia. But RD is visual indication, so we take a quantitative analysis, % washout ratio, to this phenomenon and compared % washout method with conventional method in detection of ischemic segment.

Data were collected from LPO45° to RA045° by rotating r-camera at 5 and 180 minutes after exercise. Short axis image was divided into 40 segments. Circumferential profile (CP) curve was displayed by sampling from each segment. % washout was calculated between initial and delayed count sampled from each segment and was showed by CP curve. Ischemic segment was decided by comparing with normal curve.

In patients with angina pectoris, the sensitivity (92%) of washout method was superior to the conventional method (75%) for detection of ischemia but the specificity was poor. It was suspected by our study that lower exercise load caused a false positive case. In patients with myocardial infarction, % washout value was variable. But infarct-area with low washout was indicated ischemic but viable by CAG, LVG findings and stress test.

Quantitative evaluation of RD is useful in detecting myocardial ischemia.