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EVALUATION OF LEFT VENTRICULAR WALL MOTION WITH FUNCTIONAL IMAGES. K.Nakajima, H.Bunko T.Maeda, M.Yamada and K.Hisada. Department of Nuclear Medicine and Division of Central Radioisotopes Service, Kanazawa University Hospital, Kanazawa.

Functional images of left ventricular wall motion, stroke volume (SV) image, ejection fraction (EF) image and paradox image were generated in fifty patients and compared with contrast left ventriculography in twenty patients. Biplane contrast angiograms were assessed based on the reporting system of American Heart Association grading committee. Left ventriculogram was divided into seven segments and severity of asynergy was classified into four grades. Multi-gated blood pool data were acquired using a scintillation camera and a minicomputer system in modified left anterior oblique projection. Processing of functional images were: SV image=ED image-ES image, EF image=SV image/ED image, paradox image=ES image-ED image (ED; end-diastolic, ES; end-systolic). Detectability of EF image was better than SV image, and paradox image was useful for the detection of dyskinesis. As to location and severity of asynergy, EF image and Segmental wall motion of left ventriculography were compared and had good correlations. The mean value of ejection fraction image of left ventricle was well correlated with ejection fraction determined from left ventriculography ($n=50$, $r=0.94$).

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COMPARISON OF LV WALL MOTION ANALYSIS AND Tl MYOCARDIAL IMAGE IN MYOCARDIAL INFARCTION. Y.Koga, H.Shinohara, S.Masumi and K.Harumi. Showa Univ., Fujigaoka Hosp. Yokohama.

As the most simple method, Tl myocardial image (Tl) is performed to detect myocardial infarction (MI) or ischemia. On the contrary, gated LV wall motion analysis (WMA) was needed the expensive computer systems. But, recent microprocessor controlled γ -camera with image memory can perform WMA very easily. The detection of regional LV WM abnormalities provides strong evidence for the presence of coronary heart disease. This study undertaken to determine which study is sensitive to detect small MI. 39 pts. with clinically and ECG, VCG proved old MI were studied both rest Tl and rest equilibrium WMA. Tl was obtained by Searle Pho/Gamma V in Ant., LAO 20°, 45°, 70° and L.lat. views. WM image was made using cardiac analysis program of Searle Scintiview system in MLA0 view. WMA evaluated both cine display and extended cardiac analysis program. This program makes stroke volume (SV), ejection fraction (EF), paradox SV and paradox EF images in 30 sec. Tl failed to detect 9 of 27 small MI. WMA missed only 5 of same MI. Number of abnormal WM segments in 9 normal Tl pts. was 15. And abnormal Tl segments in 5 normal WMA pts. was 4. We conclude WMA is useful method to detect small MI than Tl.

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REST-EXERCISE RADIONUCLIDE ANGIOCARDIOGRAPHY AND REST-EXERCISE THALLIUM IMAGES IN THE DETECTION OF EXERTIONAL ANGINA. M.Oshima, Y.Koh, M.Akizada, S.Koseki and Y.Sugishita. Institute of Clinical Medicine, The University of Tsukuba, Ibaraki, Japan.

Supine rest-exercise (R-Ex) first-pass radionuclide angiocardium (RNAC) using by Baird-Atomic System 77 gamma camera and R-Ex thallium-201 myocardial images (201-Tl) were performed in 18 patients (pts) of exertional angina and no pts had a history of old infarction. Ex RNAC and Ex 201-Tl images were acquired using the bicycle ergometer in a supine position. All pts had an appearance of typical anginal pain and horizontal depression of ST segment during Ex. Pts were divided into 2 groups (Gp). Twelve (67%) Gp I pts demonstrated abnormal (abnl) Ex LVEF (a fall or within $\pm 5\%$ of resting value) and 6 (33%) Gp II pts had normal (nl) Ex LVEF (increase LVEF by 5%). In Gp I, all (12/12) pts had abnl regional WM and 9 (9/12) pts had abnl 201-Tl defects. In Gp II, 4 (4/6) pts had abnl regional WM and 5 (5/6) pts had abnl 201-Tl defects. Both studies were abnl in 10 (10/12) Gp I pts, in 4 (4/6) Gp II pts and were nl in 1 (1/18) pt. More than 2 segmental abnormalities were detected in 9 (9/18) pts by Ex WM, while in 6 (6/18) pts by Ex 201-Tl. In conclusion regional WM and 201-Tl during Ex were closely related to myocardial perfusion and the combination of both studies is an useful method for the detection of exertional angina.

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QUANTITATIVE EVALUATION OF SERIAL TL-201 MYOCARDIAL SCINTIGRAMS AFTER STRESS TESTING IN ISCHEMIC HEART DISEASE. Y.WATANABE, A.SAKAI, T.SHIOYA, T.SHIRAIISHI, A.KOBAYASHI, Y.TANAKA. KANSAI MEDICAL UNIVERSITY, OSAKA

Five normal subjects and 31 patients with IHD were studied by stress test, and Tl-201 was injected 1 min before the end of the test. Myocardial scintigrams in the three views were recorded 10 min, 1 and 2 hours (phase 0, 1 and 2) after the injection. The myocardial wall was geometrically divided into 5 segments. At the area where the count rate (Cts) was highest in phase 0 scintigrams, the washout rate from phase 1 to j was defined as $WR_{ij} = (\max Cts_i - \max Cts_j) / \max Cts_i$ where Cts_i denoted Cts at phase i in the relevant area. The redistribution index (Rd_{ij}) in each segment was defined as $Rd_{ij} = Cts_i \times WR_{ij} / (Cts_i - Cts_j) / Cts_i$, where Cts_i denoted Cts at phase i in the segment. The ischemic segment was identified as 70% or less of $\max Cts_0$, while the infarcted segment by VCG in phase 0 scintigram. Mean values of Rd_{02} in the normal, ischemic and infarcted segments were -6.1 ± 5.6 , 9.7 ± 7.0 and $3.5 \pm 7.2\%$, respectively, and the differences were statistically significant ($P < 0.001$). All the 26 anginal patients except one showed WR_{12}/WR_{01} greater than 1.0. When the peak pressure-rate product that attained at the test was 200 or more, it was significantly correlated with WR_{02} ($r=0.80$). In summary, the redistribution index was helpful in quantitative assessment of the ischemic segments. The finding of WR_{12}/WR_{01} after the stress was reliable in suggesting myocardial ischemia.