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EVALUATION OF LEFT VENTRICULAR FUNCTION IN PATIENTS WITH ARTIFICIAL PACEMAKERS USING MULTIGATED CARDIAC POOL IMAGING. S.Yamamoto, M.Okada, H.Matsushima, N.Kawai, I.Sotobata, Y.Tanahashi*, T.Maseki*, T.Ishihara*, T.Higo* and M.Takayanagi*. 1st Dept. of Intern. Med., Nagoya Univ. and *Nagoya Ekisaikai Hospital, Nagoya.

The influence of the pacing mode on left ventricular function was studied at rest and during exercise in 25 patients with an artificial pacemaker (9 with VVI, 7 with AAI, 7 with VDD and 2 with DDD) using multigated cardiac pool imaging.

Multigated cardiac pool imaging was performed at various pacing rates (70, 90, 100/min) in VVI and AAI, and at various PR intervals (50, 100, 150, 200 and 250 msec) and after converting to VVI mode in VDD and DDD.

In VVI and AAI modes, percent changes in end-diastolic volume (EDV) and stroke volume (SV) were -32% and -21%, respectively, while cardiac output (CO) remained unchanged with an increase in pacing rate from 70 to 110/min. In VDD and DDD modes, EDV and SV was maximum at PR interval of 150 msec and decrease after converting to VVI (-22% and -24%, respectively). As compared with the resting value, CO at the peak exercise increased prominently in VDD and DDD (+75%) ($P < 0.01$), and mildly in VVI and AAI (+25%) ($p < 0.05$).

In conclusion, multigated cardiac pool imaging was useful to select the pacing mode most suitable for individual patients.

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ASSESSMENT OF LEFT VENTRICULAR DIASTOLIC FUNCTION DURING EXERCISE BY EQUILIBRIUM MULTIGATED RADIONUCLIDE ANGIOGRAPHY.

-(1) ASSESSMENT IN HEALTHY ADULTS - H.Nakagawa, H.Sugihara, H.Adachi, H.Katsume, H.Ijichi and K.Okamoto. 2nd Dep. of Med. Kyoto Prefectural University of Medicine, Kyoto.

We evaluated left ventricular (LV) systolic and diastolic performance during multi-stage exercise in 13 healthy adults (mean age 38.2y.o) by supine ergometer using multiple indices derived from LV volume curve fitted for high order Fourier harmonics. (1) systolic indices; Ejection Fraction (EF) increased from 57±7% at rest (R) to 65±8% at 25w, and then reached to plateau. Peak Ejection Rate (PER) and Mean normalized systolic ejection rate (MNSER) increased stepwisely. (2) diastolic indices; Peak Filling Rate (PFR) increased and Time to PFR (TPF) became shorter. PFR/PER increased from 1.01±0.20 (R) to 1.23±0.20 (75w). 1/3 Filling Fraction (FF) decreased from 56±17% (R) to 30±8% (75w). 1/3 Mean normalized diastolic filling rate (MNDFR) showed a little increase from 3.1±0.5/sec (R) to 3.6±0.6/sec (75w). Rapid Filling Time (RFT) was shortened from 218±22msec (R) to 160±23msec (75w). Rapid Filling Fraction (RFF) increased from 77.8±5.6% (R) to 86.2±10.7% (25w), and then reached to plateau.

These results in healthy adults provide the basis for evaluation of LV diastolic performance during exercise in various heart disease.

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EVALUATION OF CHANGE OF CARDIAC FUNCTION BEFORE AND AFTER OPERATION IN AORTIC VALVE DISEASE - ASSESSMENT BY LEFT AND RIGHT VENTRICULAR EJECTION FRACTION AND LEFT VENTRICULAR VOLUME CALCULATED FROM RADIONUCLIDE RADIO-ANGIOGRAPHY - T.Uehara, T.Nishimura, K.Hayashida, T.Kozuka, K.Nakajima, K.Kawazoe, T.Fujita. National Cardiovascular Center, Osaka.

Left and right ventricular ejection fraction (LVEF and RVEF) and left ventricular volume were calculated from radionuclide cardio-angiography. Left ventricular end-diastolic volume (LVEDV) was calculated from gated cardiac pool scintigraphy by Simpson method and corrected by the experimental regression line. The materials are 23 cases of aortic valve disease. As the operation reduced the aortic regurgitation, LVEDV decreased remarkably and LVEF decreased slightly according to the reduction of volume overload. RVEF, which had been slightly low before the operation, returned to normal value after the operation. It seemed that RVEF had been low because of the oppression of enlarged left ventricle before the operation.

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RADIONUCLIDE EVALUATION OF HAND GRIP EXERCISE IN ISCHEMIC HEART DISEASE.

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81 patients with ischemic heart disease (59 myocardial infarction, 22 angina pectoris) were performed RI angiocardiology using hand grip exercise.

Left ventricular function measured by radionuclide ventriculography at rest and at hand grip exercise.

Patients were divided three groups by changes of LVEF at hand grip exercise. In reduce group, LVEF/LVET was significantly decreased, and Tl defect score and CAG score were significantly larger than the other groups. There are good correlation between LVEF and Tl defect score ($r = -0.596$ $P < 0.01$), difference of LVEF and CAG score ($r = -0.400$ $P < 0.01$).

These suggested that hand grip exercise was useful for evaluation of cardiac function in ischemic heart disease.