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MORPHOLOGICAL EVALUATION OF LV BY Tl-201 MYOCARDIAL SCINTIGRAPHY. H. Miyanaga, H. Adachi, H. Sugihara, H. Katume, H. Iijichi, Y. Torii, T. Watanabe, K. Matuoka Department of 2nd Internal Medicine, Kyoto Prefectural University of Medicine, Kyoto

To evaluate morphological changes of LV in various heart disease, Tl-201 MPI was performed in the 6 projections and long axis and radius of curvature was estimated. The long axis of the LV was calculated from the equation  $L = \sqrt{y^2 + z^2 \sec^2 \theta}$ , where y and z was the y and z vector of the LV long axis in the left lateral projection,  $\theta$  was the angle between left lateral and LAO projection which LV showed transit plane. The radius of curvature was calculated  $r = 1/2d/L^2 + (d/2)^2$  where d was the distance between midpoint of the arc AB ( upper polar A and lower polar B of the LV ) and straight line AB. 51 pts was estimated, 15 pts were control, 14 pts were RV overload ( PH=5, MS=5, ASD=4 ). 22 pts were LV overload ( MR=5, AR=9, CHF=8 ). The scintigraphically estimated long axis was well correlated with one estimated from cineangiography. The ratio of the short axis (D) and the long axis (L), (D/L), was higher in PH, ASD, CHF pts. AND the ratio of the radius of the curvature for the septal wall and for the free wall of the LV (rs/rp) was higher in RV overload groups. Thus the estimation of the long axis and radius of the curvature of the LV was valuable to morphological evaluation of the LV which seemed to be affected by pathological hemodynamic changes

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COMPARATIVE STUDIES ON LEFT VENTRICULAR PRESSURE AND VOLUME OVERLOADING WITH Tl-201 MYOCARDIAL SCINTIGRAPHY, ECHOCARDIOGRAPHY, ECG AND VCG. Y. Tsukahara, K. Owada, N. Awano, M. Kijima, K. Ono, S. Ebitani, S. Muroi, K. Machii, T. Uchida and S. Kariyone First Department of Internal Medicine, Fukushima Medical College, Fukushima

Comparative studies on the pattern of Tl-201 myocardial scintigraphy, echocardiography, ECG and VCG were performed simultaneously in 40 patients with left ventricular hypertrophy. LV area, LV uptake index and wall uptake ratio were measured in LAO view of Tl-201 myocardial imaging. The following results were obtained: 1) The three indices of Tl-201 scintigraph in AS and hypertension with pressure overloading were slightly larger than those of control group, and LV area barely correlated with LVd and LVEDV. In MR and AR with volume overloading, LV area was larger, and LV uptake index and wall uptake ratio were slightly larger than control. LV area and LV uptake index correlated with LV mass, LVd and LVEDV. LV area of pressure overloading group was larger than that of volume overloading group. 2) In idiopathic cardiomyopathy, wall uptake ratio of HCM was larger, and LV area and LV uptake index of HCM were slightly larger than control. LV area of CCM was larger, and LV uptake index of CCM was slightly larger than control, and wall uptake ratio of CCM was almost equal to that of control group. LV area of HCM was smaller than that of CCM, and wall uptake ratio and IVS/LVFW of HCM were larger than those of CCM.

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EVALUATION OF LEFT VENTRICULAR HYPERTROPHY BY THALLIUM-201 MYOCARDIAL IMAGING: EXPERIMENTAL STUDY. Y. Torii, H. Adachi, S. Fujitani, A. Kizu, M. Nakagawa, M. Ochiai, H. Iijichi 2nd. Dep. of Int. Med. Kyoto Prefectural University of Medicine

Thallium-201 uptake (TLUP) in tissue is mainly dependent on blood flow to tissue. The cellular affinity, however, is also an important factor to determine TLUP. We investigated the biological properties of Tl-201 in the left ventricular hypertrophy (LVH). LVH was produced by employing a constricting silver band around the ascending aorta in rats (n=6). The TLUP per gram of the cardiac muscle was compared with the blood flow the corresponded unit mass measured by Sr-85 labelled microspheres which were injected into left ventricle (LV) through a carotid artery.

In LVH, the LV weight was increased (48%), and was significantly correlative with TLUP (r=0.93) and with myocardial blood flow (MBF; r=0.85). The increase of TLUP in LVH was 21% compared with TLUP in LV of control rats, whereas that of MBF was 35%. These findings suggested that the TLUP in tissue is not always dependant on blood flow, and that in LVH the extraction of Tl-201 in the cell membrane was considerably affected.

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EVALUATION OF DEFECTS ON EXERCISE THALLIUM-201 MYOCARDIAL IMAGE BY XENON-133 CLEARANCE METHOD. M. Naka, K. Tsuji, H. Arai, M. Shibuya, M. Nagano and M. Inokuma\* Department of Cardiology and \*Department of Nuclear Medicine, Hanwa Hospital, Osaka

To clarify the characteristics of defects on exercise Tl-201 image, measurements of regional myocardial flow (r-MBF) in different conditions were performed repeatedly by using computerized multicrystal gamma camera (Autofluoroscope®).

Tl image in 60° LAO view was divided into eight zones, which were corresponded to Xe flow image in the same view. The estimation of flow distribution compatible with Tl image was based on r-MBF ratio (defect/normal).

In 38 patients with ischemic heart disease, 33 showed defects on Tl images immediately after exercise and they were classified into three groups when compared with delayed images; persistent (Da, n=11), increasing (Db, n=10) and redistribution (Dc, n=12) groups. At rest, r-MBF ratios were 0.74±0.10 in Da, 0.76±0.11 in Db, and 0.88±0.12 in Dc. During atrial pacing, r-MBF ratio to 0.77±0.12 in Dc (p<0.01). Such changes were not observed in the other two groups. After nitroglycerin administration, r-MBF ratios increased to 0.88±0.06 in Db and to 1.00±0.13 in Dc (p<0.01, p<0.05, respectively) and did not change in Da.

These results suggested that; 1) in redistribution group, the flow distribution might be deteriorated during increased oxygen demands, and 2) in increasing group, as well as in redistribution group, might be improved after nitroglycerin, which was not seen in persistent one.