

88

LONG-TERM ALTERATION IN INFARCT SIZE ESTIMATED BY THALLIUM MYOCARDIAL SCINTIGRAM AND ELECTROCARDIOGRAM. T.Sumiyoshi, M.Saito, K.Kanno, M.Kawataki, K.Haze, K.Fukami, K.Hiramori, K.Hayashida, T.Uehara, T.Kozuka. National Cardiovascular Center, Osaka.

To evaluate the long-term alteration in infarct size (IS) estimated by thallium-201 scintigram, in association with ECG changes, thirty-three patients with first myocardial infarction (MI) (22 anterior and 11 inferior) underwent thallium myocardial imaging 33 days and 2 years after infarction. IS was quantitatively analyzed by circumferential profile method, in 5 views, comparing with profile curves of 25 normal subjects (Tl-score).

By visual estimation IS were judged improved in 9 cases and unchanged in 22; reduction in Tl-score of the former was significantly greater than the latter ($p < 0.01$). Five patients with anterior MI showed ECG improvement (diminution of abnormal Q waves and/or R wave rising), whose Tl-score were reduced significantly compared with those who showed no ECG changes ($p < 0.05$). In contrast, 6 patients with inferior MI whose ECG were considered to be improved, reduction in Tl-score was not significant.

These results suggest that in anterior MI improvement of ECG indicates reduction of IS, but in inferior MI ECG improvement does not always imply IS reduction.

89

STUDIES ON THE EXERCISE-STRESS MYOCARDIAL SCINTIGRAPHY IN MYOCARDIAL INFARCTION. (SIGNIFICANCE OF PULMONARY ACTIVITY). Y.Kobayashi, Y.Goto, T.Abe, N.Akaba, S.Abe, N.Ikebe, T.Watanabe, Y.Nagai, C.Ibukiyama, K.Miyauchi*, K.Umeda*, The 2nd Dept. of Intern.Med. & Radiol.* Tokyo Med. College.

Exercise-stress myocardial scintigraphy (EXS), exercise-stress cardiac pool study (EXP) and acute phase ^{99m}Tc -PYP scintigraphy were obtained in patients with myocardial infarction, and the clinical significance of pulmonary RI activity was examined. Exercise was performed by supine, multi-step, submaximal ergometer test. One minutes before completing the exercise, ^{201}Tl was injected, and after 7 minutes, scintigraphy was taken at four projection, then the pulmonary uptake index was calculated from the pulmonary activity deviating by the upper mediastinal activity. EF, at rest and during exercise, was obtained from EXP with ^{99m}Tc -HSA injection. cardiac output was obtained by the dye dilution method and the cardiac volume was calculated. The infarct size was measured by the ^{99m}Tc -PYP scintigraphy at four projection, and the maximum one was evaluated. Pulmonary uptake index showed good correlation with EF at rest, volume change ratio during exercise, and the infarct size. So it may be useful index for the evaluation of the cardiac function with myocardial infarction.

90

SIGNIFICANCE OF MEASUREMENT OF LOCAL MYOCARDIAL THICKNESS AND OBSERVATION OF MYOCARDIAL MOTILITY. A.Asahara, C.Kanehira, Y.Honma, Y.Oasa, S.Tachibana, M.Togin, K.Kaneko. Central Hospital of J.N.R. Tokyo.

With the myocardial image using Tl-201 and the image of the heart blood pool using Tc-99m which was recorded with same posture, myocardial thickness was extracted semi-automatically. Technical studies on experiments using phantom to establish criteria for clinical application were done. The data obtained showed a wide range including thickness change (myocardial thickness curve) associated with contraction and the phase distribution showing a maximum myocardial thickness. These results and volume curve, phased analysis, etc. were contrasted to study significance in clinical application.

In this report, clinical cases analyzed using this method were mainly reported. There were cases that myocardial images were seen visually as myocardial hypertrophy, but could not be said always to be a myocardial hypertrophy when measured. There was another case that a local myocardial hypertrophy was observed. Thus the measurement of myocardial thickness would have a clinical significance.

It is not a easy way to detect an exact edge correctly out of nuclear image. In the present study, the myocardial image was extracted semi-automatically. By this method the myocardial thickness could be directly measured and the myocardium was anatomized. An extensive observation of the cardiac function was made available and effective data could be obtained.

The present method, therefore, can be promising for clinical application.

91

SCINTIGRAPHIC EVALUATION OF THE LEFT VENTRICULAR HYPERTROPHY BY COMBINEC TECHNIQUE WITH GATED PLANER TL-201 IMAGE AND GATED POOL IMAGE. K.Nakai, K.Matsushita, A.Kawamura, M.Kato, S.Katsuragawa*, T.Takahashi*, T.Yanagisawa*, The 2nd Dept. of Int. Med. and Radiology*, Iwate Medical University, Morioka

To evaluate the left ventricular (LV) hypertrophy, combined technique with gated planer TL-201 image and gated pool image was applied to 26 patients -6 hypertrophic cardiomyopathy (HCM), 6 asymmetrical apical hypertrophy (ASH), 1 HCM & LV dilatation and 12 hypertensive heart disease (HHD)-. It had been demonstrated that the wall thickness in LV septum and LV posterior was $>13\text{mm}$ in echocardiography and ST-T abnormalities were showed in the electrocardiography in these patients. Each TL-201 images were subtracted by using threshold's method on the detection of the outer edge and Laplasian's method, as was defined by cardiac pool image, on the detection of the inner edge. Hypertrophic pattern on reconstructed TL-201 image was represented qualitatively by a "count ratio" and "length ratio". Cardiac performances determined by gated pool image were also demonstrated. It was very interesting that abnormal perfusion was shown in patients with HCM with LV dilatation, whereas symmetrical hypertrophy was observed in echocardiography.

This technique provides useful information for qualitative evaluation of the LV hypertrophy and cardiac performance.