

(HOCM), 6 cases of hypertrophic non-obstructive type (HCM) and 9 cases of congestive type (CCM) and 5 normal healthy subjects, were chosen for this study.

On 30°LAO view, thickness of septal and LV free wall were assessed by two methods, i.e. direct measurement on Polaroid film and calculation from profile through the mid point of LV long axis. Relative myocardial activity (RMA) was calculated by following equation,

$$RMA = \frac{Au(LV) - Au(Lung)}{Au(Lung)}$$

A Basic Study on Clinical Use of Tl-201 Myocardial Scintigraphy

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Myocardial imaging with Tl-201 and a scintillation camera was studied experimentally using specially designed phantoms and clinically in 23 patients with myocardial infarction or other heart diseases. Then, the following results were obtained:

1. Images of the converging collimator at the 75-keV photopeak revealed considerably higher accumulative count-rate and relatively higher quality than those of the other detecting conditions.
2. It was necessary to take images as many as possible in various projection, in order to detect the location and size of the myocardial ischemic lesion, because the lesion was demonstrated as defect clearly only in profile.
3. On the basis of observation of serial images after injection, it was evident that the images

where, Au indicated mean counts per unit area.

In summary, 1) RMA was higher in ICM group as compared to normal subjects. In one case of CCM group with recurrent history of congestive heart failure, RMA did show definitely lower value. 2) Septum to LV free wall thickness ratio was higher in HOCM group than other types of ICM and normal subjects, but not as much higher as reported by others.

taken between about 25 min. and about 90 min delineated the myocardium more clearly than those in the other period.

4. Normal images taken in 8 patients without ischemic heart disease appeared in the shape of doughnut or horseshoe, demonstrating mainly the left ventricular myocardium. In addition, the image was faint in the region of the aortic or mitral valve and thin in the region of the apical wall. On the other hand, the image of the right ventricular wall was sometimes recognized faintly.

5. In 11 of 12 patients with old myocardial infarction, the location and size of the lesion was detected sufficiently by this examination, compared with the findings of the electrocardiogram.

Study on Scintigraphy in Myocardial Infarction with ^{99m}Tc-PYP and ²⁰¹Tl-Cl

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We examined myocardial infarction with ^{99m}technetium stannus pyrophosphate (^{99m}Tc-PYP) scintigraphy and thallium-201 (²⁰¹Tl-Cl) scinti-

graphy. Twenty six patients (4 women, 22 men) were examined. The age range was from 42 to 72 years old (mean: 58 years old.) Standard 12-

lead electrocardiography and serial serum enzyme determinations were performed after admission and diagnosis of anteroseptal myocardial infarction was made in 21 patients, inferior myocardial infarction in 5 patients. Myocardial scintigraphies were performed approximately 5, 30, 180 and 360 minutes after the intravenous injection of 12 mCi (0.2 mCi/kg) ^{99m}Tc -PYP, and on the other day, 5, 40 and 120 minutes after the intravenous injection of 1.5 mCi ^{201}Tl -Cl. Myocardial scintigrams were obtained in three or four different views, using scintillation camera (Picker Inc. Dyna Camera 3 C).

Thirty seven ^{99m}Tc -PYP myocardial scintigraphies were performed from 2 to 42 days after myocardial infarction in 22 patients.

The myocardial scintigrams were graded as

positive, questionable and negative. The data obtained in this study showed that the optimal time for ^{99m}Tc -PYP scintigraphy was from 3 to 6 hours after the administration. ^{99m}Tc -PYP imaging was visualized within 14 days after the onset of myocardial infarction, and then returned to normal. The patients with positive, questionable ^{99m}Tc -PYP myocardial scintigrams had peaked serum enzyme 2 times as much as negative group. The optimal time for ^{201}Tl -Cl scintigraphy was from 40 minutes to 2 hours after the administration. ^{201}Tl -Cl scintigraphy had the high degree detection of acute or old myocardial infarction.

^{99m}Tc -PYP scintigrams are visualized as positive images only in acute phase and ^{201}Tl -Cl scintigrams as negative both in acute and old myocardial infarction.

^{201}Tl Scintigraphy of Heart Diseases

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Eleven cases without myocardial infarction and 15 with myocardial infarction were given intravenous injection of 1.5–2.0 mCi of ^{201}Tl , and the images were taken with a PHO/gamma HP camera connected to the color display apparatus CDP-1. Regions of interest corresponding to the myocardial and non myocardial regions were selected with CDP-1. In the anterior view of the scintiphotos in non infarction cases, the left ventricular wall appeared as U or O or solidovoid in shape, indicating a decrease of the activity at the apex. In the cases of suspected cardiac amyloidosis, atrial septal defect and mitral with tricuspid insufficiency, the right ventricular wall as well

as the left ventricular wall was delineated. The anterior wall infarction revealed decreased activity in the anterior, left anterior oblique and lateral views. The posteroinferior infarction was displayed in the anterior and left lateral views. The ratio of activity of normal region to infarcted region was 1.46 and that of normal to the lung and that to the ventricular cavity were 3.12 and 1.50 respectively. The ratio of the infarcted region to the lung and that to the ventricular cavity were 2.21 and 1.05 respectively. Hence in evaluating the myocardial imaging subjectively, more accurate findings can be attained from the ratios of cardiac muscle to lung.