

### **<sup>201</sup>Tl Myocardial Scan:**

#### **(I) Evaluation of Scanning Condition and Early Organ Accumulation**

H. BUNKO\*, N. TONAMI\*, K. HISADA\*, M. MATSUDAIRA\*\*, S. MATSUMOTO\*\*,  
M. SHIMIZU\*\* and M. YAMADA\*\*

*\*Department of Nuclear Medicine, Kanazawa University Hospital, Kanazawa, 920 Japan*

*\*\*Division of Radioisotopic Service, Central Radiologic IService,  
Kanazawa University Hospital, Kanazawa*

<sup>201</sup>Tl enables myocardial scan by incorporation into normal myocardium as same physiological behavior as potassium ion. <sup>201</sup>Tl has suitable energies for gamma camera and half life for clinical investigation, and is thought to be most promising myocardial scanning agent. We investigated <sup>201</sup>Tl scanning condition in the viewpoint of collimators, energies and windows with liver slice phantom. In twenty-one patients (7 myocardial infarction, 9 IHD without infarction and 5 cardiac patients other than IHD and normal volunteers), early organ accumulation up to 10 minutes after I.V. injection, and early (immediately after 10 minutes of flow study) and delayed (45–60 minutes postinjection) organ accumulation changes were evaluated with GCA 401 gamma camera-computer system.

The phantom study showed best results in 80 KeV photopeak with 20% window width in low energy collimator. In clinical study, each organ showed little change after 3–4 minutes postinjection. Kidney showed highest activity, and next to kidney were following order as normal myocardium, spleen, liver, infarcted myocardium and

lung. Early infarcted /normal myocardial (MI/NM) accumulation ratios were around 0.8. Delayed / early ratio in normal myocardium was 1.03 (mean) and in infarcted myocardium was 0.90 (mean). This was well correlated with change of NI/NM ratio from 0.78 (early) to 0.74 (delayed). Organ/normal myocardial accumulation ratio in lung, liver and spleen decreased according to time resulting better contrast in delayed scan.

Blood disappearance of <sup>201</sup>Tl was two exponential: 2.5 minutes (rapid phase) and 54.7 minutes (slow phase). Effective half life of <sup>201</sup>Tl in whole body measured by linear scan was  $2.22 \pm 0.46$  days, and whole body radiation dose was estimated to be about 160 mrad/mCi.

<sup>201</sup>Tl myocardial scan taken from 5 minutes after I.V. injection delineated normal myocardium as O and/or U shaped uniform activity and infarcted myocardium as a clear area of decreased activity. Mediastinal activity always showed lowest activity, resulting good contrast myocardial scans.

### **<sup>201</sup>Tl Myocardial Scan:**

#### **(II) Usefulness of Six View Images and Its Diagnostic Criteria**

H. BUNKO, N. TONAMI and K. HISADA

*Department of Nuclear Medicine, Kanazawa University Hospital, Kanazawa, 920 Japan*

Recently there appeared many reports according to usefulness of <sup>201</sup>Tl myocardial scan. However, scanning views and techniques were still variable from laboratory to laboratory. We made it a rule to take 6 view images to evaluate localization of area of abnormally decreased activity and its nature in rest <sup>201</sup>Tl myocardial scan. Six view images included anterior, LAO30°, LAO60° left

lateral, RAO30° and delayed LAO30° views. These were taken from 5 minutes postinjection in order as above mentioned. Delayed LAO30° views was usually taken from 45 minutes to 60 minutes postinjection. Forty patients were included in the study (14 patients with myocardial infarction, 6 patients with angina and those suspected of having infarction, 11 patients with IHD other than above