

## Scintigram and Scintiphoto of the Active Bone Marrow in Various Hematological Diseases

K. FUJIMORI, N. KURA, M. SATOH, S. KARIYONE and G. WAKISAKA

*The First Division, Department of Internal Medicine,  
Faculty of Medicine, Kyoto University, Kyoto*

The bone marrow can be visualized with radioactive colloid which is phagocytosed by the reticuloendothelial cells.  $^{99m}\text{Tc}$  sulfur colloid was prepared according to the method of Nelp et al. The yield of the colloid was about 90%.  $^{99m}\text{Tc}$  sulfur colloid was given intravenously, and bone marrow scintigram was obtained with  $\gamma$ -ray scintillation camera. When the colloid was injected intravenously into rats, 70% or more was recovered from the liver and 15~20% from the bone marrow.

Plasma clearance of  $^{99m}\text{Tc}$  sulfur colloid in man was composed of three exponential factors. In the first phase, it was rapidly cleared from the circulation ( $T_{1/2}=1-3$  minutes). Only 10% of the injected radioactivity had remained in the blood 10 minutes after administration. Urinary excretion within the first 24 hours after injection was less than 4% of the injected radioactivity.

Resolution of scintillation camera tested with line and spot phantom was satisfactory. The details of scintiphoto in pelvic bone marrow by camera were sometimes more valuable than scintiscanner's.

After the intravenous injection of about 5 mCi of  $^{99m}\text{Tc}$  colloid, the scanning procedure was commenced after a half hour, in the order of the pelvis, limbs, midtrunk region and

skull. The active bone marrow was normally found in the pelvis, proximal ends of femurs and humeri, sternum and skull. A high uptake of colloid in the liver and spleen prevented visualizing marrow in the upper lumbar and lower thoracic spine. In the skull, there was visualization of the salivary gland which made difficult to distinguish the active marrow.

When radioactivity of the normal pelvic bone marrow was distributed with 1600 channel analyzer on  $40\times 40$  matrix, higher activity was found in lower lumbar spine, sacrum and femoral heads.

The scintigrams of patient with chronic myeloid leukemia had shown some expanded marrow extending into distal femur, proximal and distal tibia and bones of foot. In aplastic anemia, marrow uptake decreased in general. Particularly, lack of activity in the sacrum was found corresponding to low activity of surface counting on sacrum by the ferrokinetics.

It is concluded that bone marrow scanning is a useful technique to visualize the active bone marrow which offers the valuable information for understanding the patient's hematopoietic status.

## Studies of Whole Body Counting after Administration of Radioisotope on Various Hematological Disorders. Report. II.

N. KURA, K. FUJIMORI, Y. INAMOTO, S. KARIYONE and G. WAKISAKA

*The First Division of Internal Medicine, Faculty of Medicine,  
Kyoto University, Kyoto*

In our previous study, the basic problems for the application of our whole body counter on hematological investigation was already re-

ported. In this paper, some of the significant results on the measurement of iron absorption ratio, the quantitation of iron loss from body