

The patient's ACD-anticoagulated blood was centrifuged and 7—8ml of plasma was sterilely removed. One to three mCi of  $^{99m}\text{Tc}$  was added to 3 ml of packed red cells and incubated for 5 min at room temperature. A freshly prepared solution containing 10  $\mu\text{g}$  per ml ACD of stannous chloride was added to the red cell suspension and the mixture was incubated for 5 min at room temperature. The labeled cells were washed three times in isotonic saline and re-suspended in patient's own plasma. The labeled blood cells were incubated at  $49\pm 0.5^\circ\text{C}$  for 10 min and infused into the patient.

Radioactivity of administered labeled red cells was accumulated in the spleen. No radioactivity in the stomach, thyroid gland, liver, intestine or lungs is noted. A small amount of radioactivity in the kidneys is found to be neglected by the three-times washes of labeled cells. There was a significant correlation

between the spleen size obtained from  $^{51}\text{Cr}$  and  $^{99m}\text{Tc}$  labeling method ( $r=0.99$ ,  $p<0.01$ ).

In this study, we used the same volume of packed red cells and plasma in patients with various hematological states. Red cells re-suspended in patient's own plasma instead of isotonic saline were damaged in water bath, which prevented the hepatic image sometimes seen in Eckelman's method.

The advantages of  $^{99m}\text{Tc}$  method were the low radiation doses to the spleen (430 mili-rad per 1 mCi) because of short half life of  $^{99m}\text{Tc}$ , which makes it possible to repeat the investigation after a short time period or do the other hematologic examination such as ferrokinetic studies or red cell survival studies at one time. We could get an excellent images even in cases of extreme splenomegalies. Images by the scintillation camera could be easily obtained.

## Quantitative Assessment of the Active Marrow Distribution by Scintigraphy Using I-131 UdR and Tc-99m Sulfur Colloids for Comparison of Hematopoietic and Reticuloendothelial Elements

Y. TAKAHASHI, K. AKASAKA,

*Hematology Division, Tenri Hospital*

K. SATOH

*Radiology, Tenri Hospital.*

T. MUKAI

*Central Laboratory of Radiology, Kyoto University*

In order to examine the coincident distribution of two cell elements, hematopoietic and reticuloendothelial ones, in the bone marrow, quantitative assessment was carried out in two ways in this report by scintigraphy using I-131 UdR, iododeoxyuridine, and Tc-99m

sulfur colloids.

This double label procedure and scintigraphy were achieved in the same manner as previously reported. Measurement and comparison of two nuclides activity were done in the following two ways.

In the first one, the exposure was made with a PHO/GAMMA H.P. scintillation camera on the 35mm photofilm over several "marrow areas". Nine to fifteen portions were recognized and selected in the scintigrams and their radioactivities were measured by densitometric technique in the unit corresponding to a circle unit of 3.2cm diameter.

In the second method, the data were collected in a 1,600 channel analyzer in order to carry out the procedure in the element unit of 1600 channel matrix (0.67×0.67cm) within one camera area. With the aid of computer procession, the 'active marrow' elements were discriminated from the 'back ground' ones according to Tc-99m activity level. The net I-131 activity of those selected marrow elements were calculated by subtraction of average I-131 value in the back-ground elements and rendered to comparison with Tc-99m activity. As the quantitative index, the correlation coefficient and regression coefficient of I-131 to Tc-99m were calculated.

In two controls, the correlation coefficient

by the first method was 0.977 and 0.872 with the regression coefficient of 0.856 and 0.577 respectively. Out of 29 studied cases, the r value was over 0.9 in 12 cases, between 0.8 and 0.9 in 9 and below 0.8 in 8 cases. In the second method their value in the posterior pelvic area was 0.779 and 0.782 in the two controls, between 0.7 and 0.9 in 7 cases and below 0.7 in 7 cases. In one case with primary myelofibrosis, the r value in the pelvis was 0.512, 0.545 in the sternum and 0.140 in the knee area, while it was 0.728 in the myelometaplastic spleen.

The first method deals with relationship among several distant marrow positions and has the microscopic character for general survey, while the second one with rather microscopic nature deals with those within a single camera area and is considered to be suitable for detecting the dissociation more sensitively. These two methods of quantification for comparison should therefore be evaluated to be supplementary to each other.

## Lymphoscintigraphy

M. MIKI, S. KARIYONE, and G. WAKISAKA

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

### 1) Tc-99m-sulfur-colloid,

Lymphoscintigraphy using Tc-99m-sulfur-colloid has been reported in order to avoid the radiation injury at the site of injection instead of using Au-198 colloid. Two-3 mCi of Tc-99m-sulfur-colloid was subcutaneously injected on the back of the feet for the lymphoscintigraphy of inguinal-retroperitoneal lymphnodes groups, and 1-2 mCi for axillary nodes groups and 1-2 mCi for cervical nodes

groups.

Tc-99m-sulfur-colloid accumulated into the normal lymphnodes about 1 hour after injection but did not accumulate into the involved lymphnodes. It took 2-3 hours for scintigraphy after injection, but muscle movements shortened the period from injection to scintigraphy.

Involved lymphnodes and groups showed images of absence or interruption, marked