

Clinical Value and Limit of Radioisotope Scanning

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Subject 8) Bone and bone marrow.

Bone studies are omitted in this report and bone marrow studies are presented from hematologic point of view.

Bone marrow cannot be visualised by X-ray. Some people use radioactive colloid for bone marrowscanning.

However, the most of it is taken up by the liver and wasted. Moreover, radiocolloid distributes in RES and does not always represent hematopoietic tissue, although the distribution of RES and hematopoietic tissue has some similarity. In contrast to radiocolloid, radioiron shows the place of erythropoietic bone marrow. However, area scintigram has shortage, since the distribution of bone marrow cannot be visualised in case poor ^{59}Fe utilization, such as in Hypoplastic anemia, hemochromatosis and etc. Using the Ring Type Total Body and Quantitative Body Section Counter having 4π moving bed geometry, we were able to visualise even in poor ^{59}Fe utilization. ^{59}Fe utilization immediately after

iv injection, 6~24 hour distribution (small amount in bone marrow, mostly in storage in poor utilization), and 15~20 day distribution (small amount in RBC, mostly in storage). By the subtraction of ^{59}Fe -RBC distribution curve, obtained from the zero time curve lowered proportionally to % utilization figure) from storage plus RBC distribution curve of 15~20 days, we obtained storage only curve. This storage curve in subtracted from bone marrow plus storage curve of 6~24 hours and then bone marrow only curve was obtained.

Thus obtained curves of hypoplastic anemias showed d'arrangement of distribution of bone marrow and the curve in hemochromatosis showed normal pattern of bone marrow distribution.

The above described method visualizes not only the bone marrow of hyper- and euplastic and also that of poor utilization. Therefore this procedure expanded the technique of bone marrow beyond the limit of area scintigram developed so far.

Clinical Utility and Limitation of Bone Scintiscans, Especially of Osteomyelitis

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Not a few reports of the studies on the application of ^{85}Sr to the diagnosis of bone disease have been made. There seems, however, to be necessary for further studies with regard to the clinical utility and limitation of bone scintiscanning.

In this paper, serial scans have been obtained from the group of patients included primary and metastatic bone tumors, acute and chronic osteomyelitis and miscellaneous bone

disorders with clinical evaluation, and an attempt was made to correlate the scanfindings with clinical findings present.

An intravenous ^{85}Sr dose of $1\ \mu\text{Ci}$ per kg of body weight was administered and scanning was began 24 hour—48 hour after injection. A photoscanning device with a 37 hole lead honey-comb collimator and a $3'' \times 3''$ sodium iodine crystal was employed for both profile scanning and area scanning.