

An Attempt at Diagnosing and Evaluating the Therapeutic Course of Metabolic Bone Diseases by Means of RI

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Bone scanning was performed on patients with osteomalacia as well as on those patients who were under treatment following the surgical removal of adenomas done under the diagnosis of primary hyperparathyroidism. Interesting findings thus obtained are documented in this paper.

Method

These patients were investigated for RI concentration in bone tissues immediately after the intravenous injection of RI using Pho/Gamma scinticamera and the data were analyzed by means of an RI data processing apparatus. Three hours after the intravenous dose of RI whole body

scans were made by the use of an SCC 750 W whole body scanner.

Results

(1) The value m just after the intravenous RI dose was calculated from the equation $C=kt^m$ according to the power function program. Patients with hyperparathyroidism were found to give a higher value than healthy subjects.

(2) Abnormally high RI concentrations in the skull and a generalized increase in RI accumulation in bone tissues were noted in common in bone scintigrams of patients with hyperparathyroidism.

Abnormal Unknown Accumulation of the Chest in Bone Scintigram

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67 entire bone scintigrams (^{99m}Tc -diphosphonate) were performed in 30 cases with hemiplegia caused by apoplexia. In 4 cases (5 scintigrams) of all, abnormal focal-spot accumulations were found in the chest scintiphoto, failed of abnormal chest rentgenogram (these would probably be accumulation in rib). All these accumulations were not necessarily localized in diseased side only,

and were not found on the scintigram which was taken two to seven months later. The value of serum alkaline phosphatase, and of calcium and phosphorus in serum and urine remained to normal in these four cases. It is suggested that these are neither bone metastasis of malignant tumor nor what caused by technical failure in preparation.

Scintigraphic Findings of Rheumatoid Arthritis

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A comparative study of joint and bone scans made in a series of rheumatoid arthritis patients is reported. Subjected to this study were 240 joints from patients with stage I to IV classical or definite RA in accordance with the classification system of the American Rheumatic Association.

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Results: Of the entire joints scanned, 66 (or 27.5%) gave positive joint and positive bone scans, 102 (42.5%) provided negative joint and negative bone scans, 27 (12.7%) yielded positive joint and negative bone scans, and 44 (18.2%)

gave negative joint and positive bone scans. A study of scans in relation to X-ray findings showed that 29 joints (12.0%) gave a negative X-ray finding in association with a positive joint scan, while 17 other joints (7.9%) did the same in conjunction with a positive bone scan; a positivity of X-ray finding was associated with a negative joint scan in 35 joints (14.5%) and with a negative bone scan in 41 (17.0%).

From these results the following conclusions might be drawn: (1) scintigraphy can detect a

lesion in those stages during which there are no appreciable changes noted on X-ray; (2) joint scan was positive in a higher percentage of cases than bone scan in those stages during which X-ray failed to demonstrate any distinct changes; (3) X-ray evidence of bone destruction does not necessarily implicate an active disease process in the affected locality unless abnormal RI accumulation is demonstrated on scan; (4) this series, when taken as a whole, exhibited a reasonably high percentage of positivity of bone scan.

Application of Bone Scintigraphy to Heterotopic Ossification

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Bone scintigraphy is one of the useful examinations for early diagnosis, analysis and therapy of heterotopic ossification. We applied to 3 cases of heterotopic ossification, which were myositis ossificans circumscripta, CO poisoning and encephalitis, with ^{99m}Tc -pyrophosphate or ^{99m}Tc -diphosphate. Then we analyzed clinical symptoms, X-ray findings, treatment and pathological findings. Ossification was found in each case in left knee, bilateral hip joints and right elbow joint, and increased uptake on scintigraphy.

In myositis ossificans and CO poisoning, ossified tissues were resected after uptake and activity of ossification decreased. The case of right hemiparesis due to encephalitis showed contracture of right elbow joint and ulnar nerve paresis, so translocation of this nerve was made before uptake diminished. But accumulation in this case was normalized gradually. We reported the significans of bone scintigraphy to 3 cases of heterotopic ossification, and analyzed clinical findings, X-ray findings and pathological findings.

Paralysis of Extremity and Bone Scintigram

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Scintigrams of entire bone were obtained by ^{99m}Tc -Phosphate. Patient limbs were paralysed motorically owing to cerebrospinal disease.

Accumulation of the isotope was elevated in diseased side compared with healthy side.

Osteoporotic findings on X-ray film were correlated to some extent to scintigraphic findings. Accumulation of the isotope seemed to increased in relation to the grade of paralysis. The isotopic findings seemed to reveal earlier X-P findings.