

And we compared their results with 58 cases with Tc-99m-pyrophosphate. Giving 10 mCi of Tc-99m-diphosphonate intravenously in adult cases we observed the state of accumulation in bone. After 3 hours we took 1/5 minisize scintigram of whole body and life size scintigram of bone lesion by S.C.C. 750W whole body scanner.

Results were as follows;

1. In the early period (about 5 minutes to 10 minutes after), the accumulation to the normal part reached plateau but that of the affected part was apt to increase.
2. After one hour, the activity of RI in the blood decreased less than 10%.
3. To get the good picture that has little

background, it is good method that begins the scanning after intravenous injection, more 2 hours after. In spite of this method, we got the high background scintigram in 12% cases.

4. We could not take notice of the particularity of the image every diseases.
5. Although we took scintigrams after urination, the observation of pelvic bone needs notice because the high accumulation to kidney and urinary bladder.
6. We could not notice of the evident relative merits of Tc-99m-diphosphonate between Tc-99m-pyrophosphate.
7. Remarkd above, there are some problem but this is superior radioactive preparation.

Scintigraphical Studies of the Bone Using ^{99m}Tc-Pyrophosphate and di-Phosphonate

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67 cases in our hospital, having the possibility of the primary or metastatic bone tumors, were performed the whole body mini-scan after intravenous injection using 10mCi of ^{99m}Tc-pyrophosphate or di-phosphonate. Also, scintigraphic differentiation between scinti scan-photos. and camera images were compared. The both radiopharmaceuticals were obtained from Dainabot RI Lab. Ltd..

In 67 cases, the positive finding cases on the roentgenogram and scintigram were almost similar ratio as approximately 25%. However, we were convinced that in the cases of multiple accumulation of radiopharmaceuticals, the possibilities of the metastatic bone tumors, were approximately 8 times by the method of

scanner images than that of the roentgenograms. And the scintiscann and camera images of the bone metastatic tumors were appeared relatively earlier than the observation of that of the roentgenograms.

And further examinations, adding to the clinical observation, were done as follows. About 50% of the both radiopharmaceuticals were cleared from the blood within 30-60 minutes and also urinary excretion was proved to be about 50% within 2-3 hours in our experiments.

In some cases, the scinticamera images were clearly revealed the metastatic tumors with ribs than that of scintiscan. We were considered that the figures of scinticamera image were

much better than that of scintiscan, due to the differences of the operating time in both methods. From these result, the best appearance time was at 3-4 hours after intravenous injection of both radiopharmaceuticals. And it was less images of the liver, spleen, and others. Comparatively, the use of the both radiopharmaceuticals in the diagnosis of the

primary or metastatic bone tumors were very valuable. Furthermore, we were considered that these examinations were very safety, inexpensively and perfectly visualized the abnormal finding. Adding, the radiation dosages to the practitioners and patients were much lower than that of the roentgenographical procedures.

Diagnosis of Carcinoma of the Prostate with Bone Metastasis: 5 Hours Urinary Excretion Test of ^{99m}Tc -Labeled Pyrophosphate

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Bony metastasis of thirty six cases with prostate cancer, being proved histologically, was studied by both bone scanning and radiography. In addition, thirteen cases was determined urinary excretion rate for five hours after ^{99m}Tc -labeled pyrophosphate injection.

The bone scanning was performed three hours after injection of 10 mCi of ^{99m}Tc -labeled pyrophosphate using minified whole body scanner (Shimadzu) and life size rectilinear scanner (Graphic-Abbott) in the interesting regions.

Age of the patients studied was ranged from 57 years old to 84, with a mean age of 72.6 years old.

Cases examined were classified into five groups according to the spreades of metastases; stage 0 stands for no metastasis proved, stage I for metastases to the pelvis and/or lumbar spine, stage II for thoracic spine and/or thor-

acic cage other than stage I, stage III for cranial region or lower extremities besides stage II, and stage IV means metastases to the bones throughout the body.

Calculation of urinary excretion rate was made as follows:

$$\begin{aligned} &\text{urinary excretion ratio (\%, 5hrs)} \\ &= \frac{\text{urine count}}{\text{standard count}} \\ &\quad \times \frac{\text{mCi of standard}}{\text{mCi of administration dose}} \times 100 \end{aligned}$$

Normal range of urinary excretion rate was indicated $49.9 \pm 3.5\%$ /5hrs for adult (mean age of 35 years old) and $29.9 \pm 1.9\%$ /5hrs for the aged (mean age of 68.5 years old).

Stagings both by bone scan and by radiography were found to be equal in twelve-three cases (63.9%). Only one case with normal bone scan showed abnormal radiography which is most probably benign osteosclerosis.