

X-rays were ribs (7 cases), sterns (5 cases), skulls (3 cases) and others.

Conclusion: In this study, I have investigated the use of Tc-Po or Tc-Py bone scanning in an attempt to find a more accurate method for the early detection of osseous metastases from prostatic carcinoma.

The results of my study suggest that the Tc-Po or Tc-Py bone scan is more sensitive than the

skeletal radiograph in the detection of metastases from carcinoma of the prostate. I feel that Tc-Po or Tc-Py bone scan is a more valuable diagnostic parameter than roentgenograph, serum acid phosphatase and serum alkaline phosphatase in managing patients with prostatic carcinoma. However, there remains the problem that Tc-Po or Tc-Py bone scan is not specific to bone metastases from prostatic carcinoma.

Indication and Availability of Bone Scintiscan on Diseases of the Pelvis

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In pelvis variety of bone disorders is encountered, and as diagnostic measurement besides roentgenogram, bone scintiscan has been utilized in many occasions.

This paper deals with review on the extent of indication and availability in the bone scanning.

In our clinic, the bone scintiscan has performed in total of 925 cases with 1104 times since 1968 to 1973. Based on our experience from these scanning, some characteristic features on several diseases of the pelvis including hip joint were analysed.

In this series as bone seekers, ^{85}Sr (20 to 100 microcurie) was used in earlier period, and in later period $^{87\text{m}}\text{Sr}$ (0.3 to 3 millicurie) has been used since 1969. Recently $^{99\text{m}}\text{Tc}$ pyrophosphate (2 to 12 millicurie) has been also used.

The scintigrams were obtained through conventional scanner equipped with 3 inch diameter crystal and scinticamera. The scintigraphic data were superimposed roentgenogram obtained by 2

meter focus distance and localization of radioisotope uptake was studied.

The information obtained from scintiscan on skeletal metastasis of malignant tumor, has several advantages as previous reports already pointed out. Of these, the availability for confirmation of roentgenographic finding is most valuable which is recognized again recently. For example, when bone metastasis is suspected by roentgenogram with positive scanning then diagnosis is reliable, and with negative scintiscan result is false. The rate of detection for bone metastasis by scintiscan is indeed quite high.

In primary malignant bone tumor, scintigram has significant value for diagnosis on extent of its bony infiltration rather than its type and quality.

In benign bone tumor, except for some cases, there note no characteristic findings on scintigram.

In degenerative coxarthrosis, scintigram has different and specific findings according to each

stage of the disease, and so has value for estimation of progression and prognosis of the disease.

Serial follow up scintigrams of post-operative cases such as intertrochanteric osteotomies have special value to determine prognosis and assessment after surgical procedures.

By scintigram for osteomyelitis, one can also obtain useful information especially for follow up study during healing process.

There has no characteristic findings on Legg-Perthes disease.

In osteonecrosis of femoral heads, specific findings are observed in all cases accordingly by stages of the disease. Especially in early stage, the diagnostic value of scintiscan is significantly high, thus it can provide quite useful information in qualitative and differential diagnosis.

Diagnosis of the Ischemia in the Femoral Head Using Catheter Semiconductor Radiation Detector

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The clinical diagnosis of avascularity of the femoral head is routinely made by roentgenographic examination, especially by intraosseous phlebography which is concerned primarily with venous drainage. It has been thought if measuring arterial blood flow in the femoral head is routinely possible that it must be valuable for clinical evaluation diagnostically and prognostically.

The radioisotope used in those studies was $DF^{32}P$ which was blood seeking pure beta emitter. In order to detect the radioactivity in the femoral head in vivo, a catheter semiconductor radiation detector which is sensitive to beta radiation and small enough was inserted into the femoral head. Approximately five minutes before the counts were taken, five microcuries of $DF^{32}P$ per kilogram of body weight was intravenously injected, then the counts were recorded at the head, the neck and the trochanter.

Results were as follows;

- 1) The counting rates recorded at the femoral heads of normal dogs were directly proportional to the blood flow rates in the abdominal

aorta.

- 2) The counting rates recorded at the femoral heads of human normal controls increased rapidly for first few minutes, and a plateau was reached in five minutes or so.

The counting rates recorded at the each portion of any normal control were almost equal. The head-to-trochanter ratios were approximately 1.0 in the four cases.

- 3) In the ten hips of the nine patients with idiopathic avascular necrosis, the head-to-trochanter ratios of counts per minutes were correlative to pathological changes in the portions, i.e., the ratios of 0.15 to 0 were obtained in the portions where roentgenographically radiodense, pathologically necrotic or sclerotic, while 0.56 to 1.20 were obtained in the portions radiolucent and vascular-fibrous.

In the case of three months after spongionoplasty, the head-to-trochanter ratio of 0.10 increased to 0.98, that suggested the blood supply of the femoral head was relatively increased by bone grafting.