about 3 hours after administration.

Scintigrams with $^{99m\text{Tc}}$-MDP were equal or superior to those with $^{99m\text{Tc}}$-Diphosphonate. We conclude $^{99m\text{Tc}}$-MDP is the best radiopharmaceutical for bone scanning available at present.

**Evaluation of Pre- and Postoperative Scintigraphy for Detecting Skeletal Metastases in Cases of Breast Cancer**

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A preoperative bone metastatic survey using skeletal scintigraphy was carried out on 29 patients clinically diagnosed when first admitted as having early breast cancer. 82 other patients who had undergone mastectomy or radiotherapy, a majority of whom complained of pain in the spine and extremities, were studied to detect sites of metastatic bone lesions.

After the administration of Tc-$^{99m}$EHDP in the dosage of 10–15 mCi IV, whole body scans were performed using a Toshiba gamma camera (type 202). At approximately the same time as the skeletal scintigraphy was carried out, each patient also had a radiological skeletal survey and biochemical tests.

Occult skeletal metastases were visible on the scintigrams of 10% of the patients who had been clinically diagnosed as having early breast cancer, and who had undergone simple mastectomy followed by chemotherapy. Radiographs had failed to detect the metastases in two thirds of the cases, showing that bone scintigraphy with Tc-$^{99m}$ is superior to conventional radiography for the detection of early metastatic bone lesions.

Overall in this study, 76% of the bone scans in postoperative cases revealed abnormalities. Over 56% of the patients with skeletal abnormalities had lesion in the thorax and vertebrae while abnormalities were detected in skull, pelvis and extremities in 39%, 25% and 26% of the cases, respectively.

Finally, it is recommended that all candidates for radical mastectomy and/or radiotherapy have a preoperative bone scan and that the procedure be repeated during and following therapy in order to assess the response to treatment or detect recurrent sites of the diseases. The procedure should preferably be performed at least once per year for three years following mastectomy even in the absence of symptoms.

**Evaluation on Diagnostic Capability of $^{99m\text{Tc}}$-Pyrophosphate Bone Scintigraphy on Bone Metastasis of Breast Cancer**

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The diagnostic capability of bone scintigraphy using $^{99m\text{Tc}}$ pyrophosphate was discussed. The scintigraphy was performed 78 patients of breast cancer. The results were summarized as follows:

1) In 18 cases with bone metastasis, 13 cases (72%) were previously diagnosed by bone scintigraphy.
2) The over-all accuracy ratio was 79.5% in 78 cases and 75.7% in 118 scintigraphies.
3) The incidence of false positive was 45.5% in 118 scintigraphies, and common causes were high accumulations of radioisotope in the breast bone, lumbar vertebrae and hip-joint.
4) The incidence of false negative was 5%, and the focuses of all these cases were metastatic focuses in the ribs.
Follow up Study of 20 Prostate Cancers by Bone Scanning


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The detection of bone metastases in patients with prostate cancer is proven to be useful for the detection and evaluation of the therapy and prognosis of prostate cancer.

In this study, value of follow up bone scan study on prostate cancer was evaluated on 20 cases of proven prostate cancer. Ages of these cases ranged from 50 to 83 years (mean 67.8 years) and duration of follow up period is from 2 to 5 years. In all cases the diagnosis was confirmed by histological examination of tissue obtained by either transrectal biopsy or transurethral resection.

According to the clinical staging method one patient was grouped in stage I, 3 patients in stage II, 8 patients in stage III and 8 patients in stage IV.

Nineteen patients were treated by antiandrogen therapy from the time when diagnosis was established. One patient in stage I did not receive hormone therapy.

The bone Scintigram was performed 2 hours after injection of 10 mCi of $^{99m}$Tc-pyrophosphate or $^{99m}$Tc-MDP using scanner gamma camera or PHO/CON.

Follow up bone scan study, skeletal X-rays and serum phosphatase (Acp and Alp) examination were performed every three months or 12 months 8 intervals.

The results were as follows:

Out of the 11 patients who had a negative scan at the initial scan, 2 became positive scan at the initial scan, only 1 became negative scan and negative X-ray, 3 cases showed improved scans and 2 showed aggrevated scans.

Among these 4 patients whose scan showed progress one case is still alive and 3 had passed away during the follow up period of 5 years. The remaining 16 patients are still alive.

We believe that follow up study in patients with carcinoma of prostate should be performed bone scan every 3 months’ intervals rather than routine X-ray bone survey.

I summary, bone scan survey were found to be useful for the follow-up of the cases with prostate cancer.

Evaluation of Abnormal Accumulations in Vertebrae Found on the Whole Body Bone Scintigram in Cancer Patients

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For the past two years, from 1975 through 1976, 412 patients were studied by bone scanning with $^{99m}$Tc-phosphate compounds for searching metastatic lesions. One hundred and eighty were found to have abnormal accumulations in vertebrae. After careful survey of their clinical records, 121 were selected for this study on the basis of autopsy findings, follow-up data of X-ray studies