

sphate was intravenously administered, and two to five hours, scannings were made with conventional rectilinear scanner and gamma camera.

Positive scans were obtained in 100% of patients with primary bone tumors, in 59% of regions in bone scannings of malignant diseases in various organs. In fourteen regions with

metastatic tumors of bones were detected prior to observable changes in X-ray films.

In conclusion ^{99m}Tc -pyrophosphate provides us with a high quality, rapid method of evaluating bone disease and it was proved to be useful bone scanning agent for primary or metastatic tumors.

Observations on the Course of Treatment of Primary Malignant Bone Tumors by Bone Scanning

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Concerning the effect of radiation therapy in the management of primary malignant bone tumors, it is no unanimity of opinion as yet. In recent years, however, ^{60}Co - γ rays and high pressure X-rays have been applied increasingly and survival effect due to the treatment has been observed in some kinds of tumor. We conducted bone scanning at various times prior to and after treatment and investigated its advisability for the observation on the progress under treatment and the assessment of conditions of diseases. Histological features of primary lesions were also examined before and after radiation.

Forty-two patients with primary malignant tumors receiving radiation therapy in our clinic were studied; 25 cases in osteosarcoma, 7 cases in Ewing's tumor, 2 cases in reticulosarcoma, 5 cases in fibrosarcoma, and 3 cases in chondrosarcoma. The patients were given 200—500 rads of ^{60}Co -X rays or linac once daily. The total dose is ranged from 22,000 rads to 2,400 rads in an average of 9,870

rads. Scan was carried out before radiation, at the end of radiation and every six months after radiation. ^{87m}Sr was used as nuclide, and scan was carried out an hour after i.v. injection of 2 mCi. Recently, scan has been carried out three hours after i.v. injection of 10 mCi. of ^{99m}Tc -pyrophosphate.

Result: Scintigrams prior to and during radiation therapy revealed high concentration of RI at the site of the lesions, but after treatment, it showed decrease with the lapse of time. Bone scanning as well as roentgenographic examination was very effective for the observation of progress under radiation therapy and the assessment of conditions of diseases. Histological examination made three months after radiation revealed appreciable degeneration of tumor cells in the patient who had received a total of 11,000 rads. In another patient who had received a total of 18,600 rads fibrosis was seen clearly, and it appeared that activity of tumor tissue was disturbed to a considerable extent.