recently been attracting wide attentions because of its excellent result. At our hospital, scintigram using $^{87}\text{Sr}$, $^{88}\text{Sr}$, $^{99m}\text{Tc}$ polyphosphate or $^{67}\text{Ga}$ is taken in the course of routine tests for primary and metastatic bone tumors as well as tumors of the soft tissue. Reported here is the result of our comparative study of these isotopes used in scintiscanning.

Our procedure is: First take whole-body scintigram from anterior and posterior sides, and, if some abnormality is found in the above record or if an abnormality is suspected in X-ray picture, take local scintigram subsequently. To enhance the diagnostic value of scintigram, it is necessary to select a suitable nuclide and adjust the conditions of scintiscanning according to the type of tumor and site of focus. In cases of metastatic bone tumor, whole-body scintigram is often of greater value than X-ray picture, and greater advantage is gained from the scintigram readily showing the site of focus than from the one representing minute changes. In cases of primary bone tumor, diagnosis is usually established by X-ray and other tests, so that scintigram is required, not primarily for discovery of the focus, but for confirmation of a spread of tumor preceding operation or radiotherapy. With the above view in mind, we have taken scintigram for the tumor of the bone or soft tissue in over 100 cases since the opening of the present hospital in Nov., 1972. Selecting 12 cases of primary bone tumor, 3 cases of inflammation and 17 cases of metastatic bone tumor out of the above cases, we studied ratio between uptake of radiosotope by tumor and that by normal tissue, time-course change and the appearance of background other than the bone, specific to each nuclide, and, with X-ray or operation findings as reference, compared the results produced by different nuclides.

Clinical Study of Intervertebral Disc Scintigram Using $^{99m}\text{Tc}$-pertechnetate by Intradiscal Injection

T. Arima and S. Adachi

Department of Orthopedic Surgery, Hiratsuka City Hospital, Kanagawa

A. Kubo

Department of Radiology, Keio University, Tokyo

W. Shinada and H. Nakamura

Division of Radiology, Hiratsuka City Hospital, Kanagawa

In order to study retention capacity of the injected substance into the intervertebral disc, 41 cases (78 discs) of low back pain were examined by scintillation camera after intradiscal injection of $^{99m}\text{Tc}$-pertechnetate at lumbar discography with a dosage of 300 $\mu$Ci respectively. Scintigrams obtained immediately, 30 minutes, and one hour after injection were compared with discogram findings.

In 16 cases, clearance curves were recorded throughout the first one hour and retention ratio of $^{99m}\text{Tc}$-pertechnetate at one hour after injection was calculated.

Results are as follows.
1) In normal discs on discograms, the scintigrams show round figure of high radioactivity and no remarkable change occurs until one hour later. The clearance curve in normal cases decreases gradually, and one hour retention ratio remains in approximately 90\%.

2) In the cases of herniated discs with no leakage on discogram, it is difficult to distinguish scintigraphically from the normal disc during the one hour observation after injection. On the other hand, in the cases with leakage that the disc space communicates through the herniation with the epidural space, the scintigrams at one hour later show remarkably diminished radioactivity in comparison with at just injection.

3) In most of severe degenerated siscs in which contrast medium extends to the periphery of the disc and the leakage is visible on the discogram, the scintigrams also show various deformed figures immediately after injection and radioactivity decreases markedly with time. But in the other cases of severe degeneration with no leakage, radioactivity does not necessarily show marked decrease and one hour retention ratio remains over 80\%. 