In order to differentiate malignant bone tumor from benign bone disease using the delayed uptake of Tc-99m MDP at 24 hr, bone scan was performed in 20 patients, of whom 10 had metastatic bone tumors, 1 had osteosarcoma, and 9 had benign bone diseases. Lesions were displayed and a rectangular ROI was placed over a normal bone area. The lesion-to-normal bone scan ratio (L/N) was calculated for the ordinary and delayed studies. The delayed-to-ordinary study ratio (D/O) was defined as L/N 24 hr / L/N 3-6 hr. The average D/O values for benign bone diseases and malignant bone tumors were 1.18±0.09 (n=13), 1.2±0.09 (n=15), respectively. The difference in the D/O value was not statistically significant.

In conclusion, a 24-hr image in bone scanning was invalid for the differentiation between malignant and benign bone diseases, but we would like to institute a four-phase bone scan, including bone angiography and a 24-hr image, in differentiating them.

We studied bone scintigrams on 26 patients with thyroid cancer submitted to Tc-99m MDP scintigraphy demonstrating bone metastasis. In 13 cases of adenocarcinoma, cold lesions were observed in 7 cases while hot lesions were in 2 cases. Only 2 of the 7 cases with cold lesions showed marginal uptake of the radiopharmaceutical. In 13 cases of medullary thyroid carcinoma, undifferentiated carcinoma or combined differentiated and undifferentiated carcinoma, all metastatic lesions appeared hot areas on imaging. It was suggested that different histopathological types of thyroid cancer have characteristic scintigraphic patterns for their bone metastasis.

In 7 cases among them bone metastasis was recognized on post-operative follow-up bone scintigraphy, which was repeated every 6 months. In these cases the average interval from operation to definite diagnosis of bone metastasis was 16.1 months, and these patients were relatively young-aged. Metastatic sites and clinical stages in these cases were as follows: (1) in lumbar spine, 3 in thoracic spine, 2 in pelvic bone, 1 in sternum and 1 in femur, (2) 1 in stage I, 3 in stage II and 3 in stage III.

Thus, it was shown that in patients with breast cancer the bone metastasis might occur, in spite of no findings on the time of operation, in post-operative period, and therefore it was necessary to perform periodically bone scintigraphy.