STUDIES ON THE METASTATIC BONE TUMOR.(1) THE DISTRIBUTION OF METASTATIC BONE SITES.

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We have been studying the correlation between the distribution of metastatic bone sites and the kind of various primary tumors by whole body scan using Tc-99m phosphate compound which is more sensitive than the autopsy and the radiological examination. Patients studied in this paper were 337 cases (151 lung carcinoma, 147 breast carcinoma, 21 prostate carcinoma, and 18 uterus carcinoma) that were scanned for the examination of metastatic bone tumors from Jan. 1975 to July 1978. At 4-6 hours after the injection of 10-15 mCi of Tc-99m EHDP or MDP, whole body scintigram of anterior and posterior aspects were obtained using scinticamera with moving table whole body imaging system. Out of 337 cases, 89 showed one or more abnormal accumulations on the bone scans attributable to bone metastasis. The details of 89 cases are as follows: 40/151 cases of lung carcinoma, 36/147 cases of breast carcinoma, 7/21 cases of prostate carcinoma, 6/18 cases of uterus carcinoma. The pattern of the distribution of the metastatic bone sites is shown in the table.

	lung	breast	prostate	uterus
skull	4	11	1	0
cervical spines	5	7	2	0
thoracic spines	13	20	4	0
sternum	3	8	2	0
ribs	16	16	4	1
lumbar spines	7	19	5	5
scapula	9	4	2	0
upper extremities	5	0	1	0
pelvis	13	4	6	2
lower extremities	10	5	5	1

Comparing the distribution of the metastatic bone sites in breast carcinoma with that in lung carcinoma, metastasis to the axial skeleton is more frequent than that to the extremity in the former, but metastasis distributes widely throughout the skeleton in the latter. The highest distribution of metastases to the spine is found to be thoracic spine in lung and breast carcinoma and to be lumbar spine in prostate and uterus carcinoma, respectively. The pattern of the distribution of bone metastasis seems to depend on the kind of primary tumors.

CLINICAL SIGNIFICANCE OF SKELETAL IMAGING IN BREAST AND LUNG CANCER IN THE FEMALE.

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Breast cancer possesses various clinical characteristic that are apparently different from those seen in the female lung cancer: (a) Both cancers are liable to develop bone metastases; (b) Females with lung cancer die within a half-year period of diagnosis of bone metastasis. Out of the 7 lung cancer patients, there were 5 cases who developed bone metastses within 6 months' of establishment of diagnosis and died within a half-year period after the diagnosis of bone metastasis. Out of the 19 patients with breast cancer, there were 3 positives seen among the 7 whose skeletal imaging was carried out within 6 months of their cancer diagnosis. (c) Radiation local control is practical with 4000 rad to a metastasis, preventing secondary and tertiary metastases, and undoubtedly contributing to their survival.

Fractures, pains and spinal paralysis may ensue from untreated bone metastases of the disease; this fact demands an early detection and treatment of akeletal metastasis of breast cancer.

The skeletal imaging is capable of antedating the bone radiograms. The magnification effects from large dosage of ^{99m}Tc would encourage an early detection of small bone metastases. Nonspecificity of the skeletal imaging modality may demand an employment of imaging of the bone marrow reticuloendothelial system and tumor-per se delineation.