POSITIVE ^{87m}Sr BONE SCAN IN A CASE OF HYPERTROPHIC PULMONARY OSTEOARTHROPATHY

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Radiostrontium bone scanning is based on the deposition of strontium in areas of reactive bone formation by the process of heterionic exchange. There have been previous reports of abnormal bone scans in a variety of conditions associated with active new bone formation; by contrast, quiescent lesions such as bone islands do not pick up radiostrontium. We are presenting here a case of hypertrophic pulmonary osteoarthropathy demonstrating the deposition of strontium in the areas of periosteal reaction.

CASE REPORT

A 54-year-old white male had a large mass in the upper lobe of the right lung demonstrated by chest radiography (Fig. 1) and confirmed by tomogram which also revealed destruction of ribs overlying the tumor. A final diagnosis of anaplastic bronchogenic carcinoma was made on the basis of sputum cytology and bronchial brush biopsy. An arterial gas study revealed pO_2 55.4 mmHg. A skeletal survey (Figs. 2A and B) demonstrated extensive hypertrophic pulmonary osteoarthropathy of long bones. The bone scan (Fig. 3) showed increased uptake of radiostrontium in corresponding areas of the long bones.

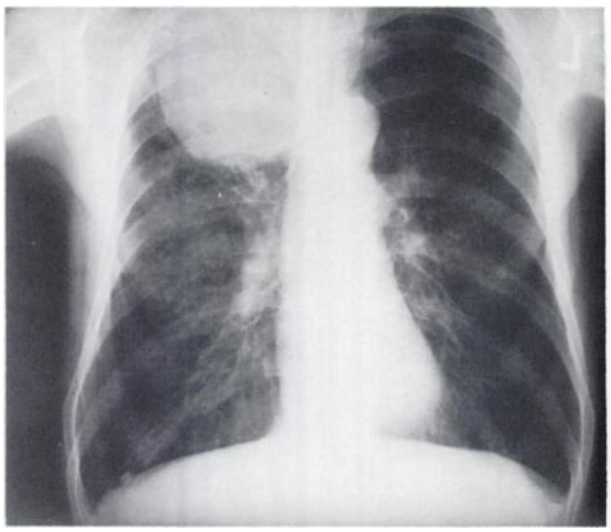

FIG. 1. Chest radiograph of patient. Note large right upper lobe lesion.

DISCUSSION

Sufficient data to assess the role of scintiscanning in various bone diseases have been reported in the literature. This paper presents further experience with this examination in another bone lesion namely, hypertrophic pulmonary osteoarthropathy (HPO). To the best of our knowledge the abnormal bone scan in HPO has not been illustrated, although a positive scan with ^{18}F has merely been mentioned in the literature (*1*). In our case ^{87m}Sr was deposited in the areas of radiographically demonstrated periosteal reaction secondary to HPO, and there was good correlation between these two techniques in defining the anatomic extent of the bony involvement. Radiostrontium enters these areas by the process of heterionic exchange with calcium deposited under the periosteum.

One has to differentiate between metastatic lesions in the bone and pulmonary osteoarthropathy from the treatment point of view. The usual indication for bone scanning in a patient with carcinoma of lung is the definition of bony metastases. Had the bone scan in the present case not been correlated with the radiographic examination an erroneous diagnosis of dif-

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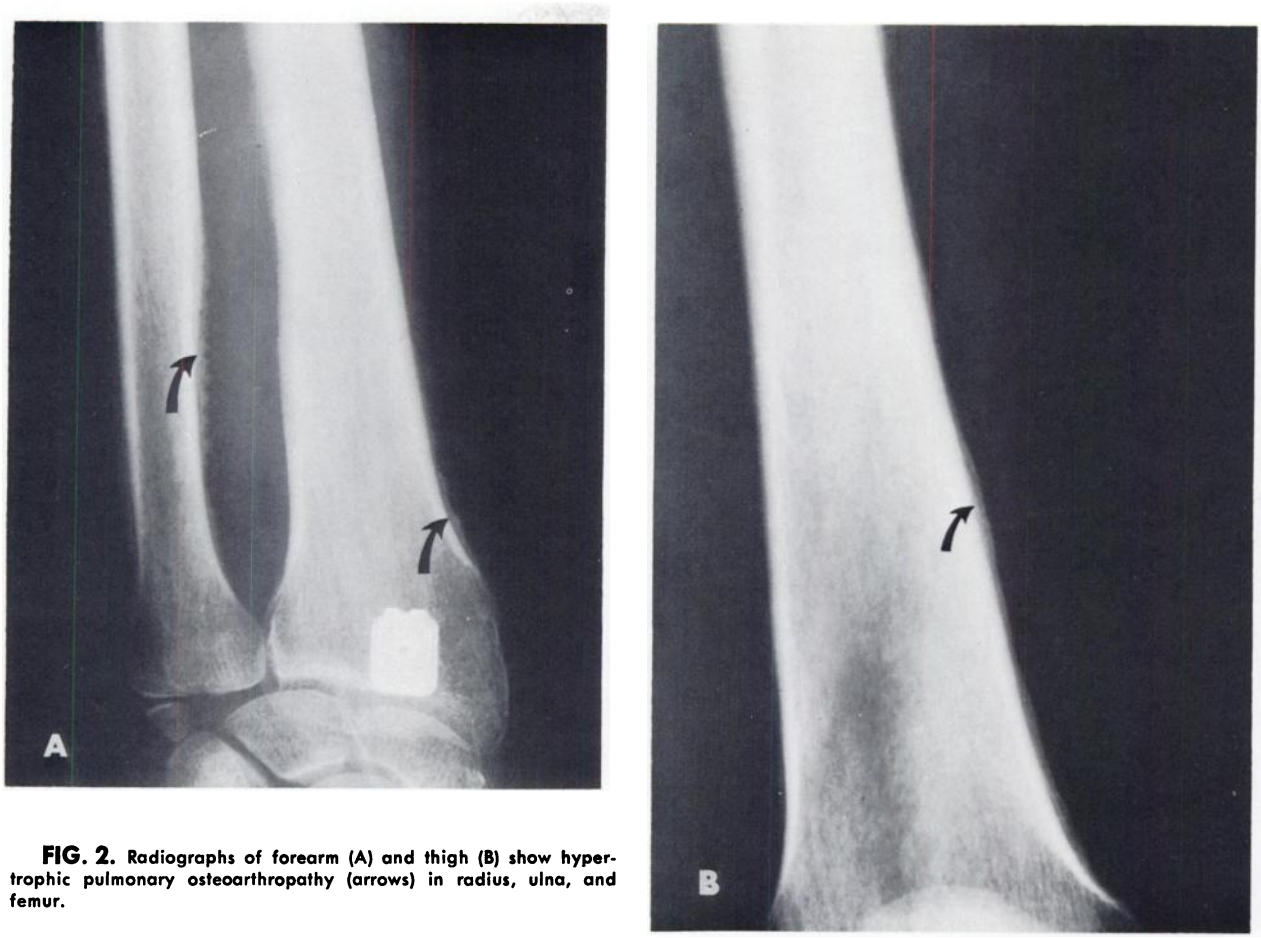

FIG. 2. Radiographs of forearm (A) and thigh (B) show hypertrophic pulmonary osteoarthropathy (arrows) in radius, ulna, and femur.

fuse osseous metastases may have been concluded. Although increased radiostrontium uptake in the bone of a patient with bronchogenic carcinoma is more commonly due to metastatic disease, the possibility of HPO must be considered. This of course reflects the nonspecificity of positive bone scan which only indicates active new bone formation because of a locally accelerated mineral accretion rate.

SUMMARY

A positive radiostrontium bone scan reflecting hypertrophic pulmonary osteoarthropathy is reported. The importance of correlating the bone scan with radiographic findings is emphasized.

REFERENCE

1. HARMER CL, BURNS JE, SAMS A, et al: The value of Fluorine-18 for scanning bone tumours. *Clin Radiol* 20: 204–212, 1969

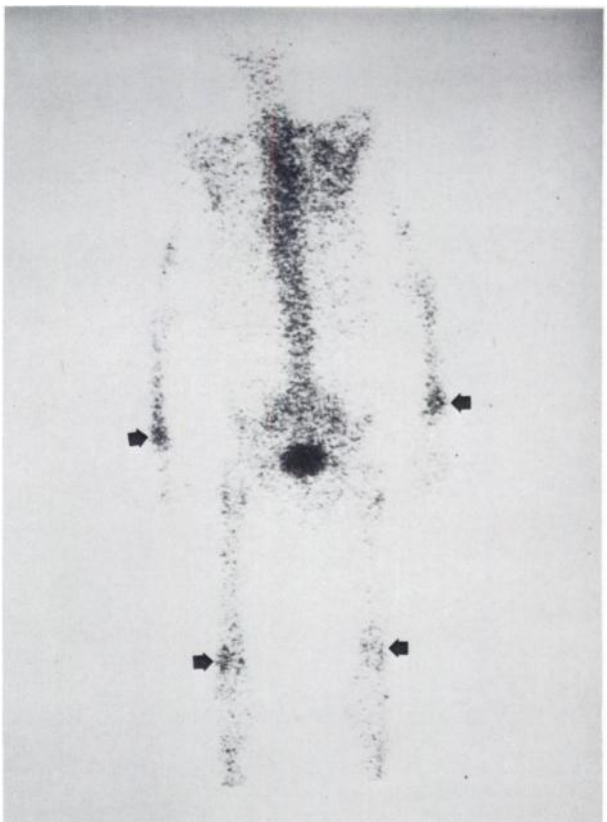

FIG. 3. Whole-body scan (posterior view) with ^{87m}Sr. Note increased uptake of radiostrontium in lower ends of forearm bones and femur. These areas correspond with radiographic findings. There is also high strontium concentration in right upper lung. This is partly due to osteoblastic changes in overlying ribs and partly due to accumulation of isotope in tumor mass.