POSITIVE ^{18}F BONE SCAN IN A CASE OF OSTEOID OSTEOMA: CASE REPORT

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A positive radiofluorine bone scan is reported in a proven case of osteoid osteoma.

Although there are many reports of osteoid osteoma in the literature, we were able to find only one case in which a bone scan was performed (*1*). The scan showed no definite lesion. McAfee has advised us that he has performed imaging studies on two proven instances of osteoid osteoma, both demonstrating markedly increased uptake, but he is unable to cite a specific reference in the literature (*2*). We are presenting a case of osteoid osteoma of the distal tibia, with classical radiographic appearance and prominent uptake of radiofluorine.

CASE REPORT

A 21-year-old white man experienced pain in the right ankle, particularly at night, which was poorly relieved by salicylates and only transiently by phenylbutazone. Routine radiographic studies of the right ankle were interpreted as normal (Fig. 1). An ^{18}F bone scan showed increased uptake in the distal tibia (Fig. 2). Finally, planigrams of the involved area shown on the bone scan revealed a 5-mm circular radiolucency with surrounding sclerosis in the tibial epiphysis (Fig. 3). Surgical exploration demonstrated reactive bone approximately 4 mm above the joint with a pea-sized red central area. The nidus was excised totally. Microscopic examination showed masses of osteoid with extensive focal calcification and hemorrhage, diagnostic of osteoid osteoma.

FIG. 1. Anteroposterior roentgenogram of right ankle, showing no remarkable diagnostic finding.

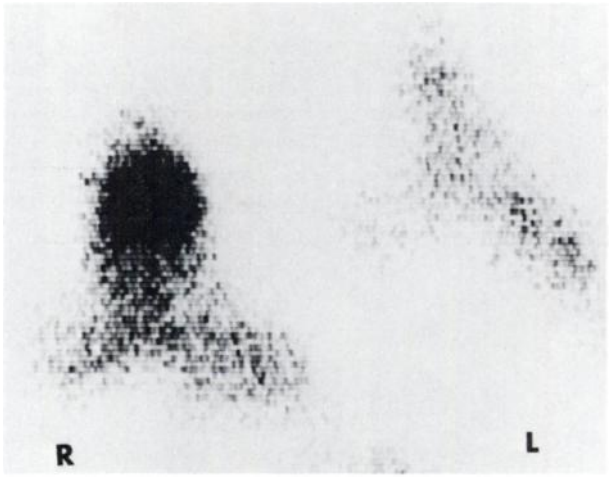

FIG. 2. Lateral ^{18}F bone scan of right ankle, with comparison scan of left ankle, showing markedly increased uptake in distal right tibia.

DISCUSSION

Radiofluorine bone scanning is based on the exchange of fluoride ions with hydroxyl ions on the surface of submicroscopic crystals of hydroxyapatite to form fluoroapatite. The fluoride and hydroxyl ions are of similar size and can therefore exchange in the crystal lattice without serious distortion. Hydroxyl ions are present in extracellular fluid in relatively low

Received Sept. 10, 1974; revision accepted Dec. 31, 1974.

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FIG. 3. Anteroposterior planigram of right ankle showing (arrow) classic radiographic findings of osteoid osteoma in distal tibial epiphysis: calcified central nidus, intermediate lucent zone, and sclerotic margin. Inset is roentgenogram of surgical specimen showing same findings more plainly.

concentration so that even a small amount of administered fluoride ion can compete successfully for positions in the crystal lattice. Uptake of fluoride in bone is a reflection of increased metabolic activity in the vicinity of bone lesions and it is this mechanism that permits visualization by scanning (*3*).

The superior sensitivity of radioisotopic bone scanning to radiographic studies is shown plainly by the striking appearance of the lesion on the scan, whereas tomography was necessary for radiographic identification and was used only after the scan had already indicated the location. One suspects that the scan would have been positive much earlier.

ACKNOWLEDGMENT

We thank Gustavus D. Bock for permission to report his case.

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