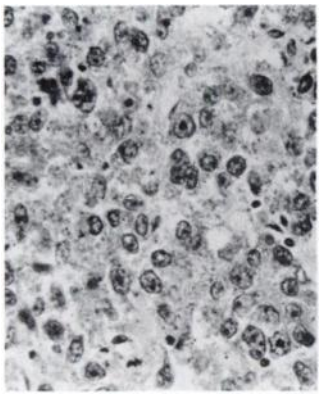

FIG. 2. Photomicrograph of metastatic seminoma from mediastinal lymph node.

ule, largely necrotic. The upper lobe of the left lung contained a firm gray tumor, 4 cm in diameter, which was centrally necrotic with a rim of viable tumor tissue. A separate tumor nodule, 1 cm in diameter, was found in the lingula. Both testes were small and on section appeared atrophic and with no sign of tumor. Histologic sections of the retroperitoneal tumor, lung tumors, abdominal and mediastinal nodes, and renal vein thrombus all showed typical seminoma. In all sites most of the tumor was necrotic, but small groups of viable cells confirmed the diagnosis. The testes showed severe degenerative changes of the tubules with interstitial fibrosis. No seminoma cells were seen in either testis. Sections of the lung tumors stained by von Kossa's method showed no calcification. The final pathologic diagnosis was extragenital retroperitoneal seminoma, involving the left kidney and lumbar spine, and metastatic seminoma involving the lungs and abdominal and mediastinal lymph nodes (*8*).

Although the ^{99m}Tc-labeled phosphates are excellent bone-scanning agents, it has become apparent that they are able to concentrate in tissues other than bone. In the present case the agent localized in lung metastases from an extragenital seminoma, although there was no preferential accumulation in soft-tissue tumor at other sites. Within the lung metastases the technetium distribution was nonuniform (Fig. 1A), with apparently less uptake in the central necrotic regions.

The mechanism of ^{99m}Tc-pyrophosphate accumulation remains obscure. Unreacted pertechnetate ions were not responsible, since no uptake by the thyroid or salivary glands were detected. There was no microscopic evidence of calcification within the lesions. A similar finding was reported by Lowenthal et al. (*2*), who described cases of ^{99m}Tc-polyphosphate uptake by squamous-cell carcinomas of the lung. Chaudhuri et al. (*9*) showed that both ^{99m}Tc-polyphosphate and ^{87m}Sr were concentrated by a noncalcified soft-tissue metastasis from an adenocarcinoma of the rectum. It seems unlikely that these bone-scanning agents would be preferentially taken up by tumors in the absence of significantly increased concentrations of calcium or phosphate. Possibly there is a mechanism involving the intracellular accumulation of calcium and phosphate, like that proposed by Bonte et al. to explain the uptake of ^{99m}Tc-pyrophosphate in infarcted myocardium (*3*). In the case of ^{99m}Tc-diphosphonate accumulation in malignant pleural effusions (*5*), however, the radiopharmaceutical was almost exclusively extracellular.

More than one mechanism are probably involved in the soft-tissue concentration of the ^{99m}Tc-labeled phosphate radiopharmaceuticals. The reason for the uptake in the present case remains unresolved.

J. G. HARDY
G. S. ANDERSON
G. M. NEWBLE
Essex County Hospital
Colchester, United Kingdom

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REFERENCES

1. RICHMAN LS, GUMERMAN LW, LEVINE G, et al.: Localization of ^{99m}Tc-polyphosphate in soft tissue malignancies. *Am J Roentgenol Radium Ther Nucl Med* 124: 577–582, 1975

2. LOWENTHAL IS, TOW DE, CHANG YC: Accumulation of ^{99m}Tc-polyphosphate in two squamous cell carcinomas of the lung: Case report. *J Nucl Med* 16: 1021–1023, 1975

3. BONTE FJ, PARKEY RW, GRAHAM KD, et al.: A new method for radionuclide imaging of myocardial infarcts. *Radiology* 110: 473–474, 1974

4. MCLAUGHLIN P, COATES G, WOOD D, et al.: Detection of acute myocardial infarction by technetium-99m-polyphosphate. *Am J Cardiol* 35: 390–396, 1975

5. SIEGEL ME, WALKER WJ, CAMPBELL JL: Accumulation of ^{99m}Tc-diphosphonate in malignant pleural effusions: Detection and verification. *J Nucl Med* 16: 883–885, 1975

6. MCLAUGHLIN AF: Uptake of ^{99m}Tc bone-scanning agent by lungs with metastatic calcification. *J Nucl Med* 16: 322–323, 1975

7. FITZER PM: ^{99m}Tc-polyphosphate concentration in a neuroblastoma. *J Nucl Med* 15: 904–906, 1974

8. THACKRAY AC, CRANE WAJ: *Pathology of the Testis*, Pugh RCB, ed. Oxford, Blackwell, 1976, pp 190–192

9. CHAUDHURI TK, CHAUDHURI TK, CHRISTIE JH: Tumor uptake of ^{99m}Tc-polyphosphate: Its similarity with ^{87m}Sr-citrate and dissimilarity with ^{67}Ga-citrate. *J Nucl Med* 15: 458–459, 1974

Bone Scan in Melorheostosis

Melorheostosis is an uncommon disorder of bone diagnosed primarily by its characteristic appearance on roentgenograms. We believe this is the first report of a bone scan performed on a patient with melorheostosis.

The patient was a 16-year-old white male with known melorheostotic involvement of his left femur since age 6. At age 7 an epiphysiodesis of the distal right femur was performed to equalize growth between the right leg and the congenitally shortened left leg. Approximately 5 months prior to our bone scan, he had been seen in an orthopedic outpatient clinic for complaints of left knee pain secondary to injury while playing in a neighborhood football game. At that time, roentgenograms of the left knee revealed no bone or joint abnormalities; however, roentgenograms of his left proximal femur and pelvis showed evidence of melorheostosis (Fig. 1). The patient was given symptomatic treatment and released. Three weeks prior to the scan he complained of increasing left knee pain and right-sided thigh pain. A bone scan was recommended to assess the localization and extent of his known osseous disease, and for detection of other bone disease that might not be visualized on conventional roentgenograms.

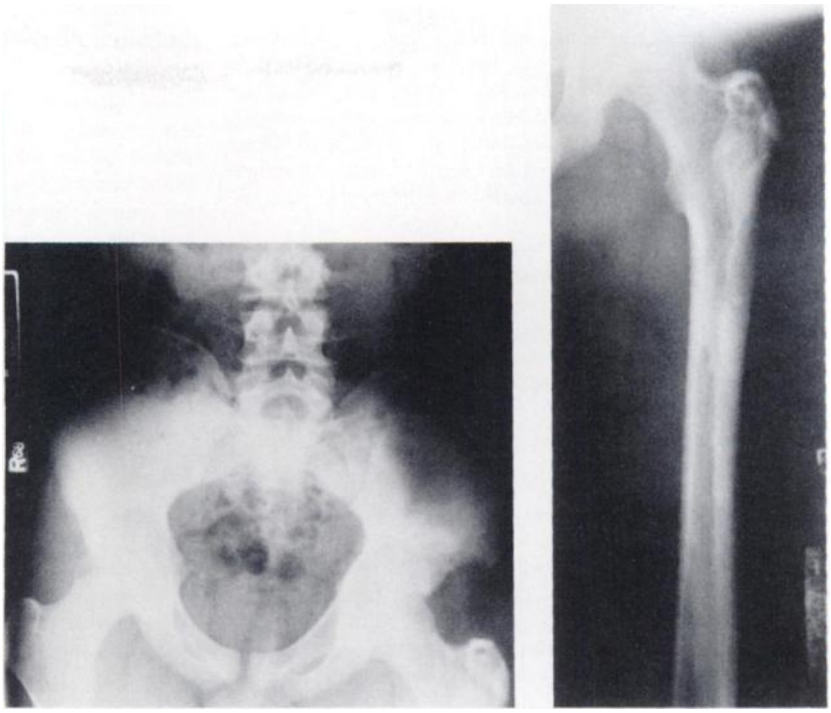

FIG. 1. Melorheostotic disease, extending along the lateral aspect of the left femur and greater trochanter, and in the left pelvis.

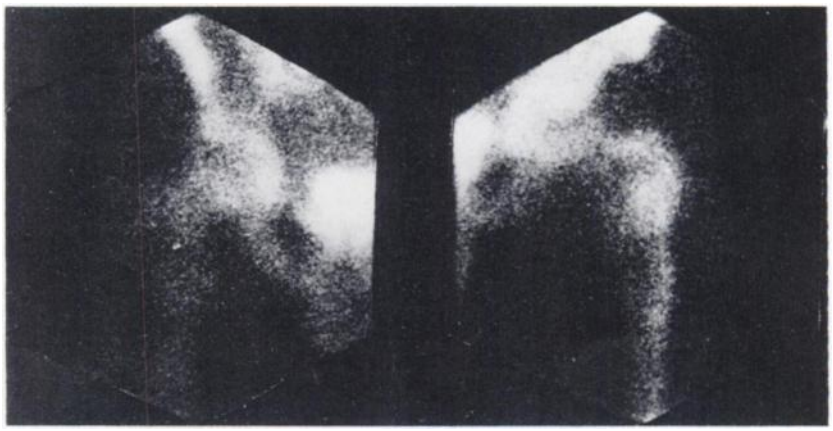

FIG. 2. Pyrophosphate bone scintiphoto of normal right pelvis, abnormal left pelvis, and abnormal left femur (proximal and lateral portions).

Three hours after the intravenous administration of 15 mCi of ^{99m}Tc-pyrophosphate, the patient was scanned by a dual-probe 5-in. rectilinear scanner with 1:5 minification.* Detailed views of the femur and pelvis were performed with a scintillation camera† using a high-resolution collimator. The bone scan (Fig. 2) showed areas of increased uptake of the radionuclide in the left femur and pelvis corresponding to the areas of melorheostotic involvement seen on the roentgenograms obtained 5 months earlier. The remainder of the scan, including the left knee and right femur, was interpreted as normal. The patient was dismissed with plans for future outpatient followup and has done well.

Melorheostosis has afflicted mankind since 500 A.D. (*1*), but no specific name was given it until 1922, when Léri and Joanny described the typical findings (*2*). Since that time there have been fewer than 200 cases reported (*3*). All ages (*4*), both sexes (*5*), various bones, and numerous orthopedic (*6*), vascular (*7*), and dermatologic symptoms (*3,6,8,9*) have been associated with this entity of unknown etiology and no known genetic predilection (*10*). The typical radiographic appearance is that of a monostotic linear hyperostosis that appears to flow along the cortex of a bone. It is rarely concentric in nature and has been likened to tallow drippings on the side of a burning candle (*8*). Microscopy of melorheostotic bone reveals haversian systems that are irregularly arranged, with dense thick anastomosing trabeculae. In some areas, immature and adult bone are interlaced with conspicuous osteoid seams. Cellular fibrous tissue within the marrow spaces and about the proliferative bone is usually present. Occasionally, islands of cartilage with evidence of endochondral bone formation, and intramembranous bone formation within the cellular fibrous tissue, are described (*6*). Extraosseous abnormalities such as contractures and fibrosis may be present at birth or in childhood, but the radiographic bone changes may be inconspicuous and remain so for several years thereafter (*9*).

Uptake of ^{99m}Tc-pyrophosphate is increased in areas of increased bone turnover and increased blood flow, regardless of etiology. Since new bone is being slowly laid down in melorheostosis, it is not surprising that the bone scan was positive and showed only moderate uptake in the involved areas. The scan did not detect new areas of involve-

ment not seen radiographically. The uptake in the radiographically involved bone was only slightly greater than that in the radiographically normal femur and pelvis. As additional patients with melorheostosis come to be imaged by radionuclide scanning, the ability of the scan to detect new areas should be evaluated and some correlation sought between intensity of uptake, rapidity of radiographic changes, and severity of symptoms.

JOEL JANOUSEK
DAVID F. PRESTON
NORMAN L. MARTIN
RALPH G. ROBINSON
University of Kansas Medical Center
Kansas City, Kansas

FOOTNOTES

* Ohio-Nuclear Model 54 (Solon, Ohio).
† Ohio-Nuclear Series 100.

REFERENCES

1. LESTER CW: Melorheostosis in a prehistoric Alaskan skeleton. *J Bone Joint Surg (Am)* 49: 142–143, 1967

2. LÉRI A, JOANNY J: Une affection non decrite des os. Hypertose "en coulée" sur toute la longueur d'un membre ou "melorheostose." *Bull Mem Soc Hôp Paris* 46: 1141–1145, 1922

3. SOFFA DJ, SIRE DJ, DODSON JH: Melorheostosis with linear sclerodermatous skin changes. *Radiology* 114: 577–578, 1975

4. SIGGERS DC: Melorheostosis. In *Birth Defects: Skeletal Dysplasias*, Bergsma D, ed. Original Article Series 10: 513–514, 1974

5. SEN JK, BAKSHI DP, BOSE KS: Melorheostosis. A case of involvement of inferior extremities with 12 years' follow-up. *J Indian Med Assoc* 46: 89–90, 1966

6. MORRIS JM, SAMILSON RL, CORLEY CL: Melorheostosis. Review of the literature and report of an interesting case with a nineteen-year follow-up. *J Bone Joint Surg (Am)* 45: 1191–1206, 1963

7. KANIS JA, THOMPSON JG: Mixed sclerosing bone dystrophy with regression of melorheostosis. *Br J Radiol* 48: 400–402, 1975

8. MULLER SA, HENDERSON ED: Melorheostosis with linear scleroderma. *Arch Dermatol* 88: 142–145, 1963

9. CAMPBELL CJ, PAPADEMETRIOU T, BONFIGLIO M: Melorheostosis. A report of the clinical, roentgenographic, and pathological findings in fourteen cases. *J Bone Joint Surg (Am)* 50: 1281–1304, 1968

10. AMERATUNGA B: Melorheostosis. *Australas Radiol* 16: 148–151, 1972

Inflamed Pierced Ear on Brain Scan

An incidental finding of an inflamed ear lobe due to piercing was noted on a routine brain scan. The lesion appeared as an area of increased activity in dynamic and static images. This abnormality disappeared 3 weeks after the patient stopped wearing her earring. The "ear" artifact on brain scans reported in the *Journal* by Patton et al. prompted us to describe this case (*1*).

A 40-year-old black woman was referred to us because of recurrent headaches. The clinical impression was tension headache. Nevertheless, a brain scan was requested to rule out intracranial disease. The dynamic images obtained with 20 mCi of $Na^{99m}TcO_4$ revealed a small superficial circumscribed area of increased activity at the level of the left carotid bifurcation. This early increased activity persisted throughout the 40-sec dynamic study. Static images obtained 2 hr later also showed this same activity (Fig. 1).

At first glance, the abnormality was thought to be a vascular tumor within the left parotid gland, or possibly a chemodectoma arising in the carotid body, but a retrospective physical examination was unhelpful. We then learned that the patient had had her ears pierced at a department store 1 month prior to the scanning. She was wearing gold earrings and denied discomfort in either ear lobe. Her left ear lobe showed a minimal amount of edema. When the lobe was shielded with lead, the scan abnormality disappeared. The patient was asked not to wear the earring for the next few weeks and to return for a repeat examination. The abnormality was not present on the dynamic and static images obtained 3 weeks after the initial scan (Fig. 2).

Such extracranial pathologic conditions as scalp lesions, sinusitis, intraorbital tumor, and parotitis are often discovered on brain scans. Common artifacts include normal soft-tissue activity in the temporalis muscle, contamination by saliva, shielding defects from metallic ear ornaments or, rarely, from fingers of a technologist holding the head of an uncooperative patient. Increased tracer uptake in skin lesions has been observed in cellulitis with ^{99m}Tc-diphosphonate (*2*) and in Kaposi sarcoma with pertechnetate (*3*), all probably related to hypervascularity of the lesion. The abnormality described here is likewise believed to be secondary to increased vascularity and edema due to inflammation in the pierced ear lobe.

HEE-MYUNG PARK
Indiana University
Indianapolis, Indiana

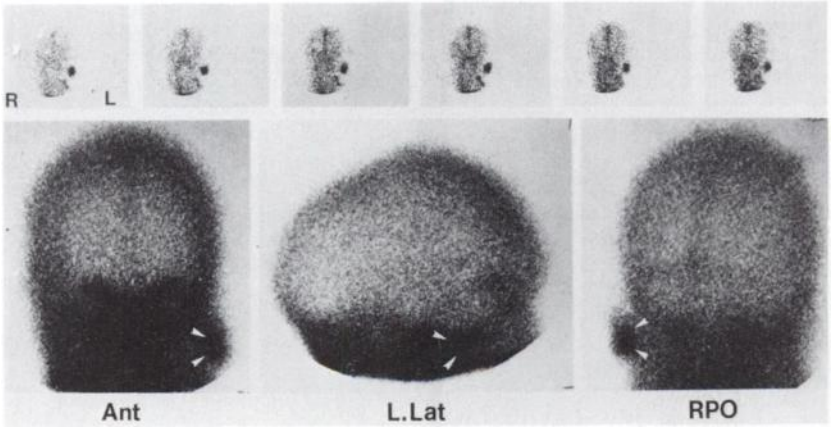

FIG. 1. Anterior cerebral dynamic images obtained with 20 mCi of $^{99m}TcO_4^-$ (upper row) and static images at 2 hr (lower row) show intense uptake in inflamed pierced ear lobe (arrow heads).