Case report 443

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Radiological studies

Fig. 1. An anteroposterior roentgenogram of the right femur shows exuberant, virtually solid cortical thickening of the femoral shaft, with small lucent areas interspersed within the sclerotic process. These lucencies are noted particularly in the proximal portions of the area of sclerosis.

Fig. 2. A lateral roentgenogram of the left heel shows a large area of sclerosis affecting the inferior half of the calcaneus with irregular, periosteal reaction on its plantar aspect.

Fig. 3. An anterior view of a technetium-phosphate bone scan shows increased radionuclide activity in the proximal half of the right femur, left patella, and left calcaneus.

Clinical information

This 20-year-old Hispano male “break dancer” presented to the clinic with a 3-month history of pain in the right thigh and left ankle. He described the pain as aching, but tolerable. Physical examination was unremarkable. Blood chemical studies were within normal limits. No other abnormal history relevant to the skeleton was obtained.

Roentgenograms of the right thigh and left calcaneus were obtained. The roentgenogram of the right femur showed localized exuberant cortical thickening with interspersed, lytic areas within the zone of cortical sclerosis. The cortical thickening was solid and presented an appearance of a benign disorder. The roentgenogram of the left heel showed sclerotic changes in the lower half of the calcaneus, particularly in the cancellous bone associated with a periosteal reaction on the plantar aspect of the calcaneus (Figs 1 and 2). A technetium-phosphate bone scan demonstrated increased activity in the right femur (proximal half), the left calcaneus (Fig. 3) and the left patella.

The patient was lost to follow-up for 2 years. He subsequently presented again with unchanged clinical and radiographic data.

Biopsy of the right femur was performed.
Diagnosis: Florid cortical and periosteal reactions due to stress fractures of the right femur and left calcaneus in a “break dancer”

The differential diagnosis included chronic multifocal osteomyelitis, Paget disease, fibrous dysplasia, Engelmann-Camurati disease, Ribbing disease, hyperphosphatasia, van Buchem disease, and melorheostosis. Osteosarcoma might be considered in evaluating the radiological pattern of the periosteal reaction of the left calcaneus. The biopsy (Fig. 4) showed normal lamellar cortical bone in the right femur, with a small area of woven bone suggesting recent bone formation. The findings were consistent with stress reaction (fracture).

Histological features

Fig. 4. A photomicrograph obtained from the biopsy specimen of the right femoral shaft shows considerable cortical bone, which appears normal. Virtually all this cortical bone is lamellar. However, one small area shows a woven or primitive bone pattern suggesting recent bone formation. (HE, original magnification x 170)

Discussion

Radiologically, cortical thickening may be due to either a local or generalized process.

Most of the entities named in the differential diagnosis can be excluded in this case on the basis of age, clinical presentation, and radiological findings. As an example, Engelmann-Camurati disease is usually far more disseminated and is associated with neuromuscular dystrophy and wasting. It occurs in a younger age group (4-12 years of age), with involvement of all long bones, not just the femur and calcaneus as in this case. Hyperphosphatasia and van Buchem disease involve generally the entire appendicular skeleton and in both instances an elevated alkaline phosphatase is present [3]. Ribbing disease is a hereditary disorder that occurs during adolescence and young adulthood. It may represent the adult form of Engelmann-Camurati disease after the clinical symptoms have subsided [7].

The other entities mentioned such as Paget disease, fibrous dysplasia, melorheostosis, and chronic osteomyelitis may deserve consideration but in general are not tenable as diagnostic possibilities. Osteosarcoma is extremely unlikely.

“Break dancing” is a popular contemporary form of entertainment in the United States, with important medical implications [6]. Break dancing is referred to also as “breaking” which is a form of free style dancing that involves an elaborate combination of traditional mime and complex acrobatic moves, such as splits, hand-stands, and spins. The origin of break dancing can be traced to the urban youth of New York’s South Bronx and the Barrio in Los Angeles. This form of dancing started approximately 15 years ago and has been popularized recently through movies, television, and street shows. This free style of dancing has moved from the street into the schools and