Case report

A 47-year-old man presented with a right leg bump associated with intermittent pain for a year. He had pain only when he was jogging, enough to stop him. He did not have any history of injury, weight loss, nocturnal pain, or night sweats. On clinical examination, he had a bump on the anterior shin that was small and hard to the touch. He complained of very minimal tenderness with palpation. There was no associated soft-tissue swelling. He had full range of motion of his ankle, and sensation was grossly intact. He was otherwise healthy without any prior medical or surgical history.

Radiograph of the right lower leg revealed an expansile and geographic lytic lesion at the anterolateral cortex of the distal tibial diaphysis (Fig. 1). There were internal lattice-like, vertically oriented striations and trabeculae with a minimal, thin, sclerotic rim and cortical erosion. There was no associated periosteal reaction. Magnetic resonance imaging (MRI) of the right lower leg showed a cortical-based mass at the anterior distal tibia. The mass had low signal intensity on T1-weighted images (Fig. 2A) and very high signal intensity on T2-weighted images (Fig. 2B). On the fat-suppressed, postgadolinium T1-weighted images, there

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Figure 1. 47-year-old man with intracortical hemangioma. Lateral radiograph of the right lower leg shows an expansile, lytic lesion with geographic border at the anterolateral cortex of the distal tibial diaphysis. There are internal lattice-like, vertically oriented striations and trabeculae with a minimal, thin, sclerotic rim and cortical erosion.
was homogeneous enhancement of the lesion (Fig. 2C). There were internal septa with low signal intensity on all pulse sequences (MRI appearance of polka dot). (D) Sagittal post gadolinium T1-weighted fat-saturated image shows MRI appearance of corduroy pattern with multiple vertical hypointense septa.

Figure 2. 47-year-old man with intracortical hemangioma. MRI of the right lower leg. (A) Axial T1-weighted image shows intracortical mass with low signal intensity. (B) Axial T2-weighted image shows very high-signal-intensity mass. (C) Axial post gadolinium T1-weighted fat-saturated image shows contrast enhancement of the mass. There are internal septa with low signal intensity on all pulse sequences (MRI appearance of polka dot). (D) Sagittal post gadolinium T1-weighted fat-saturated image shows MRI appearance of corduroy pattern with multiple vertical hypointense septa.

Figure 3. 47-year-old man with intracortical hemangioma. A whole-body bone scan image shows slightly increased uptake in the right distal tibia.

Figure 4. 47-year-old man with intracortical hemangioma. There is remodeled cortical and trabecular bone with increased numbers of vessels in Haversian systems and intertrabecular space. The vessels varied from small capillary-type vessels to more cavernous-appearing vascular spaces (HE stain, 100x).

Discussion

Skeletal hemangiomas are rare, accounting for only 1% of all primary bone tumors (1). Intracortical hemangioma is an even smaller subset, and is extremely uncommon. Approximately 75% of skeletal hemangiomas arise in the vertebrae or skull, and appendicular skeletons are infrequently involved. Most lesions in the vertebrae or skull are asymptomatic and discovered incidentally, but extremity lesions are usually symptomatic, with either pain or pain...
associated with a swelling or mass. Pathologic fracture is uncommon, being the initial clinical manifestation in less than 10% of patients. Skeletal hemangioma is one of the few bone lesions with a female preponderance (2).

There is sometimes clinical and radiographic overlap between periosteal and intracortical hemangiomas, and Devaney et al. (3) reported these tumors as "surface-based hemangiomas of bone." To date, all reported cases of surface-based hemangiomas have been encountered in the long bones, most commonly the tibia and fibula, and they are mainly (77%) diaphyseal (2). Histologically, intracortical hemangiomas consisted of a capillary, arteriovenous, or (more frequently) cavernous hemangioma located within the cortical bone without an adjacent soft-tissue mass (4). No histopathologic features are specific for intracortical hemangiomas (compared to other bone hemangiomas).

Radiographically, intracortical hemangiomas demonstrate localized lytic lesion with or without cortical thickening and sclerosis (3-8). The radiographic appearance of the tumor leads to a differential diagnosis that includes osteoid osteoma, cortical fibrous lesion, ossifying fibroma, adamantinoma, Brodie’s abscess, and intracortical metastasis.

Computed tomographic (CT) imaging reveals intracortical lytic lesion with vascular channels (8) and spotty calcifications (4). MRI findings are nonspecific. Imagined lesions show a cortical-based soft-tissue mass that is of intermediate or low signal intensity on T1-weighted images and has high signal intensity on T2-weighted images (4, 5, 8). Internal hypointense septa on T1 and T2-weighted sequences were reported in one report (4). Bone scans demonstrate increased activity (6).

In our case, we observed very distinct vertical striations and trabeculae that were described in two previous case reports (4, 8). Those vertical striations correlate with the thickened/remodeled trabecular bone in pathology. This vertical striation corresponds to the classic "corduroy" pattern of vertebral hemangiomas, which is uncommon in extremity skeletal hemangiomas. Similarities were noted on MR imaging, with the trabeculae remaining low on all pulse sequences. Axial images showed small multilocular appearance of vascular channels with intervening low signal intensity septa (MR appearance of polkadot), and long-axis images showed the corduroy pattern. These features are specific for skeletal hemangiomas, and are very helpful for a diagnosis of hemangioma when they are observed in an intracortical lytic lesion.

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