Multicentric giant-cell reparative granuloma

A case in the foot

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A case of multicentric giant-cell reparative granuloma in the foot of a 17-year-old boy is reported. Initially, there was a calcaneal lesion and 6 months later, three additional lesions in the forefoot. The calcaneal lesion was treated by curettage and bone grafting, and those in the forefoot by wide excision. The patient has now been free of disease for 18 months.

Giant-cell reparative granuloma as described by Jaffe (1953) is a benign lesion of the jaw. However, other authors have described occasional cases with histologically similar lesions in the small bones of the hands and feet (Lorenzo and Dorfman 1980, Glass et al. 1983, Picci et al. 1986, Wold et al. 1986). The term "giant-cell reparative granulomas in extragnathic sites" was coined by Lorenzo and Dorfman (1980). We report a case of multiple lesions in the bones of the foot.

Case history

A 17-year-old male sought medical advice in April 1985 because of pain in his right heel of 6-months' duration. There was no history of trauma or general disease. A physical examination was negative except for tenderness over the medial aspect of the calcaneus. Radiography showed a thin-walled round cyst in the posterior part of the calcaneus with a pathologic fracture medially. A radiograph of the forefoot was normal. A bone scan showed increased uptake of ^{99m}IC-MAP in the right calcaneus and also in the metatarsal region. Serum levels of calcium, phosphate, alkaline phosphatase, and parathormone were normal. At open biopsy of the calcaneal lesion, soft yellowish tissue was removed. The histologic diagnosis was atypical aneurysmal bone cyst. Subsequently, curettage and bone grafting were performed. The patient was asymptomatic for 6 months. He then returned because of forefoot pain. There was swelling and tenderness over the second metatarsal head. Radiography showed osteolytic cortex-expanding lesions in the head of the 2nd metatarsus, base of the 2nd proximal phalanx, and base of the 4th proximal phalanx (Figure 1). The calcaneal lesion was partially healed. A bone scan was similar to the previous one. Open biopsy was performed; and grossly, the lesions were similar to the calcaneal lesion. Microscopic examination showed fibrous septae surrounding clusters of multinucleated giant cells in a stroma composed mainly of spindle-shaped fibroblasts with areas of hemorrhage and osteoid formation (Figure 1). Upon review of the previous slides the lesions were found to be similar, and the diagnosis of giant-cell reparative granuloma was made. Once again, blood tests including parathormone levels were normal. In July 1986, the patient underwent wide excision of the affected phalanges and the second metatarsus. By now, 2 years later, the patient is asymptomatic, and the calcaneal lesion has healed. Repeated radiography, bone scans, and blood tests are normal.

Discussion

Our case is unusual in several respects. Giant-cell reparative granuloma typically occurs in the jaw (Jaffe 1953, Lorenzo and Dorfman 1980). In a review of the literature, we found only 19 cases of giant-cell reparative granuloma in the small bones of the feet. None of the lesions described affected the calcaneus, and none was multicentric.

The differential diagnosis includes hyperparathy-

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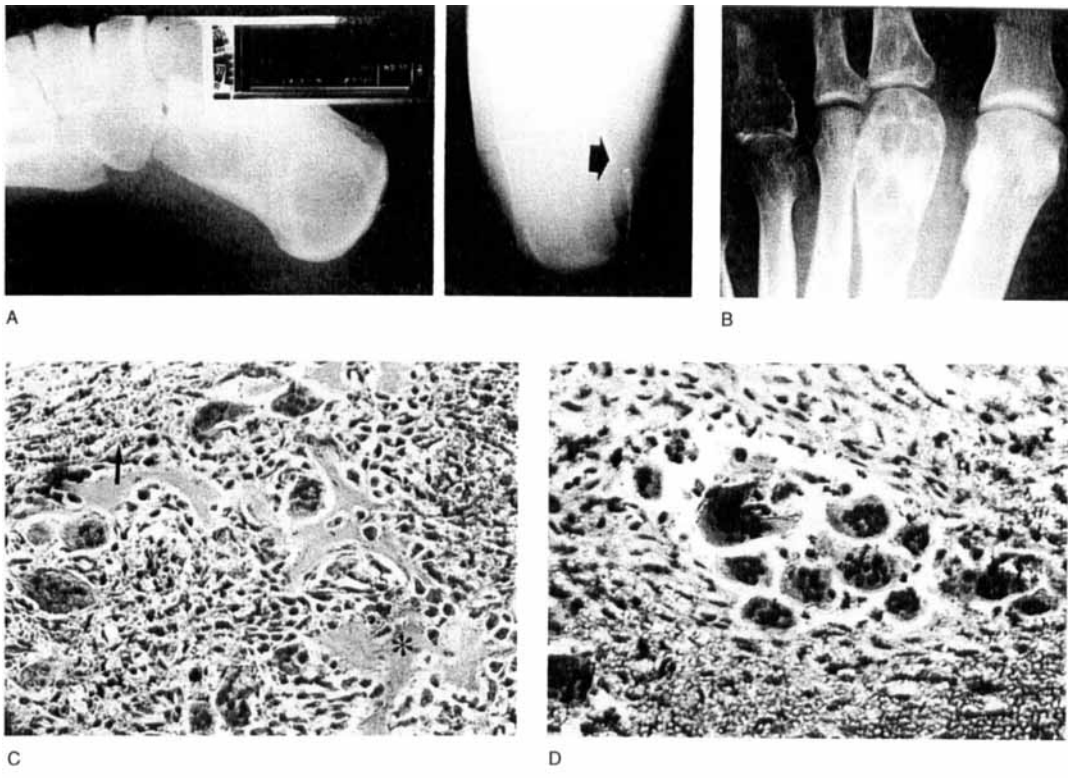

Figure 1. A 17-year-old man who had pain in his right heel for 16 months.
A. A thin-walled round cyst in the posterior calcaneus. Note the pathologic fracture through the medial wall (arrow). A radiograph of the foot taken at the same time is normal.
B. Six months later, cystic forefoot lesions can be seen.
C. Histologic picture of the calcaneal lesion demonstrating aggregates of multinucleated giant cells embedded in benign-appearing stroma composed mainly of spindle-shaped fibroblasts with areas of hemorrhage (thin arrow), as well as osteoid formation (asterisk). HE, x100.
D. Similar histologic findings from the forefoot lesions. Note areas of hemorrhage in the lower half of the field and a cluster of giant cells nearby. HE, x200.

roidism, giant-cell tumor, and aneurysmal bone cyst. Hyperparathyroidism can be very similar both radiographically and histologically. It can only be excluded by the absence of biochemical abnormalities and the absence of radiographic evidence of generalized skeletal rarefaction. The radiographic appearance of a giant-cell tumor can also be similar to a giant-cell reparative granuloma. However, the latter does not penetrate the cortex. An aneurysmal bone cyst is also rather similar radiographically, but it is rare in the small bones of the hands and feet, and typically occurs before skeletal maturity. Notably, a bone scan revealed the forefoot lesions 6 months before they became symptomatic and radiographically evident.

The diagnosis of giant-cell reparative granuloma is made by microscopic examination. Typically, fibrous septae surround highly cellular areas, which are composed mainly of unremarkable spindle cells, fibrosis, and lymphocytic infiltrates. Two features considered essential for diagnosis (Wold et al. 1986) are areas of hemosiderin deposits and osteoid islands. The giant cells, elongated or star-shaped (Bertheussen et al. 1983), appear in clusters adjacent to areas of hemorrhage and sometimes contain phagocytized red blood cells (Lorenzo and Dorfman 1980). In contrast, giant-cell tumors contain widely dispersed round and uniform giant cells with nuclei similar to those of the stromal cells (Picci et al. 1986). Aneurysmal bone cysts are difficult to differentiate from giant-cell reparative granuloma. Osteoid and hemosiderin deposit may be seen in both lesions. However, the giant cells in aneurysmal bone cyst are clustered around large blood-filled channels (Merkow et al. 1985). Primarily our case was diagnosed as an atypical aneurysmal bone cyst. However, at review, foci of giant-cell reparative granuloma were apparent. Such foci preclude aneurysmal bone cyst as the primary diagnosis (Glass et al. 1983).

Giant-cell reparative granuloma has a lower recurrence rate than giant-cell tumor. Recurrence is usually evident within a few months and can be treated by wide resection.

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