CHAPTER **40**

GIANT CELL TUMOR OF BONE – A CASE REPORT IN THE DISTAL PHALANX OF THE HALLUX

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OVERVIEW

Giant cell tumors of bone (GCTB) account for 2-9% of all bone tumors depending on the source and are the most common bone tumors in young adults. They occur in approximately one person per million per year. GCTBs typically present in the third decade of life and never before epiphyseal closure. They are more common in women than men and typically present in long bones of the lower extremity.

These tumors are benign lesions, but do have a high recurrence rate at 45-50%, are locally aggressive, and have the potential for malignant transformation, reported as high as 10%. The differential diagnosis includes, aneurismal bone cysts, unicameral bone cysts, nonosteogenic fibroma, chondroblastoma, and brown tumors.

GCTBs arise from connective, nonosseous tissue of bone. Some patients will indicate trauma as the causative agent, but this has not been completed determined. Most patients present with a complaint of diffuse pain or a dull ache in the area with or without some local soft tissue swelling. Generally symptoms arise when the tumor has destructed the cortex and periostitis has begun.

Radiographically, GCTBs present with a central area of radiolucense and increasing density towards the periphery. They often thin the cortex, and in some cases, pathologic fractures can be identified. In some instances they can be well demarcated, and sometimes they have a soap-bubble appearance. Due to the aggressive nature of these tumors, there is no specific radiographic description. Histologically, there are numerous multi-nucleated giant cells as well as a moderately strong vascular supply. Since other tumors contain giant cells, stromal cell appearance in the tumor is important in the diagnosis of GCTBs.

CASE PRESENTATION

A 49-year-old man presented to the office for left hallux pain. He indicated he had broken the toe in the past and in the last 2 months it had started swelling and became more painful. Interestingly, he had been in the office 4 months prior with a complaint of heel pain and nail changes. At that time his toe had not bothered him. Prior to this visit, he saw his primary care physician, who ordered a CBC. The results were within normal limits.

Clinically, his left hallux was edematous and mildly erythematous. There was a subungual hematoma noted, encompassing less than 50% of the nail. Further examination revealed no purulence. Radiographs were taken and did reveal a soap bubble appearance of the distal phalanx. There was also some dorsal plantar thickening noted of the phalanx, and loss of cortical integrity distally (Figures 1-3). The radiographs from 4 months before were reviewed and while the phalanx was grossly within normal limits in terms of appearance, there was some loss of cortical density on the distal medial aspect noted on close-up (Figures 4-5).

At the time, the decision was made to perform a trephine biopsy of the bone. This specimen was sent for histologic examination, bacterial, and fungal cultures. The histologic examination revealed a giant cell tumor of bone, Enneking stage II-III (Figure 6).

Although, curettage of the cyst with replacement of either bone graft of polymethyl methacrylate is the best treatment for GCTBs, the fact that this one encompassed

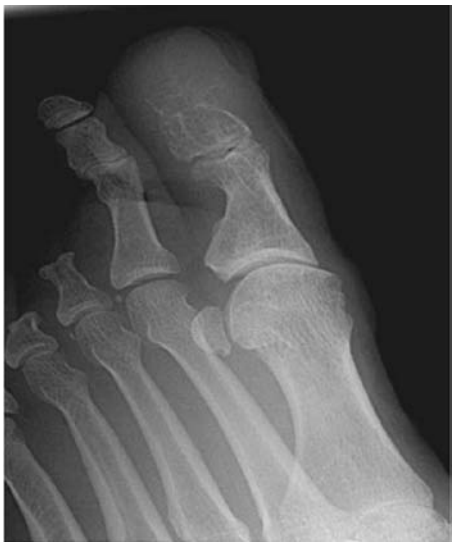

Figure 1. Oblique view of left hallux showing the osseous changes in the distal phalanx.

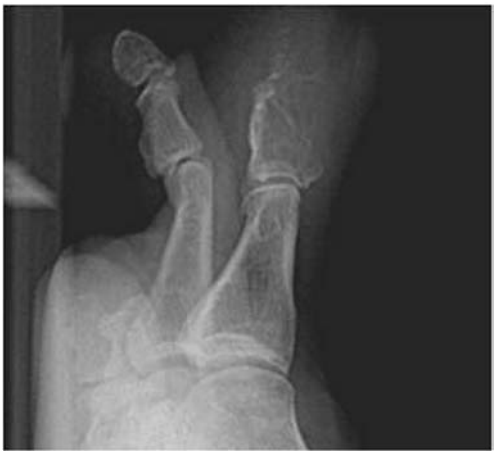

Figure 2. Lateral view of left hallux showing the osseous changes in the distal phalanx.

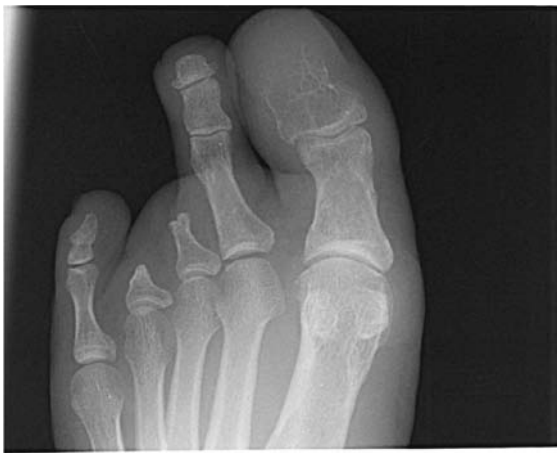

Figure 3. Dorsal plantar view of left hallux showing the osseous changes in the distal phalanx.

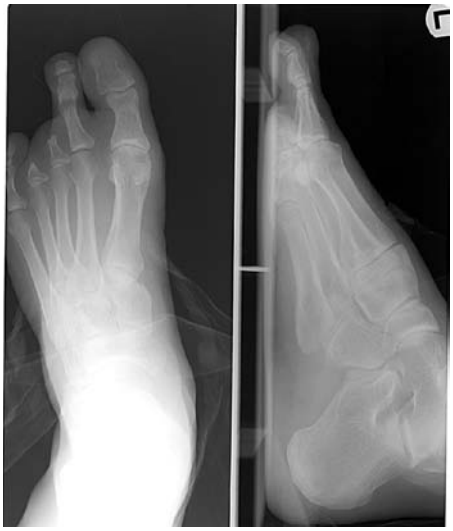

Figure 4. DP and lateral views of the left foot 4 months prior to the complaint.

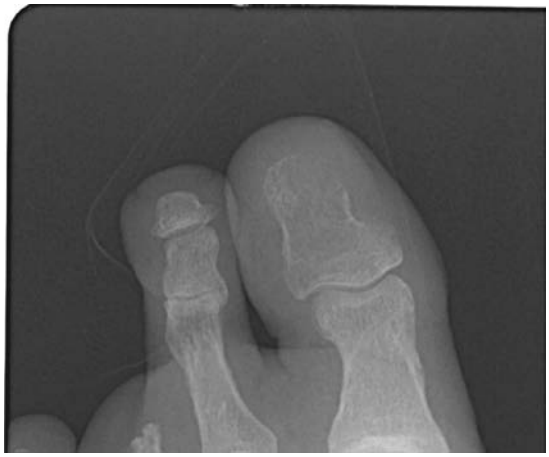

Figure 5. Close-up DP view of hallux from 4 months prior to the complaint.

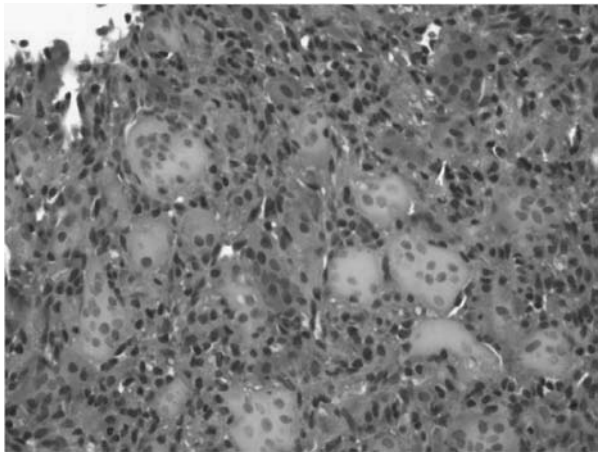

Figure 6. Histological slide of giant cell tumor of bone from trephine biopsy.

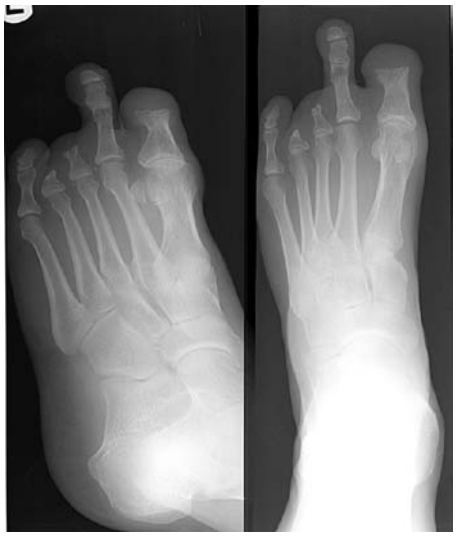

Figure 7. Follow-up x-rays at 2 years post amputation.

the entire distal phalanx negated curettage as an option. Radiation has been reported as a treatment option, but due to the aggressive nature, potential recurrence, and potential malignant transformation, the patient opted for a distal amputation. He had, incidentally, lost his third and fourth toes on that same foot years ago in a motorcycle accident and had no problem with the concept of amputation as patients often do.

Amputation of the hallux was carried out under general anesthesia. The nail structure was encircled and removed, exposing the distal phalanx. This was removed en toto and sent for further examination. The cartilaginous surface of the middle phalanx was removed with a rongeur and the long flexor and extensor tendons were sutured together with a non-absorbable suture. The plantar flap was remodeled and was folded dorsally. This was then closed with 4-0 nylon mattress sutures. The patient was discharged fully weight bearing in a surgical shoe. He healed uneventfully and a 2-year follow-up revealed no adjacent recurrence in the middle phalanx (Figure 7).

Since there is the potential for malignant transformation of GCTBs, it is recommended that patients be followed for 2 years, and if there is recurrence, a computed tomography scan of the chest, abdomen, and pelvis should be performed.

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