Case Report

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Giant Cell Tumor of the Calcaneus: A Case Report

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Abstract

Giant cell tumor (GCT) is benign, locally aggressive tumor that has a tendency for local recurrence. It usually presents at the ends of long bones. Occurrences at atypical locations like bones of the feet are rare, seen in <1% of cases. The majority of cases with GCT present with 15-40 years of age, with <10% above a fifth decade. Treatment options for the same are also very ill-defined. Early diagnosis and aggressive intervention hold the key to successful treatment with less radical operative procedures. We report a case of GCT of the calcaneus in a 56-year male treated with curettage and bone grafting with no signs of recurrence on 1-year follow-up.

Key words: Calcaneus, Curettage, Giant cell tumor, Osteoclastoma

INTRODUCTION

Giant cell tumor (GCT) of bone is generally a benign tumor composed of mono-nuclear stromal cells and characteristic multinucleated giant cells. It usually develops in long bone, but can occur in unusual locations.[1] The multinucleated giant cells appear similar to osteoclasts, which led to the other term osteoclastoma. A typical GCT is a lytic lesion with well-defined, non-sclerotic margins, eccentric in location. GCT is a locally aggressive tumor, which has the tendency for local recurrence.[2] Atypical locations are rare, and tumor diagnosis in these circumstances is often confusing. Most of the multicentric GCTs occurs in the long bones of the lower extremity especially around the knee. Patients with GCTs occurring in the feet tend to present earlier as compared to those at more typical locations. There are very few cases in the medical literature where multiple foot bones are involved. The bones of the hands and feet are uncommon locations with a prevalence of <2%. Multicentric GCT has been reported in <1% of cases with lesions often located in the distal extremities particularly the hands and feet.[3] When multiple bones are involved en bloc resection removing a wide margin through normal tissue planes often leading to amputation of the involved foot will ensure the lowest rate of recurrence.[4]

Here, we present you a case of a 56-year-old male presenting to the orthopedic department with a GCT of the right calcaneus.

CASE REPORT

A 56-year-old male presented with right heel pain and swelling. The pain was present since 11 months. However, the swelling had appeared 6 months back. There was no history of trauma or fall. For this, he consulted a local medical practitioner, who managed the patient conservatively. On presentation to our hospital, a radiograph was taken which showed an osteolytic lesion in the right calcaneus (Figure 1). A computerized tomography scan was performed successively which showed a 5 cm × 3 cm × 3 cm well defined, multiloculated osteolytic lesion with intact cortical margins (Figures 2 and 3).

Excision and curettage of the lesion with bone grafting was performed. Intraoperatively the lesion was soft, greyish, well-defined lesion. Histopathology demonstrated characteristic multi nucleated giant cells in a background of mononuclear stromal cells suggestive of GCT.

The post-operative period was uneventful, and the patient was discharged on post-operative day 14. Patient was put on a below knee Plaster of Paris cast for 6 weeks.

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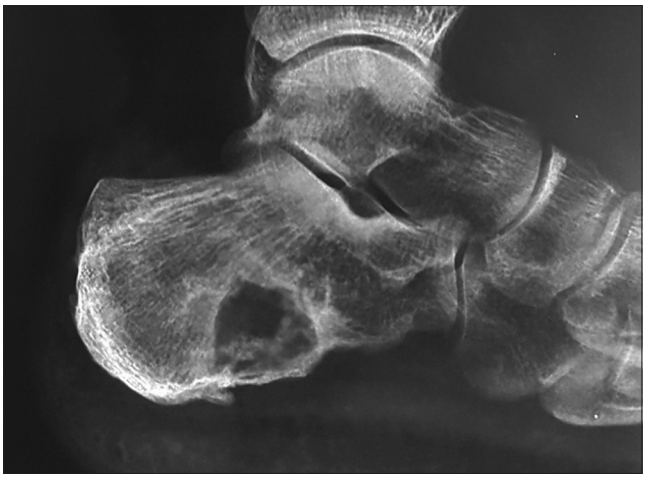

Figure 1: Plain radiograph of left calcaneus showing the tumor involving the body of the calcaneus with intact cortex

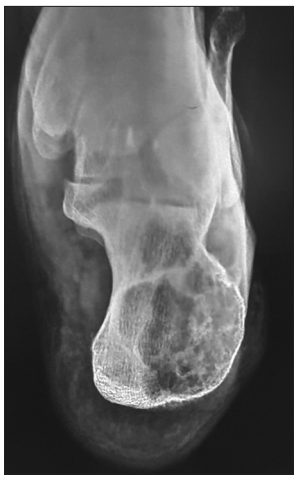

Figure 2: Plain radiograph of left calcaneus in axial view demonstrating the characteristic "soap bubble" appearance. Cortex intact

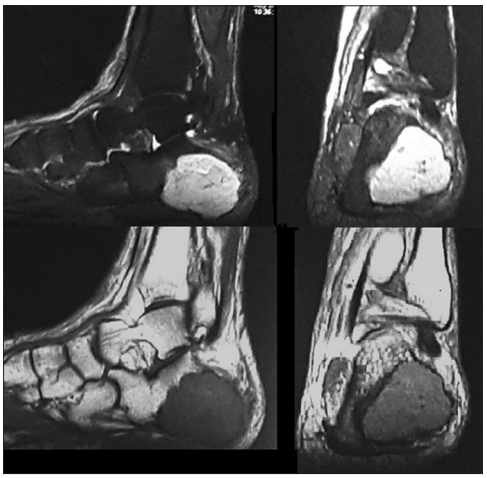

Figure 3: Computerized tomography images of the left ankle demonstrating the size and extent of the tumor

Gradual weight bearing was started 6 weeks onwards on a weight-bearing cast. Patient was followed up every monthly for 6 months, followed by every 3 monthly from next 6 months. In this 1-year follow-up the patient remained disease free and ambulatory, no recurrence of symptoms or no new growth from radiographs was observed.

DISCUSSION

GCT of bone was described by Cooper and Travers in 1818.[5] The tumor is generally benign, locally aggressive with potency of recurrence as well as for malignant transformation, which occurs in 1.5-13% of cases and metastasis primarily to the lungs, however, this is rare occurring in <1% of cases. Malignant transformation to osteosarcoma has been reported in approximately 1% of cases.[6] They occur predominantly in metaphysis and epiphysis of long bones, most common site being distal end femur, followed by proximal end tibia and distal end radius. It is usually seen in the skeletally mature patients, peak incidence in the third decade with a male:female ratio of 1:1.5.[7]

GCT is very rare in the calcaneus. In a study performed by Campanacci *et al.* two cases were reported in the calcaneus out of the total of 327, whereas Dahlin reported 4 out of 411 cases in his study; overall incidence being approximately 1%.[8]

Clinically GCT presents with non-specific symptoms like local swelling, pain, and warmth. On gross pathology, typical GCTs is a soft friable dark tissue with associated areas of cystic and necrotic changes. Histologically the tumor shows characteristic multinucleated osteoclastic type giant cells with round to oval/spindle-shaped nuclei and areas of mitotic activity. Radiologic features of GCT are usually distinctive, appearing as an expanding, eccentrically located radiolucent shadow typically toward the end of the long bone. The tumor has indistinct margins and at times it may be multilocular. Secondary aneurysmal bone cysts or malignant transformations to osteosarcoma may sometimes be encountered.[9]

Treatment of GCT is surgical. Traditionally curettage with or without bone grafting/placement of bone cement is the first line of management. However, recurrence of the tumor is a known complication, most cases presenting within 3 years of primary surgery. Hence the addition of mechanical burr drilling of the tumor was, and/or cryoablation is recommended. This patient should, hence be regularly followed up not only for recurrence but also due to the small definitive risk of malignant transformation.[10] Recently Denosumab, a monoclonal antibody that targets receptor activator of

nuclear factor k-B has been used to treat GCT of bone. It has been shown to inhibit the osteoclastic activity of GCT, hence is been used preoperatively to facilitate the recession of tumor as well as primary treatment for patients unwilling/unfit for surgery.[6]

CONCLUSION

GCT presenting in the calcaneus is a very rare entity. It could present with pain or be asymptomatic and discovered accidentally on a radiograph. The characteristic appearance makes it an easy diagnosis on simple radiographs, however, presentation in an unusual age group must not rule out its likely diagnosis. Intervention in early stages can avoid radical procedures like calcanectomy or amputation. We recommend aggressive surgical approach with close follow-up to detect recurrence if any, at an early stage.

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