A case report of rare occurrence of giant cell tumour in calcaneum misdiagnosed as ankle sprain

Shafora Bibi Samri (✉ shafora@usm.my)  
Universiti Sains Malaysia  https://orcid.org/0000-0003-2402-3955

Wan Aireene Wan Ahmed  
Universiti Sains Malaysia

Case Report

Keywords: Giant cell tumour, Osteoclastoma, Calcaneus, Ankle sprain

Posted Date: January 30th, 2023

DOI: https://doi.org/10.21203/rs.3.rs-2524912/v1

License: ☑️ This work is licensed under a Creative Commons Attribution 4.0 International License.  
Read Full License
Abstract

Background

Giant cell tumour (GCT) of the bone is locally aggressive benign bone tumour commonly occur at distal femur and proximal tibia and rarely found in calcaneus. GCT occurrence at atypical location especially at ankle may be mistakenly as trivial complaint such as ankle sprain, thus not prompt further investigation by treating doctors.

Case presentation

Our case was a 32-year-old female who was presented with left foot swelling for a period of 8 months, progressively increased in size over last 3 months. Right foot examination showed a minimal swelling at posterior ankle region. Plain radiograph showed a well-defined slightly expansile lytic lesion with non-sclerotic margin at posterior part of calcaneus. A core biopsy of the lesion demonstrated scattered osteoblastic type giant cells in the background of abundant mononuclear cells suggestive of a GCT.

Conclusions

GCT rarely involves calcaneus with incidence of about 1%, in such a case making its diagnosis challenging because of its rarity. We highlight the importance for clinicians to have high level of suspicion for bone tumour instead of ignoring patient's complaint and further evaluate with appropriate imaging.

Introduction

GCT of the bone is locally aggressive benign bone tumour comprising 5% of all primary bone tumour mainly seen in mature skeleton[1]. This tumour usually occurs in the age group of 30–40 years old and slightly more common in female than male, with male to female ratio of 1:1.5 [2]. Up to 90% of GCT were found in long bones, 50–65% of cases were found around the knee region as the most common sites are distal femur followed by proximal tibia and distal radius[2]. Histologically, GCT composed of mono-nuclear stromal cells and characteristic multinucleated osteoclastic giant cells thus other name is osteoclastoma[2]. Here, we present you a case of a 32 year-old female presented to the Orthopaedic Department with a GCT of the right calcaneus.

Case Presentation

32 years old female with no known medical illness complained of left heel swelling associated with heel pain for over a period of 2 months. She had no history of trauma prior, and she is still physically active doing her routine work. She had multiple visits to private clinics and was told that it was an ankle sprain.
She was convinced to rest assured and was given analgesia. However, after 6 months the swelling persist and progressively increase in size. She starts to worry and came to our hospital. Upon examination, there was a swelling at posterior ankle region which is firm in consistency, non-fluctuant and slightly tender on palpation. There were no skin changes noted and sensation over this area were intact.

Plain radiograph of left foot done showed a well define slightly expansile lytic lesion with non-sclerotic margin at posterior part of calcaneus (Fig. 1). Computerized tomography (CT) scan showed a well-defined osteolytic lesion measured 3.5cm x 2.6cm x 2.8cm (AP x W x CC). There was cortical breach at lateral and medial margin of left calcaneum (Fig. 2). Magnetic resonance imaging (MRI) demonstrated the lesion as a non-enhancing well defined lesion with narrow zone of transition, no extraosseous spread and no fluid-fluid level within. (Fig. 3).

A core biopsy of the lesion demonstrated scattered osteoblastic type giant cells in the background of abundant mononuclear cells suggestive of a GCT. The calcaneus margins are clear while CT scan thorax shows no lung metastasis. Patient then underwent partial calcaneus resection with curettage and reconstitution with right iliac bone graft. Follow up over a course of 1 year of this patient showed no local recurrence or distant metastasis.

Discussion

GCT is relatively common, comprising of 5% of all primary bone tumours, predominantly occurred in mature skeleton [1]. Solitary GCT of the foot commonly affecting young age group (30–40 years old) and more aggressive than long bones as seen in our patients [1]. GCT of calcaneus is a rare presentation as it only constitutes 1.2% of calcaneal tumours [3]. Clinically, GCT is usually present with non-specific symptoms such as gradual onset of local swelling, pain, and warmth at the affected site which can be mistaken as chronic sprain as occurred in our case initially[2]. Radiologically, GCT is seen as a well-defined, eccentric, osteolytic and slightly expansile lesion that mainly involves the long bones. It usually occurs at metaphysis and diaphysis but may also extend to involve the epiphysis and joint space after physeal closure. Sclerotic rim are usually absent while pathological fractures maybe seen [4].

GCT may show aggressive features, such as wide zone of transition, cortical thinning or expansion, cortical bone destruction and an associated soft-tissue mass. In 1.4% of cases, fluid-fluid levels can be seen in MRI, in keeping with secondary formation of aneurysmal bone cyst [5]. GCT can be classified into three grades based on radiographic appearance using Campanacci staging grading : grade 1 lesion (latent) has a well-defined margin with intact cortex; a grade 2 lesion (active) is a moderately expansile with relatively well-defined margin and thin cortex; and grade 3 lesion (aggressive) has indistinct borders with cortical destruction [5].

GCT had potency to recur in 20–40% of cases and malignant transformation can occur up to 3% while 2% of cases can metastasize especially to the lungs [1]. Thus, it warrants accurate preoperative diagnosis and visualization of lesion extension and distant metastasis for proper surgical planning and further management. Conservative surgery with careful curettage and placement of bone cement should be
considered the treatment of choice when feasible. However, aggressive GCTs may require wide excision and reconstruction or may be amputation. Thus, early detection and intervention is required, and these patients should be followed up regularly as it is high tendency to recur with risk of malignant transformation and distant metastasis.

Generally, symptoms and physical examinations of ankle pain and swelling are nonspecific, thus clinicians might misdiagnosed patients with less serious condition such as plantar fasciitis, chronic ankle sprain, os-trigonum syndrome, calcaneal apophysitis or fractures [6]. Therefore, a comprehensive history, physical examination and radiograph should be offered for any patient with pain and swelling of the foot to obviate the delay in diagnosis and allow an early and accurate diagnosis.

Conclusions

Our report highlights the rarity of CGT at calcaneum. Bone tumor should be considered in the differential diagnosis of ankle swelling in the absence of trauma and chronicity. Early and accurate diagnosis of the tumour clinically and radiologically are necessary to prevent further delay of the patient’s treatment. Thus, clinician and radiologist should be aware of calcaneus GCT and not ignore patients’ symptoms as earlier decision may save patient’s limb and life.

Abbreviations

T1WI: T1-weighted image; T2WI: T2-weighted image; CT: Computed tomography; GCT: Giant cell tumour; GP: general practitioner

Declarations

1. Funding

No funding was obtained for this case report.

2. Competing interests

All authors agreed to publish in this journal and have no competing interests.

3. Ethics approval

Not applicable

4. Consent to participate

The patient included in this case report gave written informed consent to participate.

5. Written consent for publication
The patient included in this case report gave written informed consent for this case to be published.

6. Availability of data and materials

The data are collected from the hospital system with the permission of the competent authority. The identity of the patient is not compromised at any places.

7. Code application

Not applicable

8. Author contributions

SBS wrote the paper. WAWA revised the manuscript. All authors read and approved the final manuscript.

Acknowledgement

I am taking this opportunity to thank everyone in Hospital Universiti Sains Malaysia who were involved in managing the patient.

References


Figures
Figure 1

(A) Lateral left ankle radiograph shows a well define lytic lesion with non-sclerotic margin at posterior part of calcaneus (long arrow). There is also thinning of the cortex with cortical breach (short arrow) at lateral margin more clearly seen in calcaneal view (B)

Figure 2

Sagittal CT image (A) clearly demonstrated well define slightly expansile lytic lesion at posterior part of calcaneus with thinning of the cortex (long arrow). Cortical breech (short arrow) clearly seen in axial view image (B)
Figure 3

Sagittal MRI shows a well-defined lesion at posterior part of calcaneus (white arrow) which exhibit hypointense signal on T1WI (A) and T2WI (B). Achilles tendon (yellow arrow) was compressed by this lesion.