

**A Case Report of Atypical Site Presentation of Giant Cell Tumor at the First Metatarsal in a Young Male**Abhishek Choudhary<sup>1</sup>, Manindra Kumar<sup>2</sup>, Kumar Dewant<sup>3</sup><sup>1</sup>3<sup>rd</sup> Year Junior Resident (MS), Department of Orthopaedics, Patna Medical College and Hospital, Patna, Bihar, India<sup>2</sup>Post Graduate Resident 3<sup>rd</sup> Year, Department of Orthopaedics, Patna Medical College and Hospital, Patna, Bihar, India<sup>3</sup>Post graduate Resident 3<sup>rd</sup> Year (MS), Department of Orthopaedics, Patna Medical College and Hospital, Patna, Bihar, India

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**Abstract:****Background:** Giant cell tumor of bone (GCTB) is a benign yet locally aggressive neoplasm that predominantly involves the epiphyseal region of long bones. Its occurrence in the small bones of the foot is extremely rare and often leads to diagnostic delay.**Case Presentation:** A young male presented with pain and swelling over the first metatarsal region. Radiological evaluation revealed an expansile lytic lesion of the first metatarsal. Histopathological examination demonstrated numerous osteoclast-like multinucleated giant cells in a mononuclear stromal background, confirming the diagnosis of giant cell tumor of bone. Surgical management was performed with favourable outcome.**Conclusion:** Despite its rarity, giant cell tumor should be considered in the differential diagnosis of lytic lesions of the metatarsal bones. Early diagnosis and appropriate surgical intervention are crucial for optimal functional outcome.**Keywords:** Giant Cell Tumor, First Metatarsal, Foot Tumor, Atypical Presentation, Case Report.**DOI:** 10.25258/ijcpr.18.1.257

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**Introduction**

Giant cell tumor of bone (GCTB) is a primary skeletal neoplasm characterized by locally aggressive behavior despite its benign histological appearance [1]. It accounts for approximately 4–5% of all primary bone tumors and commonly affects young adults between the ages of 20 and 40 years [2]. The tumor typically arises in the epiphyseal region of long bones, most frequently around the knee joint, including the distal femur and proximal tibia [3].

Involvement of the bones of the hand and foot is distinctly uncommon, representing less than 2% of all reported cases of giant cell tumor [4]. Among these, metatarsal involvement is exceedingly rare and sparsely documented in the literature [5]. Lesions at these atypical sites may exhibit more aggressive radiological features and are associated with a higher risk of local recurrence [6].

Due to its unusual location, giant cell tumor of the foot is often misdiagnosed, with differential diagnoses including aneurysmal bone cyst, enchondroma, osteomyelitis, chondroblastoma, and other giant cell-rich lesions [7,8]. Radiological

evaluation may suggest an aggressive lytic lesion; however, definitive diagnosis relies on histopathological confirmation [9]. The present case highlights a rare occurrence of giant cell tumor involving the first metatarsal bone in a young male.

**Case Presentation**

A 19-year-old male patient presented to the orthopedic outpatient department with a history of a gradually progressive swelling over the dorsum of the left foot for approximately six months. The swelling was insidious in onset and progressively increased in size. There was no history of antecedent trauma, fever, constitutional symptoms, or similar complaints in the past.

On local examination, a well-defined, firm, non-tender swelling was noted over the dorsal aspect of the first metatarsal region of the left foot. The overlying skin appeared normal, with no signs of erythema, ulceration, or sinus formation. The swelling was fixed to the underlying structures but not to the skin. Movements of the adjacent metatarsophalangeal joint were mildly restricted due

to discomfort (Figures 1 and 2). Distal neurovascular status was intact.

Plain radiographs of the left foot revealed an expansile, well-demarcated lytic lesion involving the distal half of the first metatarsal, exhibiting a characteristic “soap-bubble” appearance with cortical thinning and expansion, without evidence of periosteal reaction or pathological fracture (Figure 3A).

**Histopathological Examination:** Two specimens were received from the lesion of the left foot.

**Gross Examination:** Sample 1 consisted of multiple grey-brown soft tissue fragments measuring  $0.3 \times 0.2 \times 0.1$  cm in aggregate.

Sample 2 consisted of multiple grey-brown soft tissue fragments admixed with bony bits measuring  $0.5 \times 0.5 \times 0.4$  cm in aggregate. The specimen was subjected to decalcification prior to processing.

**Microscopic Findings:** Sections from both specimens demonstrated numerous osteoclast-like multinucleated giant cells uniformly distributed

within a background of mononuclear neoplastic stromal cells. The stromal cells exhibited eosinophilic cytoplasm with round to oval nuclei and small nucleoli (Figure 3B).

Sections from Sample 1 additionally showed fragmented stromal tissue and areas of hemorrhage.

**Impression:** Features were consistent with Giant Cell Tumor of bone.

Based on the clinical and radiological findings, a provisional diagnosis of a benign expansile bone tumor was considered. The patient underwent surgical management in the form of extended intralesional curettage of the lesion. Intraoperatively, the cavity was thoroughly curetted and subsequently filled with bone cement to provide structural stability (Figure 3C).

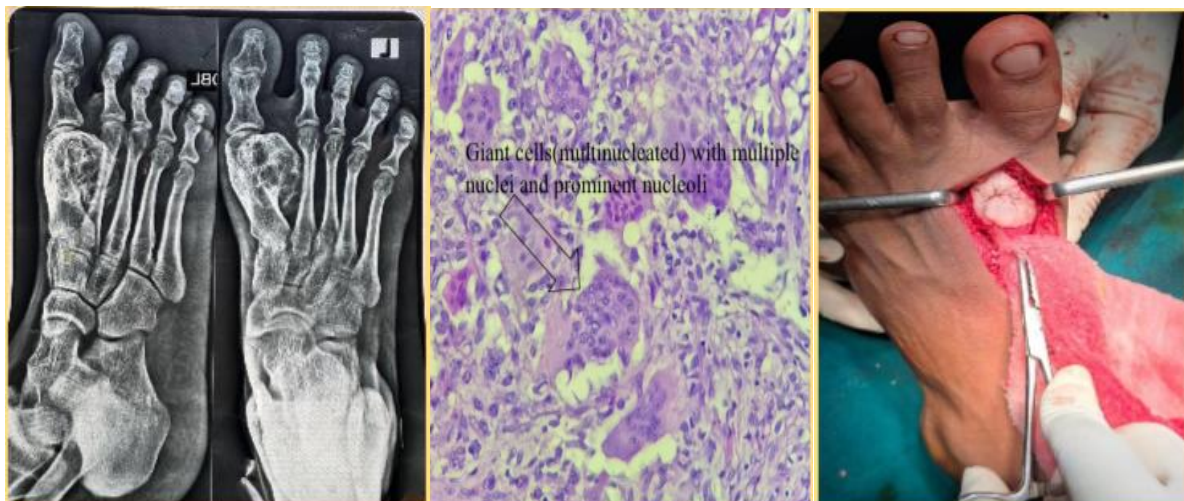
The postoperative period was uneventful. The patient was advised protected weight-bearing and is currently under regular follow-up, with no evidence of local recurrence at the latest review.



**Figure 1: Clinical photograph (lateral view) showing a localized swelling over the dorsal aspect of the first metatarsal region of the foot**



**Figure 2: Clinical photograph (dorsal view) demonstrating swelling involving the first metatarsal region of the foot**



**Figure 3: (A) Plain radiograph of the left foot showing an expansile lytic lesion with a soap-bubble appearance involving the distal half of the first metatarsal. (B) Histopathological section (H&E stain) showing numerous osteoclast-like multinucleated giant cells uniformly distributed within a background of mononuclear stromal cells. (C) Intraoperative photograph demonstrating the curetted cavity filled with bone cement**

### Discussion

Giant cell tumor of bone is known for its unpredictable biological behavior and propensity for local recurrence [10]. Although it predominantly involves long bones, involvement of the foot bones is rare and often presents diagnostic and therapeutic challenges [11].

Metatarsal giant cell tumors tend to occur in younger patients and may demonstrate aggressive radiological characteristics compared to tumors at conventional sites [12]. Radiographic findings typically include an expansile, lytic lesion with

cortical thinning, as observed in the present case [13].

The differential diagnosis of lytic lesions in the metatarsal bones includes aneurysmal bone cyst, enchondroma, brown tumor, infection, and other benign or malignant neoplasms [14–16]. Histopathology remains the gold standard for diagnosis, with characteristic multinucleated giant cells dispersed in a mononuclear stromal background [17].

Surgical management is the treatment of choice for giant cell tumor of bone. Options range from

extended curettage to en bloc resection depending on tumor location and extent [18]. The use of adjuvants has been shown to reduce recurrence rates in selected cases [19]. Due to limited soft tissue coverage and biomechanical demands of the foot, careful surgical planning is essential [20].

Recurrence rates of giant cell tumor in the foot have been reported to be higher than those at conventional sites, emphasizing the need for close postoperative surveillance [21–23]. Emerging medical therapies such as denosumab have shown promise in selected cases but surgery remains the primary modality of treatment [24]. Awareness of this rare presentation is important for early diagnosis and improved outcomes [25].

### Conclusion

Giant cell tumor of the first metatarsal is an exceptionally rare entity. Despite its benign nature, it can cause significant local destruction if not diagnosed early. A combination of clinical suspicion, imaging, and histopathological confirmation is essential. Timely surgical management can result in excellent functional outcomes with low recurrence risk.

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