VOLUME - 13, ISSUE - 03, MARCH - 2024 • PRINT ISSN No. 2277 - 8160 • DOI : 10.36106/gjra

Original Research Paper

Orthopaedics

GIANT CELL TUMOR OF THE IST METATARSAL- A RARE CASE REPORT

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ABSTRACT Although Giant Cell Tumors are classified as benign, they exhibit local aggressiveness in bones and tend to have a high likelihood of recurrence. The distal radius, distal femur, proximal tibia, and humerus are commonly impacted sites. However, the occurrence of a Giant Cell Tumor (GCT) in the first metatarsal is exceedingly rare. In situations like this, a comprehensive approach involves wide excision of the first metatarsal and its replacement with a fibular strut graft.

KEYWORDS :

INTRODUCTION

Giant-cell Tumors (GCT) make up approximately 3%–5% of all primary bone malignancies, commonly manifesting in the meta-epiphysis of long bones such as the distal radius, femur, proximal humerus, and tibia. The distal ulna, although a rare site (0.45%–3.2%), can also be affected. Metastases, observed in 1%–9% of GCT cases, have been associated with aggressive growth and local recurrence. Some surgeons opt for preserving the ulna by performing extended curettage with bone cement application. However, this approach carries a substantial recurrence risk, reaching up to 40%, and an elevated likelihood of metastasis with each recurrence.

CASE DESCRIPTION

A 29-year-old male presented with a complaint of swelling on the dorsum of the left foot persisting for 6 months, accompanied by pain in the same foot for the last 4 months. The onset of swelling was insidious, progressively increasing in size. The pain experienced was of mild to moderate intensity, characterized as a dull, continuous ache. Upon examination, a localized ovoid-shaped swelling measuring 7 by 4 cm was observed over the dorsum of the left foot, specifically in the region opposing the 1st and 2nd metatarsals. The swelling exhibited well-defined margins, tenderness on deep palpation, a hard consistency, and the overlying skin appeared unaffected (refer to Figure-1).

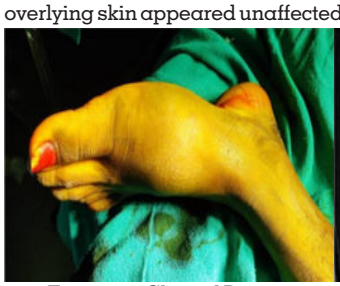


Figure 1:: Clinical Picture

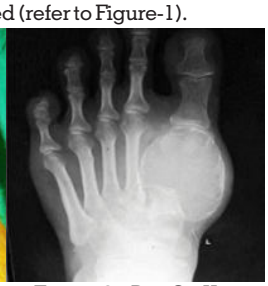
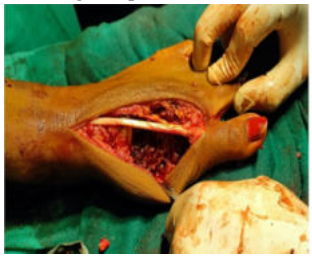


Figure 2:: Pre-Op X-ray

Radiographs disclosed an expansile osteolytic lesion encompassing the entire 1st metatarsal, affecting both the articular surface of the tarsometatarsal joint and the metatarsophalangeal joint. The lesion exhibited impingement on the 1st metatarsal and cortical thinning. A characteristic "**soap bubble appearance**" was evident in the radiographic findings, as depicted in Figure 2. To confirm the diagnosis of Giant-Cell Tumor (GCT), fine needle aspiration cytology was performed.

A reconstructive surgery involving the fusion of the Cuneiform metatarsal and metatarsophalangeal joint was planned for the patient. The tumor was meticulously removed along with a cuff of normal tissue, and thorough inspection of the proximal and distal joints was conducted. No articular cartilage was found in the Cuneiform metatarsal joint. Subsequently, a fibular graft was harvested and inserted into the troughs created in the medial cuneiform and proximal phalanx, securing it with K-wires both proximally and distally (refer to figures 3 & 4). Following the surgery, the patient was placed in a below-knee cast for a period of three months. Full weight-bearing was initiated after this postoperative period. At the 9-month follow-up, the graft showed successful integration, and there were no indications of recurrence, both clinically and radiologically.



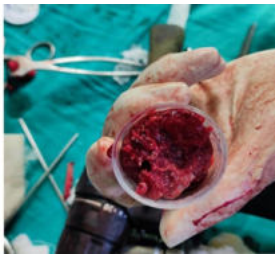


Figure 3:: Wide Surgical Resection

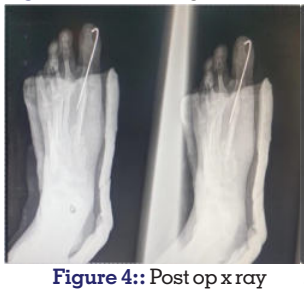


Figure 4:: Post op x ray

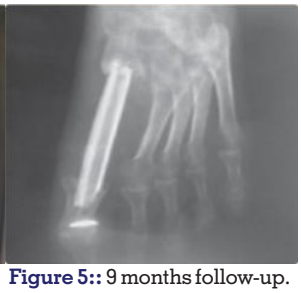


Figure 5:: 9 months follow-up.

DISCUSSION

Giant-cell tumor (GCT) of the bone, although benign, displays local aggressiveness and is a relatively uncommon tumor characterized by connective tissue stromal cells interacting with multinucleated giant cells resembling osteoclasts [1]. It predominantly affects long bones, with the femur (approximately 30%), tibia (25%), radius (10%), and humerus (6%) being the primary sites [1, 2, 3, 4]. Involvement of the spine and innominate bone is occasional. GCT of the hand accounts for only 2% of cases, mostly in phalanges rather than metacarpals. The occurrence of GCT in the foot is even rarer, suggesting differences from conventional GCT in other skeletal locations [1, 6, 9]. A bone scan, recommended due to an 18% incidence of multicentric foci, is integral to the routine workup of these tumors. Typically, they manifest in a younger age group and have a relatively short duration of symptoms,

often around six months before diagnosis [5, 9].

Differential considerations based on appearance and location include giant cell reparative granuloma, aneurysmal bone cyst, chondromyxoid fibroma, brown tumor of hyperparathyroidism, angiosarcoma, myeloma, and expansile metastatic lesions like renal cell carcinoma. Despite GCT not being a sarcoma, the extent of the tumor at diagnosis and the high recurrence rate following limited resection often necessitate en bloc resection through normal tissues to prevent local recurrence. However, such a treatment creates a significant skeletal defect, especially challenging in foot reconstruction due to the need to restore the joint surface and bone. The fibula is commonly used for reconstruction, matching the anatomy of the foot as a weight-bearing structure. Various treatment modalities documented in the literature include curettage, curettage with bone grafting, irradiation, amputation, and resection with reconstruction.

CONCLUSION

Giant-cell tumor (GCT), also known as osteoclastoma, is an osteolytic tumor that is mostly benign but exhibits local aggressiveness, typically occurring in young adults at the epiphysis. The primary area of predilection is the epiphysis of long bones, accounting for 85-90% of cases. Approximately 4% of GCTs are found in the iliac bone and spine, while only 2% occur in the hand, with GCT in phalanges being more common than in metacarpals.

The preferred surgical treatment involves local resection of the affected metatarsal, followed by autograft or allograft replacement. Several factors support this approach: firstly, there is no established correlation between the grade of GCT and the recurrence rate, making all giant foot tumors considered locally aggressive. Additionally, curettage, with or without bone grafts, has shown recurrence rates of about 90%, rendering it an unacceptable treatment option. Secondly, while amputation may prevent recurrence, it comes with cosmetic deformities and a reduction in foot function.

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