

## Evaluation and management of Giant Cell Tumor of the Distal Fibula, a Case Report.

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Article information	Abstract
<p><b>Key words:</b> Giant cell tumor, Distal fibula, Tibiotalus fusion, Ankle function, Case report</p> <p><b>Core Tip:</b> Giant cell tumor of the distal fibula is rare, and In this study, the tibiotalar joint was fused with three screws and within the period of 6 months showed satisfactory results.</p> <p><i>Received: 22-12-2024</i> <i>Accepted: 09-01-2024</i> <i>Available: 29-01-2025</i></p>	<p><b>BACKGROUND</b> It is rare for giant cell tumor to occur in the distal fibula and there is no consensus on the modality of management of such tumor</p> <p><b>CASE SUMMARY</b> A 48 -old woman who had a long-standing history of pain and swelling of the right lateral malleolus presented to our hospital. imaging revealed a 7 cm x4 cm cystic expansile lytic lesion occupying the lateral malleolus. The biopsy obtained by excising the mass confirmed it was a giant cell tumor. The patient was a known case of End Stage Renal Disease, after consulting anesthesia regarding patient preparation for surgery and considering treatment options with the patient we proceeded to preform excision of the mass and tibiotalar fusion, which performed well in the 6-month period of follow up with the patient</p> <p><b>CONCLUSION</b> Tumor resection of the distal fibula and tibiotalar fusion of the ankle is a successful option for the management of such case</p>

### I) Introduction

The ankle joint is complex and formed by lower ends of fibula, tibia, and talus along with complex ligamentous restraints. The Lower end of fibula forms an important component of ankle mortise. Any pathological lesion or ensuing deformity in the lower fibula can lead to an unstable ankle resulting into lifelong debility. The management of any lesion in the lower end of fibula needs to address both the primary pathology management and restoration of the ankle joint for an adequate functional outcome. Giant Cell Tumour (GCT) is one of the most encountered bone tumours in clinical practice. More than 50% of these tumors occur around the knee joint [1]. The upper end of the fibula is more commonly involved, greater than the distal fibula [2] The GCT of the distal fibula is a rare condition [3]. The treatment of aggressive GCT at this location is challenging. Only a few case reports or small case series have been published on this subject [4, 5] and hence there are no clear guidelines available for its management and outcomes.

## II) CASE PRESENTATION

### A) Chief complaints

A 48-year-old woman presented with progressive painful swelling of the right lateral malleolus for half a year and was aggravated in the last 2 weeks.

### B) History of past illness

She is known to have ESRD on hemodialysis.

### C) Family history

The patient denied any relevant family history.

### D) Physical examination

A palpable soft mass localized around the left lateral malleolus, about 12x 8 cm in size with well-defined boundaries and no skin changes.

### E) Imaging examinations

X rays show an expansile lytic lesion in the distal fibula occupying most of the lateral malleolus with ill-defined margins and no periosteal reaction (Figure 1). The magnetic resonance imaging scan of her right ankle revealed not only a lytic lesion in the distal fibula but multiple calcaneal and talar hypo intense lesions that are likely to be synchronous lesions (Figure 2).

Figure 1.



Radiographs showed expansile lesion with soap bubble appearance.

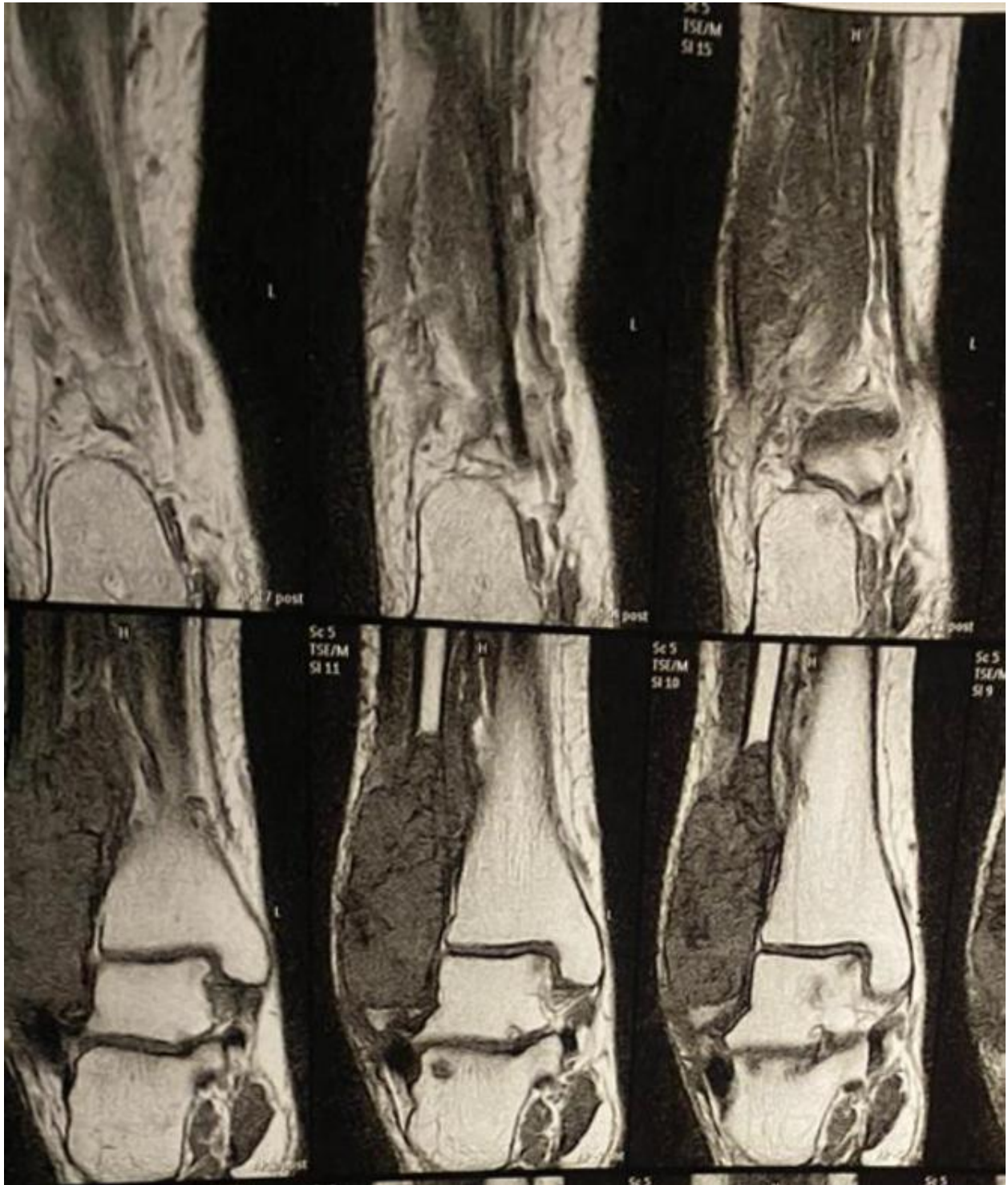


Figure 2.

Magnetic resonance imaging



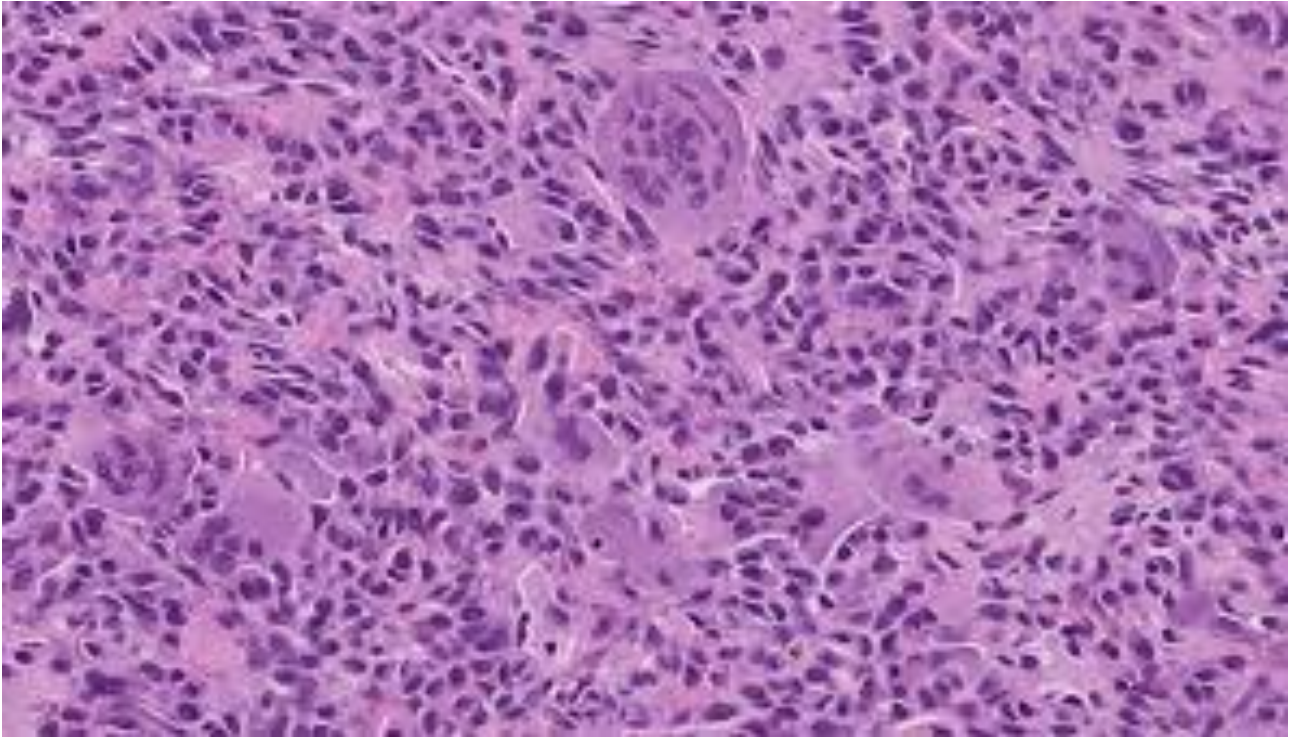


Figure 3

Pathologically, the tumor comprised mononuclear stromal cells and multinuclear giant cells. Original magnification:  $\times 100$ .

#### **F) FINAL DIAGNOSIS**

Based on the clinical, radiological, and pathological findings, the diagnosis of distal fibula GCT was confirmed.

#### **G) TREATMENT**

The choice and plan of management were discussed in a multidisciplinary clinic meeting. We offered resection and arthrodesis. Because the patient had low requirements for ankle joint function she opted for arthrodesis.

Through an incision along the lateral side of the left lateral malleolus, subcutaneous separation of soft tissue to achieve bone exposure was performed. The tumor was encapsulated and there was mobility. However, the mass was completely exposed. The local soft tissue was soaked in distilled water for 10 min. The tumor was completely resected along with the lateral malleolus. 3 cancellous screws were applied to the tibiotalar joint for fixation. The tibiotalar joint was fixed firmly allowing no micromotion. Next, we sutured the remaining peroneus brevis to the peroneus longus muscle and attached it to the lateral fascia to stabilize the ankle joint laterally. The skin was trimmed, and the wound was sutured. Dressing and a plaster cast were applied with a plan to remove after 6 weeks. The patient was permitted to partially bear weight after that time period. Three months later the patient progressed to full weight bearing.



Figure 4.

Postoperative X ray showed the tibiotalar joint was secured with three screws.

## II) DISCUSSION

Totally, 24 The lateral malleolus is an important part of the ankle joint, and its distal ligaments are very important for the stability and function of the ankle joint [6-8]. Once the lateral malleolus is invaded by a tumor, this might cause ankle joint dysfunction. GCTs on the bone of the distal fibula are extremely rare [9]. It usually occurs in people aged 20-40 years, and the most common sites are in the distal femur, proximal tibia, distal radius, and proximal humerus.

Standard GCT treatment is surgical removal, either by curettage or resection, combined with intraoperative adjuvant therapy with phenol and other sclerosing agents [10]; however, some sites may not be amenable to resection, especially near the joint, such as the GCTs of the distal fibula [7,8 ,11]. Once the articular surface is invaded by a tumor, complete resection is necessary. Due to the importance of its anatomical structure, they are extremely difficult to treat once they occur, and currently there are no guidelines to adopt. Reconstruction treatment such as proximal fibula inversion, allograft, prosthetic replacement, etc. can restore the ankle function to the greatest extent, but external ankle ligament reconstruction has its corresponding difficulties, including soft tissue reconstruction and even rebuilding, and the ligament or tendon-bone healing is still difficult [12-14]. Furthermore, it can lead to long-term complications such as ankle arthritis, joint instability, and pain.

Although reconstructive surgery may improve ankle function, it is time consuming, requires a high cost for reconstruction surgery, and can induce traumatic arthritis, leading to dissatisfaction with the ankle function restoration. Arthrodesis reduces joint function; however, the patient can walk without pain and the cost is lower. Therefore, there is no consensus on the best treatment modality. In this case, we first performed biopsy and histopathological study if the tumor. In order to avoid tumor, spread, we used bone cement to seal the wound cavity. In the fusion procedure, we completely excised the mass and the soft tissue invaded by the tumor, sutured the normal peroneus brevis muscle to the peroneus longus muscle, and then sutured it to the deep fascia surrounding the lateral malleolus to enhance ankle stability. In our experience, arthrodesis is a good option.[14]

Tibiotalar fusion and tibiotocalcaneal fusion are two types of arthrodesis. Tibiotalar fusion is often used in young patients and in patients with good subtalar joint to preserve the range of motion of the subtalar joint [15,16]. Tibiotalar fusion is often used to reconstruct lateral stability, and in this case, the tibiotalar joint was fixed with three screws. The technique has the advantages of requiring less operation time, having a simple operation, and being reliable with effective fixation and good stability of the ankle joint. it is also less invasive and less expensive than prosthetic replacement or reconstruction. After 6 months of follow-up, we concluded that tibiotalar joint fusion with screws was a good option for extensive resection of distal fibula tumors without anatomic reconstruction.

### **III) CONCLUSION:**

Despite knowing the importance and the contribution of the lateral malleolus to joint stability, minimal resection of the tumor mass is not an effective choice for management because of the risk of recurrence. With arthrodesis we ensure the ankle joint stability and weight bearing remain acceptable, despite compromising the range of motion. Therefore, it can be used as a surgical option for the treatment of distal fibular tumors.

### **IV) Footnotes:**

Informed consent statement: The guardian of patient provided written informed consent to publish this case report and any accompanying images.

Conflict-of-interest statement: The authors report no relevant conflicts of interest for this article.

CARE Checklist (2016) statement: The authors have read the CARE Checklist (2016), and the manuscript was prepared and revised according to the CARE Checklist (2016).

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