

Case Report

Extended Curettage and Cement Reconstruction in a Giant Cell Tumour of the Proximal Tibia: A Case Report

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Abstract: Giant cell tumour (GCT) of bone is a benign but locally aggressive neoplasm, frequently involving the epiphyseal region of long bones, particularly around the knee [1-3]. We report a case of GCT of the right proximal tibia in a skeletally mature patient who presented with pain and swelling. Radiological evaluation showed a well-defined expansile lytic lesion without evidence of metastasis [1-4]. The patient was managed with extended intralesional curettage using a high-speed burr, adjuvant chemical cauterisation, and defect reconstruction with polymethylmethacrylate (PMMA) bone cement [3, 4]. Post-operative recovery was uneventful, with excellent knee function and no recurrence at follow-up. Bone cement provided immediate stability, enabled early mobilisation, and facilitated detection of recurrence on imaging [4, 5]. This case highlights that extended curettage with adjuvant therapy and cement reconstruction is an effective joint-preserving technique for proximal tibial GCT, offering good functional outcomes and low recurrence rates [3-5].

Keywords: Giant cell tumour, Proximal tibia, Extended curettage, Benign but locally aggressive.

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INTRODUCTION

Giant cell tumour (GCT) rarely metastasises, on few occasions to the lungs, but is usually benign and locally invasive, occurring in mature bones between the ages of 20 and 45 years [1, 2]. It can also be rarely found in immature bone of teenagers, usually associated with other diseases such as Paget's disease and Goltz syndrome [1, 2]. GCT affects both sexes equally but has a slight female preponderance [1]. The most common locations are the distal femur, proximal tibia, distal radius, and sacral ala [1-3]. Patients usually present with dull aching pain, often without significant trauma history, stiffness of the joint, and swelling that progressively increases in size; in some cases, it is associated with pathological fracture [1-5]. Radiographically, GCT typically appears as a single, metaphyseal, eccentric, lytic lesion with a narrow transition zone, minimal or no matrix calcification, and little or no periosteal reaction [1-5]. Histologically, the tumour appears red to reddish-purple, with yellow soft foci, and contains mononuclear stromal cells resembling interstitial fibroblasts (type 1), monocyte/macrophage

family precursors (type 2), and numerous multinucleated giant cells (type 3) with up to 50 nuclei [1, 2]. Type 2 and type 3 cells express IGF-I and IGF-II activity. The lesion is usually well vascularised, with osteoclast-like giant cells derived from haematopoietic stem cells and stimulated by RANKL (receptor activator for nuclear factor κ B) [2-7].

CASE PRESENTATION

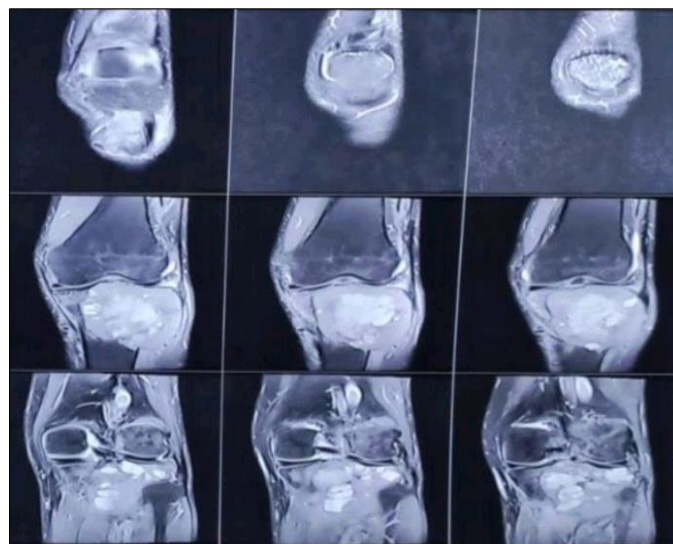
40 years old Male presented to us with Right Leg pain for the past 7 months which was insidious in onset, continuous in nature dull aching type and non radiating, aggravated during full flexion, walking, night and relieved while resting associated with swelling over right knee which was small for the past 4 months and then increased during the 4 months period to attain the current size. Xray Right knee AP and Lateral revealed a solitary epiphyseal eccentric lesion having narrow zone transition with soft tissue extension with no calcification and no periosteal reaction in Tibia with minimal soft tissue involvement.



Clinical images



Figure 1: Preoperative radiograph (anteroposterior and lateral views)



Magnetic resonance imaging (MRI) was performed and it revealed A large well margined expansile lobulated T1 hypointense T2 mildly iso to hyperintense soft tissue mass with scattered cystic areas showing fluid-fluid level seen eccentrically located in lateral tibial condyle epiphysis and metaphysis region. Mild surrounding bone marrow oedema seen in adjacent proximal tibia with mild adjacent.

Surgical Technique

The patient was placed supine on a radiolucent table, with the knee flexed to approximately 60 degrees. A small bag was positioned under the buttock to correct the natural external rotation of the lower limb, and a tourniquet was applied. An inverted L-shaped incision, beginning approximately 1 to 3 cm distal to the joint line and just lateral to the patellar tendon, was made. The incision curved anteriorly over Gerdy's tubercle and

extended distally about 1 cm lateral to the anterior border of the tibia. Below the joint line, the incision was deepened through subcutaneous tissue and the fascia overlying the tibialis anterior muscle. The proximal tibia was exposed, revealing a chocolate-brown, soft, spongy, and fragile lesion suggestive of GCT [1-4]. The lesion was thoroughly curetted using a high-speed burr to ensure removal of tumour tissue [3-5]. It was noted that

the anterior, medial, and posterior cortices were involved, leaving a remnant medial wall of approximately 1.5 cm thickness after curettage. Feeder arteries from the popliteal artery supplying the tumour were identified and cauterised. Thermal cauterisation of the cavity was performed, followed by copious irrigation with hydrogen peroxide and saline as adjuvant treatment to reduce recurrence risk [4-7].



The remanant bone prepared for cementing. Cortical screw (SS) of size 57 mm was directed divergently along the shaft from lateral to medial. Cementing was done and a Cortico-Cancellous screw (SS) of size 60mm applied percutaneously from medial to

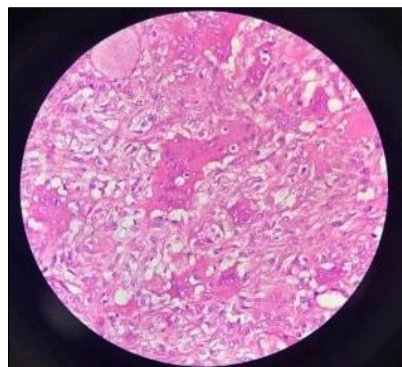
lateral in the subchondral plane. The position of the screws and cement confirmed with C-arm. The samples of the lesion were sent for histopathological examination and Culture & sensitivity.



C-arm images

Postoperatively long knee brace was advised for full time for 1 month following with gentle Knee motion

exercise. After 6 weeks patient was advised weight bearing as tolerated with progress to full weight bearing.



Histology slide

DISCUSSION

A 40-year-old male presented with pain and swelling around the right knee, and radiographic evaluation revealed a lytic, expansile lesion involving the epiphyseal-metaphyseal region of the proximal tibia with cortical thinning, suggestive of a giant cell tumour [1-4]. The lesion's location and radiological features are characteristic, as GCTs commonly involve the knee region in skeletally mature patients [1, 2]. Management in such cases focuses on complete intralesional curettage with adjuvant therapy to minimise recurrence risk, followed by defect reconstruction—either with bone graft or cement—to restore joint stability and function [3-5]. Given the proximity to the articular surface, careful preservation of subchondral bone is crucial to maintain knee function [4, 5]. With adequate clearance and reconstruction, favourable functional and oncological outcomes are achievable [4-6].

CONCLUSIONS

In this paper, we presented a case of giant cell tumour (GCT) of the right proximal tibia, managed with extended curettage and cementing. GCT is a rare, locally invasive bone tumour that primarily affects young adults, causing pain, swelling, and, in some cases, pathological fracture [1, 2]. Diagnosis is based on characteristic radiological and histological features [1-4]. Treatment options include surgery, chemotherapy, and radiotherapy, with extended intralesional curettage being the preferred surgical approach for most lesions to preserve joint function [3-5]. In our case, extended curettage was performed, leaving only the medial wall intact, with careful control of a feeder artery from the popliteal artery supplying the tumour. The defect was reconstructed with polymethylmethacrylate bone cement, which provided immediate stability, reduced recurrence risk through its thermal effect, and allowed

easier detection of recurrence on follow-up imaging [4-6]. The patient had an uneventful recovery with no recurrence at six weeks. This case supports the use of extended curettage and cement reconstruction as an effective and safe treatment for proximal tibial GCT, especially when there is risk of vascular injury or fracture, though long-term studies are required to assess durability and late complications [4-7].

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