

Giant Cell Tumor of Left Distal Femur: A Case Report

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Abstract

Giant cell tumor (GCT) is one of the most common benign bone tumors, predominantly occurring in young adults aged between 25 to 45 years. Typically found at the metaphyseal or epiphyseal regions of the femur or tibia bone. GCT, despite its predominantly benign nature, exhibits a highly unpredictable spectrum of disease behavior. It has high recurrence rate. We introduce a report of a case of GCT in a female where lesion was identified at left distal thigh.

Presentation of case: We describe a 29-year-old female patient with GCT over left distal thigh since six months. Initially swelling was localised and insidious in onset not associated with fever and weight loss and swelling was not freely mobile, it is adherent to bone. Patient also complains pain and localised tenderness. Radiographic and histopathological examination is necessary to help determine whether to take further treatment. Surgical excision was performed, including complete removal of the tumour. Histopathology suggested that the tumour was consistent with GCT

without malignancy. There was no clinical and radiologic evidence of recurrence after three months of surgery.

Keywords: Cortical Destruction, Giant Cell Tumor, Radiolucent, Swelling

Introduction

Giant cell tumor (GCT) is one of the most common benign bone tumors, predominantly occurring in young adults aged 20 to 40 with a high recurrence rate and the potential for aggressive behavior⁽¹⁾. GCT represents approximately 5% of all primary bone tumors^(2,3). More than half of these lesions occur in the third and fourth decades of life⁽³⁾. Local aggressiveness varies from focal symptoms arising from bony or cortical destruction and surrounding soft tissue expansion to the rare occurrence of metastasis. Instances of GCT within the axial skeleton pose a heightened risk of severe local complications and are often deemed unresectable⁴.

Although considered to be benign tumors of bone, GCT has a relatively high recurrence rate. Metastases occur in 1% to 9% of patients with GCT and some earlier studies

have correlated the incidence of metastases with aggressive growth and local recurrence^{5,6}.

There is no widely held consensus regarding the ideal treatment method selection. There are advocates of varying surgical techniques ranging from intra-lesional curettage to wide resection. The goals of treatment are eradication of the tumor, preservation of limb function, and prevention of local recurrence and distant metastasis. Several adjuvant methods beyond simple curettage have been reported in the orthopaedics literature during the last decade to facilitate better local control and prevent recurrences⁷.

Case presentation

A 29-year-old female, right hand dominant, visited to tertiary health care center with six-month history of left thigh discomfort and obvious growing masses. Based on physical examination, the swelling were nearly 7.5 * 5 * 4*cm in size at the lateral aspect of the left distal thigh. (figure 1). The swelling was slowly growing smooth and regular in consistency not associated with dimpling of skin, localised and insidious in onset not associated with fever and weight loss and swelling was not freely mobile, it is adherant to bone. Patient also complaints pain and localised tenderness over lateral aspect of left distal thigh. The range of motion of the left knee joint were terminally restricted, patient does not have any history of trauma. The patient has no history of smoking and alcohol abuse, and no family member has any history of related diseases.

Xray examination of the left distal femur shows characteristic radiolucent, geo-graphic, osteolytic appearance with a narrow zone of transition found at the margin of the lesion. This margin, contrary to that of many other benign lesions, lacks a complete sclerotic rim. GCTs are eccentric lesions in epiphyseal region

with a tendency to extend within centimeter of the subchondral bone.

The FNAC report was suggestive of sections showing a tumor composed of multinucleated giant cells scattered within a monomorphic stroma; the nuclei of the giant cells were similar to those of the stromal cells.

The patient was taken for elective surgery after due pre-operative evaluation and was given spinal anesthesia

Clinical pictures



Figure 1,2: anterior and medial aspect of left knee

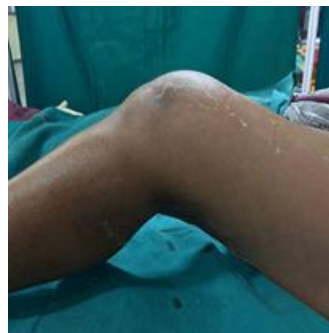


Figure 3: lateral aspect of left knee

Xray of left knee -Radiograph examination typically reveals a characteristic radiolucent geographic lytic appearance at left distal femur with a narrow transition zone at the lesion margin. Unlike many benign lesions, GCT lacks a prominent sclerotic rim at the lesion margin. Calcification of the matrix, periosteal reaction, and new bone formation are typically absent⁸.



Figure 4: left knee lateral xray



Figure 5: left knee AP xray

Figure 6,7,8,9 MRI of left knee joint -GCT lesions typically present with homogeneous signal intensity, appearing as well-circumscribed lesions on MRI. On T1-weighted images, these lesions exhibit low signal intensity, while on T2-weighted images, intermediate signal intensity is observed. The typical features include an expansile hypervascular mass with cystic changes, displaying heterogeneous low to intermediate signal intensity on T1-weighted images and intermediate to high intensity on T2-weighted images^{9,10}



Figure 6:

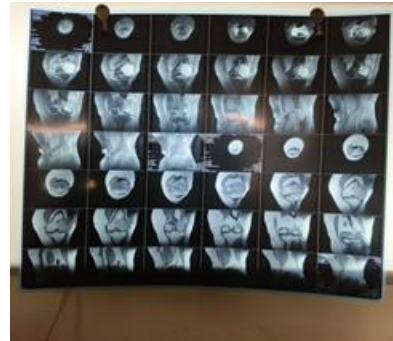


Figure 7:

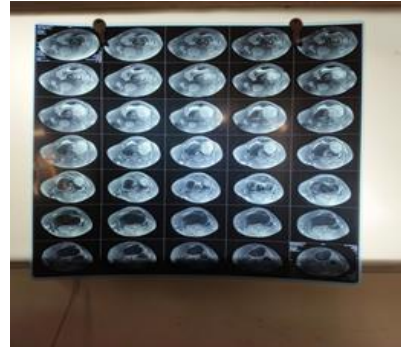


Figure 8:



Figure 9:

A tourniquet was applied, and a 15 cm incision was made on lateral aspect of left distal thigh, extending from the lateral joint line. Soft tissue dissection was performed. tensor fascia lata incised and vastus lateralis split. After dissection, the tumour appeared to be attached to the bone. Through a large cortical window, the tumours were curetted until normal-appearing bone was seen. The cavity was then enlarged in all directions using a high-speed burr, with care to avoid

contamination of the surrounding soft tissues. The cavity was cleaned with pulsatile lavage of 5% phenol, and phenolsoaked gauze was placed inside the cavity for 2 minutes. Care was taken not to spill the phenol to the surrounding tissues. Phenol was not used in cases with a pathological fracture. Structural allografts of 3 to 5 mm thickness were packed adjacent to the subarticular surface as a 5 to 8 mm thick layer. A layer of gel foam was laid over the allograft, and the remaining cavity was packed with cement. The tourniquet was released, hemostasis was achieved, and suturing was done in layers.

Intraoperative pictures

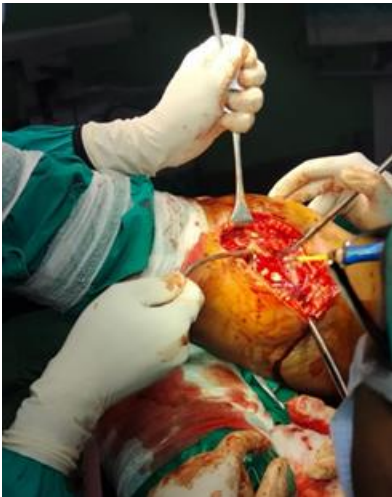


Figure 10: skin incision taken, soft tissue dissected and tensor fascia lata split



Figure 11: After through dissection bone exposed and extended curettage done and thermal burr used



Figure 12: bone cement application

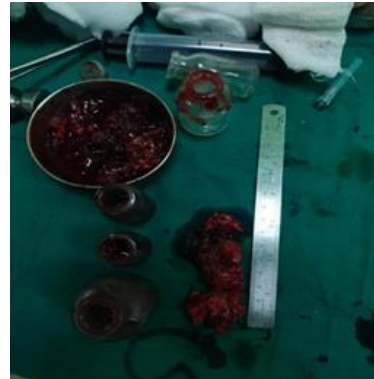


Figure 13: giant cell tumor excised and specimen collected.

Histopathological examination showed that the tumour was lobulated and multinucleated giant cells scattered within monomorphic stroma, nuclei of giant cell are similar to stromal cells, there is no evidence of malignancy

Histopathology suggest these masses are consistent with giant cell tumor of bone (Figure 14) and 15) showing multinucleate giant cells scattered within monomorphic stroma

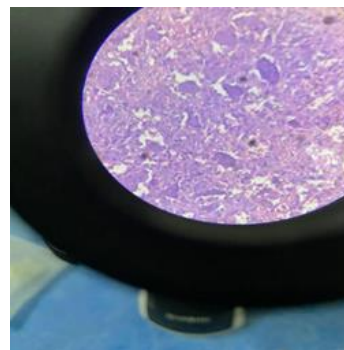


Figure 14:

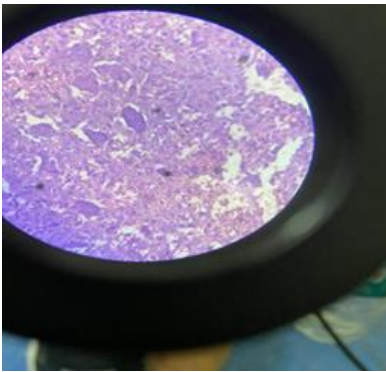


Figure 15:

Post operative xray

Reconstruction with allograft, gel foam, and cement (the sandwich technique) for GCT of bone



Figure 16: left knee AP xray



Figure 17: left knee lateral xray

Post operative scar



Figure 18:

Discussion

Treatment for GCTs around the knee include curettage alone, curettage with adjuvant therapy (liquid nitrogen, hydrogen peroxide, phenol, argon laser photocoagulation, bone cement, or bone graft), and marginal/wide resection, followed by reconstruction, arthrodesis, or mega-prosthetic joint replacement. Intralesional curettage alone has a high recurrence rate of 60%, whereas marginal/wide resection is associated with functional disability. Preservation of joint function is an advantage of intralesional curettage compared to wide resection. In our study, intralesional curettage and reconstruction with the sandwich technique achieved a low recurrence rate (2.8%) and good functional outcome (92.3%)¹¹.

While wide resection has been associated with a decreased risk of local recurrence, potentially raising the recurrence-free survival rate from 84% to 100%^(12,13,14). Local adjuvant therapy has been shown to be useful in controlling recurrence rates⁽¹⁵⁾. No recurrence was found at the three-month follow-up, which was continued in the following study.

Conclusion

Our case represents , giant cell tumour of left distal femur in 29 year old female patient ,after through investigations and confirmation of giant cell tumour Intralesional curettage, use of phenol, and reconstruction

with allograft, gel foam, and cement (the sandwich technique) for GCT of bone achieved good functional outcome and a low recurrence rate.

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