CASE REPORT

GIANT CELL TUMOUR OF LOWER END OF TIBIA

Abstract

Introduction: Giant cell tumour is a locally aggressive tumour accounts for 5% of primary bone tumours. Most common age group affected is 20 to 55 years, more common among females. Most common sites are distal end of radius and proximal tibia.

Case Report: A 22-year-old male presented with complaints of pain of the right ankle joint for 2 months. There was no history of trauma. On examination, tenderness on the anterior lateral aspect of the right ankle joint. No visible swelling and no restriction of movements. X-rays revealed a well-defined expansile predominantly lytic lesion in the distal epi-metaphyseal region of the right tibia. Magnetic resonance imaging revealed an ill-defined expansile lesion involving the epi-metaphyseal end of the lower end of tibia causing cortical destruction with the possibility of GCT. Surgery by excision, curettage, and bone grafting was performed to fill the defect. Histopathology of the tissue showed multinucleated giant cells with a uniform vesicular nucleus and mononuclear cells which were spindle shaped with uniform vesicular nucleus suggestive of GCT.

Conclusion: The patient at 7 months follow-up is doing well, walking without any pain, comfortably and with a full range of motion of the ankle joint with no signs of recurrence.

Keywords: Giant cell tumour, distal tibia

Introduction

Cooper in 1818 first described giant cell tumours (GCT) of the bone (1). Later Nelaton showed their local aggressiveness, and Virchow revealed their malignant potential. GCT represents approximately 5% of all primary bone tumours(1,2). More than half of these lesions occur in the third and fourth decades of life [3].

GCTs are benign tumours with potential for aggressive behaviour and capacity to metastasize. Although considered to be benign tumours of bone, GCT has a relatively high recurrence rate. Metastases occur in 1–9% of patients with GCT and some earlier studies have correlated the incidence of metastases with aggressive growth and local recurrence(2–4)

90% of GCT exhibits the typical epiphyseal location(5,6).The common clinical symptoms are pain related to affected bone, swelling, and decreased range of movement in adjacent joint(7).The most common locations, in decreasing order, are the distal femur, the proximal tibia, the distal radius, and the sacrum(8)

The diagnosis of giant cell tumour of bones depends mainly on clinical and radiological examination (plain X-ray and CT scan) on the site of the lesion(2) The treatment of GCT is directed towards local control without sacrificing joint function. This can be achieved by intralesional curettage with autograft reconstruction by packing the cavity of the excised tumour with morselised iliac corticocancellous bone or using bone cement as packaging material for the defect(7).

The distal epiphysis of the tibia is an unusual localization for a primary bone GCT which occurs in only 0.15–2.8% of all primary GCTs (11). We present a case to highlight the rare

location of GCT in the distal tibia which was treated successfully with curettage and bone grafting with 7 months follow up.

Case report

A 22-year-old male presented to us in May 2020 with complaints of pain over the dorsolateral aspect of right ankle joint for 2 months. The pain aggravated on walking. There was no history of trauma and was not associated with fever, loss of weight, or any other constitutional symptoms. History and family history were non-contributory. Clinical examination (figure1) revealed no findings on inspection. Palpation revealed tenderness over the dorsolateral aspect of the distal tibia with no local rise of temperature. Range of motion of the right ankle joint was normal. X-rays revealed a well-defined expansile predominantly lytic lesion in the distal epi-metaphyseal region of the right tibia with cortical breach and no periosteal reaction (Fig.2).

MRI of right ankle showed (figure 3) well defined lesion in the epi-metaphyseal region of distal tibia approximately 27*35*38 mm size with narrow zone of transition. Cortical destruction present with no evidence of periosteal reaction. No soft tissue component noted.

According to the radiological classification of Campanacci the tumour was classified as a grade 3 lesions(10)

Laboratory investigations were within normal limits. All preoperative work -up done and surgery planned as intralesional curettage and bone grafting. Anterior approach to distal end of the tibia, bone was exposed, a cortical window made (Fig. 4), the tumour was excised (Fig. 5), and curettage was done. A thorough wash was given and the cavity was filled with bone graft (Fig. 6).

The tumour was sent for histopathological examination which confirmed the diagnosis of GCT (Fig. 7).

The patient was immobilised in a below knee cast for one month and converted to a PTB cast later. Sequential X-rays (Fig.8) were taken to confirm the union. After 3 months post operatively cast removed and regular physical therapy started and allowed weight bearing. Patient was followed up at regular intervals and there is no evidence of recurrence at the end of 7 months. The patient is still under follow up.

Discussion

GCT of bone constitutes 20% of biopsy analysed benign bone tumours. It affects young adults between the ages of 20 and 40 years, several authors have reported a slight predominance of women over men. Ninety percent of GCT exhibits the typical epiphyseal location. (5,6)

Pain is the leading symptom relating to the mechanical insufficiency resulting from the bone destruction. A soft tissue mass or bump can occasionally be seen
and results from the cortical destruction and tumour progression outside bone. GCT is often found close to the joint thus limited range of motion is common, joint effusion and synovitis are also possible.

Bini et al. [10] published a paper in which they treated giant cell tumour with curettage and cementation. It is postulated that the exothermic reaction of poly methyl methacrylate generates local hyperthermia which induces necrosis of any remaining neoplastic tissue.

Proximal tibia, distal femur and radius are typical sites. The distal epiphysis of the tibia is an unusual localization for a primary bone GCT which occurs in only 0.15–2.8% of all primary

GCTs. In one study, 87 cases of GCT of bone were reviewed retrospectively, the tumour was located in the distal end of the tibia in only one patient (11). Su and Chen found 6 GCTs of the lower end of tibia in a group of 285 patients (12).

We treated the patient with curettage and bone grafting to pack the cavity which showed good postoperative results without any recurrences and functional problems. We conclude that it is a good treatment option for GCT of lower end of tibia.

Conclusion

Hence, we conclude that a patient of GCT of distal tibia was successfully treated with intralesional curettage and bone grafting with no signs of recurrence in 7months follow up.

References

1. Eckardt JJ, Grogan TJ. Giant cell tumor of bone. Clin Orthop Relat Res. 1986; 204(2):45–58.

2. McGrath PJ. Giant-cell tumour of bone: an analysis of fifty-two cases. J Bone Joint Surg Br. 1972; 54(2): 216–29.

3. Bertoni F, Present D, Sudanese A, Baldini N, Bacchini P, Campanacci M, et al. Giant-cell tumor of bone with pulmonary metastases. Six case reports and a review of the literature. Clin Orthop Relat Res 1988;237:275-85.

4. Siebenrock KA, Unni KK, Rock MG. Giant-cell tumour of bone metastasising to the lungs. A long-term follow-up. J Bone Joint Surg Br 1998;80:43-7.

5. Hoeffel JC, Galloy MA, Grignon Y, Chastagner P, Floquet J, Mainard L, et al. Giant cell tumor of bone in children and adolescents. Rev Rhum Engl Ed 1996;63:618-23.

6. Shih HN, Hsu RW, Sim FH. Excision curettage and allografting of giant cell tumor. World J Surg 1998;22:432- 7.

7. “Chapter 21: Benign/aggressive tumors of bone,” in Campbell’s Operative Orthopaedics, T. S. Canale, Ed., vol. 1, pp. 883–886, Mosby, New York, NY, USA, 11th edition, 2007.

8. Osaka S, Toriyama S. Surgical treatment of giant cell tumors of the pelvis. Clin Orthop Relat Res 1987;222:123-31.

9. Cribb GL, Cool P, Hill SO, Mangham DC. Distal tibial giant cell tumour treated with curettage and stabilisation with an ilizarov frame. Foot Ankle Surg 2009;15:28-32.

10. S. A. Bini, K. Gill, and J. O. Johnston, “Giant cell tumour of bone. Curettage and cement reconstruction,” Clinical Orthopaedics and Related Research, no. 321, pp. 245–250, 1995.

11. Klenke FM, Wenger DE, Inwards CY, Rose PS, Sim FH. Giant cell tumor of bone: risk factors for recurrence. Clin Orthop Relat Res 2011;469:591–9.

12. Su YP, Chen WM, Chen TH. Giant-cell tumors of bone: an analysis of 87 cases. Int Orthop 2004;28:239–43.

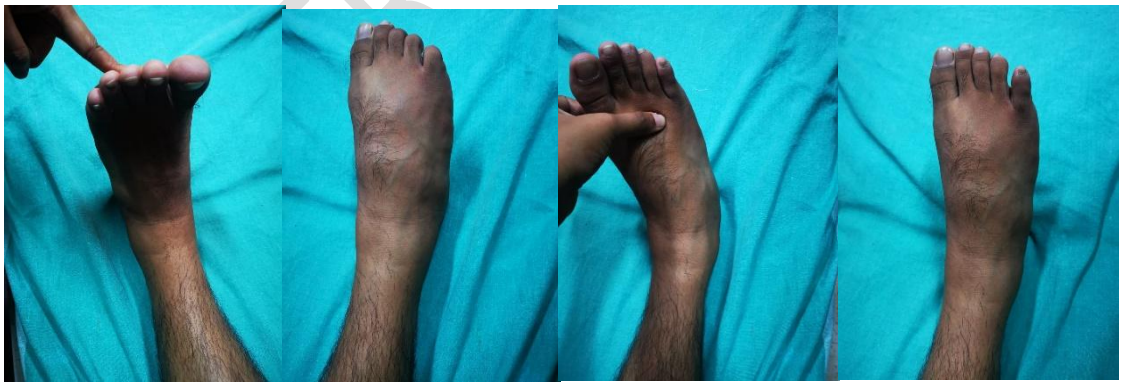

Figure1: Preoperative clinical photos

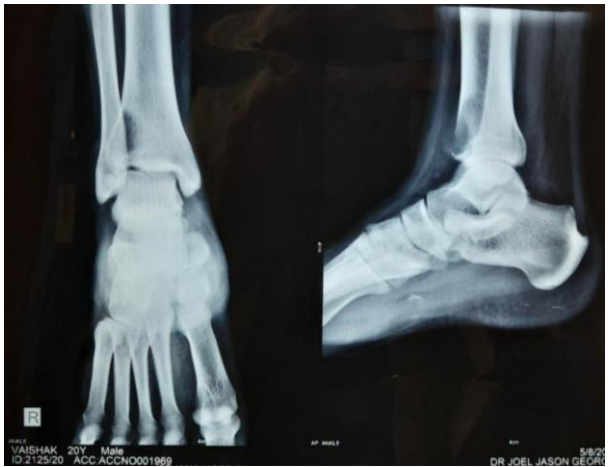

Figure 2**:** X-ray showing a well-defined expansile predominantly lytic lesion in the distal epiphysial-metaphyseal region with cortical breach

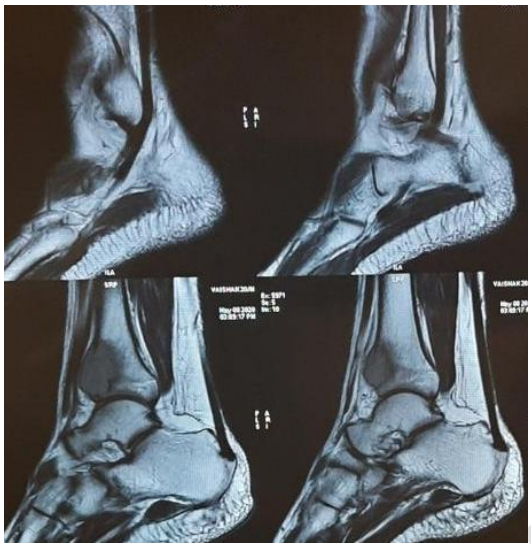

Figure 3: Magnetic resonance imaging of the right ankle joint suggested an ill-defined eccentric expansile lesion.

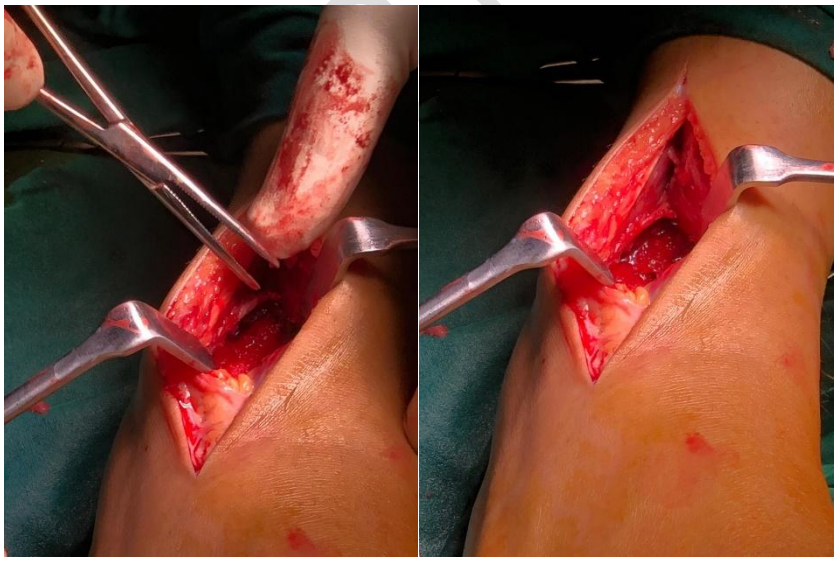

Figure 4: cortical window

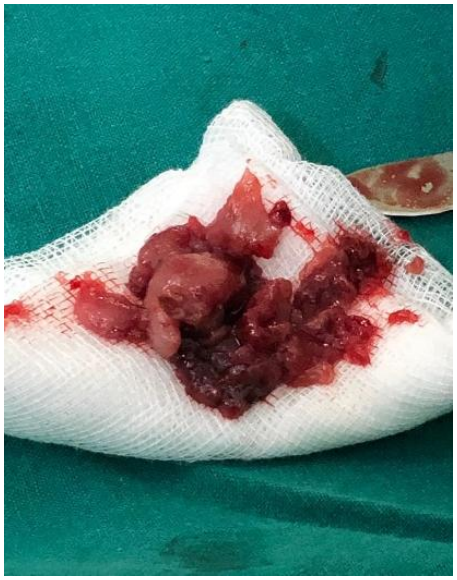

Figure 5: Excised tumour

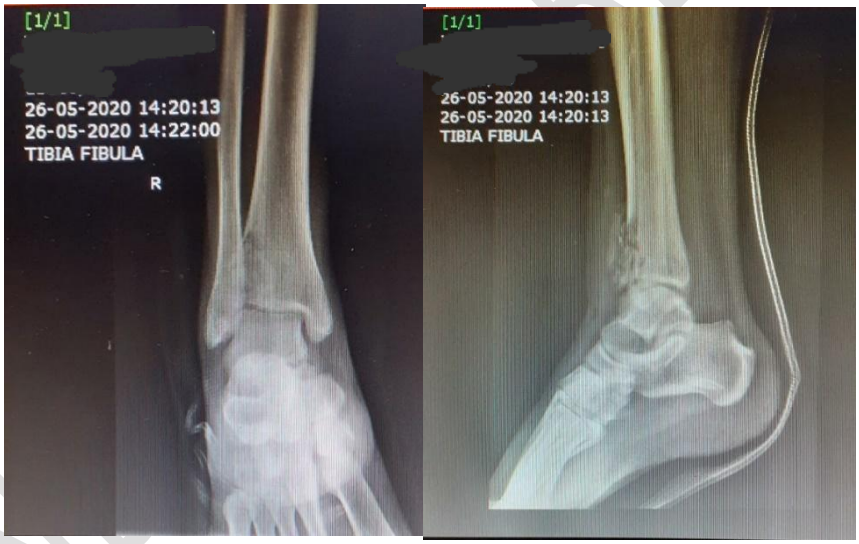

Figure 6: Postoperative x ray showing the cavity filled with bone graft and bone cement

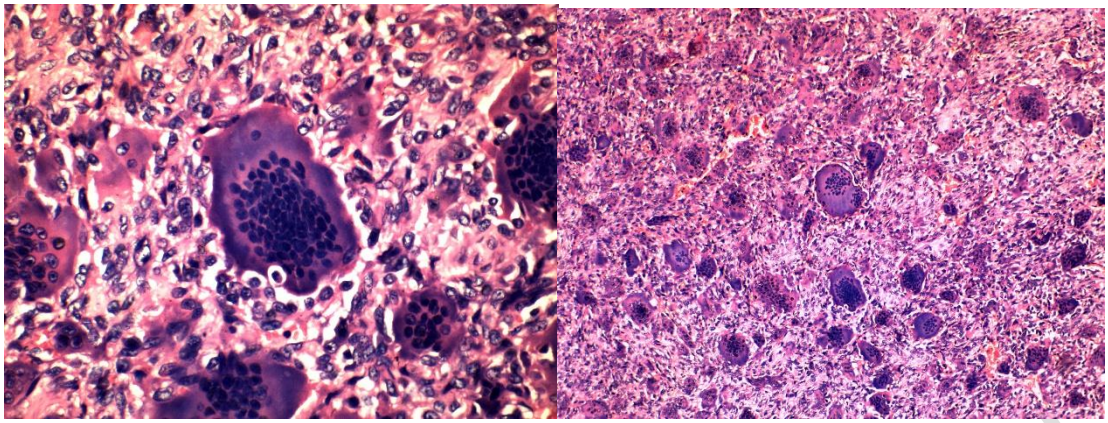

Figure 7: Histopathology of the tumour confirming GCT.

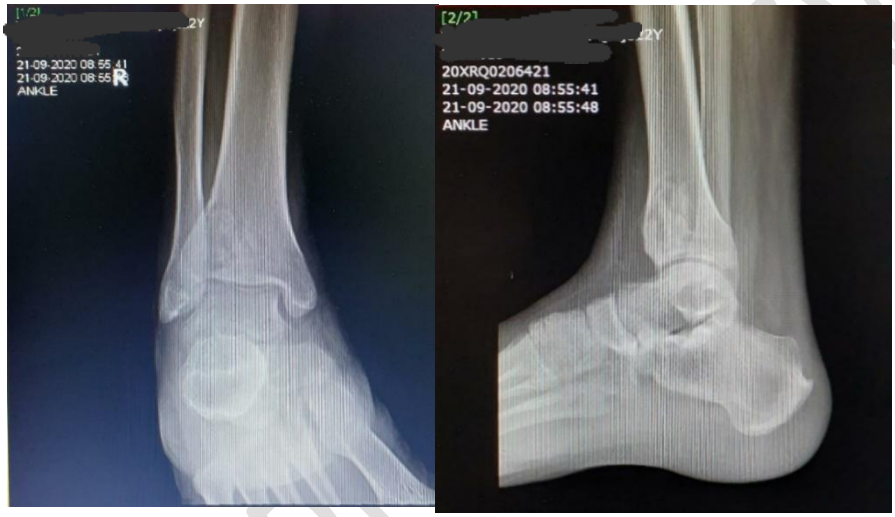

Figure 8: Follow up x ray