CASE REPORT

Topic: giant cell tumour of lower end of tibia

GIANT CELL TUMOUR OF LOWER END OF TIBIA

Abstract

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

Case Report: A 22-year-old male patient presented with complaints of pain of the right ankle joint for 2 months. There was no history of trauma. On examination, tenderness on the anterolateral aspect of the right ankle joint was elicited. No visible swelling was found and there was no restriction of movements. X-ray of right ankle joint showed a lytic lesion in the distal epi-metaphyseal region of the tibia. Magnetic resonance imaging revealed a lesion at distal epi-metaphyseal end of tibia. It was an expansile lesion causing cortical destruction with possibility of GCT. Excision and curettage of tumour with bone grafting was performed to fill the defect. Histopathological examination of the tissue showed multinucleated giant cells with a uniform vesicular nucleus and the spindle shaped mononuclear cells with uniform vesicular nucleus suggestive of GCT.

Conclusion: We did 7 months of out-patient follow-up. Patient had full range of motion of the ankle joint during follow up. There are no signs of recurrence till now.

Keywords: Giant cell tumour, distal tibia

Introduction

5% of primary bone tumours represents GCT (1,2). Cooper described giant cell tumours of the bone in 1818 (1). It is more common between 30 to 40 years of age[3].

GCTs are benign aggressive tumours with capacity to metastasize. Recurrence rate is higher compared to other benign tumours. Recurrence rate of giant cell tumour of long bones after meticulous curettage and bone grafting is around 10% to 20% (4).

90% of GCT are in epiphyseal area (5,6). Common presenting complaints are pain and swelling of affected area. Adjacent joint movements will be reduced in some cases(7). Most common locations are the distal femur, proximal tibia, distal radius and the sacrum (8).

Diagnosis mainly based on clinical and radiological examination (2).

Aim of the treatment is to get local control of the tumour with preservation of the adjacent joint function. This can be achieved by intralesional curettage of the tumour and filling the cavity with graft. Corticocancellous bone or bone cement can be used as a packaging material for the defect (7).

Only 0.15–2.8% of all primary GCTs occur in the distal epiphysis of the tibia (11).

Distal end of tibia is a rare location for GCT. We present a case of GCT in the distal end of tibia 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 anterolateral aspect of right ankle joint for 2 months. Pain aggravated on walking. He had no history of trauma. Fever, loss of weight and other constitutional symptoms were absent. Personal and family history were non-contributory.

Clinical examination (figure1) of the right leg and ankle joint was done. Inspection revealed no findings pertaining to the disease. On palpation tenderness was elicited over the dorsolateral aspect of the distal tibia. Range of motion of the right ankle joint was normal.

X-rays revealed a lesion in the distal epi-metaphyseal region of the right tibia. Which was an expansile lytic lesion with cortical breach and without periosteal reaction (Fig.2).

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

The tumour was classified as a grade 3 lesion according to the radiological classification of Campanacci. (10)

Laboratory investigations were within normal limits. All preoperative work -up were done and an intralesional curettage and bone grafting was planned. Intraoperatively bone was exposed through an anterior approach to distal end of the tibia, a cortical window was 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).

Diagnosis of GCT was confirmed by histopathological examination of the tumour specimen (Fig.7). During the postoperative period a below knee cast was applied to the right leg for one month and converted to a PTB cast later. During the follow-up, X-rays (Fig.8) were taken to confirm the union. Cast was removed after 3 months and regular physical therapy and weight bearing was also initiated. Patient was followed up at regular intervals and there is no evidence of recurrence at the end of 7 months.

Discussion

20% of benign bone tumours constitutes GCT. It affects young adults between the ages of 20 and 40 years. GCT has slight predominance of women over men. 90% of GCT exhibits the typical epiphyseal location (5,6).

Pain is the most common presenting complaint of the patient. A soft tissue mass occurs due to cortical destruction and tumour progression outside the bone. Bone destruction can result in mechanical insufficiency and pathological fracture of bone. Because of the proximity of lesion to the joint, it can also present as limited range of motion, joint effusion and synovitis.

Bini et al. [10] published an article in which curettage of the lesion and filling the cavity with polymethyl methacrylate cause an exothermic reaction. This results in a local hyperthermia causes necrosis of the remaining neoplastic tissue.

0.15–2.8% of all primary GCTs occur at distal epiphysis of the tibia. In a retrospective study, only one patient had GCT of the distal end of the tibia when 87 cases of GCT were reviewed. (11). Another study done by Su and Chen in a group of 285 patients in which only six GCT were in the lower end of tibia (12).

We treated the patient with curettage and filled the cavity with corticocancellous bone graft. Postoperative results were good. There were no signs of recurrences during the follow up period.

Conclusion

We conclude that intralesional curettage and bone grafting is one of the efficient treatment options for GCT. Even though the distal end of tibia is an uncommon location for GCT, always include GCT as one of the differentials in work up.

Ethical Approval:

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

Consent

As per international standard or university standard, patients' written consent has been collected and preserved by the author(s).

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. Turcotte RE. Giant cell tumour of bone. Orthop Clin North Am. 2006;37:35–51.Metastases

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.