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Case Report

Giant cell tumour with intra-articular extension: a case report

Gokul Raj Dhanaraj*, Siddharth Ramesh Babu, Balaji Rajendran

Department of Orthopaedics, Sri Ramachandra University, Porur, Chennai-600016, Tamil Nadu, India

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***Correspondence:**
Dr. Gokul Raj Dhanaraj,
E-mail: orthogokul@gmail.com

ABSTRACT

Giant cell tumour is usually a benign but locally aggressive tumour. Intra-articular extension of giant cell tumour is rare. Treatment options are limited in such cases. I present here a 33 year old male with a history of swelling around his right knee for 6 months. Patient was diagnosed clinically, radiologically and histologically as giant cell tumour. Patient was treated by surgical excision of the tumour and reconstruction with custom mega prosthesis.

Keywords: Giant cell tumour, Intra-articular extension, Custom mega prosthesis

INTRODUCTION

Giant cell tumour otherwise known as osteoclastoma is usually a benign but locally aggressive lesion with high incidence of recurrence.[7] Common age of occurrence is between 20 to 40 years of age with a higher predominance in males in the Indian population and in females in the western population. Common sites of occurrence include distal femur, proximal tibia and distal radius. Treatment depends upon the stage according to the Campanacci grade.[6] With more involvement of subchondral bone,[2] the functional outcome is generally worse after treatment. Custom mega Prosthesis as the primary modality[1] in the management of malignant bone tumours of the lower limb is seen to have superior results with minimal complications.

CASE REPORT

A 33 year old male came to the outpatient department with history of pain, swelling and decreased range of movements in the right knee for 6 months. The swelling was preceded by the pain. The pain was localised in the right knee for 6 months, was insidious in onset, gradually progressive dull aching in nature, aggravated on bearing weight on right lower limb, relieved with medication, pain was worse at night. Swelling in the right knee for 3 months gradually increasing in size. Patient had inability to weight bear in the right lower limb for 2 months. History of loss of weight and appetite was present.

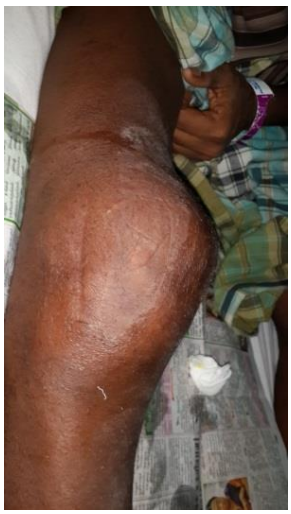

Figure 1: Clinical photo at First presentation.

On examination patient was of a poor build. Local examination of the right knee revealed a 12 x 10 cm diffuse swelling anteromedial aspect of thigh, round swelling, surface was smooth, overlying skin was free, tender on palpation, firm in consistency, swelling was fixed to the bone, with a fixed flexion deformity of knee joint of 15 degrees, range of movements of the knee was between 15 to 110 degrees, associated with pain at extreme flexion, no distal neurovascular deficit, no lymph node enlargement. Systemic examination was normal.

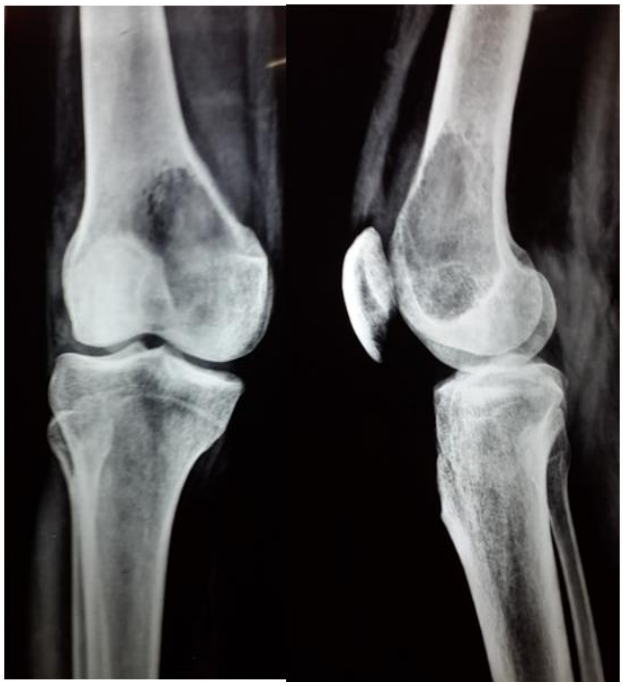

Figure 2: X-ray at first presentation.

An x-ray was taken and it revealed an eccentric expansile lesion in the metaphysio-epiphyseal region with poor zone of transition, irregular margins with no periosteal reaction.

Blood investigations revealed an ESR of 25, CBC, CRP, calcium, phosphorous and alkaline phosphatase were all within normal limits.

Patient was advised at this stage for an MRI to define the extent of lesion, biopsy to confirm the diagnosis and Treatment by curettage with bone grafting.

But patient presented to us again only 2 months later with complaints of severe pain and a swelling which increased to a size of 15 x 12 cm around the knee joint. Range of movements was grossly restricted.

X-ray was repeated, it revealed an eccentric expansile lesion in the metaphysio-epihyseal region with poor zone of transition, irregular margins, break in cortex and no periosteal reaction.

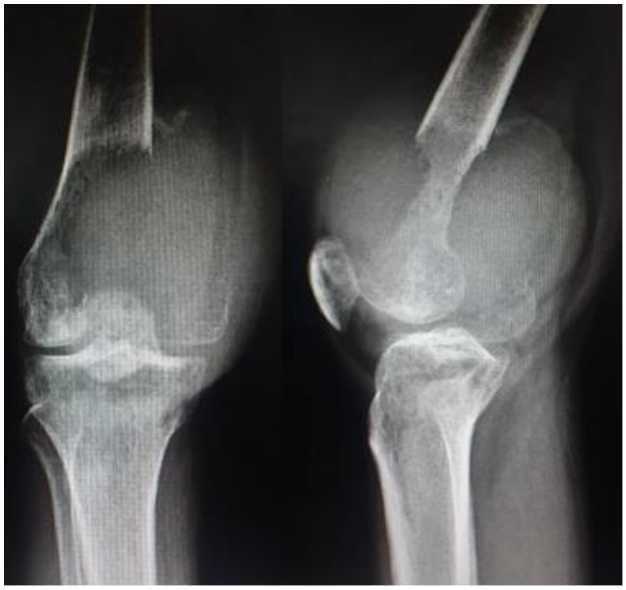

Figure 3: Pre-operative X-ray.

Due to the massive increase in size of the lesion in a short duration, a bone scan was done to rule out pulmonary metastasis and presence of any multicentric lesions which may be present in Campanacci stage 3 tumours. It revealed only a solitary lesion.

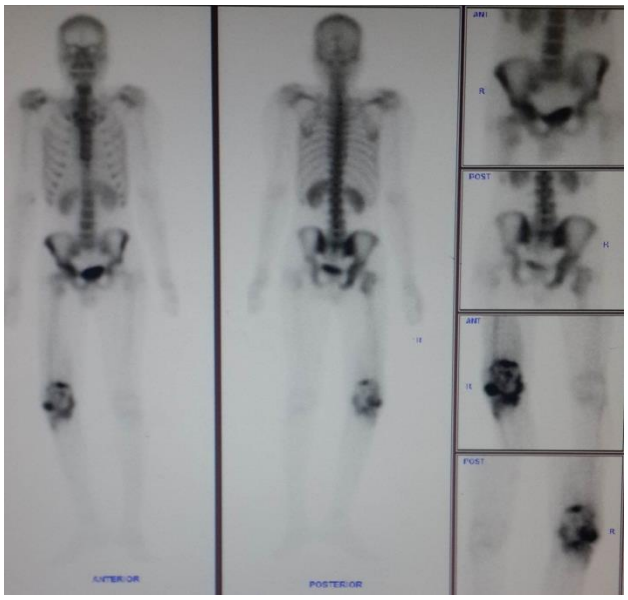

Figure 4: Tc99 bone scan revealing solitary lesion at distal femur.

This was followed by an MRI of the knee joint to define the extent of the lesion, lesion was hypointense on T1 and hyperintense on T2 corresponding to Giant cell tumour presentation. There were also fluid filled levels typical of Secondary aneurysmal bone cyst changes. Interestingly however we were able to make out Intra-articular extension of the tumour.

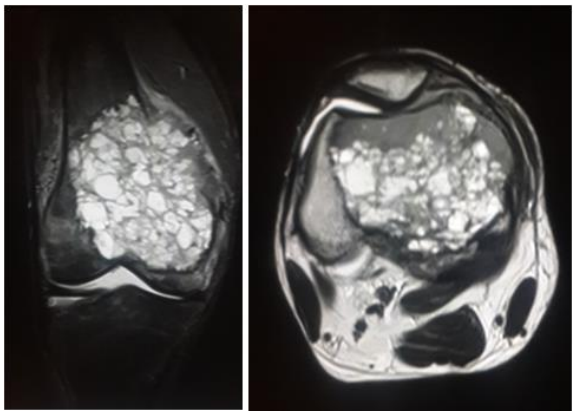

Figure 5: MRI of knee joint revealing hyperintense lesion with fluid filled levels with intra-articular extension.

To better understand the amount of bone destruction, a CT scan of the knee was taken.

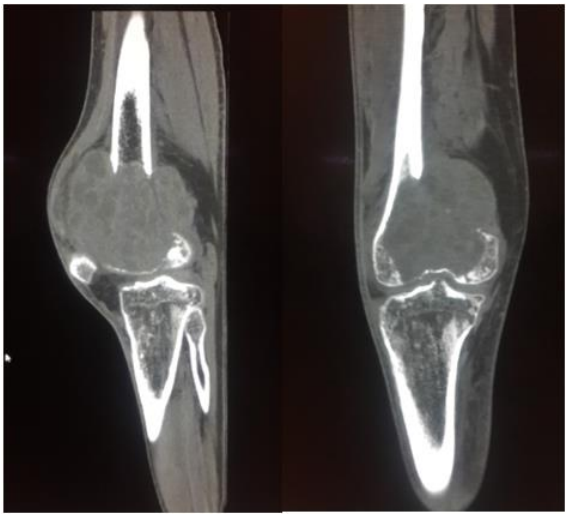

Figure 6: CT-scan revealing the amount of bone destruction.

To confirm the diagnosis an open biopsy was done, which revealed multiple multinucleated giant cells in a sea of Mononuclear stromal cells. The nuclei of the giant cells was identical to the mononuclear cells which is pathognormic, Secondary aneurysmal bone cyst changes are also noted.

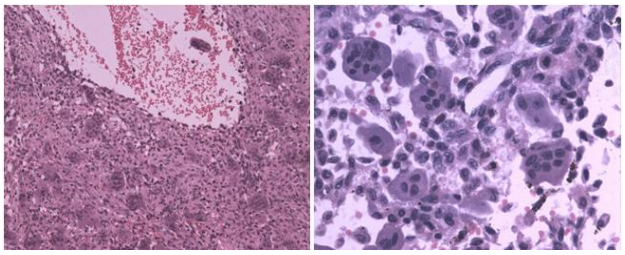

Figure 7: Biopsy showing multiple multinucleated giant cells in a sea of mononuclear stromal cells.

Patient underwent tumour resection and reconstruction with custom mega prosthesis.

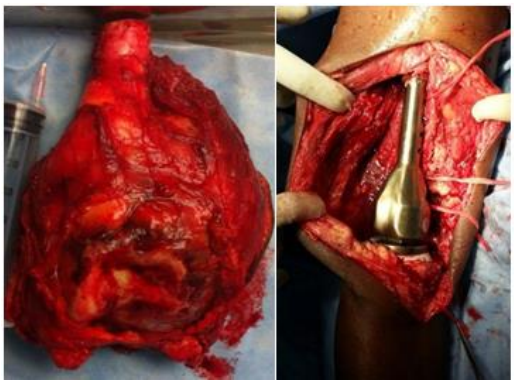

Figure 8: Resected tumour and intra-operative photo of custom mega prosthesis *in situ*.

The Specimen was sent for histopathological examination and was confirmed to be a giant cell tumour.

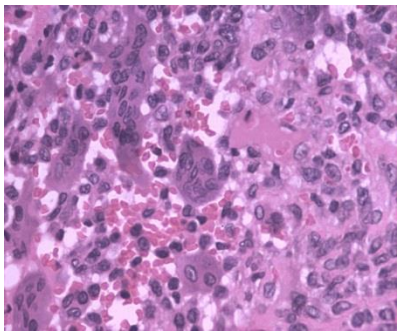

Figure 9: Excision biopsy slide revealing multiple multinucleated giant cells in a sea of mononuclear stromal cells.

Post-operative X-rays were done. Patient was started on knee mobilisation exercises and full weight bearing walking with walker support.

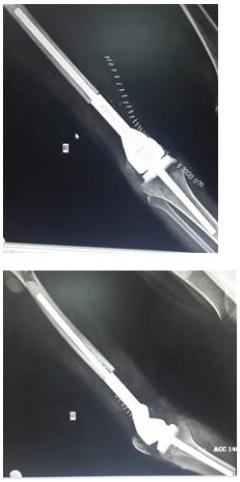

Figure 10: Immediate post-operative X-rays.

Patient was followed up upto 6 months. Final result patient had an extensor lag of 5 degrees, flexion upto 40 degrees, clinically no signs of infection, X-ray shows osteolysis in the tibial component at 6 months. ESR and CRP were within normal levels.

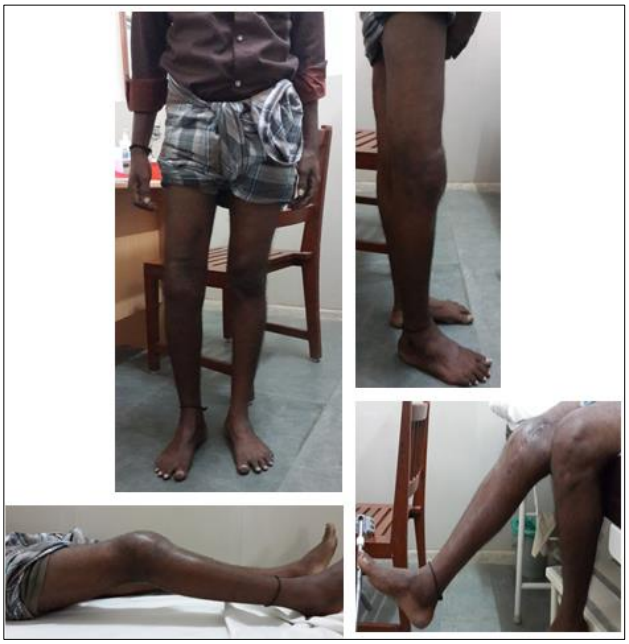

Figure 11: Clinical photo at 6 months post-op.

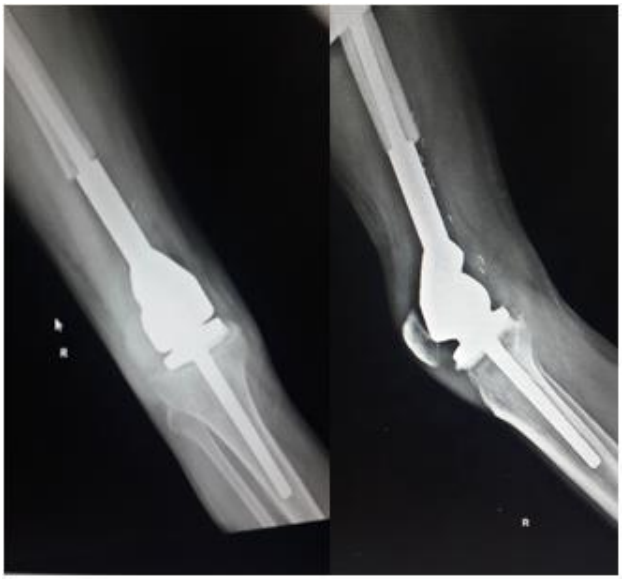

Figure 12: X-ray at 6 months post-op.

DISCUSSION

Giant cell tumour is usually a benign but locally aggressive lesion with high tendency of local recurrence. It usually occurs between the age group of 20 to 40 years with a higher incidence in males in the Indian population. Common sites include distal femur, proximal tibia and distal radius. Pulmonary metastasis is seen in 5% cases with Campanacci stage 3 being at a higher risk. Giant cell tumour is usually solitary but in 1% to 2% cases they are multicentric. Most patients present with pain, swelling and limitation in movements. On plain X-ray GCT appears as an eccentric, expansile osteoltic lesion in the metaphseo-epiphyseal region, with poor zone of transition, irregular margins, lesion may break the cortex, subchondral bone usually intact, with no periosteal reaction. "Soap bubble appearance" as characterised by trabeculations in the wall of cystic lesions is sometimes seen. Grading by radiology is by Camapacci grading as Latent, active or aggressive type. MRI is useful to define the extent of the lesion, it is hypointense on T1 and Hyper intense on T2. In 20% cases fluid filled levels typical of secondary aneurysmal bone cyst is seen. Biopsy is essential for diagnosis before treatment. Multiple multinucleated giant cells in a sea of mononuclear stromal cells , the nuclei of giant cells being identical to mononuclear stromal cells is pathognormic, secondary aneurysmal bone cyst changes may be seen. Histological grading is by Netherlands committee of bone tumours, but this grading is not very useful in defining the treatment of giant cell tumours. Treatment depends on the Campanacci grade - Grade I and grade II maybe treated by extended curettage with adjuvant therapy with bone grafting/cement, Recurrence rates of upto 7% is seen. In grade III tumours treatment consists of wide resection followed by reconstruction by either arthrodesis or custom mega prosthesis.

Our case is a 33 year old male corresponding to a Campanacci stage III. Hence the treatment options were either arthrodesis or custom mega prosthesis. Arthrodesis has the advantages of stability and longevity whereas custom mega prosthesis has the advantage of stability and mobility but disadvantage being loosening and repeated revision. Considering the patients' needs custom mega prosthesis was chosen. But this patient showed a poor result due to the amount of subchondral bone integrity. If more involvement of subchondral bone is present, usually the better option of treatment is arthrodesis.

CONCLUSION

Giant cell tumour is a benign but locally aggressive lesion with high tendency of local recurrence. Intra-articular extension of giant cell tumour[3,7] is a rare occurrence . Giant cell tumour with aneurysmal bone cyst changes[5] are seen in approximately 20% of cases. In Campanacci grade III tumours are generally treated by resection of tumour along with reconstruction either by arthrodesis or custom mega prosthesis with superior results in management by custom mega prosthesis.[1] In cases where the subchondral bone involvement[2] is more, worse is the functional score.

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Ethical approval: Not required

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