

CASE REPORT

AGGRESSIVE GIANT CELL TUMOUR OF PROXIMAL FEMUR: EXCISION AND MEGAPROSTHESIS

Eknath Devising Pawar¹, Sandesh Thete², Nilesh Kachnerkar³, Vijayanand Lokhande⁴

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ABSTRACT: INTRODUCTION: Giant cell tumor (GCT) is a benign, locally aggressive bone tumor with predilection to occur the knee joint¹¹. The World Health Organisation has classified GCT as "an aggressive, potentially malignant lesion", which means that its evolution based on its histological features is unpredictable. Statistically, 80% of GCTs have a benign course, with a local rate of recurrence of 20% to 50%. About 10% undergo malignant transformation at recurrence and 1% to 4% gives pulmonary metastases even in cases of benign histology. Proximal femur is a relatively rare site for the occurrence of primary GCT accounting for only 1-10%^{6, 7}. GCT in this location poses a unique challenge in management owing to difficulties in preoperative diagnosis, obtaining a safe surgical margin and reconstruction of the surgical defect, considering the complex biomechanics of the hip joint^{8, 12, 15}. **CASE REPORT:** We report a case proximal femur giant cell tumour in an active young female who presented with pathological fracture. The tumour was excised with wide margin and the defect was reconstructed successfully with a custom made endoprosthesis. **KEY MESSAGE:** Endoprosthetic replacement for Campanacci stage-III GCT of the proximal femur achieves good to excellent functional and oncological outcomes.

KEY WORDS: Giant cell tumour, arthroplasty, femur, mega prosthesis

INTRODUCTION: Giant cell tumors (GCT) of bone are locally aggressive and predominantly affect the ends of long bones (usually the distal femur and proximal tibia) in young adults¹¹. Oncological and functional results are variable after treatments ranging from extended curettage to wide local resection⁶. Reconstruction options for GCT of the proximal femur are limited, owing to proximity of the lesion to the hip joint and its complex biomechanics¹². The use of endoprosthesis in young adults with good life expectancy is debatable because survival of implants is reported to be fair to poor. We report a case of proximal femur GCT managed with wide local resection and endoprosthesis.

CASE REPORT: A 20-year-old female worker, presented to our hospital with a history of inability to walk and swelling over proximal thigh since one year. The patient gave a history of constant dull ache in the left hip region since 6 months. There was no significant proximal lymphadenopathy or distal neurovascular deficit. The general examination was unremarkable. Local examination revealed large swelling over upper aspect of thigh, firm in consistency; she had flexion deformity of thirty degrees at hip joint. All movements of hip joint were restricted. Radiological examination revealed a sub-trochanteric fracture femur with a lytic lesion involving the head, neck and upper third femur. There was breach in cortex suggestive of Grade III GCT by Campanacci classification¹³. MRI of proximal femur revealed soft tissue involvement at the site of fracture. HRCT of chest failed to demonstrate any pulmonary metastases. All routine hematological investigations and X-ray chest were normal, except for serum total acid phosphatase (TACP) which was elevated (27U/L). A Fine Needle Aspiration Cytology (FNAC)

CASE REPORT

failed to give a definite diagnosis, revealing haemorrhagic fluid and no malignant cells. So an incisional biopsy was done through posterior approach keeping in mind the incision of definitive surgery.

Patient underwent wide local excision of the tumour with clear margins. The patient was put in a lateral position, and the proximal femur was dissected through a posterolateral approach. Intraoperative samples were sent for histopathological examination by frozen section for confirming clear margins. Following tumour excision, the distal femur was prepared with flexible reaming of the shaft to 1.5 mm more than the selected stem size. The cementing technique involved lavage, use of cement restrictor, and pressurization. A customized, titanium, bipolar, cemented proximal femoral mega prosthesis was then inserted. After the bipolar cup was reduced, local soft-tissue reconstruction was performed with emphasis on securing the hip abductors onto the prosthesis. Wound was closed over a negative suction drain after meticulous haemostasis. Postoperatively static quadriceps exercise was started on day one with knee range after day five. The patient was made to stand with support on the fifteenth day and started partial weight bearing. The wound healed without complications. The high serum TACP levels seen preoperatively decreased to normal levels after tumour removal. The excised specimen was sent for histopathological examination. Microscopic evaluation of the resected specimen confirmed the diagnosis of GCT showing stromal cells with no appreciable atypism. Occasional stromal cells showed large nuclei with abundant giant cells.

DISCUSSION: Giant cell tumor is notorious for local recurrence unless completely excised with adequate margin¹. Curettage with or without bone grafting are associated with high recurrence rates and can help a certain group of patients when carefully chosen¹⁰. Adequate (wide) tumour margin during excision seems to be an important predictor of good outcome than adjuvant therapy following curettage^{7, 8, 12}. There is a higher incidence of pathological fracture associated with GCT of proximal femur than in any other areas. Pathological fracture is associated with higher recurrence rate due to tumour dissemination during fracture⁶. Pathological fracture associated with GCT of proximal femur poses a challenge in management particularly in the young active man. Achieving wide tumour margin becomes extremely difficult with intralesional excision which is compounded by the lack of stability at the fracture site with routine fixation devices. Wide excision and reconstruction with endoprosthesis for proximal femur GCT in young patients has got its own limitations considering the high rate of mechanical failure and concerns over the longevity of the implant⁸. This age group of patients comes under the high demand group, whose daily activities can mechanically load the endoprosthesis with forces beyond its stress limits. Nevertheless, wide excision tumour and replacement with endoprosthesis remains the primary treatment of choice in giant cell tumor in this region at present, instead of using it as a secondary procedure for recurrence, non-union or other complications^{2,9,10}.

CASE REPORT

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CASE REPORT



Fig. 1



Fig. 2



Fig. 3

CASE REPORT



Fig 4



Fig. 5



Fig. 6

CASE REPORT

AUTHORS:

1. Eknath Devising Pawar
2. Sandesh Thete
3. Nilesh Kachnerkar
4. Vijayanand Lokhande

PARTICULARS OF CONTRIBUTORS:

1. Associate Professor, Department of Orthopaedics, Government Medical College, Aurangabad, Maharashtra, India.
2. Assistant Professor, Department of Orthopaedics, Government Medical College, Aurangabad, Maharashtra, India.
3. Assistant Professor, Department of Orthopaedics, Government Medical College, Aurangabad, Maharashtra, India.

4

4. Registrar, Department of Orthopaedics, Government Medical College, Aurangabad, Maharashtra, India.

NAME ADDRESS EMAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Eknath Devising Pawar,
Plot No. 107, F-1,
Anatdarshan Apartment,
Behind Varadganesh Mandir,
Samarthnagar, Aurangabad,
Maharashtra, India - 431001.
Email - drpawared2003@yahoo.co.in

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