



## Total Hip Arthroplasty For Giant-Cell Tumor of Femoral Neck

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**ABSTRACT**

Giant cell tumor (GCT) also called osteoclastoma of bone is the most common bone tumor encountered by an orthopedic surgeon. GCT generally occurs in skeletally mature individuals with peak incidence in the third decade of life. Less than 5% are found in patients with open physis and only about 10% of cases occur in patients older than 65 years. We present a case of GCT of femoral neck managed with total hip arthroplasty.

### KEYWORDS

Total hip arthroplasty, giant cell tumor, most common bone tumor

### INTRODUCTION:

Giant cell tumors (GCTs) represent 3-4% of all primary tumors of bone.<sup>[1]</sup> Distal femur and proximal tibia are the most common sites followed by the proximal femur and distal radius. The ideal aim in the management of GCT is to eradicate the tumor without sacrificing the joint.<sup>[2]</sup> Current treatment modalities including a meticulous curettage with extension of tumor removal using high speed burrs and adjuvant local therapy.<sup>[3]</sup> However with these modalities there is a recurrence rate of 60%. Wide resection should be the treatment of choice, especially for situations such as recurrences, pathological fractures and tumors which are frankly malignant tumors.<sup>[4]</sup> En bloc resection of major joints creates a problem for the reconstruction of large defects. Recent advances in arthroplasty implants are helpful for the replacement of defects near joints.

### CASE REPORT:

This was a case report of a 37-year-old male came to our out-patient department with the chief complaint of pain in right hip since 4 months. The pain was insidious in onset and progressive in nature, throbbing in character, radiating to right lower limb and moderate in intensity, aggravating on bearing weight on the affected limb. There was no history of trauma to the affected hip.

X-ray of pelvis with both hips with thigh in anteroposterior projections was done, which showed an osteolytic lesion in the neck of femur [Figures 1]. Magnetic resonance imaging (MRI) of right hip with thigh was done to get accurate tumor delineation, which showed subtle cortical destruction and extraosseous extend of the tumor without involvement of joint space and neurovascular structures around the hip [Figure 2]. The tumor was in Stage 3 according to Enneking system for benign tumors.<sup>[5]</sup> After getting fitness by the Anesthetist, the patient was posted for excision of the tumor and hip arthroplasty. With patient in left lateral position, posterior moor's incision given centering right greater trochanter. Tensor Fascia Lata incised, short external rotators released and joint dislocated. Femoral head and neck with tumor excised [Figure 3]. Total hip arthroplasty implant manufactured by Johnson and Johnson company was used in this case. Acetabular reaming done upto 51 mm and Duralock acetabular cup of size 52 mm fixed with 2 screws in 45 degrees of inclination and 15 degrees of antversion. Marathon liner madeup of HMWPE press fitted. Femoral canal prepared and Corail femoral stem of size 9 mm press fitted in 15 degrees of antversion. While hammering the stem inside the femoral canal, proximal cortex splitted slightly which was managed with encircling stainless steel wire. After taking trials, ceramic femoral head of size

28 mm with standard neck length attached to femoral stem. Joint reduced and stability checked [Figure 4]. Wound closed in layers under negative suction drain. Sterile dressing done. Post-operative X-rays were taken [Figure 5]. Tumor tissue sent for histopathological analysis which showed Giant Cell Tumor [Fig. 6]. Quadriceps strengthening exercises were started from the second post operative day. Protected weight bearing with the help of walker begun after third post operative day and patient instructed to keep limbs in wide abduction and not to squat at the time of discharge. Patient is under follow up.

### DISCUSSION:

The treatment of GCTs is directed towards local control without sacrificing joint function. This has traditionally been achieved by intralesional curettage with autograft reconstruction by packing the cavity of excised tumor with morselized iliac cortico-cancellous bone. Regardless of how thoroughly performed, intralesional excision leaves microscopic disease in the bone and hence a reported recurrence rate as high as 60%. Use of modern instruments such as high power burr, pulsatile jet lavage system, head lamp and dental mirror combined with multiple angled curettes to identify and access small pockets of residual disease failed to provide 100% results. Recurrence has been reported instead of the use of adjuvants such as phenol and hydrogen peroxide. Cryosurgery using liquid nitrogen is associated with high incidence of local wound and bone complications.<sup>[6,7]</sup>

Adequate removal of tumor seems to be a more important predictive factor for the outcome of surgery. However it leaves large bone defects. Methylmethacrylate cement, used to fill the defect is though strong in compression is relatively weak when subjected to shear and torsional forces. Moreover, it can lead to degeneration of articular cartilage in subchondral lesions. Autografts can be used to fill the defect but its quantity is limited and harvesting autograft causes donor site morbidity. Allograft is expensive and requires a bone bank. Allograft itself can lead to infection, fracture, non-union and joint instability. Bone lengthening is a time consuming procedure. Arthrodesis has complications including a high risk of delayed or non-union and fractures. An arthrodesed knee is awkward and causes problems when sitting, particularly in public transport such as buses, trains etc. The cosmetic outcome of rotation plasty is a serious disadvantage.<sup>[8,9]</sup>

Hence, arthroplasty has become the method of choice after bone tumor resection at the hip. It is the primary modality in the treatment of aggressive bone tumors of lower limb. The use of prosthesis is a simple and technically superior method

of feeling the bone defects in benign aggressive lesions with or without pathological fractures and where skeletal reconstruction is difficult after intralesional curettage. The advantages of arthroplasty are least rates of recurrence, immediate resumption of hip function with early ambulation. The possible complications include flap necrosis, secondary infection, aseptic loosening and breakage.

**CONCLUSION:**

In cases of GCT, the management depends upon the various factors such as site, age, involvement of the bone, extent of bone involvement and whether there is articular involvement or not. If tumor is involving more soft-tissue with involvement of neurovascular structure then limb salvage surgery will not be possible. If there is intra articular extension, then the main aim of management should be eradication of tumor without sacrificing joint function. By using the technique of arthroplastic reconstruction in GCT of femoral neck, we have achieved satisfactory oncological and functional outcomes in our patient.



Figure-1 X-ray Pelvis with Both Hips (AP) showing Osteolytic Lesion in Right Femoral Neck



Figure-2 MRI of Right Hip Joint showing Cortical Destruction and Extrasosseous extend of Tumor



Figure-3 Excised Femoral Head and Neck with Tumor

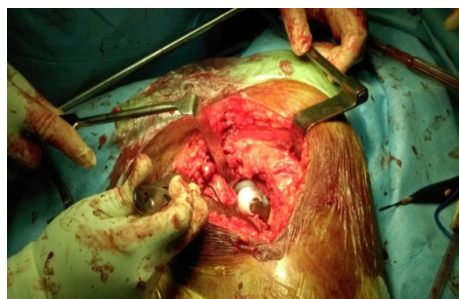


Figure-4 Intra Operative picture showing Total Hip Prosthesis



Figure-5 Post Operative x-ray

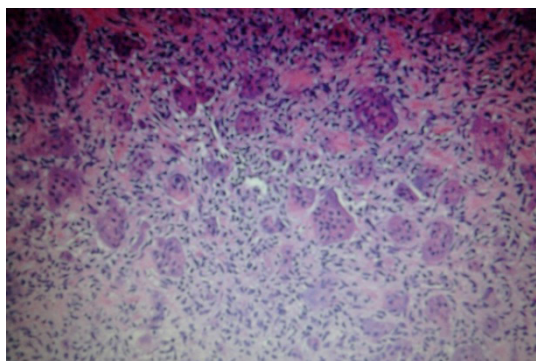


Figure-6 Histopathological Slide showing Multinucleated Giant Cells

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