

Management of Proximal Femur Giant Cell Tumor by Custom Mega Prosthetic Arthroplasty

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Abstract

Introduction :- Giant Cell Tumor also called Osteoclastoma of bone is the commonest bone tumor encountered by an orthopaedic surgeon. The incidence of GCT is 30% of all bone tumors. 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.¹ We present a case of Proximal Femur Giant Cell Tumor managed with custom mega prosthetic arthroplasty.

Key words: ACL, PCL, Medial meniscus (MM), Lateral meniscus (LM), Osteochondral Defects (OCD), Arthroscopy, MRI.

Introduction

The ideal aim in the management of GCT is to eradicate the tumor and still save the joint.² Wide resection is the treatment of choice, especially for situations such as pathological fractures, recurrences and tumors which are high-grade or frankly malignant tumours.^{2,6} En bloc resection of major joints creates a problem for the reconstruction of large bone gaps and requires a facility with reconstruction techniques including the use of allografts, large autogenous grafts and fusion or custom arthroplasty. These are technically difficult procedures with many early and late complications. Progress in biomedical engineering along with better surgical techniques has improved overall 10-year prosthetic survival rate after endoprosthesis replacement from 20% to 80% in the past three decades.

Case Report

A 25 yrs old male came with chief complaint of swelling around Right Hip since 4 months. The swelling was incidence in onset and gradually progressive in nature. Patient was experiencing pain in the swelling since 1 month. The pain was acute in onset and progressive in nature, dull aching in character, radiating to right lower limb and severe in intensity so that patient was not able to bear weight on the affected limb at the time of presentation. There was no history of trauma to the

affected hip.

Radiologically an osteolytic lesion involving the metaphysis of proximal femur with pathological fracture was evident. Open biopsy was taken from the swelling and sample sent for histopathological analysis. On the basis of radiological and histopathological features diagnosis of Giant Cell Tumour was made. MRI of right hip with thigh was done to get accurate tumour delineation which showed extraosseous extend of the tumour. Neurovascular structures around the hip were not involved as revealed by MRI. His blood investigations were within normal limits.

The patient was posted for wide excision of the tumour and custom mega prosthetic arthroplasty. With patient in the left lateral position on table, posterior Moor's approach extended distally over the lateral aspect of right thigh encircling the biopsy site was used. The custom mega prosthesis, manufactured in Delhi, India was used. The basic components of the prosthesis are a femoral head component of bipolar design with diameter of 46 mm, a proximal femoral shaft component of length 80 mm with neck shaft angle being 135 degrees, a stem of length 10 cms with collar bushes. Measurement radiography and MRI were used to estimate the size of the prosthesis to be used. Complete resection of the tumor bearing part and replacement with cemented custom mega prosthesis was done. Proximally, the prosthesis was anteverted to 15 degrees. Vastus lateralis muscle was sutured to the hook given to the prosthesis. Adductor tenotomy was done to compensate weak abductors. After closure of the wound a cylindrical slab was applied to avoid knee bending and hip flexion. Quadriceps strengthening exercises were started from the second post operative day. Protected weight bearing with the help of walker begun after suture removal and patient instructed to keep limbs in wide abduction and not to squat at the time of discharge. Patient is under

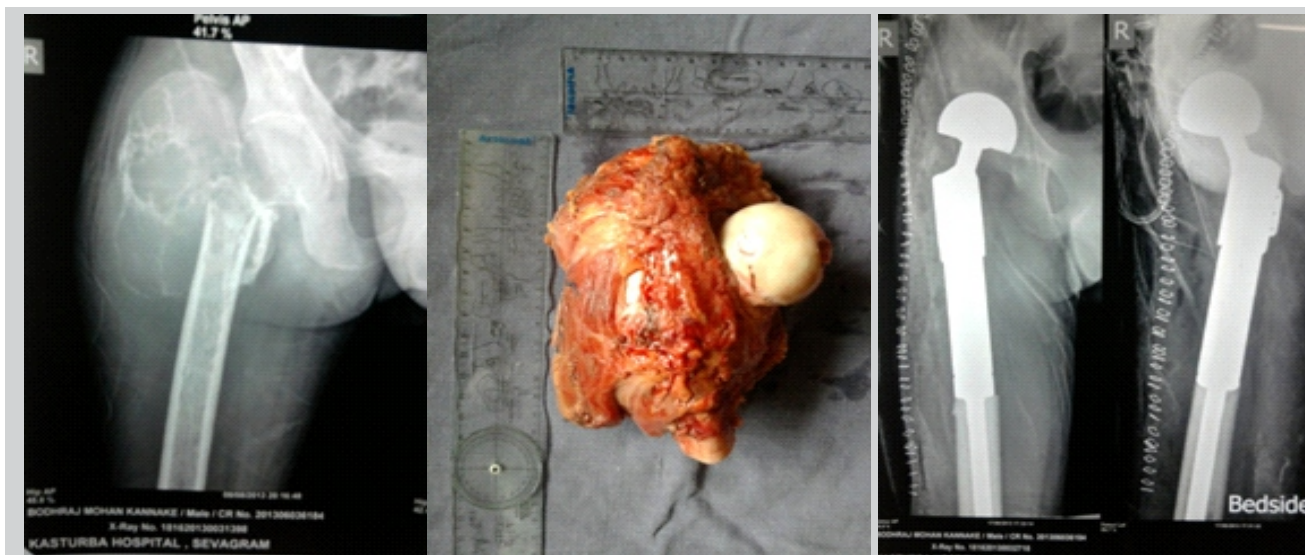
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GCT of Proximal Femur Right side managed with custom mega prosthesis

follow up..

Discussion

The problem of selecting the proper treatment in GCT is complicated by the failure of its histological and radiological appearance to indicate its biologic behavior. The management of juxta-articular giant cell tumors around the hip occurring in young patients continues to be one of the most challenging areas in orthopedic oncology. Enneking's and Campanacci's radiographic classifications and surgical staging are helpful in planning the initial surgical treatment, as a number of the active (Stage 2) lesions and most of the aggressive (Stage 3) lesions have a higher incidence of local recurrence (20-50%) when treated by curettage with or without bone grafting. The use of methylmethacrylate cement has equivalent recurrence rates. The safety and advantages of additional adjuvant treatment of the bone bed with phenol or liquid nitrogen after tumor resection is questionable. Since the local behavior of giant cell tumors can be aggressive and they have a greater risk of local recurrence, some authors advocate en bloc resection and reconstruction for these Grade III lesions from the point of view of preventing local recurrence rate and preserving joint.

Although it is the treatment of choice for these tumors, wide resection creates a problem for the reconstruction of large bone gaps. The reconstructive procedure has to be based on several considerations, such as durability of the surgical procedure, the oncological prognosis, restoration of the anatomy and function, and the needs of the patient. Resection arthrodesis achieves excellent stability but has the major drawback of lack of hip motion. Massive osteochondral allografts are popular alternative to prosthesis and have been used for benign and low-grade malignant tumors but have several complications like a high rate of infection, fracture of the allograft, nonunion

and joint instability.

The use of mega prosthesis has become the method of choice after bone tumor resection at the hip. It is the primary modality in the management of malignant bone tumors of lower limb. Custom mega prosthesis has proved to be a simple, technically superior method of replacing the lost segment of the bone in benign aggressive lesions with pathological fractures and where disease progression has resulted in a clinical situation that prevents skeletal reconstruction after intralesional curettage. The advantages of custom mega prosthetic arthroplasty are cost-effectiveness, early resumption of hip function with unassisted ambulation and least rates of recurrence. The possible complications include flap necrosis, secondary infection, aseptic loosening fracture and breakage.

Conclusion

By using the technique of Limb Salvage by Custom Mega Prosthesis we have achieved satisfactory oncological and functional outcomes in our patient.

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