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Indian Journal of Orthopaedics Surgery

Journal homepage: https://www.ijos.co.in/

Case Report

A case of proximal femoral giant cell tumor treated with total hip arthroplasty following a pathological fracture

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ARTICLE INFO

Article history:
Received 06-03-2023
Accepted 19-04-2023
Available online 30-05-2023

Keywords:
Giant cell tumor
Total hip arthroplasty
Proximal femur
Reconstruction

ABSTRACT

Giant cell tumors occurring in the proximal femoral region are rather rare and present as challenges to physicians due to their aggressive nature leading to pathological fractures. Preservation of the hip joint is rather difficult due to their affinity to the periarticular area. As per vast literature search, reconstruction of the proximal femoral region using total hip arthroplasty provide favorable results compared to hip preservation in terms of functional outcomes and reduced recurrence rates. Hereby, we present our experience in a case of proximal femoral giant cell tumor managed with total hip arthroplasty following pathological fracture.

1. Introduction

Giant cell tumors are rather uncommon and represent approximately five percent of all skeletal tumors. Giant cell tumors (GCT) usually affect young adults belonging to the age group of 20-35 years of age, predominantly females with affinity for proximal tibia and distal femur in the epiphyseo-metaphyseal region.[1,2] Proximal femoral giant cell tumors are rather rare and being locally aggressive are at a high risk of pathological fractures.[3]

Histology of these tumors comprises majority stromal cells with giant cells having osteoclastic activity. Certain cases may present with distal metastasis and significant incidence of local recurrence.[4] Management of these tumors presents as a challenge for clinicians till date due to its high recurrence rate and other associated complications. This case report aims at studying the management of proximal femoral giant cell tumor with pathological fracture following ideal oncological principles such as excision, curettage, adjuvant therapy and THA (total hip arthroplasty.[5,6] The overall aim of management is to excise the tumor, minimize the risk of local recurrence and maintain functional capacity.

2. Case Report

A twenty-three-year-old male presented to the out patient department of our tertiary care hospital with chief complaints of atraumatic right hip pain and difficulty in weight bearing since the past one month. On clinical examination, tenderness was elicited in the right hip region with normal range of motion. Plain radiographs were suggestive of a lytic lesion with pathological fracture in the epiphyseal-metaphysical proximal femur. The patient was admitted for further investigations such as complete blood count, biochemical markers and radiological investigations such as computed tomography and magnetic resonance imaging. Computed tomography was suggestive of a lytic, expansive, eccentric lesion with pathological fracture in the head neck region. Magnetic resonance imaging

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https://doi.org/10.18231/j.ijos.2023.025

(MRI) showed a homogeneous T1 image with hyper intense T2 weighted image in the head neck region with regular and well-defined margins suggesting primary differential diagnosis of giant cell tumor, chondroblastoma and metastatic lesion.

The patient was operated with standard operative protocols under spinal Anesthesia in lateral decubitus for a primary hybrid total hip Arthroplasty (THA) including cement-less acetabular cup and cemented femoral stem. Intraoperatively, the pathological site was identified, respected with thorough curettage was done with application of carbolic acid as adjuvant and sample was taken for histopathological examination. The decision of cemented femoral stem was taken as literature is suggestive of the benefit of the local cauterizing effect of cement to reduce the recurrence of the disease. The histopathological report confirmed the diagnosis of giant cell tumor due to the presence of cellular tumor sheets of multinucleate osteoclast giant cells mixed with mononuclear round cell population with minimal motoring activity. Patient was not given any adjuvant drugs such as denosumab in the post-operative period. Immediately post-operatively the patient was started with physiotherapy and weight bearing as tolerated with an eventless post-operative period.

Six months post-operatively the patient has excellent functional outcome as per the Harris hip score and no signs of recurrence clinically or radiologically.

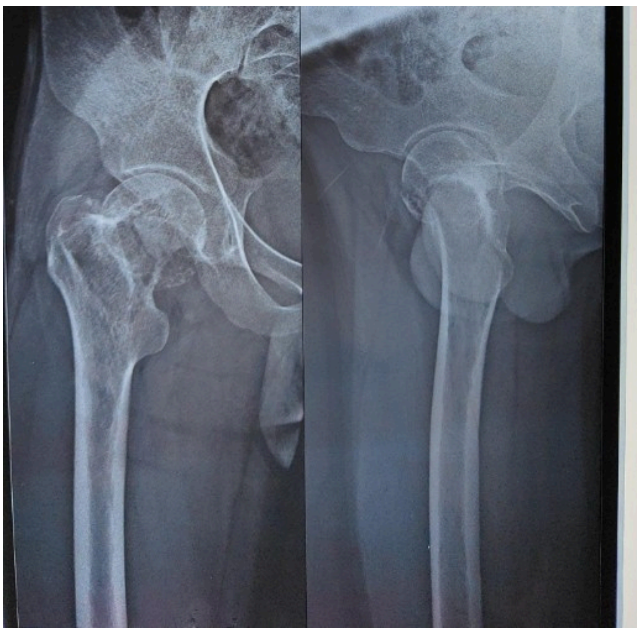

Fig. 1: AP and lateral radiographs showing lytic lesion in the right proximal femoral region

Fig. 2: Coronal CT scan showing well-defined lytic lesion with pathological fracture

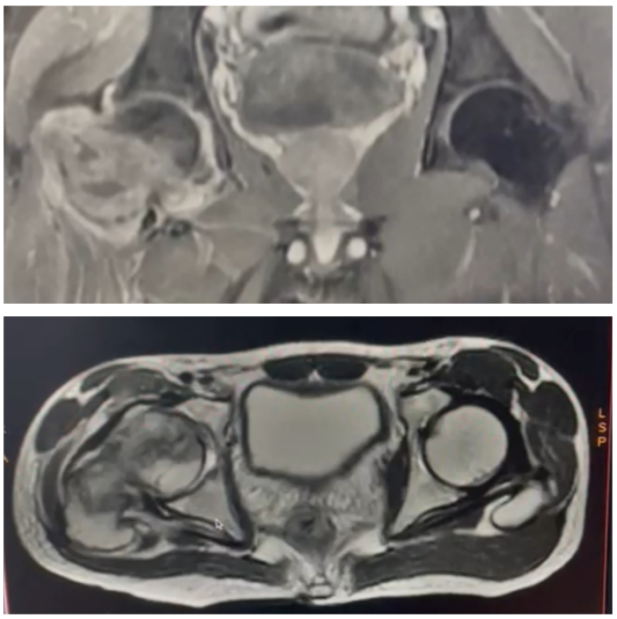

Fig. 3: Coronal and axial MRI films showing homogenous lytic lesion in the right femoral head neck region

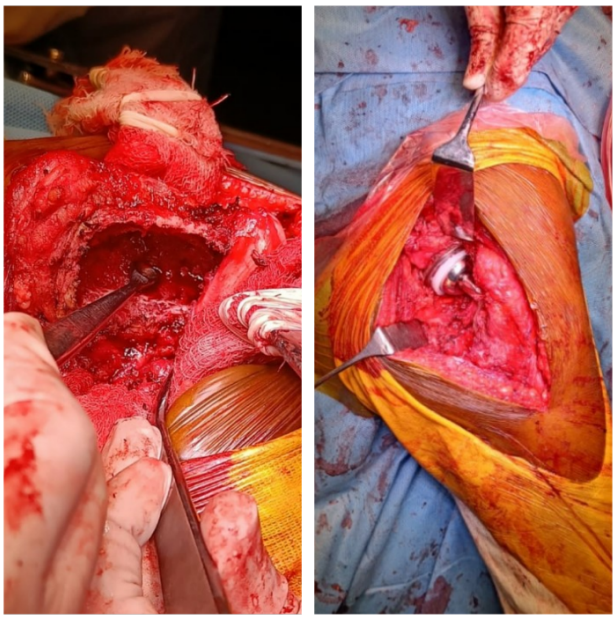

Fig. 4: Intraoperative images showing complete tumor excision with curettage and final THA in situ

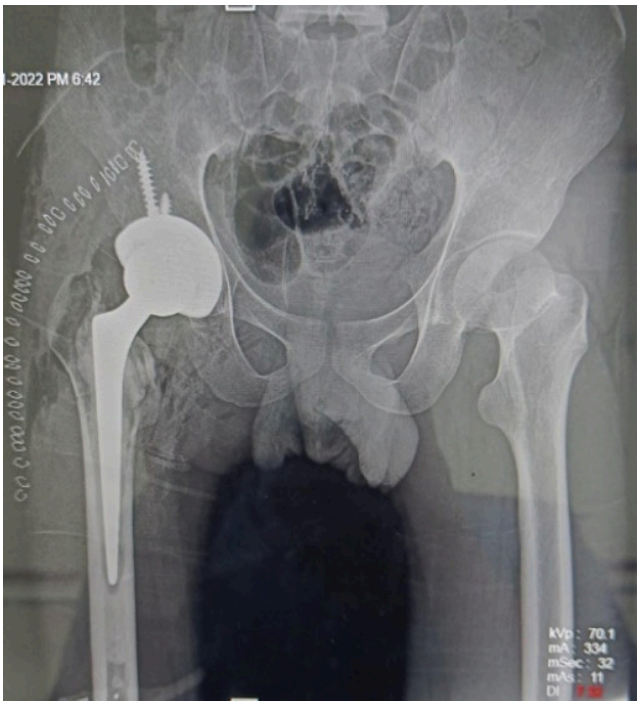

Fig. 5: Post-operative radiograph showing well positioned total hip arthroplasty

3. Discussion

The management of the giant cell tumor in rare locations such as the proximal femur pose a challenge to the clinicians in spite the advent of technology. Due to the local aggressiveness and ability to metastasize, giant cell tumors can lead to significant functional impairment and mortality in certain scenarios. Aim of management is to excise the tumor completely, avoid recurrence and maintain function capacity of the patient. Management of giant cell tumors is essentially surgical with primary aims of complete resection of the tumor with safe margins as per oncological protocols, curettage and application of local adjuvants such as carbolic acid, electrocauterization, argon, liquid nitrogen, etc. and reconstruction either with bone grafting, cement or reconstructive prosthesis. Treatments involving substitution, such as reconstruction of the proximal femur using endoprosthesis or conventional total hip Arthroplasty are technique successful in the management of hip giant cell tumors.[7,8] As per literature, the use of (PMMA) polymethylmethacrylate (bone cement) has been associated with reduction in the incidence of recurrence.[5,6] Joint preserving procedures in the form of curettage and bone cementing have a high rate of recurrence ranging from 50% to 60%.[9] As the tumor is located in the juxta articular region of the bone, reconstruction of the bone with preserving the head is almost impossible. Thus, in our case, reconstruction using total hip Arthroplasty provided the patient with hip joint stability and normal gait with return to daily activities and thus can be considered for managing similar patients.

4. Conclusion

Management of giant cell tumors in the proximal femoral region being periarticular and weight bearing region provide a serious challenge for orthopedic surgeon to provide a good outcome to the patient. Hip preservation and reconstruction are two techniques available with reconstruction providing superior outcomes. In our case, we have managed a case of proximal femoral giant cell tumor with pathological fracture with hybrid total hip arthroplasty providing the patient with an excellent functional outcome. However, long term and multi centric studies are required for further information pertaining to such scenarios.

5. Abbreviations

THA – Total Hip Arthroplasty, GCT– Giant Cell Tumor, PMMA– Polymethylmethylacrylate. MRI– Magnetic Resonance Imaging, CT– Computed Tomography.

6. Source of Funding

None.

7. Conflicts of Interest

None declared.

References

1. Yin H, Cheng M, Li B, Li B, Wang P, Meng T. Treatment and outcome of malignant giant cell tumor in the spine. *J Neurooncol*. 2015;124(2):275–81.
2. Miszczyk L, Wydmański J, Spindel J. Efficacy of radiotherapy for giant cell tumor of bone:Given either postoperatively or as sole treatment. *Int J Radiat Oncol Biol Phys*. 2001;49(5):1239–42.
3. Abdulrazak S, Marzouki A, Bah ST, Lahrach K, Boutayeb F. Giant cell tumour of the femoral neck:Failure of curettage-cavity filling cementation with screw fixation, a case report. *Trauma Case Rep*. 2019;22:100216. doi:10.1016/j.tcr.2019.100216.
4. Oda Y, Miura H, Tsuneyoshi M, Iwamoto Y. Giant cell tumour of bone: oncological and functional results of long-term follow-up. *Jpn J Clin Oncol*. 1998;28(5):323–8.
5. Gaston CL, Puls F, Grimer RJ. The dilemma of denosumab: Salvage of a femoral head giant cell tumour. *Int J Surg Case Rep*. 2014;5:783–6.
6. Mkandawire N. Giant cell tumour of the neck of femur treated by total hip replacement. *Malawi Med J*. 2005;17(1):21–8.
7. Kulkarni SS, Dogra AS, Bhosale PB. Total hip arthroplasty for giant cell tumour. *J Postgrad Med*. 1996;42(3):82–4.
8. Croci AT, Camargo OP, Baptista AM, Caiero MT. The use of a modular titanium endoprosthesis in skeletal reconstructions after bone tumor resections: method presentation and analysis of 37 cases. *Rev Hosp Clin Fac Med São Paulo*. 2000;55(5):169–76.
9. Cho HS, Park IH, Han I, Kang SC, Kim HS. Giant cell tumor of the femoral head and neck: Result of intralesional curettage. *Arch Orthop Trauma Surg*. 2010;130(11):1329–33.

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Cite this article: Paigude PA, Bartakke G, Lakde S, Puranik R, Katkar M. A case of proximal femoral giant cell tumor treated with total hip arthroplasty following a pathological fracture. *Indian J Orthop Surg* 2023;9(2):118-121.