Giant cell tumor of femoral neck with pathological fracture: A case report

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INTRODUCTION

Giant cell tumor is a locally aggressive benign bone tumor. Sometimes, its behavior is unpredictable. Histologically, it is characterized by rich vascularized tissue with numerous osteoclastic giant cells evenly distributed throughout the tumor.[1-3] There may be extensive infiltration of tumor tissue by ovoid and fusiform cells.

Giant cell tumors mainly affect young adult female, especially in 20–35 years of age group. Their most frequent locations are distal radius, proximal tibia, and distal femur. They are also found in proximal femur and femoral neck. Approximately 8% of primary bone tumors are giant cell tumor.[4]

The purpose of this case report is to emphasize the benefit of middle path of management, between the radical proximal femoral resection and preservation of femoral head. The chances of failure are much more common in femoral head preservation and primary fixation. In radical resection and endoprosthesis replacement, the chances of failure are less but long-term survival is guarded.

Intralesional curettage and chemical cauterization with cemented total hip replacement[5] offer a middle path between preservation and radical resection. We take the advantage of favorable biomechanics and long-term survival with less chances of failure. If there is any tumor recurrence, it can be seen early at the bone-cement interface[6] and can be managed by revision arthroplasty or radical proximal femoral resection and endoprosthesis as a primary treatment.

KEY WORDS: Giant cell tumour, chemical cauterization, total hip replacement, pathological femoral neck fracture

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The authors describe a case of pathological fracture of femur neck secondary to giant cell tumour. There was adjacent bone invasion over intertrochanteric region. Patient has pain in his Lt. hip since 1 year and was non weight bearing past 5 months. There was grade 1 bed sore over his sacral area. His MRI report was suggestive of giant cell tumour with differential diagnosis of aneurysmal bone cyst. Due to non-malignant nature of the lesion we planned excisional biopsy, chemical cauterization and cemented total hip replacement. The purpose of this article is to demonstrate surgical procedure and its problems. The role of chemical cauterization after resection of giant cell tumour is also emphasized. The authors also aimed to favour intralesional resection and chemical cauterization with cemented total hip replacement over radical proximal femoral resection and endoprosthesis as a primary treatment.
CASE REPORT

A 34-year-old male patient presented to us with pain in Lt. hip for 1 year and unable to bear weight past 5 months. There is no history of significant trauma. On physical examination, tenderness was present at Scarpa’s triangle and the patient was unable to do active straight leg raise test. The Lt. limb was 2 cm short as compared to Rt. lower limb. There are no other symptoms and sign suggestive of chest or abdomen involvement. Grade 1 bed sore was present at the sacral area. There was no lymphadenopathy. Distal neurovascular status was intact.

X-ray (pelvis with both hip) revealed the presence of extensive osteolytic lesion with extension over intertrochanteric area and femoral neck fracture [Figure 1].

MRI revealed expansile osteolytic lesion (8.6 × 6.2 × 4.5 cm) extending from subcapital region of the left femoral head up to the intertrochanteric region appearing hypointense on T1W sequence and hyperintense on T2W and PD fat-sat sequence with multiple internal septation [Figure 2]. There is also a cortical breach of femoral neck. Minimal left hip joint effusion with mild periarticular soft-tissue swelling was also noted.

Based on X-ray and MRI findings, the possibility of giant cell tumor and differential diagnosis of aneurysmal bone cyst was proposed. Clinical examination, X-ray, and MRI findings all are suggestive of benign nature of lesion. Since the patient was bed ridden from the past 3 months and there was also Grade 1 bed sore present at the sacral area, authors decided to plan excisional biopsy and do intralesional curettage and chemical cauterization with phenol and all cemented total hip replacement with long stem femoral component.

On exploration through posterior approach, we found friable tissue mixed with old blood and some fatty tissue. All grossly abnormal tissues were excised and sent for histopathological biopsy. Anterior portion of intertrochanteric region was also involved and we extended curettage over the anterior portion till upper margin of lesser trochanter. Phenol was used for chemical cauterization. On gross examination, acetabular cartilage was normal. After the preparation of acetabulum, we cemented the prosthesis. Femur was prepared for cemented long stem (250 mm) prosthesis [Figure 3]. After confirming the intraoperative stability of components, we closed the wound over drain and shifted the patient to post-operative ward.

Drain was removed after 48 h and stitches 12 days after operation. The wound healed well. We kept patient non-weight-bearing for 3 weeks and then mobilized with frame. There was no pain on full weight-bearing [Figure 4]. Both lower limbs were equal in length. The patient was directed to walk with stick after 4 weeks and unassisted walking was advised only 3 months postoperatively.

The final report from histopathology department confirmed it as giant cell tumor with rich vascular tissue and numerous osteoclastic giant cells.
DISCUSSION

After excision of GCT in pathological fracture neck femur, the following important points are worth considering:

- Wide resection and cauterization of tumor to prevent recurrence
- To give stable joint for good functional outcome and normal gait pattern
- To opt for the procedure which has less chances of failure and greater longevity.

A good surgical technique and clean dissection help to identify the abnormal tissue and its complete removal possible. Chemical cauterization with phenol further reduces the chances of recurrence.[7] In addition, methyl methacrylate bone cement has been shown to decrease the incidence of local recurrence. Methyl methacrylate bone cement also helps for early recognition of tumor recurrence.[5] This recurrence can be identified on X-ray as osteolysis around bone-cement interface.

Other treatment modalities include radical resection of proximal femur with endoprosthesis replacement[8,9] and intralional curettage, bone grafting, and internal fixation.[10] Plan to preserve the head is dictated by tumor extension and how much normal femoral head is present. Internal fixation with bone grafting after curettage also has greater chances of failure because its final outcome depends on bone healing which is already compromised due to pathology.

Radical resection and endoprosthesis replacement offer a wide margin of safety to prevent further recurrence but simultaneously it has very less longevity when compared to conventional cemented total hip arthroplasty. After resection of all proximal femur, abductor functions are compromised and chances of Trendelenburg gait are high.

Between these two options, conventional total hip replacement with all cement[5] offers the best chance of wide resection, less incidence of recurrence, early mobility, and greater longevity. In addition, any recurrence of tumor can be identified in the early phase through simple radiograph. If recurrence happens, conventional total hip replacement can be converted to radical resection and endoprosthesis replacement.

CONCLUSION

Conventional cemented total hip replacement after curettage and chemical cauterization can be a better management decision to treat pathological fracture neck femur secondary to giant cell tumor. It offers the better chances for early mobilization, good functional outcome, and early recognition of tumor recurrence.

REFERENCES
