Giant Cell Tumor of Proximal Fibula in an Adult- A Rare Site

Sachin Kumar[1], Kaushalendra Singh[2]

ABSTRACT

Giant cell tumour (GCT) is benign, locally aggressive tumor of long bone particularly in distal femur and the proximal tibia. Giant cell tumors very rarely involve fibula bone. Incidence of occurrence of GCT lies between 20-40 years age groups with peak incidence in third decade of life but rare in children. Main symptoms of GCT are pain and swelling around affected joints followed by limited movements. The definitive diagnosis of GCT is based upon radiological and histological findings. In present case study, X-ray showed ill defined lytic lesion on proximal metaphyseal region of fibula with cortical thinning and MRI findings revealed an expansile lytic mass in the proximal epi-metaphysis of fibula appearing hypointense signal on T1 and intermediate signal on PDFS images with hypointense rim. Core needle biopsy on histo-pathological examination showed giant cell tumor on proximal fibula. GCT has higher tendency of recurrence even after surgery. Wide local excision of tumor mass was done to prevent recurrence and to enhance functional outcomes by saving adjacent anatomical structure.

Keywords: Giant Cell Tumor, Fibula, Wide excision, Distal Femur

INTRODUCTION

Giant cell tumor (GCT) of bone is common benign bone tumor encountered by an orthopedic surgeon. Sometimes, Giant cell tumors undergo malignant transformation. GCT is locally aggressive and generally occurs in mature skeleton. Incidence of occurrence of GCT lies between 20-40 years age groups with peak incidence in third decade of life.[1-3] Occurrence of GCT is more in Asian and Oriental population in comparison of Caucasian population.[4] Histopathologically, Giant cell tumors are classified as osteoclastic gaint cell rich tumors of intermediate grade with local aggressiveness. There are rare incidences (1.8% to 10.6%) of Giant cell tumors in children.

The biological behavior, symptoms and management of GCT is similar in all age groups.[5,6] In children and adolescent, it is no different from that in adults. Patients of GCT present with symptoms like pain and swelling around affected joints followed by limited movements. The definitive diagnosis of GCT is based upon radiological and histological findings. Surgical excision of tumor mass is primary treatment in cases of GCT. Selection of appropriate surgical management plays a vital role in reducing recurrence rate.

Various studies reported lower end of femur and upper end of tibia as common sites for Giant cell tumors of bones.[7,8] Study done by Puri A et al.[3] found lower end of the femur was the most common site (5 lesions, 29%) followed by the upper end of tibia (4 lesions, 24%). Other sites like upper end of the fibula distal end of radius, upper end of the humerus etc were rare sites for GCT of bones. Giant cell tumors involve fibula bone very rarely and very few cases of involvement of fibula bone have been reported in literature.[9,10] In present study, we have reported a case of Giant cell tumor of proximal fibula bone in a 42 year old male adult. The aim of present study is to share knowledge on rare site for disease for contribution in the field of Orthopedic.

CASE PRESENTATION

History: A 42-year-old adult male presented in the outpatient department with the pain and swelling over lateral aspect of right proximal leg including knee since three months duration. Characteristics of pain was gradual onset, localized, progressive, dull aching and unaffected by knee movements. Patient was afebrile and limping, instability & locking was not present. On examination, diffuse swelling over upper end of right fibula bone at lateral knee region was seen.

Radiological findings: On X-ray, ill defined lytic lesion on proximal metaphyseal region of fibula with cortical thinning was observed. MRI was done to confirm the findings. On MRI, expansile lytic mass was noted in the proximal epi-metaphysis of fibula appearing hypointense signal on T1 and intermediate signal on PDFS images with hypointense rim. The mass measures 3.8x3.9x3.0 cm in craniocaudal, AP, and transverse dimensions. No evidence of cortical break was noted. No evidence of periosteal reaction was noted. Adjacent periosteal soft tissue edema was noted. The fat planes with the neurovascular bundles are well maintained. Diffuse intermediate signal on PDFS images was seen in the anterior cruciate ligament. Loculated synovial fluid collection was noted along the anterior aspect of caudal third of anterior cruciate ligament. Grade II signal was seen in the posterior horn of medial meniscus appearing as intra-substance linear intermediate signal without articular margin extension. (Figure 1 to 3)

Histo-pathological findings: Biopsy from right fibula was done for histo-pathological analysis. On gross examination, biopsy specimen showed a grey brown friable cystic tumor measuring 5 cm x 4 cm x 3 cm. On microscopic examination, sections showed a tumor in which numerous osteoclast like

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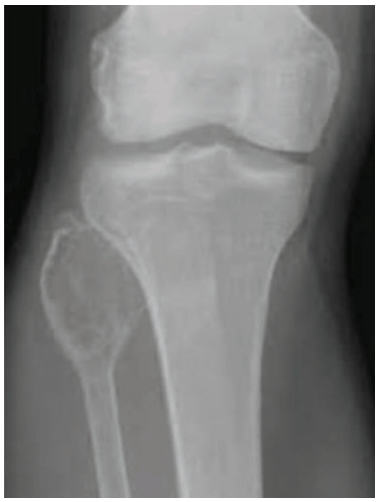

Figure-1: Pre-operative Radiograph of Right Knee Joint

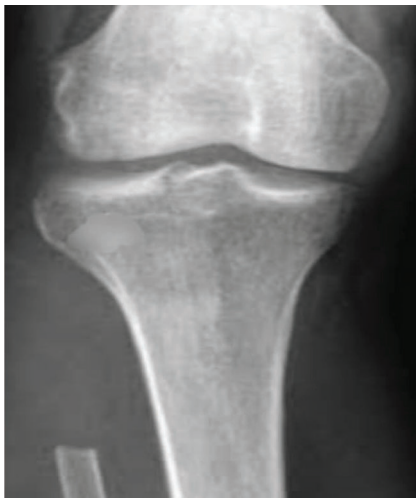

Figure-2: Post-operative Radiograph of Right Knee Joint

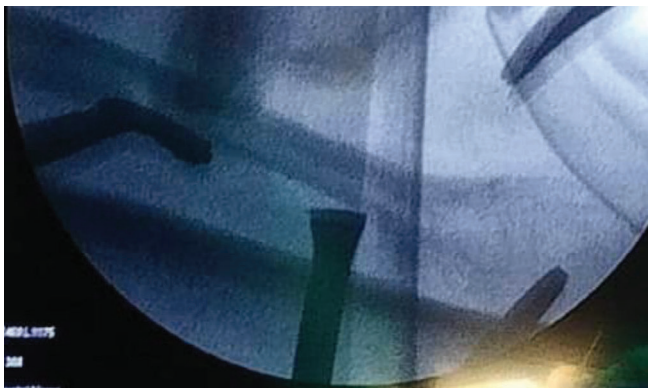

Figure-3: Intra-operative C-Arm Image

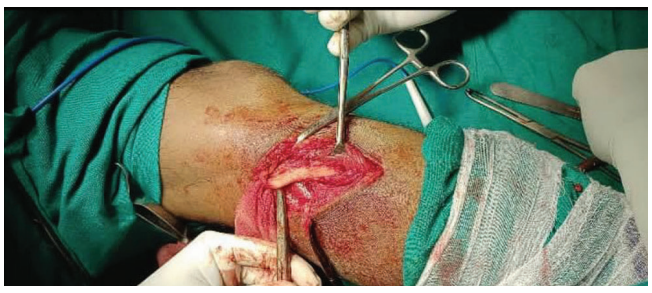

Figure-4: Intra-operative picture showing common peroneal nerve superior to tumor bone.

giant cells were uniformly distributed throughout the tumor. Many giant cells were larger than normal osteoclasts with numerous (> 10) nuclei. Some areas had a paucity of giant cells. Spindle and round/oval mononuclear cells were also present. Stoma was highly vascular and showed fibrosis. Acute hemorrhage, haemosiderin and xanthomatous histiocytes were also seen. As per histo-pathological report, findings were consistent with Giant Cell tumor.

Management: Excision of fibular head saving common peroneal nerve and lateral collateral ligament and bicep femoris muscle to proximal tibia with non-absorbable sutures was done to prevent recurrence. Post operatively patient was kept on supportive brace for two weeks and gradually walking started as pain tolerated. No ligament instability on varus stress test was observed and patient can walk without pain and squats normally. (Figure 4) Therefore we performed wide local excision of tumor.

DISCUSSION

Giant cell tumor of bones generally occurs in age group 20-40 years with peak incidence in third decade. In our case report also age of the patient was 42 years. Although incidence of GCT is relatively low but study done by Settakorn J et al. observed that in Asian population, about 18% of all non-haemogenous primary bone tumor are GCT.

Various studies reported lower end of femur and upper end of tibia as common sites for Giant cell tumors of bones. Study done by Puri A et al.[3] found lower end of the femur was the most common site (5 lesions, 29%) followed by the upper end of tibia (4 lesions, 24%). Other sites like upper end of the fibula distal end of radius, upper end of the humerus etc were rare sites for GCT of bones. Giant cell tumors involve fibula bone very rarely and very few cases of involvement of fibula bone have been reported in literature. In present study, we have also reported a case of Giant cell tumor of proximal fibula bone in a 42 year old male adult.

GCT is locally aggressive tumor with high recurrence rate[3,11] and occasionally it undergoes malignant transformation. Therefore it should be well treated. Recurrence rate is variable after surgery and it is affected by selection of appropriate treatment and site involved. A multicentre retrospective study done by Hu P et al.[10] in China between 2000-2014 regarding recurrence rate of primary GCT around knee among aged 20-39 years population and they found 23.4% of local recurrence rate. According to location, recurrence rate was higher in cases of proximal fibula in comparison of distal femur bone.

To minimise the recurrence rate in GCT, selection of appropriate treatment is an important step but treatment dilemmas exists related to functional and oncological outcomes. In present case, aim of the treatment was to remove the tumor completely and to preserve the surrounding anatomical structures for functional outcome. Therefore we performed wide local excision of tumor saving common peroneal nerve and lateral collateral ligament and bicep femoris muscle to proximal tibia with non-absorbable sutures. Various studies[3,9,12] observed lower rate of recurrence

with wide local excision in comparison of treatment with intralesional curettage and curettage combined with resection. A study conducted by Klenke FM et al.[13] observed lower recurrence rate in patient treated with wide resection (5%) than treated with intralesional surgery (25%).

CONCLUSION

GCT is locally aggressive tumor with high recurrence rate and generally occurs in mature skeleton. Incidence of occurrence of GCT lies between 20-40 years age groups with peak incidence in third decade of life. The biological behavior, symptoms and management of GCT is similar in all age groups. The definitive diagnosis of GCT is based upon radiological and histological findings. Surgical excision of tumor mass is primary treatment in cases of GCT. Lower end of femur and upper end of tibia are common sites for Giant cell tumors of bones. Giant cell tumors involve fibula bone very rarely. Wide local excision of tumor has lower recurrence rate with better functional and oncological outcome.

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