Abstract: Giant cell tumor (GCT) is a benign, locally aggressive tumor. It is most commonly found in epiphysio-metaphyseal region of distal femur, proximal tibia and distal radius. GCT in metaphysio-diaphyseal region of proximal tibia and epiphyseal region of medial condyle of humerus has rarely been reported in literature. In this study, I am presenting two cases of giant cell tumor in rare sites.

Keyword: GCT, metaphysio-diaphysis, medial condyle humerus, proximal tibia, extended curettage, cortico-cancellous bone graft.

INTRODUCTION:
Cooper and Travers first described GCT of tibia in 1818. GCT is a benign, locally aggressive tumor that represents 5% of bone neoplasms. They typically occur in patients 20 to 40 years old and there is a slightly female predominance. It commonly arises in the epiphysio-metaphyseal region of long bones in skeletally mature individual.

The six most common sites of GCT are distal femur, proximal tibia, distal radius, proximal femur, sacrum, and proximal fibula. The characteristic radiographic findings of GCT are eccentric, expansile osteolytic lesion in the epiphysio-metaphyseal region of long bones usually abutting the subchondral bone.

MATERIALS AND METHODS: We studied 2 cases, both male patients, one a 19 year old boy and another 32 year old middle aged man.

CASE: I
A 19 year old male patient presented with complaints of pain and slow growing swelling over the proximal part of right leg of 6 months duration. On examination, diffuse swelling of size 8 x 6 cm was present over the antero-medial aspect of right proximal leg about 8 cm from knee joint. Local tenderness was present. Range of movements of right knee was full. There was no evidence of distal neurovascular deficit. X-ray of right knee with leg showed a well defined, osteolytic lesion present in the metaphysio-diaphyseal region of proximal tibia.
Incisional biopsy was done. Biopsy reported as benign GCT. As the tumor fell under Campanacci Grade I, we planned for extended curettage with autologous bone grafting. Under spinal anaesthesia, through the anterolateral approach, incision was made over the swelling of the proximal tibia and lesion was exposed. A chocolate brown, soft, spongy and friable mass was seen. Extended curettage was done. Hydrogen peroxide was used as an adjuvant. The autologous cortico-cancellous bone graft was harvested from right iliac crest and packed in the curetted cavity. Biopsy material was sent for HPE. Biopsy reported as benign GCT. Post operatively, sutures were removed on twelfth day and wound healed well. He was put on above knee cast for 6 weeks. Periodic clinical and radiological reviews were done and patient had good functional outcome with no recurrence in the subsequent one year followup.

Pre-operative X ray Rt knee knee AP view:
Per-operative picture: Immediate post operative Xray Rt kneeAP/lat - lesion with cortico cancellous bone graft Chocolate brown, friable irregular mass

Pre operite:X ray Rt KneeAP and lat view s well marginated osteolytic lesion seen in metaphysio diaphyseal region.
Biopsy:Multinucleated giant cell seen One year follow up X rays Rt knee Ap/Lat view: Bone graft well incorporated and no evidence of recurrence
Functional outcome the patient CASE: 2

A 32 year old male patient presented with complaints of insidious onset of pain and swelling in the right elbow of 6 months duration.

On examination, swelling was present over the medial aspect of distal humerus of size 5 x 4 cm. Local tenderness was present. Skin over the swelling was normal. There was no distal neurovascular deficit.

On examination, swelling was present over the medial aspect of distal humerus of size 5 x 4 cm. Local tenderness was present. Skin over the swelling was normal. There was no distal neurovascular deficit.

X-ray right elbow showed an eccentric, expansile osteolytic lesion in epiphyseal region of medial condyle of humerus with cortex thinned out but intact.

CT report showed no evidence of cortical break and surrounding soft tissue involvement. Incisional biopsy was done and reported as benign GCT. As the tumor fell under Campanacci Grade II, we planned for extended curettage with autologous bone grafting.

Under supraclavicular block, through the medial approach, incision was made over the swelling and the lesion was exposed and cortical window made. A brownish, friable, soft irregular mass was seen and extended curettage was done. Hydrogen peroxide was used as an adjuvant. Then autologous bone graft was harvested from right iliac bone and packed in the curetted cavity. Curetted mass was sent for HPE. HPE reported as benign GCT.

Post operatively, sutures were removed on twelfth day and wound healed well. He was put on above elbow cast for 2 weeks. Periodic clinical and radiological reviews were done. Bone graft incorporated well and the patient had good functional outcome with no recurrence in the subsequent.

Pre operative X rays of Rt elbow AP/ Lat view:Eccentric,expansile osteolytic lesion in Pre operative CT scan:Cortex thinned out and intact
DISCUSSION:
Most GCTs are present in the epiphyseal or epimetaphyseal end of the long bones. Although benign, GCT shows a tendency for bone destruction, local recurrence and occasional metastasis. Giant cell tumors usually are solitary lesion; however 1% to 2%

Through medial Lesion exposed and cortical brownish, friable irregular

Hydrogen peroxide used as an adjuvant window created to access the tumor mass was curetted

Immediate post operative X rays Rt elbow AP/Lat view One year follow X rays Rt elbow AP/Lat view: Bone graft well incorporated and no evidence
may be synchronously or metachronously multicentric. **CASE: 1**

Most GCTs are located within epiphysis of long bones but often extend into the metaphyseal region. In skeletally immature patient, GCT usually arises in the metaphysis. In several published series, GCTs involving the metaphysis or diaphysis without involvement of epiphysis has been reported as extremely rare. If the epiphysis is not involved, a diagnosis of GCT is dubious. The radiographic findings are helpful but cannot clinch the diagnosis. Histological examination is still the gold standard for diagnosis. The histological appearance of the tumor in this patient was composed of highly cellular tissue containing spindle cells and multinucleated giant cells. There is predominance of spindle cells with abundant intercellular collagen in most of the areas. These features are suggestive of a typical giant cell tumor. Histological examination is still the gold standard for diagnosis. The histological appearance of the tumor in this patient was composed of highly cellular tissue containing spindle cells and multinucleated giant cells. There is predominance of spindle cells with abundant intercellular collagen in most of the areas. These features are suggestive of a typical giant cell tumor. However, in view of its subperiosteal position and its location some distance from the epiphysis, a number of differential diagnosis also had to be considered. Aneurysmal bone cysts, fibrous dysplasia, osteosarcomas, chondromyxoid fibromas, chondroblastomas, unicameral bone cysts often contain giant cells and have been confused with giant-cell tumors. Aneurysmal bone cyst also commonly appears in the metaphysis. The more solid zones within them exhibit fibrogenesis and osteoid trabeculae. The stroma between the spaces contains hemosiderin laden macrophages, chronic inflammatory cells and broad seams of reactive osteoid. Multinucleated giant cells are often conspicuous. Osteosarcoma is a lesion in the metaphysis and contains numerous benign giant cells. The stroma reveals cells with anaplasia and irregular size and shape. Also presence of cartilage is not uncommon. Fibrous cortical defect is a benign lesion which regresses spontaneously. Radiology shows a characteristic eccentric zone of rarefaction with well-defined scalloped margins. The microscopic picture reveals a mixture of collagen and fibroblasts with irregular cluster of histiocytes filled with lipid and hemosiderin. Multinucleated giant cells may be found. A simple bone cyst generally touches the epiphyseal growth plate. It is benign lesion and shows radiolucence with fine trabeculation. It contains fibrous tissue with few giant cells. Giant-cell reparative granulomas characteristically have an appearance which suggests previous injury and inflammation with subsequent fibrosis. Giant cells are found in the vicinity of old areas of hemorrhage, though not dispersed throughout the lesion. Mandible is a common site for these lesions. The case we have reported did not contain areas of hemorrhage, hemosiderin pigment, osteoid bone or significant amounts of collagen. The lesion also did not have the fibrotic, scarred appearance of a fibrous cortical defect, or reparative granuloma. The clinical and histological features of other osseous lesions which may contain giant cells were not present. Another study showed that in patients with multifocal lesions, there is an increased prevalence of extension of lesion into the diaphyseal region. This maybe particularly true in children who have open physes, which act as barriers to
epiphyseal spread. Hence, as our patient
is skeletally mature, a metaphysio-
diaphyseal origin can be considered as
extremely rare. Fain JS et al in their
study, reported 14 patients of nonepiphy-
seal GCT involving metaphysis and
diaphysis. Among those cases, 10 pa-
tients had metaphyseal GCT, 2 patients
had metadiaphyseal GCT and 2 patients
had diaphyseal GCT. They reported inci-
dence of nonepiphyseal GCT of only
0.8% in their case review.9

Case: 2

GCT is most frequently seen around
the knee joint (60%), in the upper end
of the humerus (15%), and in the
lower end of the radius (10%) or the
tibia (10%).10 Incidence of GCT in distal humerus is
only 5%11. Moreover, in these cases; it
frequently involves the proximal ulna and
radius. Hence, the presence of GCT as
an isolated lesion in medial condyle of
humerus as seen in our patient is ex-
tremely rare.

A thorough literature search revealed 2
cases of medial epicondyle GCT, but no
case of giant cell tumor of the medial
condyle of humerus was reported yet.

CONCLUSION:

Giant cell tumour usually arises from epi-
physio-metaphyseal region of long bones.
A thorough literature and online search
showed that benign GCT arising from
metaphysio-diaphyseal region of long
bone is rarely seen. Epiphyseal GCT usu-
ally occurs around the knee joint, prox-
imal humerus and distal radius but the oc-
currence in medial condyle of humerus
is not reported in literature. As Jafee has
mentioned, ‘A bone lesion may be un-
characteristic in all other aspects, but if it
exhibits the cytological pattern of a giant
cell tumor, it should be

recognised as a “GCT”13. We concluded
that irrespective of site of bony involve-
ment and location, a giant cell tumor
should only be diagnosed based on its
histopathology.

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