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Multicentric, Synchronous Giant Cell Tumour Involving Knee and Distal Tibia of Ipsilateral Lower Limb: A Case Report

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Abstract: *Multicentric giant cell tumour is a extremely rare variant of GCT. We report a case of multicentric giant cell tumour of 15 year old boy involving the distal femur, proximal and distal tibia of the same limb. Patient was treated with reconstructive arthrodesis for right knee and curettage with bone cement filling for right distal tibia. Patient is on regular follow up and there is no sign of recurrence and metastasis even after 1 year of biopsy.*

Keywords: *Multicentric, giant cell tumour, synchronous, open biopsy, curettage.*

I. Introduction

Giant cell tumour of bone is a benign locally aggressive tumour with feature of frequent local recurrence and potential for metastasis and malignant transformation.[1] Giant cell tumour of bone account for 4% to 5% of all primary bone tumour with multicentric variety of tumour rarely occurs in less than 1% of cases of GCT.[2-4] In its most standard presentation, GCT is a solitary neoplasm growing eccentrically in the epiphysio-metaphyseal region of long bones of mature young adult (2nd to 4th decade of life) with a male : female ratio of 1: 1.5.[5] Though many cases of Multicentric giant cell tumour reported, a lot of confusion exist with present state of our knowledge regarding incidence , evaluation , pathogenesis, prognosis and management option of multicentric GCT. We hereby present a rare case of multicentric GCT of bone.

II. Case Report

A 15 year old boy was admitted in our hospital – RIMS, Imphal in June 2015 with complaints of pain and swelling over the right knee and right distal leg of 4 months duration. The pain and swelling started to appear following history of fall from stairs 4 months back and was progressively increasing in nature. On physical examination, 3 diffuse swellings noted over the right lateral femoral condyle of 10x8 cm, right lateral tibial condyle of 6x4 cm and right distal tibia of 8x7 cm. On palpation, local tenderness was elicited over the swelling with feeling of egg shell crackling in few areas. There was no local rise of temperature and no skin changes. Patient could walk normally with complain of pain over the swelling on prolonged walking and standing. The ROM of right knee and ankle were within normal limits compared to opposite side with complain of mild pain. All routine blood investigations were within normal limit. Chest x-ray shows no sign of pulmonary metastasis. Plain X – ray study showed typical osteolytic lesions in the lower femur and upper & lower tibia. Computed tomography of the patient showed expansile osteolytic lesion involving lower end of femur and upper & lower end of tibia of right lower limb with minimal extension into the adjacent soft tissue. Excisional biopsy was done and histological examination confirmed the diagnosis of multicentric giant cell tumour. There was no evidence of osteoid formation in any of the lesions. The patient was treated with reconstructive arthrodesis of right knee. The tumour on right distal tibia was curetted thoroughly and the cavity was filled with bone cement. After 6 weeks of above knee immobilization, partial weight bearing was allowed. Patient is on regular follow up without any complaints or complications. There is no sign of recurrence or metastasis even after 1 year of follow up.

III. Discussion

Primary giant cell tumour are rare and should be diagnosis of exclusion.[6-10] Multicentric GCT tends to involve the younger population compared to solitary GCT with mean age reported between 20-24 year.[4,8,9] However, Hoch et al[4] reported 17 of 30 multicentric cases (59%) being less than 20 years of age, with 13 being less than 16 years at presentation. Dhillon et al[10] reported the involvement of short bones of hand and feet and meta-diaphyseal region as the commonest site for multicentric GCT. But in our case, there is subarticular involvement of the distal femur and proximal & distal tibia of same limb.

Hoch et al[4] in 2006 classified tumours as synchronous when multiple tumour had been discovered at the initial presentation or when second tumour had been diagnosed within 6 month after first. If the second tumour developed more than 6 months after first lesion, the lesions were considered to be metachronous. Synchronous tumour occur less frequently than metachronous tumour. In our case all three lesion occurred snychronously.[2,3,4,11]

Controversy regarding pathogenesis of multicentric GCT exist to date. Various mechanisms have been described including contagious spread, iatrogenic seeding of tumour cell, benign metastasis, malignant transformation and de novo multifocal formation.[3,4,8,9,12-14] The diagnosis of multicentric GCT require careful scrutiny by clinical, radiological and histological finding to rule out other conditions that can present with similar features such as brown tumour of hyperthyroidism, multifocal giant cell reparative granuloma, Paget's disease, fibrous dysplasia, fibrosarcoma, metastasis, osteosarcoma, multiple myeloma and multifocal osteomyelitis.[2,3,9,15] MRI scan is currently the best imaging modality since it allows accurate tumour delineation, extraosseous extent and articular surface involvement. CT scan is a reasonable alternative to define intraosseous extension.[16]

The primary goal of treatment of this tumour is to eradicate the lesion and to preserve the function of the affected bones and joints.[2,4,9,11] The current modalities of treatment of GCT are intralesional extended curettage and filling the cavity with bone cement , wide resection and reconstruction and rarely amputation.[17] In our case, due to involvement of lateral femoral condyle and lateral tibial condyle of left knee, we performed wide resection of tumour with arthodesis of knee joint. For distal tibial tumour, we performed curettage and filled the cavity with bone cement. Recurrence after intralesional curettage is reported to be 25% whereas wide resection is associated with a rate of 5%.[2,4,9] In our case, there is no sign of recurrence and metastasis even after 1 year of follow – up. Bone scan screening at unusual sites is recommended for patient with solitary lesion on a semiannual basis for five years since most case of multicentricity occur within this period.[4]

IV. Conclusion

Multicentric GCT is extremely rare and in patient with GCT multicentricity has to be taken in considertation when the patient are of younger age group or lesion are located at unusal site. We presented this case for its rarity with the hope of adding little more information about multicentric GCT.

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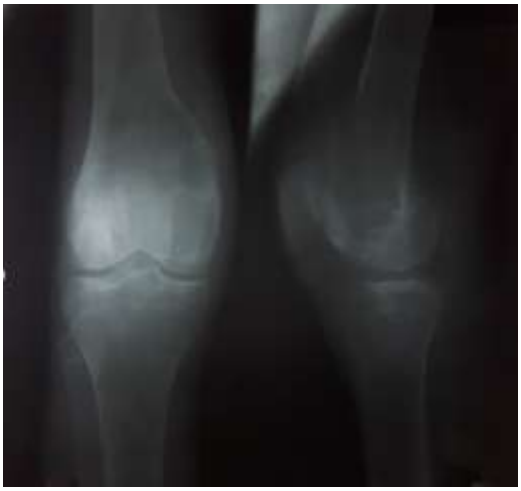

Fig 1: X - ray right knee showing osteolytic lesion in distal femur and proximal tibia

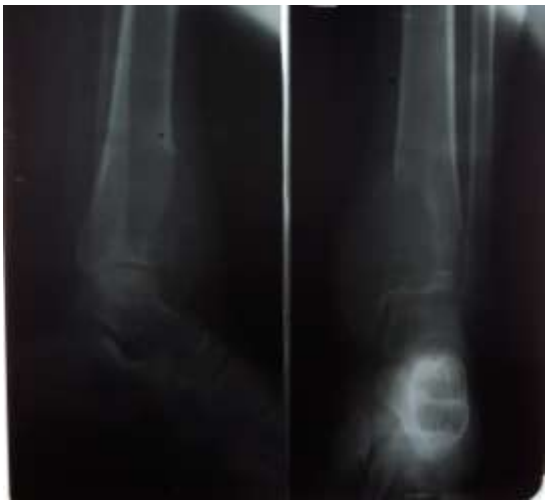

Fig 2: X - ray right ankle showing osteolytic lesion in distal tibia

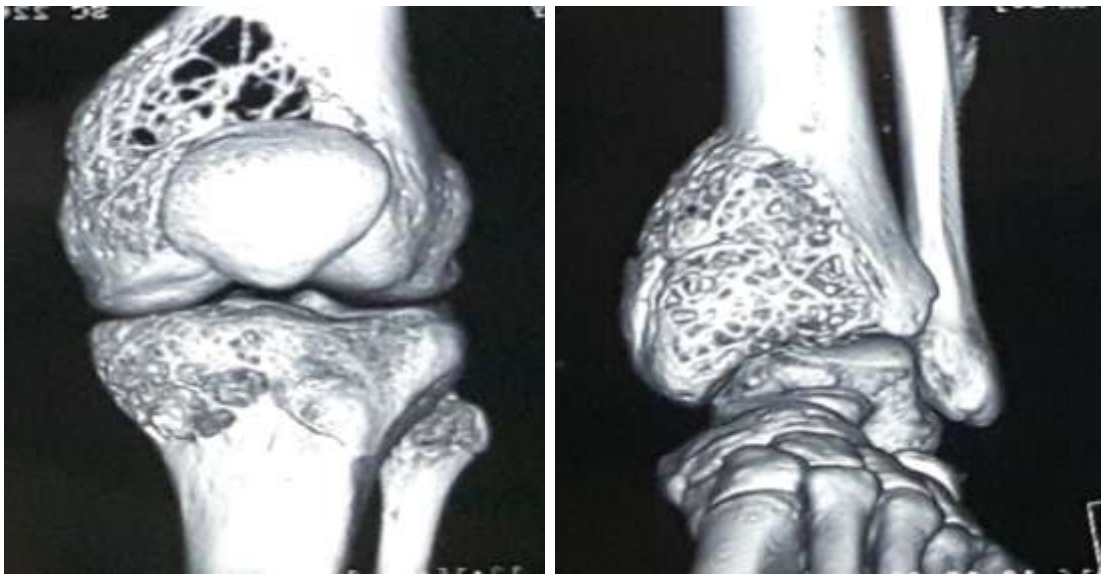

Fig 3: CT scan of knee and ankle showing osteolytic lesion in the distal femur, proximal tibia and distal tibia

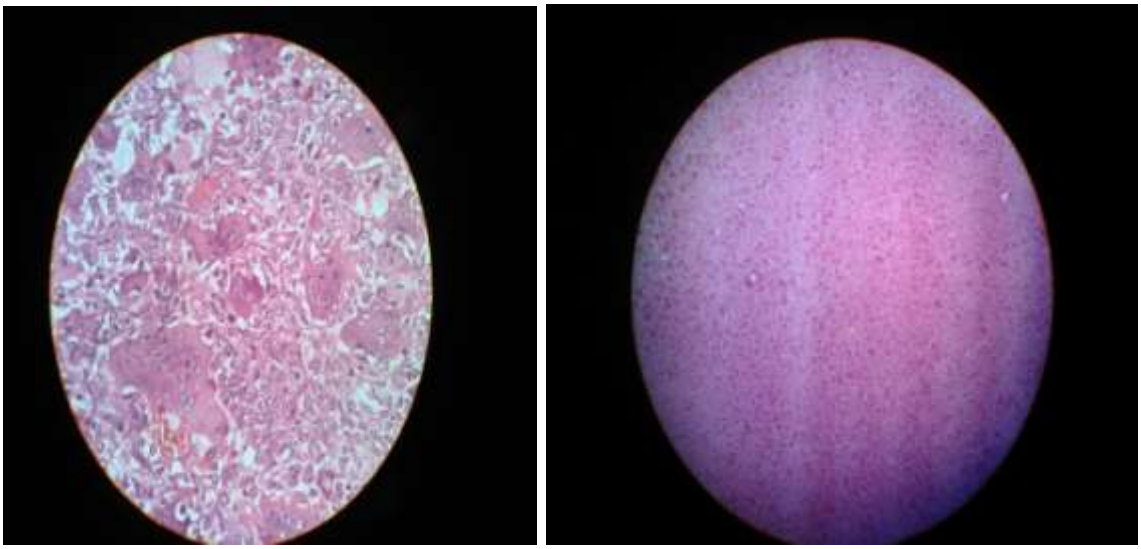

Fig 4: Histo-pathological slide at 40x and 4x showing multinucleate giant cell consistent with giant cell tumour

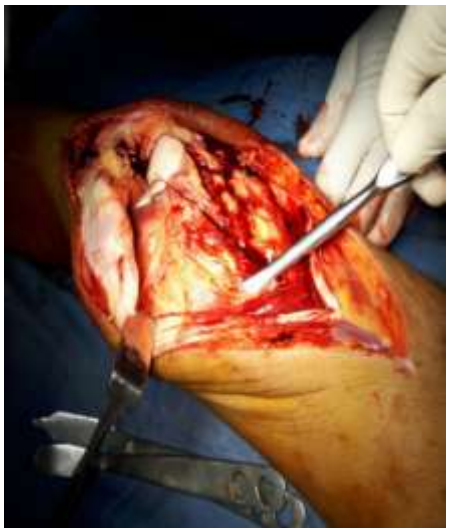

Fig 5: Intraoperative picture showing proximal tibia and distal femur of knee

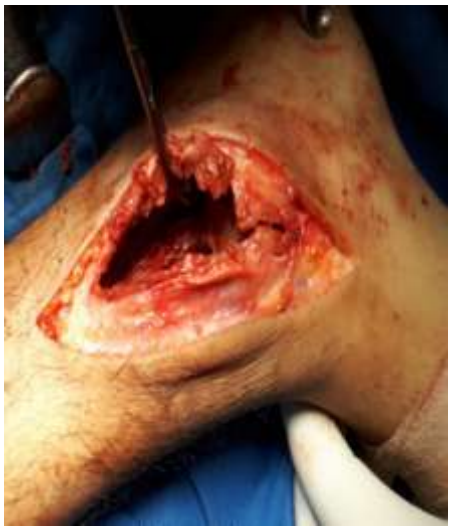

Fig 6: Intraoperative curetted distal tibial tumour

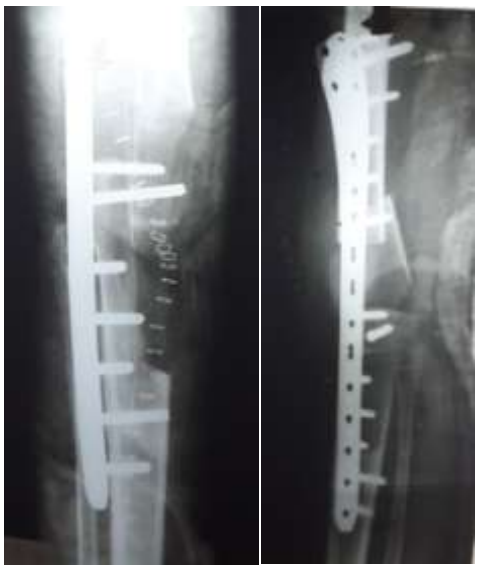

Fig 7: Postoperative x-ray of knee

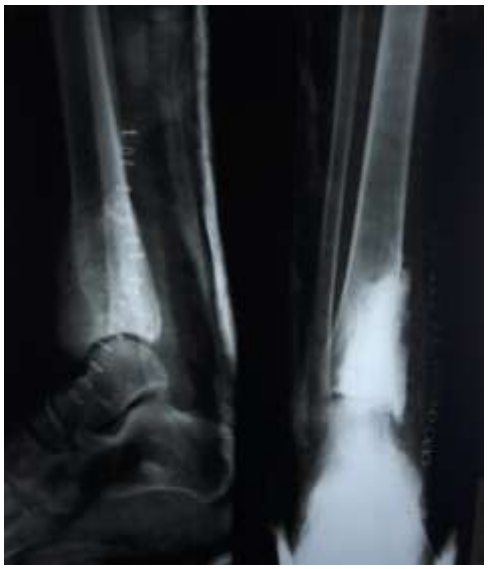

Fig 8: Postoperative x-ray of distal leg

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