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Atypical Large Enchondroma of Distal Femur Treated by Curettage and Bone Cementing: A Case Report

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Abstract
Background: *Chondromas constitutes approximately 25% of all benign bone tumours and 35-58% occur in short tubular bones of hands and feet but large chondroma of long bone like femur is very rare. Chondromas are characterized by formation of mature hyaline cartilage. Enchondroma is the chondroma arising from within medullary cavity.*
Result: *Our patient is an elderly female presented with swelling and pain in left knee underwent Curettage and bone cementing. Bone cementing to prevent pathological fracture during physiological loading.*
Conclusion: *Malignant transformation to chondrosarcoma although rare but can occur. Lytic lesions in weight bearing long bone like femur requires early diagnosis and timely intervention.*
Keywords: *Enchondroma, Chondrosarcoma, Curettage, Bone cementing.*

Introduction

Chondromas constitutes approximately 25% of all benign bone tumours[1] and 35-58% occur in short tubular bones of hands and feet[2] but large chondroma of long bone like femur is very rare. Enchondromas are more common forms of chondroma and more frequently seen in age group of 20-40 years. Malignant transformation to chondrosarcoma although rare but can occur.

Case Report

Our patient is a 72years old female presented to OPD, Department of Orthopaedics, JNIMS, Imphal, Manipur with complaints of pain in left knee of 6 months duration and swelling at left knee of 4 months duration. Examination of left knee joint revealed a swelling arising from distal femur measuring about 6cm horizontally and 7cm vertically, mild tenderness with preserved knee joint range of motion.

Plain radiograph of left knee antero-posterior and lateral views was taken which showed osteolytic radiolucent areas that are surrounded by a thin rim of radiodense bone in distal femur.

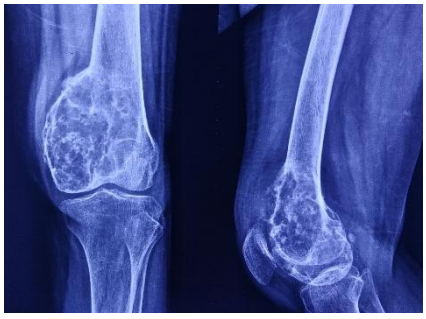

Figure 1: X-ray AP and Lateral views of left knee showing osteolytic radiolucent areas surrounded by thin rim of radiodense bone.

CT scan of left knee with 3D reconstruction showed a large expansilebonylytic lesion involving medial femoral condyle extending to metadiaphyseal region of distal femur suggestive of different conditions such as Aneurysmal bone cyst, Giant cell tumour, Non ossifying fibroma and chondroma or chondrosarcoma.

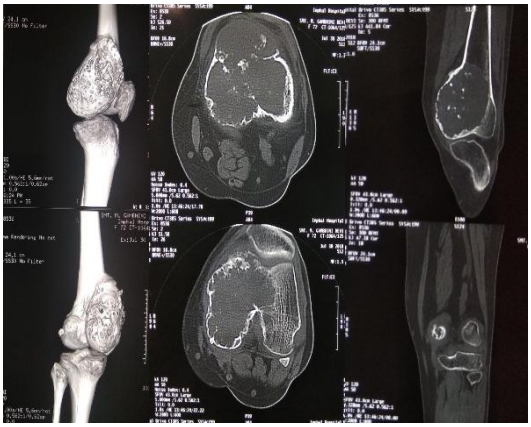

Figure 2: CT Scan of left knee showing expansileosteolytic lesion involving medial condyle of left femur

Curettage with bone cementing was done under spinal anaesthesia. Intraoperative findings are as shown in figure 3. Bone cementing was done as the bony defect after curettage was large, to provide mechanical stability and to prevent pathological fracture during physiological loading.

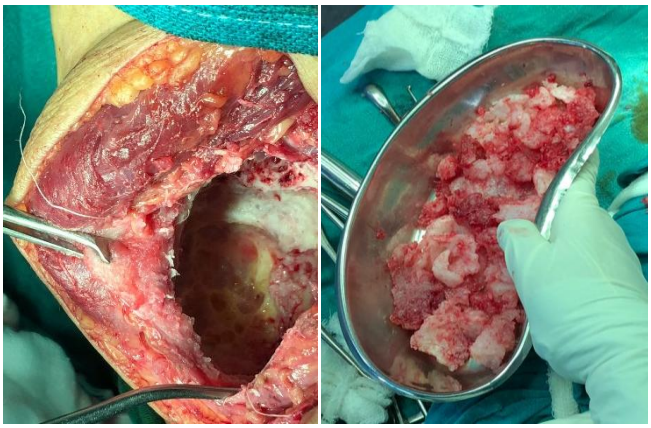

Figure 3: Intraoperative findings showing bony cavity resulted after curettage and gross appearance of tumour tissue.

Histopathologic findings include lobules of benign hyaline cartilaginous tissue with peripheral areas showing thin cancellous bone suggestive of Chondroma. There were no evidence of atypia, hypercellularity and permeation into cortical bone differentiating chondroma from chondrosarcoma.

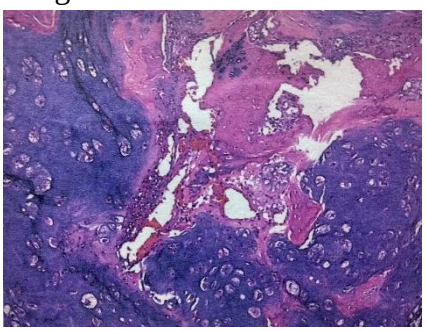

Figure 4: HPE study showing lobules of benign hyaline cartilaginous tissue with peripheral areas showing thin cancellous bone.

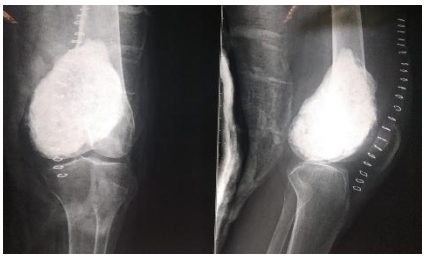

Figure 5: Post operative X-Ray of left knee through POP showing in situ bone cement.

Patient followed upto6months. Partial weight bearing allowed at 6weeks and complete weight bearing allowed at 12 weeks and patient could move left knee in its full range.

Discussion

There are wide variety of bone tumors which differ in gross and microscopic morphology, age at onset, slow growing to rapidly fatal. Chondromas are the benign hyaline cartilaginous primary bone tumors. Among the bone tumours benign forms are more common compared to malignant forms. Chondrogenic tumours include benign conditions like Osteochondroma, Chondroma, Chondroblastoma, Chondromyxoid fibroma and malignant conditions like Chondrosarcoma, Dedifferentiated chondrosarcoma, Mesenchymal chondrosarcoma. Chondromas constitutes approximately 25% of all benign bone tumours[1] and 35-58% occur in short tubular bones of hands and feet[2]. Chondromas are characterized by formation of mature hyaline cartilage. The term Enchondroma used when the chondroma arises from within medullary cavity

and the term Subperiosteal or Juxtacortical chondroma used when the chondroma arises from bone surface. The Juxtacortical chondroma was first described by Lichtenstein and Hall in 1952.Amary et al[3] showed association of central low grade cartilaginous tumours and somatic mutations in isocitrate dehydrogenase 1 and 2 (IDH1 and IDH2). Enneking et al[4]., described the most widely used staging system for benign bone tumors i.e., Stage 1 or latent, Stage 2 or active, Stage 3 or aggressive tumors. Enchondroma protuberans is a lesion that arises in medullary cavity of long bone and forms a exophytic mass on cortical surface. Intracortical chondroma is a lesion located in cortical bone and is surrounded by sclerosis of medullary bone and periosteal reaction. Complications of chondroma include pathological fractures, malignant transformation to form chondrosarcoma. Enchondromatosis is a condition marked by multiple enchondromas most commonly in metaphyseal and diaphyseal regions. The term Ollier disease applied in case of extensive skeletal involvement with predominant unilateral distribution. Maffucci syndrome is characterized by enchondromatosis and soft tissue angiomatosis. Enchondromatosis, Ollier disease (25% lifetime risk) and Maffucci syndrome(near 100% lifetime risk) are associated with high risk of malignant transformation[5].

Stephen F Miller[6] reported imaging features of seven children with Juxtacortical chondroma, six of seven children had plain radiograph and 4/7 had dedicated CT of lesion. Plain radiograph showed Soft tissue mass, Cortical scalloping and over hanging cortical edges in 5/6 children(83%) whereas cortical sclerosis in 6/6(100%) and Internal matrix calcification in only one child (16.7%). and CT detected soft-tissue mass in 4/4 children (100%), internal matrix calcification in 2/4(50%). In our case the large expansive osteolytic lesion seen in left distal femur in contrast to most common presentation of annular, punctate, and comma-shaped calcifi cations in the matrix. Histopathologic examination of tumour sample is very important in diagnosing and differentiating chondroma from chondrosarcoma. Skeletal Lesions Inter observer Correlation among Expert Diagnosticians (SLICED) Study group demonstrated that low reliability even among specialized and experienced pathologists and radiologists. Low reliability both in differentiating benign from malignant lesions and in differentiating high-grade from low-grade malignant lesions, both of which are critical to safe treatment of cartilaginous neoplasms of long bones[7]. Kendell et al[8]., described radiographic features which favour chondrosarcoma over chondroma in fibula such as soft tissue mass, periosteal reaction, cortical disruption in juxta-articular fibula, cortical thickening and tumor size greater than 4cm.

Different treatment options available are curettage, curettage and injection of calcium phosphate bone cement[9] or bone grafting for small defects. Curettage with bone cementing or prosthetic implant placement in case larger bony defect can be considered.

Bauer et al[10]., in a study of 40 patients with Enchondroma and 40 patients with low grade chondrosarcoma, the 10 year local recurrence was 0.04in Enchondroma group and 0.09 in chondrosarcoma group.

Conclusion

Lytic lesions in weight bearing long bone like femur requires early diagnosis and timely intervention to avoid pathological fracture. Curettage and bone cementing can be considered in chondroma of weight bearing long bones to prevent increased morbidity associated with fracture.

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