

Chondroblastoma of the distal femur: A Case Report

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Citation

M Subramaniam, V Singh. *Chondroblastoma of the distal femur: A Case Report*. The Internet Journal of Orthopedic Surgery. 2007 Volume 8 Number 1.

Abstract

INTRODUCTION

Chondroblastoma is a rare primary benign tumour of bone with a relatively high incidence in older children (₁). The knee, hip and shoulder are most common affected areas (₂). The tumour usually involves the epiphysis before closure of the physis (₃). Ninety percent of patients are between the ages of 5 to 25 years. Males predominate with a ratio of 3 to 2. There can be functional impairment and growth disturbances as the tumour is usually localised near a joint or growth plate. There is also a high rate of recurrences. Metastasis of a histologically benign chondroblastoma is rare (₄). The suggested treatment for aggressive chondroblastoma ranges from simple curettage to wide resection with structural reconstruction (₁).

CASE REPORT

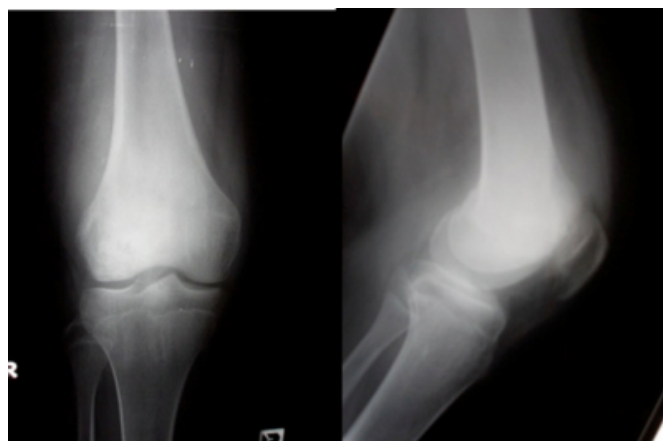
This is a 17 years old teenager who presented with a 6 months history of right knee and swelling. He has severe pain over the right knee radiating up the thigh. It is associated with night pain and rest pain. Lately the pain has got severe, causing difficult in walking. After a fall 2 months prior to presentation, he developed swelling over the knee. It has progressively increased in size. Now he finds it difficult in squatting and standing for long period of time. There are no constitutional symptoms such as loss of weight or appetite. There is no history of exposure to Tuberculosis.

Examination revealed a large swelling involving the anterior and lateral aspects of his right knee. It is firm, fixed, warm and tender on deep palpation. Patellar tap is positive, indication infusion of the joint and active range of motion of the knee is 10 to 95 degrees.

Radiographs done showed an osteolytic lesion in the distal epiphysis the femur extending into the physis. There is involvement of soft tissue anteriorly but no periosteal reaction is seen, as shown in figure 1.

Figure 1

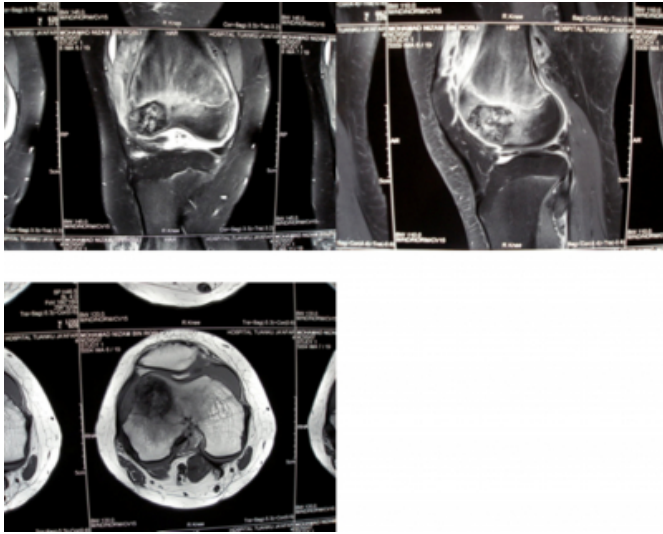
Figure 1: Shows a lytic lesion within the lateral condyle of the right femur.



Magnetic resonance scanning done showed a heterogenous lesion within the lateral condyle of the femur, extending up to the physis and there is a break in the lateral cortex of the femur. The surrounding soft tissue is inflamed (figure 2).

Figure 2

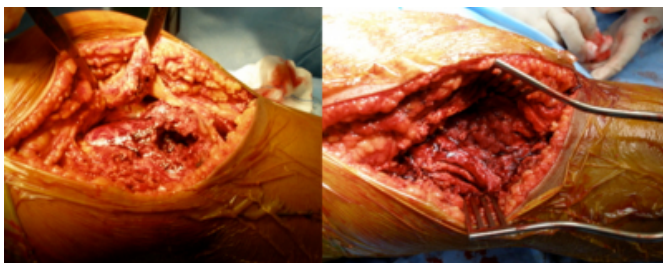
Figure 2: Shows a heterogenous lesion within the lateral condyle of the right femur with a break in the lateral cortex.



A core needle biopsy was done and the histopathological report confirm the clinical diagnosis of chondroblastoma. We proceeded with an intralesional bone curettage and autologous iliac crest bone grafting. The biopsy tract was excised during this procedure, as shown in figure 3.

Figure 3

Figure 3: Shows the lesion within the lateral condyle of the femur before and after curettage and cementating.



Postoperatively, patient was put on full length plaster of paris with knee kept in extension. Isometric quadriceps muscle and straight leg raising exercises were initiated on the second postoperative day. The cast was removed two weeks after the surgery. Active and active assisted range of motion exercises were initiated at that time. Three months after the surgery, patient is ambulating full weight bearing with no pain.

DISCUSSION

Chondroblastoma constitutes a very rare bone tumour entity (^{1,5}). It is the most common primary epiphyseal tumor in children. Most commonly arises between ages 10 to 30. These lesions are distributed widely in the skeleton, but

mostly involving the epiphyses or apophyses regions. Most lesions occur in the proximal part of the tibia (17%) and the proximal part of the humerus (15%). Other regions that are commonly affected are the distal femur and pelvis. It may also occur in the apophysis of the greater trochanter. It commonly affects males more than females.

In the literature, there are only three types of tumours that involve the physis. They are chondroblastoma, Giant cell tumour of the bone, and clear cell chondrosarcoma. Other possible differential diagnosis would be epiphyseal osteomyelitis. Chondroblastomas are generally well circumscribed lesions limited within the epiphysis. The radiographic appearance is usually suggestive of the diagnosis. The lesion is usually seen as an oval intramedullary tumour with distinct margins. A key diagnostic feature is its almost invariable location within an epiphysis or an apophysis. Other common features are expansion, sclerotic rim, and matrix calcification. Penetration through the cortex into the soft tissues is seen only in a small percentage of cases (⁶). The adjacent cortex is normal in only 15% of tumors (advanced and stage III lesions) (⁶). Three fourths of the tumours result in erosion and thinning of the involved cortical bone. Cortical destruction is unusual, occurring in 10% of cases (^{1,7}). The subchondral articular cortex is thinned to less than 5 mm in slightly more than half of the cases. The cortex is normal in 41% and completely destroyed in at least one region in up to 5% of cases (^{1,6,7}). Regional epiphyseal plate expansion has also been observed. Thinning of subchondral bone and close proximity to the articular cartilage may cause excessive fluid collection in the knee. Chondroblastoma in soft tissues tends to be well circumscribed and usually has a shell of ossification (¹). Hence complete resection of the lesion is not difficult. Predominant secondary aneurysmal bone cyst like changes has been noted in up to 15% of chondroblastoma cases (⁸). Some authors have suggested that recurrences are more common when aneurysmal bone cyst changes are present (¹).

Treatment for chondroblastoma consists of simple curettage, bone grafting, and possible cementation using similar techniques as for giant cell tumour surgery (^{7, 8}). After intralesional resection, reconstruction can be accomplished with autograft or allograft or both. When treated with curettage these tumours seem to have a higher rate of recurrence (⁹). Unni recommendations that aggressive lesions (lesions with cortical erosion or cortical breakthrough) should be treated with wide cortical

saucerisation and curettage. Cryotherapy or phenol can be used as adjuvants (1). Vascularised or cancellous autogenous grafts would give maximum bone incorporation but donor site morbidity limits their use.

Limb length discrepancy and deformity have been reported after curettage of physeal chondroblastomas in children (3, 6). Secondary aneurysmal bone cyst-like changes were seen indeed in more than one-third of all lesions reported. The term chondroblastoma suggests a benign cartilage-forming tumour, but in fact this epiphyseal lesion of childhood has a histological appearance that is more typical of the benign metaphyseal-epiphyseal giant cell tumour seen in young adults (1). Even though chondroblastoma is considered benign, on rare occasions it can metastasize to the lung (4). Local recurrences after curettage range from 10% to 38.

In conclusion, chondroblastoma is a benign bone tumour that seldom cause cortex destruction. Curettage and grafting is an effective treatment modality and these patients must be followed-up on a regular basis for immediate diagnosis of recurrence.

References

1. Unni K. Dahlin's Bone Tumors. Lippincott-Raven Publishers, 1996, p 45-59.
2. Dahlin DC, Ivins JC. Benign chondroblastoma : A study of 125 cases. Cancer 1972 ; 30 : 401-404.
3. Caterini R, Manili M, Spinelli M. Epiphyseal chondroblastoma of bone : long-term effects on skeletal growth and articular function in 15 cases treated surgically. Arch Orthop Trauma Surg 1992 ; 111 : 327-331.
4. Riddell RJ, Louis CJ, Bromberger NA. Pulmonary metastases from chondroblastoma of the tibia : report of a case, J Bone Joint Surg 1973 ; 55-B : 848-853.
5. Huvos AG, Marcove RC, Erlandson RA. Chondroblastoma of bone : a clinicopathological and electron microscopic study. Cancer 1972 ; 29 : 760-765.
6. Nagai M, Minami A. Recurrent benign chondroblastoma at the distal end of the radius. J Hand Surg 1999 ; 24-B : 113-115.
7. Rana TA, Bohrer SP. Chondroblastoma. South Med J 1992 ; 85 : 668-672.
8. Ramappa A, Lee F, Tang P, Carlson J, Gebhardt M, Mankin H. Chondroblastoma of bone. J Bone Joint Surg 2000 ; 82-A : 1140-1145.
9. Kurt A-M, Unni KK, Sim FH, Mcleone RA. Chondroblastoma of bone. Hum Pathol 1989 ; 20 : 965-970.

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