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Solitary Diaphyseal Osteochondroma of Femur- A Rare Case Report

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Abstract
Osteochondroma is most common benign bone tumour and affects metaphyseal region. Most common location is around knee joint. Mostly these tumours are painless and present with swelling over affected region. Here we are presenting case study of 14 years old boy who presented in OPD with pain and swelling over anterior aspect of distal thigh left side. On radiological examination X-ray and MRI confirmed diagnosis as Osteochondroma with features of continuation of cartilage cap with medullary canal. Growth was excised, and diagnosis of solitary exostosis arising from diaphyseal region was confirmed on histopathology examination. This case report shows uncommon location of Osteochondroma at diaphyseal level which requires excision as it was symptomatic.

Keywords- *Diaphyseal Osteochondroma, benign bone tumours, excision, Solitary, Perichondrium.*

Introduction

Osteochondromas are common, benign bone tumours that arise from a defect in the perichondral ring (ring of Ranvier), which mainly affects the metaphyseal region of long bones.[1]. They comprise approximately 35-50% of all benign tumors and 10-15% of all tumors[2].Around 35% cases of are seen around the knee joint, another common site is proximal humerus[3]. By definition, osteochondromas are cartilage-capped bony projections on the external surface of a bone[1]. It is commonly encountered in the first two decades of life and has a male preponderance with males to female ratio at 3:1.[4] These tumors are mostly painless and slow growing mass but can show symptoms of pain if a fracture occurs at the base of the tumor, nerve impingement, bony deformity[3]. The lesions can be solitary or multiple; sessile or pedunculated[5]. Histologically, they are hamartomas developed from endochondral ossification coated with a thin cartilage layer [6]. The majority of osteochondromata present as solitary, nonhereditary lesions, however, around 15% will present in the context of multiple lesions as part of hereditary multiple osteochondromata (HMO), an autosomal dominant condition affecting the EXT1 or EXT2 genes[1]. A sudden increase in size associated with pain are indicators of possible malignant transformation. MRI gives characteristic like endosteal scalloping, thick periosteal reaction and cortical hook.[7]. Treatment with surgical excision gives consistent results and relief of pain[8]. Chondrosarcoma is the second primary malignancy of bone. Most commonly occur in pelvis, hip and shoulder.[8] With very few cases reported in the literature, herein is presented a case of solitary exostosis in the diaphyseal region of the femur in a young Indian boy.

Case Report

A 14 years old boy presented with complains of pain and swelling over anterior aspect of left distal thigh since 15 months. Sometimes pain was radiating to knee joint which was gradual in onset and not related to activity. Anterior swelling was insidious in onset gradually progressive in nature, regular margins well palpable, hard in consistency and non mobile attached with underlying bone. It was single in number of approximate size 5cm x 3cm on diaphyseal aspect of left femur. Other ipsilateral hip and knee joint movements are normal and without any neurovascular deficits. There was no similar palpable swelling found elsewhere in the extremities.

Radiological Examination- Plain radiographs (AP and lateral view) of left thigh with knee were taken which showed a sessile outgrowth originating from the anterior aspect of the left distal femur, with a broad base and continuous with the cortex of the underlying bone. Followed which Magnetic Resonance Imaging (MRI) was done to confirm continuity of medullary canal. It showed well defined bony cortical outgrowth arising from the anterior surface of left distal femur with broad base at its origin. Cartilage cap with maximum thickness of 3.5mm.

Histopathological Examination

Histopathological examination of excised tumor showed mature hyaline cartilage, confirming the benign nature of osteochondroma. Chondroid tissue shows a chondroblastic activity without cytotoxic atypicality. A perichondrium with a chondrogenic cap and spongy bony substance (Fig.3) without any evidence of a malignant transformation is seen .[5]

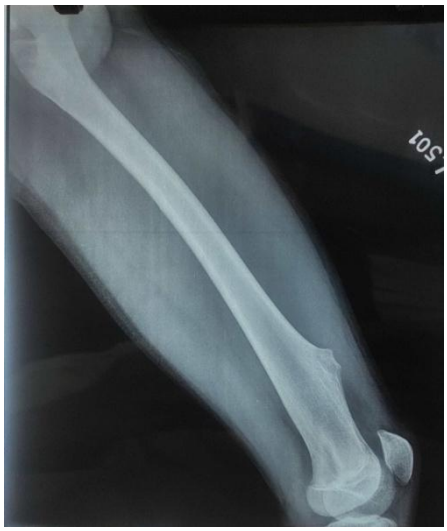

Fig 1 X-ray Lateral View of Left femur

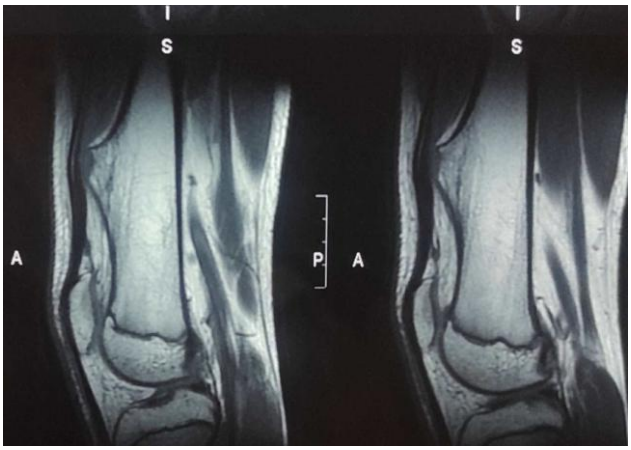

Fig 2- MRI Left femur showing- Sessile outgrowth and continuity with medullary canal anterior aspect of distal femur

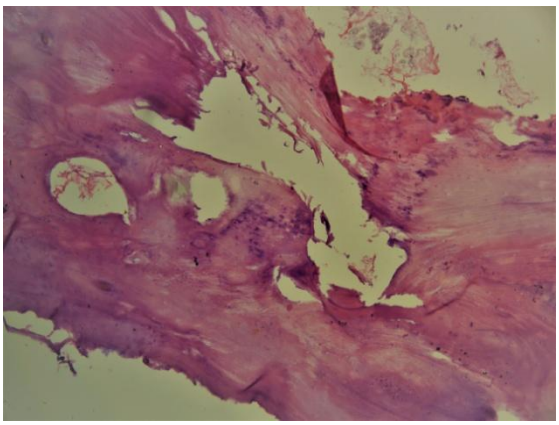

Fig 3 Histopathological Slide showing cartilaginous tissue with underlying bone

Management- We treated the patient with surgical wide excision to confirm the diagnosis, to reduce pain, and to relieve mechanical symptoms.

Surgical Procedure- Under all aseptic precautions, under spinal anaesthesia, through anterolateral approach, plane made between vastus lateralis and quadriceps and lesion exposed. Wide margin distal femur resection with excision of perichondrium done. Any remaining tissue or perichondrium was checked. Bone wax was applied at the base of lesion with drain in situ incision was closed in layers. Dressing done.

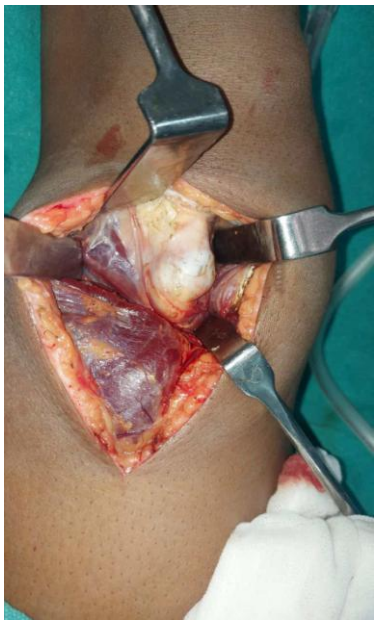

Fig 4 Intraoperative picture of Osteochondroma with Perichondrium

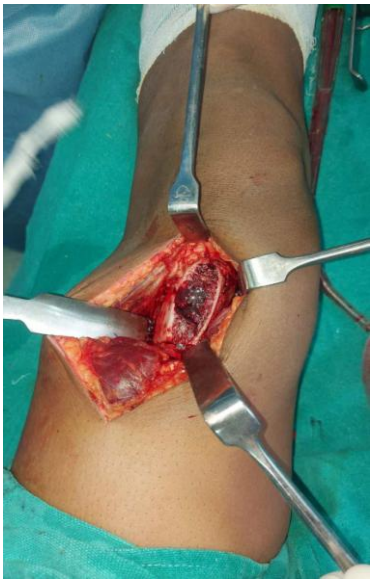

Fig 5 Wide excision of tumor with cartilaginous cap and perichondrium

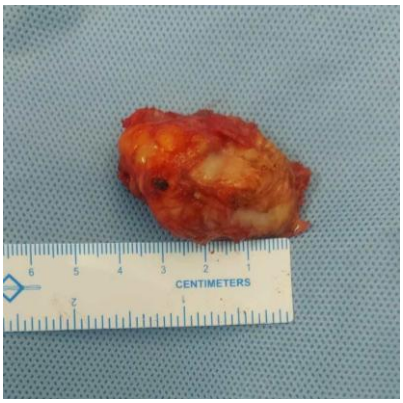

Fig 6 Gross appearance of Excised tumor

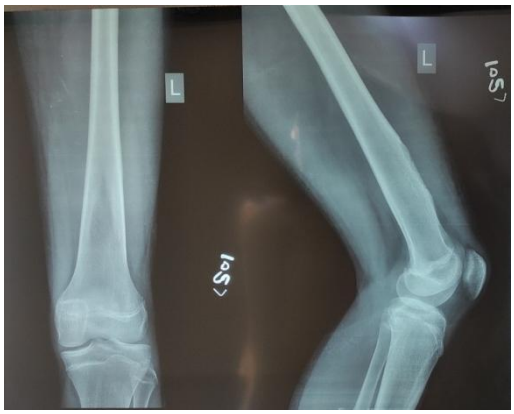

Fig 7 Post operative X-ray of Excised tumor

Discussion

Most of the osteochondromas 85% present as solitary and non hereditary lesion[4]. In our case the osteochondroma is arising from distal shaft of femur which is a rare occurance. The etiology for this is peripheral portion of the physis herniates from the growth plate and gives rise to osteochondroma[9]. This herniation could either be idiopathic or following trauma or due to a deficient perichondrial ring. This leads to abnormal migration of the metaplastic cartilage that responds to factors stimulating the growth plate and subsequently results in what is seen as an exostosis outgrowth. This possibly explains the medullary continuity of these lesions with the shaft of the bone. The physis herniation theory also explains the growth potential of osteochondromas until skeletal maturity. [10] These tumors may occasionally be asymptomatic, the diagnosis of these tumorsis often times an incidental finding on radiographs that are obtained for other reasons. Pain associated with

osteochondromas is usually due to irritation of the surrounding musculature and neural tissue; bursitis over the exostosis or due to fracture of the stalk. Occasionally, these lesions can predispose to restricted joint movements, neural or vascular compression, and deformity and shortening of the long bones [5].In addition to detail history imaging techniques helps to diagnose osteochondromas. The thickness of cartilaginous cap exceeding 2 cm signifies possibilities of malignant transformation of an Osteochondroma mostly in adults who have attained complete skeletal maturity [11].MRI is the most accurate diagnostic tool for evaluation of exact morphology of tumor, arterial and venous or neural compromise. MRI helps in assessing the thickness of cartilage cap. Malignant transformation of a solitary osteochondroma may occur in 7.6% of patients. Enlargement of tumor and irregularity of margins on plain radiograph[12]; increased thickness of cartilaginous cap[13] ; accompanying edema in a short time [14]and increased metabolic activity on thallium scan[15] are the warning signs of malignant transformation. Treatment for osteochondrmas is depend on symptoms from the patient, if patient is asymptomtic regular followup to be done and if size is increasing then definitive management to be done in the form of wide margin excision. Surgery is indicated when tumor size is increasing and associated with pain, neurovascular compromise and fracture of the stalk.[5] Care must be taken to remove complete tumor with cartilaginous tissue and surrounding perichondrium and without disturbing growth plate. Patient was instructed about chance of recurrence as recurrence rate in skeletally immature patient is 2-5% if tissue or perichondrium not excised completely[16] .

Conclusion

Osteochondroma generally is the tumor of metaphyseal region. But as discussed in above case it understood that solitary osteochondroma can occur at rare site i.e. diaphysis of long bone like femur. Osteochondroma generally presents with minimal pain and as cosmetic deformity. If pain and size of tumor increases within less time malignant transformation to be suspected. Surgical excision gives consistent relief of pain and deformity and improves range of motion if restricted. So surgeons should consider osteochondromas as differential diagnosis before ruling out of tumoral pathology of long bone.

Conflict of Interest – Nil
Source of Support - None

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