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Dr. Rajesh K Ambulgekar
Prof. & Head, Department of Orthopedics, Dr. Shankarrao Chavan Govt. Medical College, Nanded, Maharashtra, India

Dr. Akshay Kharat
Junior Resident, Department of Orthopedics, Dr. Shankarrao Chavan Govt. Medical College, Nanded, Maharashtra, India

Dr. Dhananjay More
Junior Resident, Department of Orthopedics, Dr. Shankarrao Chavan Govt. Medical College, Nanded, Maharashtra, India

Corresponding Author:
Dr. Akshay Kharat
Junior Resident, Department of Orthopedics, Dr. Shankarrao Chavan Govt. Medical College, Nanded, Maharashtra, India

A case report of multiple osteochondromatosis around the knee joint with clinical and imaging presentation

Dr. Rajesh K Ambulgekar, Dr. Akshay Kharat and Dr. Dhananjay More

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Abstract
Osteochondroma or exostosis is also known as bone spur, is the formation of new bone on the surface of the bone which is asymptomatic and grows away from the nearby joint. This paper reports a presentation of multiple osteochondroma around the knee in which the patient had only complain of swelling. This lesion grew toward the nearby joint and was treated surgically by excision of one of the bony masses

Keywords: Knee joint, osteochondroma, radiography

Introduction
Osteochondroma is the most common benign bone tumor which is composed of spongy bone covered by a cartilaginous cap [1]. A benign chondrogenic lesion derived from aberrant cartilage from the perichondral ring may take form of solitary osteochondroma or multiple hereditary exostosis [2, 3]. There is a male predominance, with a male-to-female ratio of 2:1. Its peak incidence is in the second decade of life [2, 3]. Exostosis that related to family history is called hereditary multiple exostoses or diaphyseal aclasis. In this condition causes abnormal bone growths on the long bones [5, 6]. These lesions occur most frequently in long bones next to the metaphysis. The most common sites are around the knees (distal femur and proximal tibia) followed by the proximal humerus [2].
We were presented with manifestation of osteochondroma; a 14-year-old female child with a swelling over distal femur and proximal tibia.

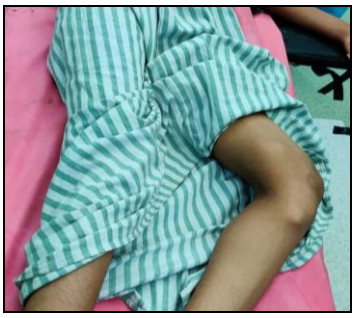

Fig 1: Bony swelling over the lower thigh and upper knee

Case report
The present case report is about a 14-year-old female patient who was came to the hospital due to swelling over the leg, which had started since she was 4 months of age. There was nothing of significance in her past or family history. Initially swelling was of small size gradually increase over the period of time, not associated with pain. Physical examination showed nothing of significance.
Radiography study: On anteroposterior (AP) [Figure 1a], lateral [Figure 1a] and axial [Figure 1b] views of right knee on x-rays, there is a large bony globular lesion originating from distal femur and proximal tibia. The lesion appears to be mostly hyperdense, containing hypodense lacunae with a sharp border.

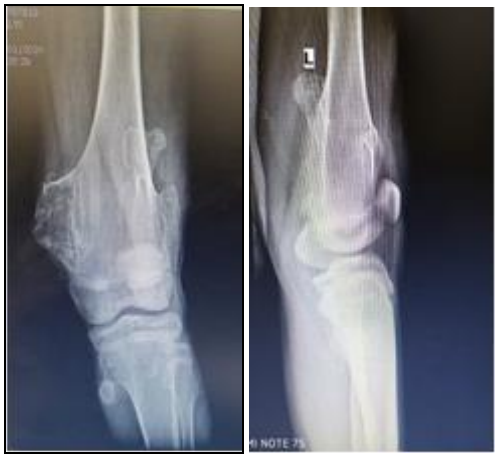

Fig 2: Radiography study: On anteroposterior (AP) [Figure 1a], lateral [Figure 1a] and axial [Figure 1b] views of right knee on x-rays, there is a large bony globular lesion originating from distal femur and proximal tibia

During surgery, a lobulated, pink and firm bony mass lesion was seen to have extended from the tibial tubercle toward the knee joint but not into the actual joint space. On AP and lateral views of right knee after surgery [Figure 3], the tumor is completely resected

Pathology study: Microscopic examination reveals proliferation in the osteoid and chondroid tissues. Lamellar and mature trabeculae of the bone are located in the center and are separated by fibro-fatty tissue and capillary vessels. These bony trabeculae are covered by a thick layer of hyaline cartilage. There is no evidence of malignancy and the features are those of benign osteochondroma.

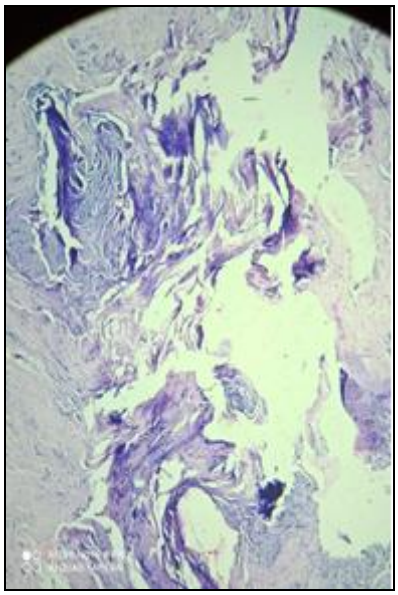

Fig 3: Microscopic examination reveals proliferation in osteoid and chondroid tissue. Lamellar and mature trabeculae of bone are located in the center and are separated by fibro-fatty tissue and capillary vessels. These bony trabeculae are covered by a thick layer of hyaline cartilage. There is no evidence of malignancy and the features are those of benign osteochondroma

Discussion

Osteochondromas are usually thought to be benign bone tumors although they are more correctly thought of as developmental anomalies [8]. They present as solitary (85% of cases) or multiple lesions in the context of hereditary multiple exostosis (in 15% of case), commonly in an autosomal dominant manner [1]. Most solitary osteochondromas are found in children and adolescents and symptomatic lesions usually occur in younger patients. They are typically asymptomatic and are discovered incidentally [2, 4]. Clinical feature of osteochondroma include a non-tender, painless, slowly growing mass [9]. In our case presentation, the patient was younger and asymptomatic.

Fig 4: A lobulated, pink and firm bony mass lesion excised from the swelling

Radiographic findings include cartilage capped bone outgrowth arising from the external surface of a long tubular bone that may be pedunculated or sessile. Cartilage cap can also be calcified [6, 7].

Sessile type with a broad-based attachment to the cortex and pedunculated one with a long and thin stalk and bulbous tip are the two types of osteochondroma. In general, lesions point away from the nearby joint and toward the diaphysis [9, 10].

On CT angiography scan of bilateral lower limb, multiple exophytic lesions arising from lower ends of bilateral femurs and upper end of bilateral tibia and fibula were seen in this case.

MRI of the joint shows evidence of multiple bony growths from the posteromedial aspect of the proximal tibia and fibula also along the medial and lateral aspects of distal femur which is continuous with medullary cavity and 6mm thickness cartilaginous cap. No adjacent soft tissue abnormality. The appearance is consistent with an osteochondroma without features of malignant transformation.

There are some complications associated with osteochondroma including nerve or vascular injury, bursa formation, configuration of a pseudoaneurysm and malignant transformation [12]. The frequency of malignant degeneration is approximately 1% for solitary type and 5-25% for hereditary multiple exostoses [2].

Conclusion

Osteochondroma occur most frequently in long bones next to the metaphysis. These tumors can also develop in unusual sites. Intra-articular exostosis is a rare entity that can be found in joints with large capsular spaces for example the patellofemoral joint.

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