

# A case report of osteochondroma with unusual clinical and imaging presentation

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## Abstract

Osteochondroma or exostosis is a bony developmental anomaly, which arises from exophytic outgrowth on bone surfaces in a characteristic manner. Osteochondroma is asymptomatic and grows away from the nearby joint. This paper reports an unusual presentation of osteochondroma in which the patient was surprisingly completely symptomatic. The lesion grew toward the nearby joint and the radiographic findings were not compatible with surgical findings.

**Key Words:** Knee joint, osteochondroma, radiography

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## INTRODUCTION

Osteochondroma is the most common primary bone tumor comprising more than one-third of all benign bone tumors.<sup>[1]</sup> Osteochondroma is a bony developmental anomaly which forms due to exophytic protuberance on the surface of growing bones.<sup>[2,3]</sup> There is a male predominance, with a male-to-female ratio of 2:1. Its peak incidence is in the second decade of life. They commonly appear as solitary nonhereditary tumors.<sup>[2,4]</sup> Multiple types of exostoses include rare hereditary disorders occurring in an autosomal dominant manner. In contrast to the solitary type, most of them appear earlier in the

first decade of life. Incidence of this type is one-tenth of solitary exostosis.<sup>[5,6]</sup> 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.<sup>[2]</sup> 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.<sup>[7]</sup>

We were presented with an unusual manifestation of osteochondroma; a 30-year-old woman with a painful juxta-articular lesion.

## CASE REPORT

The present case report is about a 30-year-old female patient who was referred to the hospital due to right knee pain, which had started since she was 4 months of age. There was nothing of significance in her past or family history. Her pain was not relieved by aspirin and not aggravated during the night. Physical examination showed nothing of significance.

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**Radiography study:** On anteroposterior (AP) [Figure 1a], lateral [Figure 1a] and axial [Figure 1b] views of right knee, there is a large bony excrescence originating from tibial tubercle and is extended toward the knee joint between the tibia, femur and patella. The lesion appears to be mostly hyperdense, containing hypodense lacunae with a sharp border. It seems to be intra-articular. The fat lines are normal. No signs of fracture or dislocation can be seen.

The differential diagnoses at this point include synovial chondromatosis, osteochondroma, large osteophyte and pigmented villonodular synovitis.

**Computed tomography (CT) scanning study:** On axial spiral CT scanning of the right knee joint [Figure 2a-c] without contrast with 3-mm slices (kV = 100, mA = 100), the cortex and the medulla of tibia appears to be in continuation the lesion. The soft-tissues are

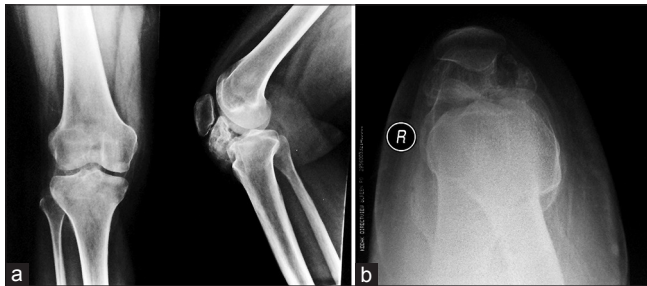
normal. Therefore, the diagnosis of osteochondroma is more probable.

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

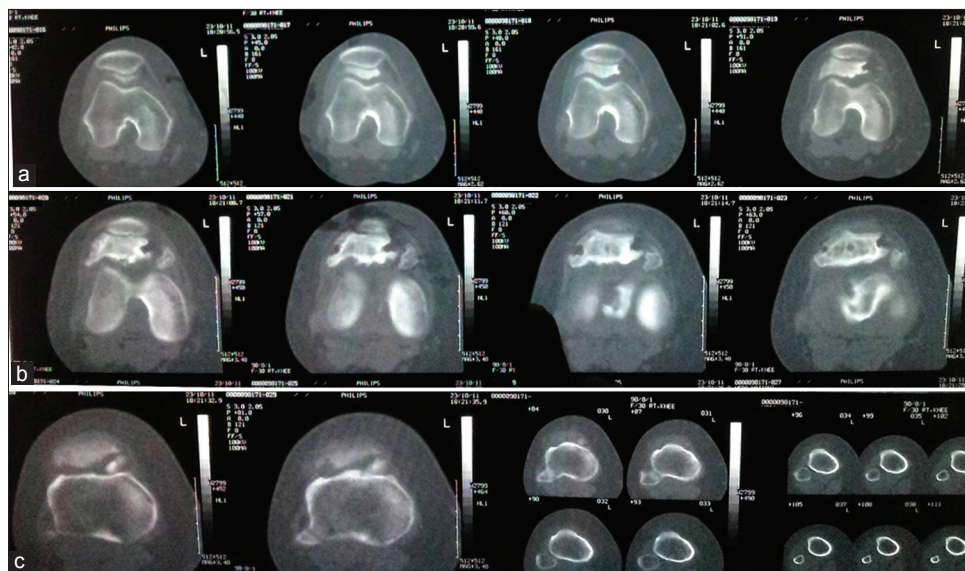
**Pathology study:** Microscopic examination [Figure 4a and b] reveals proliferation in the osteoid and chondroid tissues. Lamellar and mature trabeculae of the bone are located in the center and are separated by fibro-fatty tissue and capillary vessels. These bony trabeculae are covered by a thick layer of hyaline cartilage. There is no evidence of malignancy and the features are those of benign osteochondroma.

## DISCUSSION

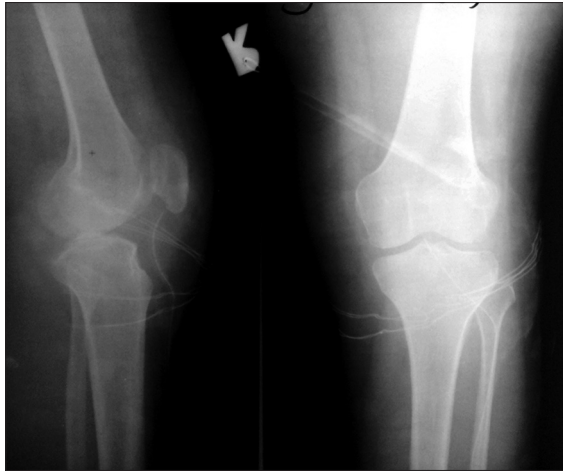
Osteochondromas are usually thought to be benign bone tumors although they are more correctly thought of as developmental anomalies.<sup>[8]</sup> They present as solitary (85% of cases) or multiple lesions in the context of hereditary multiple oexostosis (in 15% of case), commonly in an autosomal dominant manner.<sup>[11]</sup> 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.<sup>[2,4]</sup> Clinical feature of osteochondroma include a non-tender, painless, slowly growing mass.<sup>[9]</sup> In our case presentation, the patient was older and completely symptomatic. The



**Figure 1:** On anteroposterior (a), lateral (b) views of right knee, there is a large bony excrescence originated from tibial tubercle and is extended toward knee joint between tibia, femur and patella. The lesion is mostly hyperdense containing hypodense lacunae. Its border is crenated. It seems to be intra-articular



**Figure 2:** On axial spiral computed tomography scanning of right knee joint (a-c) without contrast with 3-mm slices (kV = 100, mA = 100), there is a large bony excrescence originated from tibial tubercle and is extended toward knee joint between tibia, femur and patella. The cortex of tibia is in continuation with the cortex of the lesion and the medulla of tibia is also in continuation with that of the lesion



**Figure 3:** On anteroposterior and lateral views of right knee after surgery, the tumor is completely resected and the joint space is intact

clinical presentation of this case of osteochondroma is rather unusual as the diagnosis was made based on the presenting complaint being “pain.”

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.<sup>[6,7]</sup>

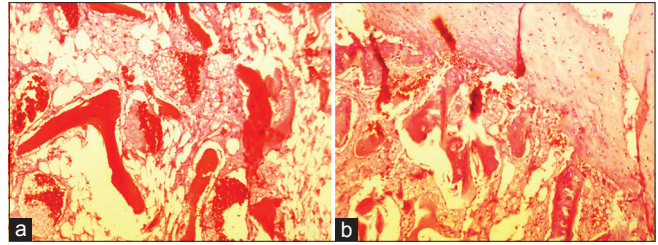
Sessile type with a broad-based attachment to the cortex and pedunculated one with a long and thin stalk and bulbous tip are the two types of osteochondroma. In general, lesions point away from the nearby joint and toward the diaphysis.<sup>[9,10]</sup>

The radiographic presentation of this osteochondroma is unusual due to its different growth direction, toward the joint, in contrast to the typical exostosis.

On a non-contrast enhanced CT scan, as a characteristic finding, the cortical and medullary portions of the lesion are continuous with those of the host bone.<sup>[1,6]</sup>

Evaluation of thickness of the cartilaginous cap can be done with CT scan or magnetic resonance imaging (MRI);<sup>[3,11]</sup> however, it is best demonstrated on MRI because of the high signal intensity on T2W images. A low signal rim surrounding the cap is known as the perichondrium.<sup>[8]</sup>

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



**Figure 4:** (a and b) 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

Any alterations in radiological appearance, especially with ill-defined margin evolution and thickening of the cartilage cap >15 mm, is highly suggestive of chondrosarcoma.<sup>[4,11,13]</sup>

Regarding to the mentioned imaging studies, the lesion seems to be intra-articular. However, during surgery, it was found to be extra-articular and only extended over articular capsule, not into the joint space. This is another unusual feature of our case.

## 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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