An unusual case of an Intra-articular Osteochondroma arising from the Tibia: A case report

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Abstract

Osteochondroma is a common benign bone tumor. Such tumors are usually located in the physeal regions and grow in a direction away from the joint. Intra-articular osteochondromas are extremely rare,and therefore there is the potential for misdiagnosis. This case describes the first intra-articular osteochondroma of the knee arising from the tibial surface. Intra-articular osteochondroma is much more likely to cause mechanical symptoms due to their location surgery was required to relieve the mechanical symptoms and histology confirmed an osteochondroma. Any features suggestive of malignant transformation within the osteochondroma such as thickening of the cartilage cap would require apre-operative biopsy to confirm the diagnosis.Such lesions should be managed in a specialist center with the appropriate radiological, pathological and clinical expertise to allow accurate diagnosis and appropriate treatment.

Keywords: ???

Introduction

Osteochondroma (osteocartilaginous exostosis) is the mostcommon benign bone tumor. Considered more like a hamartoma than a tumor, it accounts for 45% of benign bone tumors and 12% of all bone tumors[1]. Lesions can be solitary or multiple as with hereditary multipleexostoses(HME) and typically occur within the first three decades of life. They are postulated to develop from embryonic rests from the epiphysis that are displaced to the bone surface during periods of bone growth [2]. Common sites include the physeal regions of the long bones especially around the knee as well as the flat bones. Periarticular osteochondromas are common around the knee, however, intra-articular osteochondromas are rare and limited to a small number case reports. We report a case of an intra-articular osteochondroma of the knee joint arising from the tibia, this is the first report in the literature of such a case.

Case Report

The patient, a 49-year-old teaching assistant, presented with a long history of a mass in the left knee which had been present since childhood. Over recent months, the mass had become more painful, particularly when kneeling, though had not subjectively increased in size. The patient described activity-related anterior knee pain, popping and grinding attributable to the mass. No masses were apparent elsewhere. Review of systems and family history was non-contributory. Examination revealed a normal range of movement in the left knee and normal patellar tracking. An obvious, walnut-sized mass was easily palpable on the anterolateral aspect of the tibial joint line, abutting the patella tendon and impinging on the patella tendon in deep flexion.

Imaging findings

MRI of the lesion (Fig. 1) confirms an osteochondroma with a stalk connecting it to the proximal tibia and rather surprisingly extends into the joint. There is no thickening of the cartilage cap to suggest malignancy. Inflammatory change in the surrounding Hoffa's fat pad is suggestive of a mechanical impingement. The normal growth pattern of an osteochondroma is away from the joint (Fig. 2). At operation, the mass was approached through an anterolateral arthrotomy. The osteochondroma was identified arising from the anterolateral tibial joint line, anterior to the insertion of the lateral meniscus, impinging on the retropatellar fat pad and displacing the lateral border of the patella tendon inflexion. Marked synovitis and synovial thickening were noted in association with the mass. Following meticulous dissection of the osteochondroma, it was removed from the anterior tibia with an osteotome, resecting the pedicle of the osteochondroma leaving a smooth border to the anterolateral tibia. Patella tracking was normal following removal of the osteochondroma without impingement of the patella tendon. Following irrigation, the arthrotomy was closed in routine fashion,and the patient rehabilitated without complication. The gross

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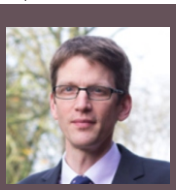
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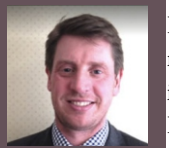
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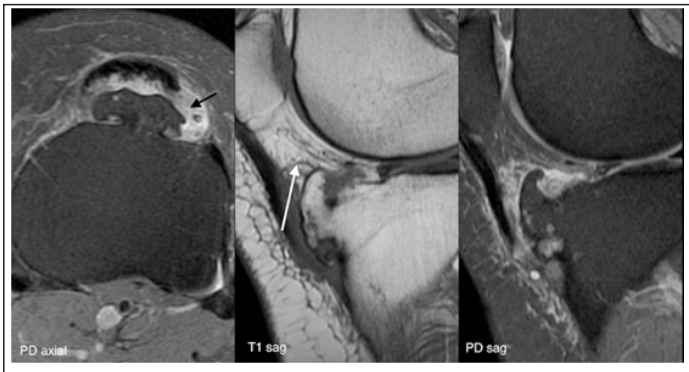

Figure 1: Radiological findings: Axial PD fat saturation, sagittal T1 and sagittal PD fat saturation MRI images (left, middle, and right).Osteochondroma is arising from the proximal tibia. Note how it grows toward the joint (white arrow), which is a rare finding. Connection to the tibia is through a wide stalk. Inflammatory changes in the adjacent Hoffa's fat pad suggest mechanical impingement (black arrow). No thickening of the cartilage cap >2cm is noted.

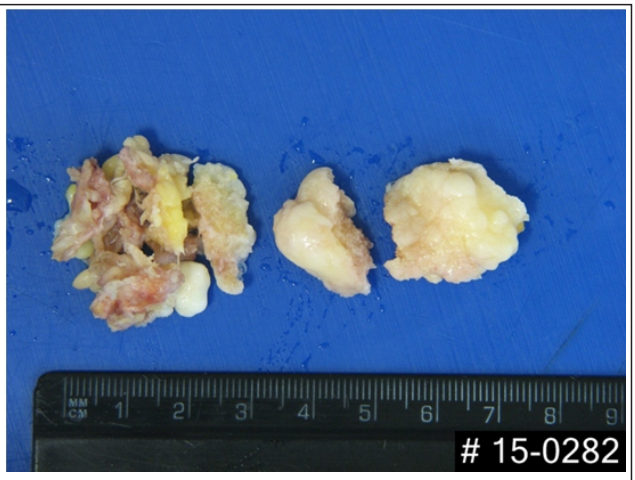

Figure 2: Gross surgical specimen is showing cartilage-covered bone fragments.

specimen measured approximately 5×3× 4 cm and consisted of bone fragments and overlying cartilage fragments in keeping with an osteochondroma (Fig. 3). Histology confirms osteochondromatousfragments covered in fibrocartilage. No evidence of malignancy was seen in the resection specimen.

Discussions

Despite osteochondromas being the mostcommon benign bone tumors, the location of such a lesion within a joint is very rare. In the growing skeleton, osteochondromas grow from the epiphysis/metaphysis in a direction away from the joint toward the diaphysis. This is possibly related to the "pull" of the adjacenttendons, which may explain why lesions are much less likely to occupy an intra-articular position [3]. Such tumors have their own growth plate and in the vast majority of cases stops growing at the point of skeletal maturity. Most lesions are asymptomatic and are usually discovered incidentally,however, when large or in close proximity to muscles or neurovascular structures can cause symptoms. The presence of an osteochondroma in the intra-articular positionmay also predispose to pain and/or mechanical symptoms. Intra-articular osteochondroma of the knee has been previously reported in the medical literature; however, these cases have been limited to lesions originating to the femur [4, 5, 6]. A few cases of extraosseousosteochondromatousproliferations,which have formed against the joint capsule have been reported [7, 8, 9, 10] but these did not have an underlying connection to the tibia or femur. Interestingly, 2 of the patients with such lesions had a history of HME,but none of the knee lesions could be classifiedas true osteochondromas.Intra-articular osteochondroma hasalso been describedin the hip [11], ankle [12],and finger joints [13]. Our case is unique as it is the first reported case of an intra-articular osteochondroma arising from the tibia. This was a true osteochondroma where there was a stalk connectingit to the underlying bone rather than the more frequently seen (but also very rare) osteochondromatous proliferationwhich is attached to the capsuleof the joint with no connection to the underlying bone. MRI of the lesion demonstrated a thin cartilage cap on the lateral surface of the lesionwith minor adjacent inflammatory change within the infra patella fat pad suggesting mechanical impingement which correlated with the symptoms the patient was describing. On imaging, there was no thickening of the cartilage cap to suggestmalignant transformation. Due to pain and restriction of movement the decision was made to operate. The differential diagnosis includessynovial chondromatosis, synovial chondrosarcoma, synovial sarcoma, and osteosarcoma. In our case, imaging features confirmed classical appearances ofan osteochondroma witha stalk connecting to the tibia with a thin cartilage cap. In view of the classical imaging features,pre-operative biopsy was deemed unnecessary. However, in some cases, especially those in which imaging is non-specific or the cartilage thickness is >2 cm it may be prudent to refer to a bone tumorcenter for a biopsy and conformation of histology before excision.

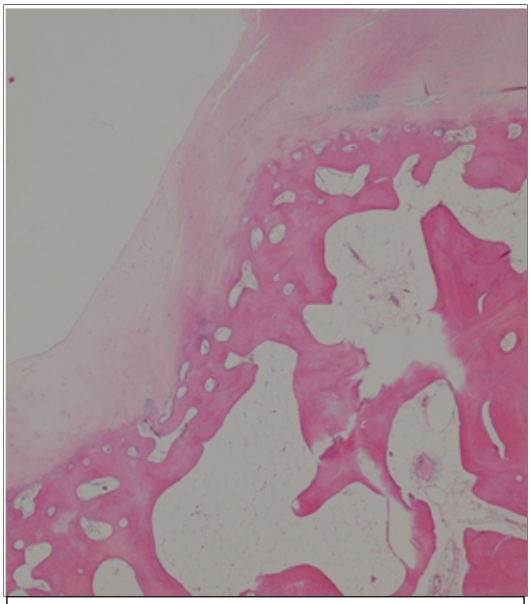

Figure 3: Histology confirms osteochondromatous fragments covered with fibrocartilage in keeping with an intra-articular osteochondroma.

Conclusions

Intra-articular location of an osteochondroma is rare. Management should be performed in a specialist bone tumor unit following clinical and radiological assessment. If there is suspicion of malignant transformation as suggested in rapid growth, pain or a cartilage cap thickness of >2 cm, or the diagnosis is in doubt, a biopsy should be performedbefore excision. Surgery is the treatment of choice for symptomatic lesions or those that have undergone malignant transformation.

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