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Case Report

Solitary Intracapsular Para-Articular Hoffa Fat Pad Osteochondroma: First Case Report from United Arab Emirates

Muhammad Ali Raffat[1]*, Farid Ghasemzadeh Mojaveri[2], Hatem Afana[3] and Nada Ibrahim[4]

[1]Registrar Orthopaedics and Trauma, King's College Hospital London in Dubai

2Master Surgeon in Orthopaedics, King's College Hospital London in Dubai

[3]Registrar Orthopaedics, King's College Hospital London in Dubai

[4]Consultant Clinical Histopathologist at Kings College Hospital London in Dubai

***Corresponding Author:** Muhammad Ali Raffat, Registrar Orthopaedics and Trauma, King's College Hospital London in Dubai.

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Abstract

Introduction: Paraarticular osteochondroma of the knee is a rare finding usually in the middle-aged demographics. These benign lesions usually present with dull aches and restriction of activity depending on the size of the lesion.

Paraarticular Osteochondroma are a sub category to extra skeletal osteochondroma which are hypothesized to arise from metaplasia of soft tissue and has no bony attachment. Three types of extraskeletal osteochondromas are defined which includes synovial chondromatosis, soft tissue chondroma and intracapsular but extraarticular osteochondroma.

Case: We here present the first case from the United Arab Emirates of a patient presenting with pain and restriction of activity due to intracapsular, para-articular osteochondroma at infrapatellar Hoffa fat pad of the knee with successful pain relief and improvement of function after surgical excision.

Keywords: Para-Articular Osteochondroma; Intracapsular; Hoffa Fat Pad

Introduction

Osteochondroma are the most common benign bone tumors accounting for 20-50% of all benign bone tumors. Osteochondroma are generally formed in bones with origin from cartilage matrix mostly around the metaphyseal region of long bones and to a lesser extent at flat bones scapula and ilium [1].

Extraskeletal osteochondroma are hypothesized to arise from metaplasia of soft tissue with no underlying bone attachment. Three types of extraskeletal osteochondromas are defined which include synovial chondromatosis, soft tissue chondroma and intracapsular but extraarticular osteochondroma [2].

Para-articular osteochondroma of knee is defined as intracapsular but extra synovial osteochondroma that arises from osteo-cartilaginous metaplasia of the capsule or connective tissue around the knee. The infrapatellar fat pad of Hoffa, is an intraarticular but extra-synovial structure and forms the anterior compartment of knee, it is reported to be the most frequent location for para-articular osteochondroma of knee [3].

Reith et al in 1997 established three characteristic criterion to define a para-articular osteochondroma: a solitary lesion clinically and radiologically; composed of cartilage and bone on histologic evaluation and presents as an extra synovial tumor [4]. These identifiers distinct the para-articular osteochondroma from synovial chondromatosis which arise from intraarticular location from metaplasia of synovial membrane.

Case Presentation

We here present the case of a 46-year lady presenting with an insidious onset of Left knee pain for a two-month duration started after a workout session. She reports no injury to her knee and pain was reported constant and dull with difficulty in participating in recreational sports activities because of pain.

In the physical examination there was generalized anterior tenderness on the patellar tendon at the left knee and swelling observed in the infrapatellar region which appeared to be deep to patellar tendon and non-mobile. She had restriction in flexion at the left knee with a 20-degree lag as compared to right knee but the extension range was full and comparable.

Apart from fullness as observed there were no overlying skin changes no distal neurovascular deficit no ligamentous injury and examination of the hip joint was unremarkable.

Open surgical Excision was planned through a medial parapatellar tendon approach and a single osseocartilaginous mass was exposed surrounded by a fibrous capsule and removed EN bloc. No underlying attachment to bone was observed and the mass was completely in the infrapatellar fat bed.

Figure 1: Radiographs were reported for multiple calcified lesions in the anterior compartment of the knee behind the patellar tendon involving the Hoffa fat pad.

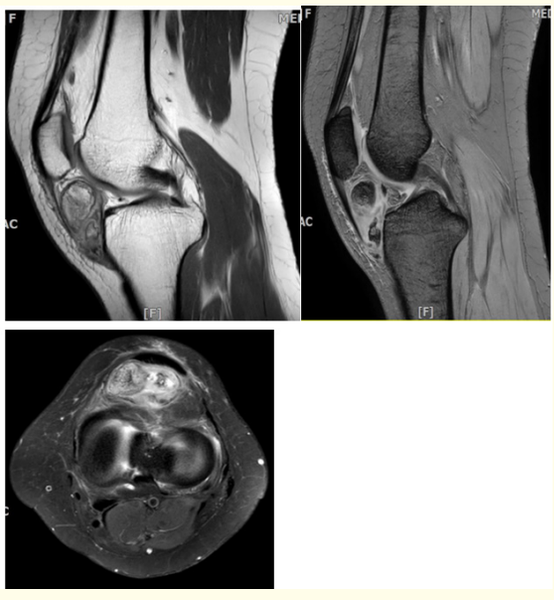

Figure 2: MRI was reported for multiple ossified lesions in the Hoffa fat pad surrounded by a thick capsule and fluid representing inflammatory reaction forming a mass measuring 34 x 28mm.

On gross evaluation size of the mass was 3 x 4 x 4 cm with a heterogenous multinodular surface, covered with a thick fibrous capsule. The mass appeared to be firm and hard in consistency like bone (Figure 3).

Figure 3: Gross specimen of the excised surgical mass.

Microscopic description

Histological evaluation revealed the mass to have central mature trabecular bone with overlying cap of hyaline cartilage covered with fibrous tissue and no malignant degeneration (Figure 4).

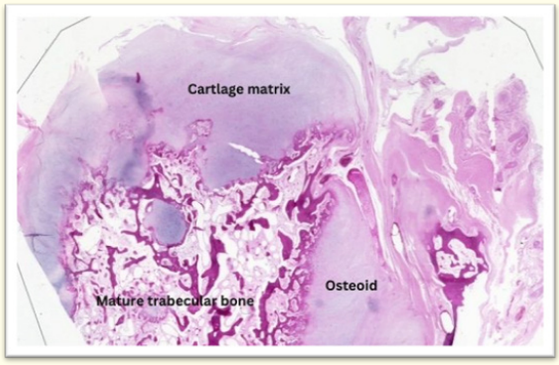

Figure 4

Follow up

Patient was allowed to bear full weight on her knee and she progressed to independent, unrestricted walk with the resolution of pain by 2 weeks. She reports complete resolution of preoperative pain and has gained full function. Her post-operative Radiographs show complete resection of calcific lesions from the Knee (Figure 5).

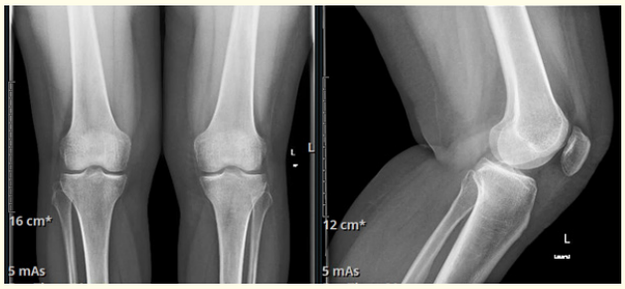

Figure 5

Outcome

The postoperative recovery was uneventful and she was allowed full weight bearing in immediate post operative period. The complain of pain has completely resolved, regained her activities and full range of movements at 3 months follow-up.

Discussion

The term extraskeletal chondromas was first detailed by Jaffe in 1958, he used the terms para-articular chondromas and intracapsular chondromas describing osteochondral metaplasia that occur in the fibrous joint capsule or soft tissue adjacent to the joint [5]. Extraskeletal osteochondroma consists of three distinct lesions which include synovial chondromatosis, soft tissue chondroma and para articular osteochondromas. In contrast to the skeletal osteochondromas, these extraskeletal osteochondromas do not have osseous attachments to the adjacent bone and occur mostly after skeletal maturation [6,7].

Milgram and Dunn first coined the term para-articular osteochondroma and differentiated these lesions from synovial osteochondromatosis and osteophyte formation and proposed their origin as a result of metaplasia of the soft tissue around the joint [8]. Multiple reports (>50) of para articular soft tissue osteochondroma around the knee are available with the most common location being the infrapatellar Hoffa fat pad [9].

The exact pathogenesis of these soft tissue tumors remains undetermined typically occurring in skeletally mature adults. Without any apparent precursor these lesions tend to appear de novo by metaplastic de differentiation of pluripotent cell lines derived from the joint synovial tissue, tenosynovial lining and other surrounding connective tissue cells [10]. Antecedent trauma history has been reported in some case reports [11] whereas, most cases have no definitive history of trauma and are of idiopathic origin, as is true in our case report.

Radiographically extraskeletal osteochondromas characteristically consist a capsulated, lobulated mass with dense calcifications or areas of ossification [12,13]. CT helps to demonstrate the extraskeletal location and dense central calcification which represents the ossification of the cartilage matrix in an osteochondroma [14].

MRI shows a well-demarcated inhomogeneous lesion with low signals on T1 and high signals on T2 weighted images for cartilage matrix, whereas focal areas of mature ossification with in the lesion give low T2 and high T1 signals [12]. It also helps to define the surrounding tissue and reactive edema in case of inflammatory process. MRI also helps to differentiate between para-articular osteochondroma from chondromatosis of synovium on the basis of absence of osteocartilageous or cartilaginous nodules tethered in synovial membrane or untethered as loose bodies within the joint cavity [5].

Histologically Para-articular osteochondroma is distinct from synovial osteochondromas in two aspects firstly it does not show malignant features and secondly cartilaginous tissue appear to undergo osseous metaplasia leading to an osteochondroma formation with no synovial tissue in the tumor [4,12]. Sakai., *et al.* reported similar findings in their study [15]. In histological evaluation of our case report, we also observed similar findings of mature osseocartilaginous tissue but no synovial tissue or malignant degeneration.

Open excision is an established treatment modality for para-articular osteochondroma owing to its usually large size and relatively superficial nature at the knee although intralesional resection by arthroscopy has also been reported [16]. Complete surgical resection has been reported with good symptomatic relief and return of full function with no recurrence for most cases treated surgically [17].

Conclusion

Intracapsular extra synovial osteochondroma are radiologically and anatomically distinct benign tumors prevailing in the adult skeletally mature population, they can be the cause of knee pain and dysfunction in this demographic population. The precise cause of tissue metaplasia to osteochondroma formation is not known. EN bloc excision is a safe and effective method to provide relief of pain and improve function.

Conflict of Interest

The authors hereby declare no financial gain or conflict of interest.

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