Synovial Hemangioma of the Knee Joint: A Rare Intra-Articular Vascular Tumor – Case Report

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Abstract

True synovial haemangiomas are extremely rare benign vascular lesions which may pose a differential diagnosis dilemma with more common intra-articular disorders such as synovitis or traumatic hemarthrosis. Haemangiomas account for approximately 1% of all primary bone tumors and are often incidentally detected. They are widely reported across different ages, with a male preponderance, though most commonly in the paediatric age group, and most frequently involving the knee joint. This is a case report of a 10-year-old female presenting with a six-month history of sudden-onset swelling and tenderness below the right knee, with no history of trauma or coagulation disorders. We made a preoperative diagnosis using clinical findings and magnetic resonance imaging, confirmed by expert radiologists. Clinically, synovial haemangiomas may present with pain, swelling, or a painless mass, and are most commonly confined within the intra-articular synovium. However, extension into adjacent bursae or the suprapatellar recess has been described. Early diagnosis is essential, since complete surgical excision is associated with an excellent prognosis and minimum recurrence rate.

Keywords: *Synovial, haemangioma, magnetic resonance imaging, hemarthrosis, pediatric.*

INTRODUCTION

Synovial haemangioma is a rare benign vascular soft-tissue tumour that can be extra-articular, juxta-articular, or intra-articular and most frequently affects the knee joint [1]. Because symptoms are frequently non-specific and episodic, diagnosis may take a long time. About 1% of all primary bone tumours are haemangiomas of the bone, but synovial involvement is rare. Less than 200 cases have been reported since Bouchut's initial description in 1856. True synovial haemangiomas are uncommon; most described lesions are intra-articular or intermediate hemangiohamartomas, which are vascular malformations involving the synovium and frequently manifest with intra-articular hemorrhage [2]. MRI is the imaging modality of choice, with histopathology required to confirm and exclude differential diagnoses [1, 3]. Angiography with embolization may be useful when feeder vessels are identified; however, complete surgical excision, either arthroscopic or open, remains the definitive treatment, including in atypical cases without hemarthrosis.

CASE REPORT

A 10-year-old female child presented with a 6-month history of sudden-onset swelling and tenderness of the right knee. There was no preceding history of trauma or fall. The patient had no personal or family history of bleeding disorders. Routine laboratory investigations were within normal limits. The patient was evaluated multiple times at orthopedic clinics across various hospitals. Subsequently, at Liaquat National Hospital, she was assessed by a pediatric orthopedic surgeon and referred to a vascular surgeon for further evaluation. Synovial fluid aspiration from the affected site was performed and sent for culture, which showed no bacterial growth and was negative for acid-fast bacilli (AFB). Cytological analysis revealed an increased number of lymphocytes and red blood cells. In view of these findings and ongoing diagnostic uncertainty, Ultrasound (**Fig. 1**) and MRI of the right knee were advised.

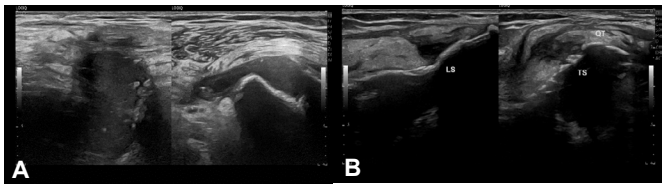


Fig. (1): (A) Ultrasound shows synovial thickening and proliferation in the suprapatellar space with internal vascularity; **(B)** shows mild joint effusion with internal echoes.

MRI was performed afterward, which revealed the findings as described below (**Fig. 2**).

These appear isointense to muscle on T1-weighted images and hyperintense on T2 and STIR images, and contain multiple internal septa on post-contrast images;



Fig. (2): MRI shows Intra-articular, lobulated abnormal signal intensity areas, predominantly medially.
Signals are seen extending up to the suprapatellar region and also involving the Hoffa's fat pad.

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heterogeneous enhancement is noted. Findings are likely due to synovial hemangioma.

Another similar lesion is seen in the anterolateral aspect of the proximal leg, likely within the tibialis anterior muscle. These also represent intramuscular hemangioma.

To date, the patient is being managed conservatively and is receiving symptomatic medical treatment, consisting of Naproxen 250 mg (as needed).

DISCUSSION

Synovial haemangioma is a rare benign tumour of the synovial tissue, and it can appear in any joint that contains synovial fluid. Knee joint synovial haemangioma accounts for around 60% of cases; however, the incidence of synovial haemangioma is still quite low, at less than 1% of all haemangiomas [1]. Usually, the illness has symptoms. They are categorized as either an intermediate form of hemangioma with both intra- and extra-articular components, a juxta-articular hemangioma, or an intra-articular hemangioma [4]. Synovial haemangioma is the most common in adolescents aged around 20, and gender has no bearing on the incidence of the condition [3, 5]. Articular synovial haemangioma is divided into two categories depending on the disease and the connection between the surrounding tissue: exogenous and infiltration. The nature of the blood vessels is also a factor, and the haemangioma can be further divided into arterial, venous, capillary, and mixed types [3, 5]. Scholars widely accept that the condition is not a tumour but rather a hamartoma or vascular malformation.

The author argues that, considering the pathological characteristics of synovial haemangioma and the definition of tumor, synovial haemangioma has more features of a benign tumor [1]. The most commonly reported complaint by patients with knee joint pain is knee pain. Additionally, limited movement, recurrent joint effusions, and intermittent joint swelling may also be reported by some patients [1, 3]. As it is an unusual condition and lacks distinct clinical symptoms, diagnosing it can be difficult. Definite histopathological confirmation can be obtained. The histopathological changes that occur include vascular channel proliferation, hemosiderin deposition, and synovial hyperplasia [4, 5]. The mainstay non-invasive imaging techniques that have been employed include X-ray, CT scan, Doppler ultrasound, and arthrography [1]. Magnetic resonance imaging is the best non-invasive imaging modality as it provides a clear assessment and definition of soft tissue lesions and their extent and involvement with adjacent tissues [4]. Because of its intra-articular origin, the main conditions that need to be differentiated from synovial haemangioma include pigmented villonodular synovitis and synovial sarcoma [1].

The most effective treatment approach for knee joint synovial haemangioma is surgical complete resection of the affected tissue, which can effectively alleviate symptoms and reduce the risk of recurrence [3, 5].

CONCLUSION

Although the scope of this study is limited, it is evident that MRI is the modality of choice when there is a suspected intra-articular vascular lesion like synovial haemangioma. Healthcare practitioners ought to consider synovial haemangioma of the knee joint when they have patients presenting with chronic joint pain, recurrent swelling, or unexplained hemarthrosis, particularly in young individuals. This case highlights that selected patients with stable symptoms may be managed conservatively with close follow-up when surgical treatment is not immediately feasible.

CONSENT FOR PUBLICATION

Written informed consent was obtained from the patient's legal guardian.

CONFLICT OF INTEREST

We have no known conflict of interest to disclose.

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