

Chronic Knee Pain in a Young Adult: Unmasking a Synovial Haemangioma after a Decade

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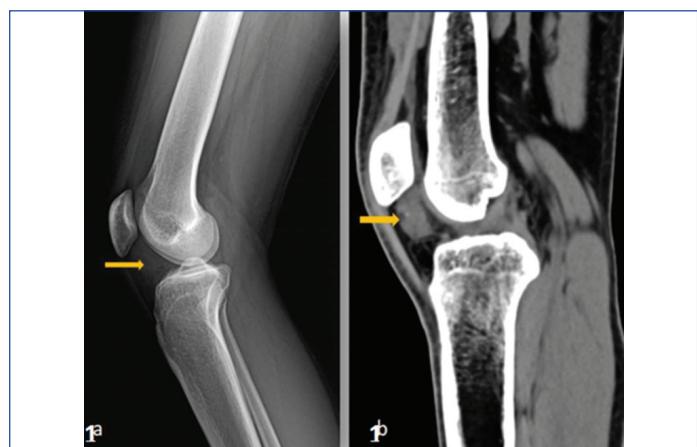
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A 21-year-old male presented with complaints of pain in the left knee for the past 10 years. The pain was insidious in onset, persistent, non-radiating, and had worsened over the last two months, particularly during weight-bearing and knee movements, with no identifiable relieving factors. There were no similar symptoms in the contralateral knee. The patient was not diabetic or hypertensive and had no history of smoking, alcohol use, or any significant past medical history. General examination was unremarkable.

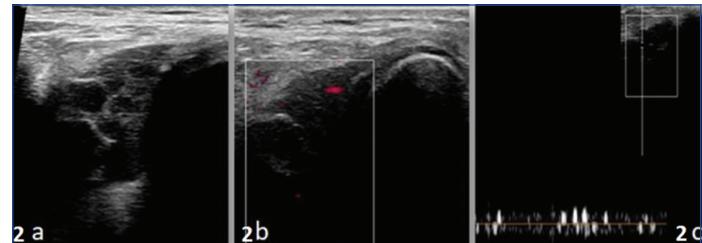
Local examination of the left knee revealed fullness over the lateral parapatellar region with mild, ill-defined swelling, which was tender on palpation but without redness or warmth. There was no joint line tenderness. The patient experienced severe pain on knee flexion. Ligament stability tests, including the Lachman test, anterior and posterior drawer tests, and varus-valgus stress tests, were normal, and blood investigations revealed no abnormalities.

Radiographic evaluation with X-ray of the left knee revealed a homogeneous soft-tissue density opacity in the Hoffa's fat pad region [Table/Fig-1a]. CT showed a soft-tissue density lesion in the Hoffa's fat pad with punctate calcification and minimal surrounding fat stranding [Table/Fig-1b]. Ultrasound of the same region demonstrated a heterogeneously hypoechoic lesion with multiple thin internal septations and minimal internal vascularity within the Hoffa's fat pad [Table/Fig-2a-c].

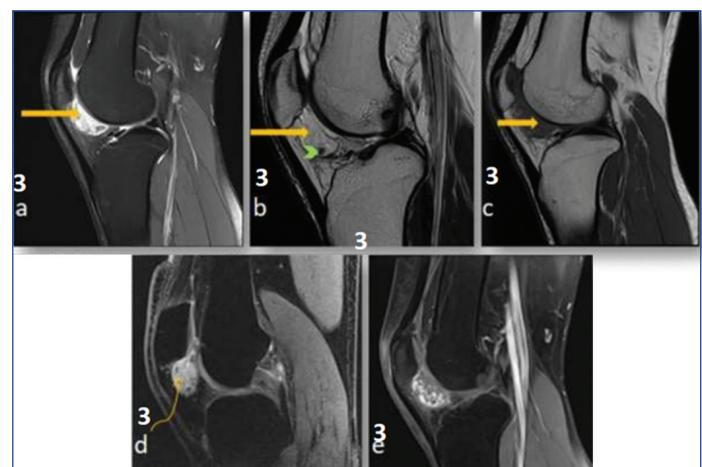


[Table/Fig-1]: X-ray lateral view of left knee reveals soft tissue density within infrapatellar fat pad (arrow in 'a'), and on sagittal CT, tiny punctate calcification noted within the soft tissue density lesion (arrow in 'b').

Contrast-enhanced MRI was done to assess the extent of the lesion, which showed a relatively well-defined Proton Density Fat Suppressed (PDFS)/T2 weighted (T2w) heterogeneously hyperintense and T1w hypointense lesion in the infrapatellar fat pad measuring $\sim 3.2 \times 2.1 \times 1.7$ cm with multiple PDFS/T2 hypointense thin internal septations and nodular hypo-intensities within [Table/Fig-3a-c]. Few foci of GRE blooming were noted within the lesion [Table/Fig-3d]. The lesion was seen to abut the infrapatellar plica. On post-contrast images, there was intense heterogeneous enhancement of the lesion [Table/Fig-3e].



[Table/Fig-2]: Ultrasonogram shows a heterogeneously hypoechoic lesion (a) with colour and spectral Doppler showing minimal internal vascularity of a slow venous flow pattern (b and c).



[Table/Fig-3]: MRI plain and contrast images of the left knee: (a) PDFS hyperintense; (b) T2 hyperintense; and (c) T1 hypointense lesion in the Hoffa's fat pad region (arrows) with T2 hypointense bands and nodularity (arrowhead); (d) Few foci of GRE blooming (curved arrow) within the lesion; (e) Post gadolinium fat-saturated T1W sagittal images show intense heterogeneous enhancement of the lesion.

The overall imaging findings were suggestive of synovial haemangioma of the Hoffa's fat pad. The patient underwent en bloc excision of the lesion, and the excised specimen consisted of a soft-tissue mass measuring approximately $4 \times 2.8 \times 2$ cm. Macroscopically, the lesion had a grey-brown to yellow external surface, with a grey-white cut surface and focal blackish areas [Table/Fig-4].



[Table/Fig-4]: (a) Excision of infrapatellar fat pad lesion through medial para-patellar arthrotomy; (b) Excised lesion.

Microscopically, sections revealed fragments of synovial tissue containing numerous dilated and congested vascular channels of varying calibres, lined by a single layer of flattened endothelial cells. These vascular spaces were embedded within a fibrocartilaginous stroma with intervening adipose tissue. Scattered haemosiderin-laden macrophages were observed, indicating previous haemorrhage. No cellular atypia, mitotic activity, or features of malignancy were noted. These findings were consistent with synovial haemangioma, a benign vascular lesion of the synovium.

Synovial haemangioma of the knee is a rare, benign vascular malformation of the synovium that typically presents in children and young adults, most commonly during the first and second decades of life. These lesions have a particular predilection for Hoffa's fat pad and may be intra-articular, resulting in joint effusions and chronic knee discomfort [1]. Various pathologies can affect this region, including joint effusion, fat pad impingement, haemangioma, pigmented villonodular synovitis, post-surgical fibrosis, nodular synovitis, and synovial osteochondromatosis [2].

The MRI is the imaging modality of choice due to its high soft-tissue contrast, sensitivity, and specificity. Recent case reports highlight the unusual presentation and imaging appearances of synovial haemangioma. Akay E et al., reported a synovial hemangioma of the knee in an adult. An MRI highlighted typical features such as enlarged veins, looped or linear patterns, and greater visibility under gadolinium. The patient underwent open surgical excision and developed a nearly full Range Of Motion (ROM) on 6-month follow-up [3]. Similarly, Slouma M et al., described a case of chronic knee

pain in a young adult. Magnetic Resonance Imaging (MRI) revealed intra-articular lesions in both knee joints, presenting as grape-like clusters. The lesions demonstrated intermediate signal intensity on T1-weighted images and high signal intensity on T2-weighted images. Patient underwent percutaneous sclerotherapy and on 3-month follow-up recovered normal knee ROM [4].

The management of synovial haemangioma is not standardised and encompasses several options, including sclerotherapy, selective embolisation, arthroscopic excision, arthroscopic laser ablation for small tumours, and open excision for larger lesions [4]. Synovial haemangioma, although rare, should be considered in the differential diagnosis of persistent knee pain and swelling, especially in young patients with an atypical clinical course. MRI serves as a valuable, non-invasive tool with high sensitivity and specificity, and should be incorporated early in the diagnostic workup.

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