



Musculoskeletal Imaging Case Report

Intra-articular Synovial Hemangioma: A Rare Cause of Knee Pain and Swelling

Ahmed D. Abdulwahab¹, Dina N. Tawfeeq², Omar Muayad Sultan²

¹Department of Radiology, Rizgary Teaching Hospital, Erbil, ²Department of Radiology, College of Medicine, Tikrit University, Tikrit, Saladin, Iraq.



***Corresponding author:**

Ahmed D. Abdulwahab,
Department of Radiology,
Rizgary Teaching Hospital,
Erbil, Iraq.

ahmeddhia1979@gmail.com

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ABSTRACT

Synovial hemangioma is a rare intra articular lesion and it has several more common differentials. Therefore, our main objective is to consider the possibility of hemangioma in any intra-articular mass to prevent diagnostic delay of unnoticed or untreated hemangioma occurring within the knee joint. Ultrasound can be useful method in assessing the lesions. Surgical excision is the definitive treatment for such lesions.

Keywords: Synovial hemangioma, Intra-articular, Knee joint, Magnetic resonance imaging

INTRODUCTION

Intra-articular synovial hemangioma of the knee is a rare benign vascular lesion that usually affects children and young adults and localized mainly in the knee joint. Patients mainly present with joint pain, swelling, and spontaneous hemarthrosis.^[1-3] However, it can be difficult to diagnose clinically, and even if the conventional radiological examinations are normal, synovial tumors should be considered in the differential diagnosis.^[3] Soft-tissue hemangiomas can be categorized based on size or type of major feeding vessels within the lesion: Cavernous (large vessel), capillary, venous, and arteriovenous.^[4-6] We report a case of a patient with intra-articular cavernous hemangiomas in the left knee medially deep to patella that had gone undiagnosed and untreated for 6 months.

CASE PRESENTATION

Twenty-one-year-old female patient presented with 6 months swelling on the medial aspect of the left knee joint with increasing pain and tenderness, the pain started to limit patient's movement. On examination, a focal tender swelling was noticed on the medial aspect of the knee (medial to the patella), no skin discoloration, no ulceration, and no erythema were noted. The X-ray of the affected knee showed faint soft-tissue density with mild bony scalloping seen at the medial femoral condyle region.

Subsequently knee magnetic resonance imaging (MRI) was performed on a 1.5 Tesla scanner. T1-weighted images (T1WI), T2-weighted images (T2WI), and T2 Fat Saturated (T2FS) sequences in three orthogonal planes were obtained. Post-contrast axial and sagittal T1-weighted and T1-weighted fat saturated images were also included in the study. The mass was iso intense on T1WI

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[Figure 1] and the signal intensity was not suppressed upon T2FS [Figure 2]. Post-gadolinium (Gd) administration, the mass demonstrated intense yet heterogeneous enhancement [Figure 3]. The medial femoral condyle showed cortical scalloping and the patella appeared to be displaced to the lateral aspect with mild joint effusion. Normal menisci, cruciate and collateral ligaments. No signs of bony invasion or destruction, and no bone marrow edema seen. Complementary ultrasound was done at the same day and showed an isoechoic tender mass with internal vascularity.

Lesion was arthroscopically excised, the mass was adherently attached to the bone, well defined boundaries, encapsulated, and partially eroding the bone. Histopathological evaluation revealed benign fatty tissue with multiple dilated vascular channels and thrombosis indicative of benign cavernous hemangioma. No evidence of any swelling, pain, or restricted joint motion was found at follow-up examination done till now.

DISCUSSION

Intra-articular cavernous hemangioma is an exceedingly rare form of synovial hemangioma with <200 reports in world

literature.^[7,8] Rather than being an actual neoplasm, it is thought to be a form of congenital vascular malformation.^[9] The lesions can be diffuse or localized. The knee joint is the most common location; other reported locations comprise the wrist, elbow, and ankle.^[3]

Synovial hemangiomas emerge from any synovium lined surfaces, including along the course of tendons or from within the joints. The intra-articular variety is a distinct soft tissue lesion lined by synovium.

A classification used predominantly by interventional radiologists and orthopedic surgeons, according to their anatomical relationship to the joint: Juxta-articular, intra-articular, or intermediate type. Juxta-articular hemangiomas are located on the outside of the joint capsule, with no intra-articular involvement, intra-articular lesions are basically situated within the joint capsule itself, and the last type, intermediate, show features of both former types. The juxta-articular and intermediate types have been the most reported cases.^[10]

It presents as recurrent swelling of the knee and intermittent pain (depending on the presence of hemarthrosis).^[11-13] In our case, the symptoms were traced back 6 months earlier.



Figure 1: (a) Magnetic resonance imaging of left knee: T1-weighted images sagittal image, shows that the mass iso intense located in contact with the medial femoral condyle with bony scalloping, (b) T2-weighted images (T2 WI) coronal image, (c) T2 WI sagittal image, the mass appears heterogeneously hyperintense causing cortical scalloping of the medial femoral condyle.



Figure 2: (a) Magnetic resonance imaging (MRI) T2-weighted fat-saturated sagittal image, (b) MRI T2-weighted fat-saturated coronal image, (c) MRI T2-weighted fat-saturated axial image shows high-intensity lesion attached to the medial femoral condyle of left knee, no signs of bone marrow edema.

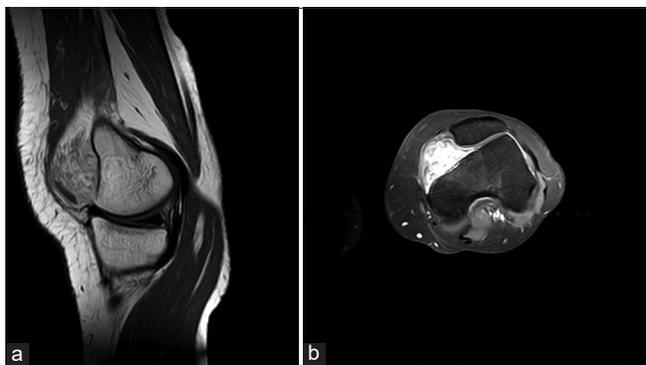


Figure 3: (a) Magnetic resonance (MR) post-contrast, T1-weighted images (T1WI) Sagittal image, (b) MR post-contrast, T1WI fat-saturated axial image, shows the mass deep to the medial retinaculum with heterogeneous intense post-contrast enhancement.

Other than pain and mild swelling in the knee, there were no specific symptoms and signs.

MRI is the best modality for evaluation of intra-articular soft-tissue lesions and should be considered as the diagnostic method of choice.^[11] MRI detects the tumor size and extent, and if any chondral degeneration present.^[2,3,11,14] Published studies have detailed the MRI features of synovial hemangioma as an intra-articular lobulated mass which can cause cortical bone erosions. The lesion usually shows low to iso-intensity signal on T1 sequences, high signal intensity with hypo intense septae or spots within the lesion on T2-weighted and fat-suppressed images. After contrast administration, the lesion shows marked heterogeneous enhancement. These MRI features are impartially characteristic of synovial hemangioma.^[15,16] Our case MRI findings showed nearly the same radiological features of the previously published reports, but fortunately no chondral degeneration or bone dysplasia was detected.

It is important to note that although the radiographical and MRI features of the present case pointed toward the diagnosis of a synovial hemangioma, it is a rare disease entity and some imaging features may assimilate other pathologies. The main differential diagnosis should be based on distinguishing MRI features and site of lesion. In particular, the MRI characteristic of a synovial hemangioma may coincide with other possible pathologies such as intra-articular synovial sarcomas or pigmented villonodular synovitis (PVNS).

Nearly all synovial sarcomas arise near the joint, and it is rare for them to originate or extend intra-articularly unlike synovial hemangiomas.^[17,18] In the present case, the mass arises within knee joint space with no juxta-articular extension, lowering the likelihood of a synovial sarcoma. Moreover, involvement of underlying bone in synovial sarcoma is not uncommon with either extrinsic erosion of bone or periosteal reaction.^[19]

Even after Gd enhancement, differentiating between malignant conditions such as synovial sarcoma from hemangioma solely by MRI findings is still difficult. Therefore, while the presence of the above-mentioned imaging features indicates a likely diagnosis of a synovial hemangioma, a definitive diagnosis requires histopathological confirmation,^[20] as in the present case.

Regarding PVNS, it usually shows intermediate signal on T1WI, low signal on T2WI with areas of high signal due to inflamed synovium or joint fluid, and variable enhancement on contrast-enhanced T1WI. It also can cause hemorrhage which can be bright on fat saturated images^[11,15] and it is possible for changes in hemoglobin or hematoma over time to produce a relatively higher intensity of the lesion on T1WI.^[21]

The lesion in the present case was on the medial aspect of joint nearly close to nerves and shows hyper vascularity on color Doppler ultrasonography. Such radiological features coincide with peripheral nerve sheath tumors such as neurofibroma and schwannoma. On ultrasonography, both lesions are oval or lobulated hyper vascular lesions.^[22] However, MRI has the pivotal role in the characterization, and differentiation of peripheral nerve sheath tumors from hemangioma. On MRI, these tumors are seen as fusiform lesions, with low to intermediate signal intensity on T1WI and high-signal intensity on T2WI and they has a lot of imaging signs in the literature, such as, entering or exiting nerve sign.^[23]

Other possible differential diagnosis is synovial osteochondromatosis, which is either primary (usually a monoarticular idiopathic disease) or secondary form (usually post-traumatic, osteoarthritis or neuropathy), the primary synovial osteochondromatosis is a result of synovial metaplasia resulting in multiple intra-articular loose cartilaginous bodies which on MRI will show synovial thickening with chondroid signal characteristics with focal areas of signal void representing mineralization, while the secondary form will show more prominent changes of the underlying bone and the intra-articular loose bodies tend to be larger in size and less numerous than the primary form.^[20]

Four methods of treatment mentioned in the literature up till now, including embolization,^[2] radiotherapy,^[24] surgical excision (open surgery or arthroscopic surgery), and arthroscopic ablation using laser.^[25] As our case was a localized intra articular tumor and well encapsulated, surgical removal was performed by arthroscopy. Arthroscopic excision should be the treatment of choice in benign intra-articular lesions that are well circumscribed, encapsulated, of various sizes and attached to the synovial membrane by a pedicle or synovial adhesions.^[17,26]

CONCLUSION

In patients with a history of recurrent knee swelling and pain, synovial hemangioma should be considered to avoid

diagnostic delay. MRI is very useful diagnostic tool to evaluate any intra-articular lesion and should be used as an initial procedure. Complementary examination by ultrasound is also a useful method in assessing the internal vascularity of hemangioma. Early complete excision may be performed to limit long-term effects of deferring the diagnosis as the prognosis with surgical resection is typically good.

Declaration of patient consent

Patient's consent not required as patients identity is not disclosed or compromised.

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Conflicts of interest

There are no conflicts of interest.

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