

Synovial hemangioma of the knee: MRI findings in two cases

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Abstract. The findings in two patients with histologically proven synovial hemangioma of the knee are described. Both cases emphasize the typical appearance of this unusual tumor on magnetic resonance imaging. Additional radiologic findings, such as adjacent osseous involvement, are discussed.

Key words: Magnetic resonance imaging – Knee – Synovial hemangioma

Synovial hemangioma is a rare benign intra-articular tumor which usually involves the knee. This report describes the findings of magnetic resonance imaging (MRI) in two patients with synovial hemangioma of the knee. This unusual diagnosis may have to be considered in young patients with unexplained pain or recurrent joint effusions, especially when these are hemorrhagic.

The MRI findings of this tumor are highly suggestive of the diagnosis and MRI should eliminate the need for invasive angiographic procedures.

Case reports

Case 1

A 15-year-old girl was admitted with a 2-month history of pain and limited motion in her right knee. One year before admission she had had a spontaneous hemarthrosis treated with arthrocentesis and immobilization.

Physical examination demonstrated swelling and tenderness over the suprapatellar pouch. There was no fever, limitation of range of motion, leg length discrepancy, or cutaneous changes. A lateral roentgenogram of the knee showed a poorly defined soft tissue density in the suprapatellar bursa. The bone was normal and no phleboliths were seen.

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MRI of the knee was performed, with T1- and T2-weighted images in the sagittal and axial planes. A lobulated mass was demonstrated along the posterior portion of the suprapatellar bursa. On T1-weighted images the lesion was homogeneous, with similar signal intensity to muscle. On T2-weighted pulse sequences the signal intensity from the lesion was very high. On these latter sequences, numerous serpentine and punctate low-signal-intensity areas were noted within the mass. There was no significant joint effusion. Extension of the tumor into the anterior femoral cortex was evident (Fig. 1).

An arthrotomy was performed, with complete excision of the tumor. Pathological examination confirmed that it was a benign synovial hemangioma.

Case 2

A 20-year-old man presented with a swollen and painful right knee which had persisted for 2 months.

No history of trauma was elicited. On physical examination there was slight swelling and tenderness along the medial joint line. Roentgenograms of the knee were normal.

MRI of the knee showed a lobulated, well-defined mass located in the suprapatellar pouch, measuring 2x4 cm in diameter. On T1-weighted images, the signal intensity of the mass was similar to that of surrounding muscle. On T2-weighted images, the signal intensity was higher than that of the subcutaneous fat. Some very low signal punctate areas and numerous low signal serpentine areas were seen within the lesion. An associated small effusion was also noted. Extension of the tumor into the adjacent femoral cortex and medullary space was observed in transaxial images, with minor destructive changes (Fig. 2).

An arthrotomy was performed, with complete macroscopic excision of the tumor. Histologic examination revealed a benign synovial cavernous hemangioma. The patient was followed for 2 years without recurrence.

Discussion

Synovial hemangioma is a rare intra-articular tumor originally described by Bouchut in 1856 [1]. It is almost always located in the knee (97%), but there have been descriptions of this type of neoplasm in the elbow and ankle. The suprapatellar pouch is the most common site

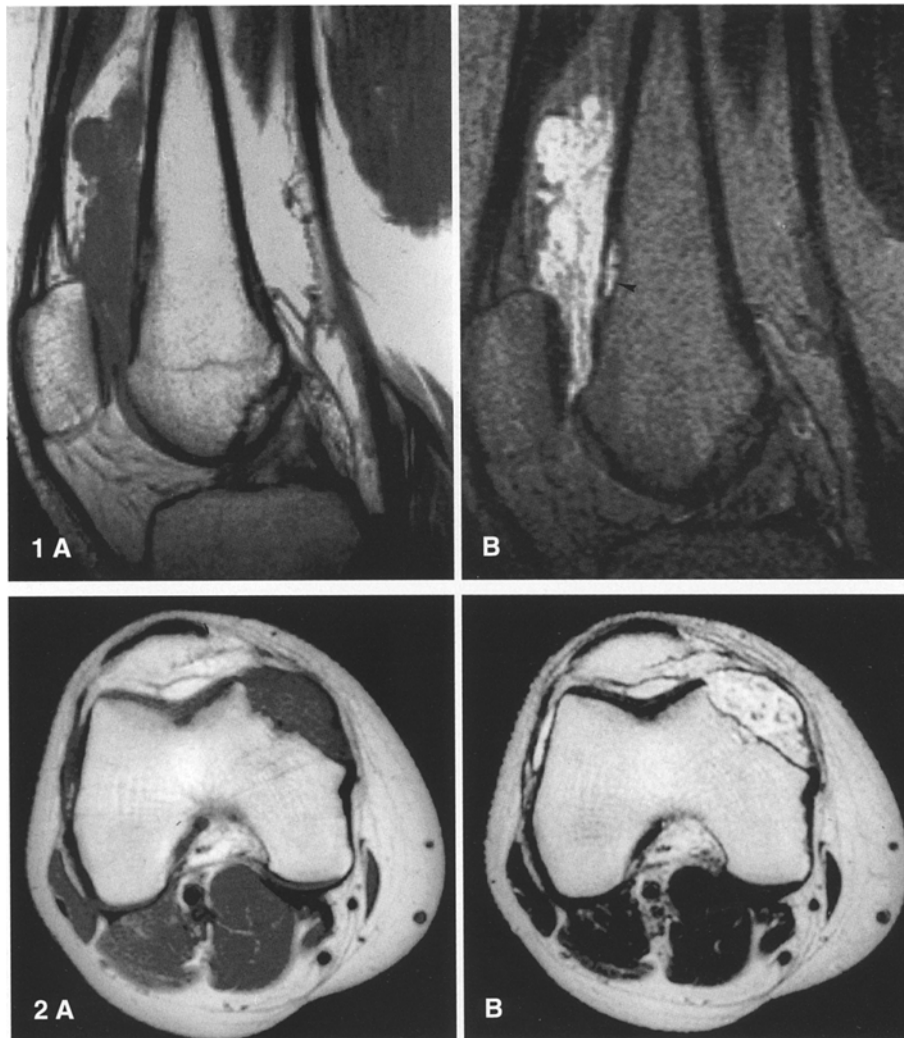


Fig. 1 **A** Sagittal T1-weighted (600/20) image shows a lobulated lesion 5 cm in length in the suprapatellar bursa of the knee. The lesion is well-defined and homogeneous, with a signal intensity similar to that of skeletal muscle. **B** In the sagittal T2-weighted image (2100/80) the signal intensity of the lesion is higher than that of fat. Small linear and punctate low-signal areas are present within the lesion. This sequence reveals erosion of and abnormal signal intensity in the adjacent femoral cortex (*arrow-head*), which probably represents osseous involvement

Fig. 2 **A** Axial T1-weighted image (600/16) demonstrates a homogeneous mass eroding the anterior cortex of the internal femoral condyle. The tumor is isointense to muscles of the popliteal region. **B** Axial fast SE T2-weighted image (3000/120) in which the tumor shows high signal intensity and small rounded areas of low signal intensity. Note the irregularity of the femoral cortex and the presence of small high-signal-intensity areas within the adjacent medullary cavity

of lesions in the knee. The patients affected are usually children and adolescents, and there is a female preponderance [2].

Clinical presentation include progressive onset of pain, recurrent joint effusions, palpable mass, and limitation of motion. Occasionally, cutaneous changes and leg length discrepancy are observed.

Prior to the advent of computed tomography (CT) and MRI, conventional radiography had a limited role in the diagnosis of synovial hemangioma. On plain films, synovial hemangioma appears as a nonspecific soft tissue mass, which may contain phleboliths or amorphous calcifications. Periosteal reaction and/or cortical destruction are seen in less than 5% of cases. However, the incidence of skeletal changes in the adjacent femoral cortex is probably underestimated because a large number of the reported cases date from before the era of CT and MRI, without which techniques such changes are difficult to detect. Our two cases each showed irregular thinning and erosion of the adjacent femoral cortex. Furthermore, on T2-weighted sequences, small nodular high-signal-intensity areas were observed within the cortex and medullary cavity, indicating osseous involvement.

The MRI characteristics of musculoskeletal hemangiomas are well-established [3, 4]. To our knowledge, however, only one report exists of MRI of synovial hemangioma [5]. The MRI features important for the characterization of musculoskeletal hemangiomas are observed on T2-weighted images and reflect the histologic composition of the tumor. These findings include (1) a lobulated configuration, (2) well-defined margins, (3) a signal intensity brighter than fat, and (4) low-signal punctate or linear structures throughout the lesion. This last finding may be due to the presence of fibrofatty septa between the vascular channels, thrombosed vessels, and/or phleboliths.

As noted in our two cases, the radiological appearance of synovial hemangioma of the knee is similar to that of musculoskeletal hemangiomas. Minor destructive change in the adjacent femoral and medullary cavity is an associated finding which may be commoner than hitherto suspected. Although spontaneous hemarthrosis and/or recurrent nontraumatic effusions are classical symptoms of this tumor, greatly excessive synovial fluid was not a significant finding in either of our patients, nor in previously reported cases with CT or MRI [5, 6].

In summary, two cases of synovial hemangioma of the knee have been described. This is an infrequent intra-articular lesion with a typical radiological appearance on MRI. MRI is therefore a noninvasive imaging technique which can provide a specific preoperative diagnosis.

References

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