SYNOVIAL HAEMANGIOMA OF THE KNEE-DIAGNOSIS BY USG, DOPPLER AND MRI

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ABSTRACT
Synovial haemangioma is a rare intra-articular benign tumour that is difficult to diagnose because of its non-specific symptoms. It commonly arises from knee joint. Around 200 cases reported so for world wide. Patients are generally children or young adults with a nontraumatic recurrent swollen painful knee. Diagnosis can be made by USG, Doppler study and MRI, if synovial haemangioma is included and kept in mind in differential diagnosis for intra articular swelling especially in the knee joint.

INTRODUCTION
Synovial haemangioma is a rare benign tumour especially affecting knee joint. Around 200 cases have been reported in the world published reports (Rajni et al., 2008; Tzurbakis et al., 2008). Affected patients are usually young and often present with clinical symptoms such as localized pain, tenderness, decreased range of motion, and hemarthrosis (Rajni et al., 2008; Okahashi et al., 2004). Nonspecific Symptoms of the tumour add to the difficulty of making a diagnosis, which leads to delay in starting appropriate treatments (Rajni et al., 2008; Okahashi et al., 2004; Meislin and Parisien, 1990). We report the case of an intra-articular synovial haemangioma of left knee which is diagnosed by ultra sonography, Doppler study and Magnetic Resonance Imaging, in a 23-year-old male with a chronic history of intermittent pain and swelling in the left knee.

Case History
23-year-old male was referred with history of pain and swelling in the left knee for past 20 years. The swelling and pain was worse in morning which reduced with slow walk and after elevation of limb for long time. No history of trauma. During childhood he consulted a surgeon, patient refused for surgery. Present Physical examination revealed swelling in medial aspect of knee joint which protrudes around quadriceps tendon on contraction of quadriceps. By palpation swelling is compressible. There was slight muscle atrophy in the affected thigh and leg. Laboratory data were normal. Plain radiographs showed a soft tissue density suggesting either joint effusion or a mass .USG of left knee(esaoete,my lab 40, 12 MH linear array) revealed heterogeneous echogenic intra-articular lesion with multiple cystic spaces in it (Fig.1.A and 1. B).The lesion is closely attached to anterior horn of medial meniscus (Fig.1.A).Lesion is compressible by applying pressure through probe. On colour Doppler imaging there is no flow detected.

RESULT AND DISCUSSION
Synovial haemangioma is a benign vascular tumour, first described by Bouchut in 1856. It is thought to be a vascular malformation arising from any synovium-lined surface, rather that a true neoplasm (Meislin and Parisien, 1990). It occurs most frequently around the knee (97%) but has also been reported in the elbow, wrist, ankle, temporo-mandibular joint and tendon sheaths (Llauger et al., 1995). It can be focal or diffuse in their involvement of the joint. Misdagnosis often contributes to a delay in diagnosis of many years (Okahashi et al., 2004; Cotton et al., 1995; Devaney et al., 1993; Devaney et al., 1993) examined 20 patients in their study and reported that the symptoms are usually pain and swelling (31%), pain alone (31%), painless mass (31%) and recurrent intra-articular haemorrhage(5%) .Age at presentation ranged from 9 to 49 years with average age 25 years (Devaney et al., 1993). They can also present with mechanical symptoms mimicking internal derangement .When the lesion is located adjacent to the medial side of the patella, physicians are likely to make an...
incorrect diagnosis of medial shelf syndrome (Okahashi et al., 2004). On clinical examination, the mass is often palpable, compressible, and spongy.

Radiographic findings of a synovial haemangioma are sparse and non-specific; often the findings mimic joint effusion (Llauger et al., 1995; Greenspan et al., 1995; Greenspan et al., 1992). Phleboliths are highly suggestive of the diagnosis but occasionally seen. When there is prolonged diagnostic delay, degenerative changes resembling haemophilic arthropathy can develop (Devaney et al., 1993).

Computed tomography (CT), if obtained, can confirm the presence of a soft tissue mass, identify phleboliths if present, and delineate any adjacent osseous change related to local mass effect. CT however, is limited in the actual characterization of the soft tissue tumour itself (Greenspan et al., 1995; Cotton et al., 1995; Greenspan et al., 1992). USG shows a complex cystic lesion as in our case or mixed echogenic lesion (Greenspan et al., 1995; Greenspan et al., 1992), phleboliths if present can be seen as hyperechoic foci with posterior acoustic shadowing. Doppler study may or may not reveal flow depending on velocity, but finding flow on gentle compression with collapse of cystic space may be taken as supportive finding as in our case. Literature regarding usefulness of Ultrasonography and Doppler in diagnosis of synovial haemangioma is not much available because only few retrospective studies (Devaney et al., 1993; Greenspan et al., 1995; Greenspan et al., 1992) done for synovial haemangioma where complete USG findings were not available or USG was not performed. So usefulness of USG and Doppler will remain controversial if all the findings are not documented in case report. MRI allows superior contrast resolution and is the modality of choice (Greenspan et al., 1995) in the imaging evaluation of synovial haemangioma (or any soft tissue tumour in general). On T1-weighted images, synovial haemangioma display low to intermediate signal intensity as compared to surrounding muscle, whereas T2-weighted images appear as high signal intensity (Llauger et al., 1995; De Filippo et al., 2006; Greenspan et al., 1992). Thin, fibrofatty septa are characteristically seen as hypointense serpentine strands separating the vascular components (Llauger et al., 1995; De Filippo et al., 2006, Greenspan et al., 1992). On GRE T2*W the lesion becomes very hyperintense compared to FSE T2W image (Stark, 1998). The identification of tiny, rounded signal voids is compatible with the presence of phleboliths, which are not common (Greenspan et al., 1995; Cotton et al., 1995; De Filippo et al., 2006). Fluid-fluid levels are non-specific but have been reported (Greenspan et al., 1995). On Gadolinium-enhanced MRI there will be moderate to intense enhancement of the lesion and provides clear demarcation of the frequently lobulated borders of the lesion, to include demonstration of any extra-articular involvement (Llauger et al., 1995; Cotton et al., 1995; Greenspan et al., 1992). The vascular mass can be differentiated from joint fluid or adjacent muscle with the use of intravenous gadolinium. MRI is superior for diagnosis of synovial haemangioma and for defining its extent. To avoid making a misdiagnosis a high index of suspicion is required, and MRI should be actively used as this is a non-invasive and useful technique which can provide much preoperative information.

**CONCLUSION**

In spite of its rarity, synovial haemangioma had to be considered as a differential diagnosis in young patients presenting with recurrent painful swelling of the knee, which alone can lead to early diagnosis and proper management of the case. Where MRI not immediately available, USG can be used as a screening.
References


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