



Utilization of Mri In The Evaluation of Cystic Lesions Around The Knee Joint - Retrospective Study

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ABSTRACT

Cystic lesions around the knee joint represent varied etiologies. MRI with its unique resolution and technique is able to differentiate these lesions than any other imaging modalities. In this retrospective study we have evaluated the MR imaging findings of cystic lesions around the knee joint in terms of imaging characteristics and preferential site of involvement to help in diagnostic conclusion.

KEYWORDS

Cystic lesion, Knee joint

Introduction

Cystic lesions around the knee joint represent a diverse group of pathologies. MRI is the imaging modality of choice as it confirms the cystic nature of the lesion and evaluates the anatomical relations.

Materials & methods

This study was done in a tertiary care hospital in India. Retrospective analysis of all MRIs of knee done over the past 2 years was done. The objective of the study was to evaluate the MRI appearance of various cystic lesions around the knee joint. Routine sequences used are T2 STIR axial, coronal & sagittal, T2 PD axial, coronal & sagittal and T1 axial sections. A total of 45 cases were found to have cystic lesions, 6 of them had more than one cystic pathology.

Results

The frequency distribution of the 51 cystic lesions is given in table 1. Histopathological correlation were obtained in 16 cases. Anatomical distribution of ganglion and meniscal cysts are given in table 2. Among the Baker cysts, 3 were of the complex type. Isolated fluid collections in suprapatellar bursa, prepatellar bursa, tibio collateral bursa and deep infrapatellar bursa were seen in our study. The various cystic lesions in the synovial related pathologies includes synovial sarcoma, synovial osteochondromatosis and various types of synovitis. Chronic inflammatory cyst and cysticercus cyst were also encountered in our study.

Discussion

Characteristic MR imaging features enable us to reach a definite diagnosis (see table 3). The anatomical location and extension of the lesion helps the surgeon in pre operative planning.

Ganglion cysts:

It is commonly seen around the knee and usually formed due to cystic degeneration in the collagenous structure adjacent to the joint capsule and tendon. They do not have synovial lining and can be intra-articular (Fig.1,2) extra-articular (Fig.3), intraosseous or periosteal. Extra-articular ganglia may arise from bursae, ligaments, tendons, muscles or nerves and rarely communicate with the joint cavity [1-5,]. On MRI, they appear as uni-

or multilobular lobulated cystic lesion which has fluid signal intensity on all the pulse sequences. It may have a thin internal septation which can enhance after administration of contrast. Intraosseous ganglia are seen in subchondral location and may be associated with insertions of the cruciate ligaments or osteoarthritic changes.

Meniscal cysts:

These cysts are relatively uncommon and are formed when synovial fluid get collected within or adjacent to meniscus secondary to meniscal tear [4-6]. They are commonly associated with horizontal meniscal tears or rarely with meniscal degeneration. The cysts could be intrameniscal (Fig.4) or parameniscal (Fig.5) [7]. On MRI, cystic lesion along the periphery of meniscus with associated horizontal meniscal tear extends to outer surface of meniscus communicating with the cyst. It is very important to mention the exact extent of cyst in MRI report as surgeon has to plan for two operations, one on the outside of the knee to remove the cyst and second one on the inside for the meniscal repair.

Baker's cysts (Popliteal cyst):

It is one of the commonest cystic mass around the knee. It is located in the gastrocnemio- semimembranosus bursa, located a between the tendons of the medial head of gastrocnemius tendon and the semimembranosus (Fig.6). It is formed as a result of extravasation of joint fluid through the weakened posteromedial joint capsule into the bursa as a result of increased intra-articular pressure due to joint effusion. Incidence is thought to be 5% [8]. In majority of cases this is associated with intrarticular pathology like internal derangement, chronic arthritis like osteoarthritis, rheumatoid arthritis and infection or it could be due to primary bursitis which is commonly seen in children. On MRI, typically cyst is located in the medial aspect of popliteal fossa, it can be septated, multilobulated with internal debris which can alter the signal intensity of fluid. Occasionally, it can be very big and can expand in various directions predominantly inferomedial or medially. It can be associated with various complication like rupture (Fig.7), infection, haemorrhage, formation of multiple loose bodies within [8,9].

Synovial related pathologies:

There are many synovial related pathologies which can present as cyst or cyst like lesions including infective or inflammatory or haemorrhagic synovial fluid collection. Synovial chondromatosis can be primary or secondary. In primary condition, multiple small osteocartilagenous bodies of similar shape and size inside the joint. While in secondary chondromatosis, loose bodies are formed secondary to trauma, osteochondritis dissecans, neuropathic osteoarthropathy, osteoarthritis or infectious arthritis[7]. Presence of loose body or calcification will give the clue to the diagnosis. Synovial sarcoma could present as soft tissue intensity or of cystic intensity on MRI(Fig.8). In the absence of trauma, presence of fluid –fluid level raises the suspicion for synovial sarcoma [10]. Numerous bursae are seen around the knee joint. It is visualised on imaging, only when they are inflamed and filled with fluid (Fig.9) [2, 5].

Chronic inflammatory cyst

These are non specific in nature. On imaging, this is a diagnosis of exclusion. When the location of lesion is not typical for other cystic lesions described above, this can be considered(Fig.10).

Conclusion

MR imaging is essential in the diagnosis and management of cystic lesions around the knee. Characteristic MR imaging features will help in the diagnosis or narrowing the differential diagnosis of the cystic lesions around the knee joint.

Figures & Figure legend



Fig 1 Intercondylar ganglion cyst. (a) T2 STIR sagittal and (b) STIR axial sections shows multiloculated cyst in the intercondylar region of right knee joint

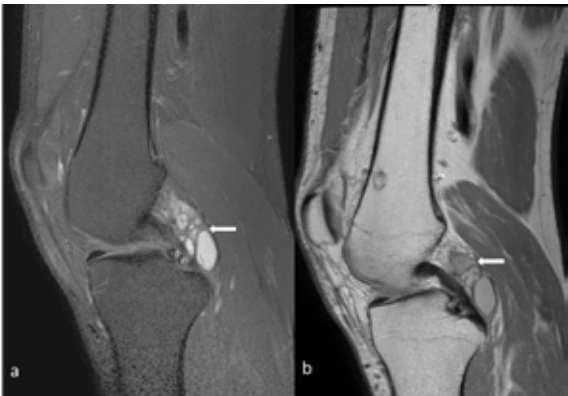


Fig 2 Ganglion cyst along PCL. (a) STIR sagittal and (b) PD sagittal sections shows multiloculated cyst along PCL



Fig 3 Juxta articular ganglion cyst. (a) PD axial & (b) STIR coronal sections show multiloculated cyst near the articular margin

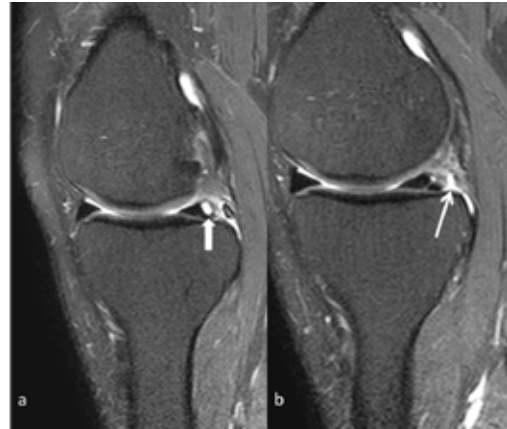


Fig 4 Medial meniscal cyst. (a) & (b) STIR sagittal section shows medial meniscal cyst [thick white arrow] and meniscal tear [thin white arrow]

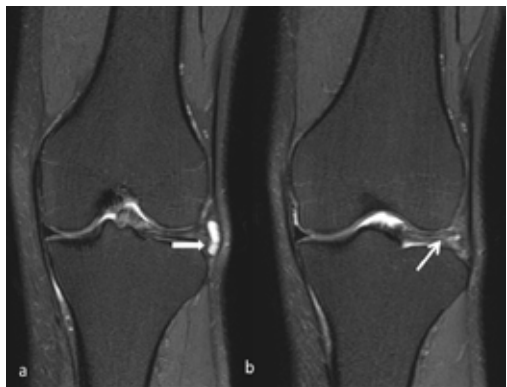


Fig 5 Discoid lateral para meniscal cyst. (a) & (b) T2 coronal sections shows parameniscal cyst [thick white arrow] and meniscal tear [thin white arrow]

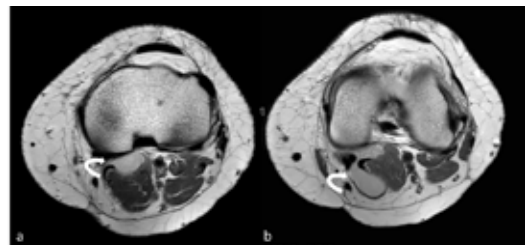


Fig 6 Simple Baker cyst. (a) & (b) PD axial sections show cyst between the medial gastrocnemius and semimembranosus tendons

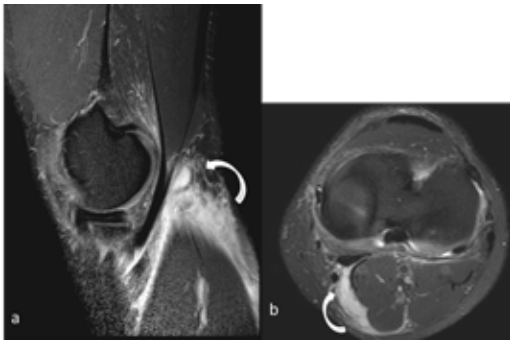


Fig 7 Ruptured Baker cyst. (a) T2 STIR sagittal and (b) T2 STIR axial sections show illdefined hyperintensity at the expected site of Baker cyst, extending into the adjacent muscle

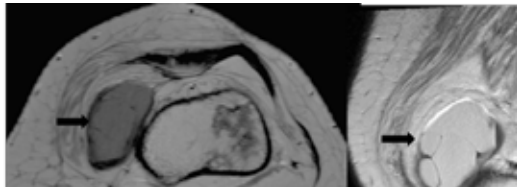


Fig 8 Synovial sarcoma. (a)T1 axial, (b) PD sagittal and (c) T2 STIR sagittal section show multiseptated cyst with nodular thickening of the cyst wall, presence of fluid level also noted in (a).

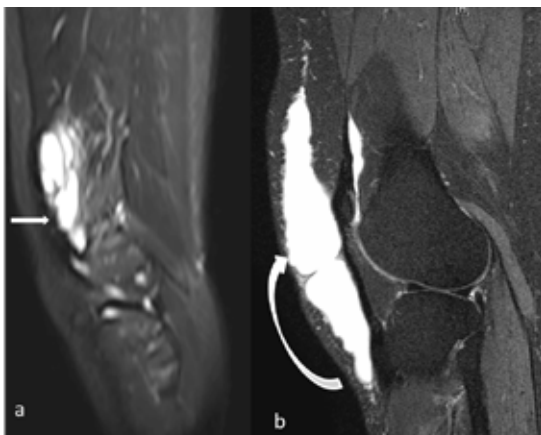


Fig 9 Bursitis. T2 STIR sagittal sections of 2 different patients with (a) supra patellar bursitis and (b) prepatellar bursitis.

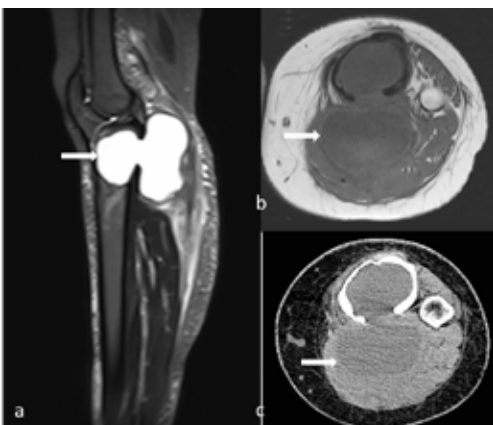


Fig 10 Chronic inflammatory cyst (a) STIR sagittal, (b) T1 axial and (c) non contrast CT axial sections show dumb-bell shaped cystic lesion around the knee joint, which is of intramuscular location

Tables

Table 1 Frequency distribution of cystic lesion around knee joint

Origin	Number
Intra-Articular ganglion cysts	
ACL	5
PCL	2
Medial collateral ligament	1
Intercondylar	1
Proximal tibiofibular ligament	1
Juxta-Articular Ganglion cysts	5
Medial meniscal cysts	7
Lateral meniscal cysts	5

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