

Clinical and Radiological Association between Baker’s Cyst and Meniscus Tear

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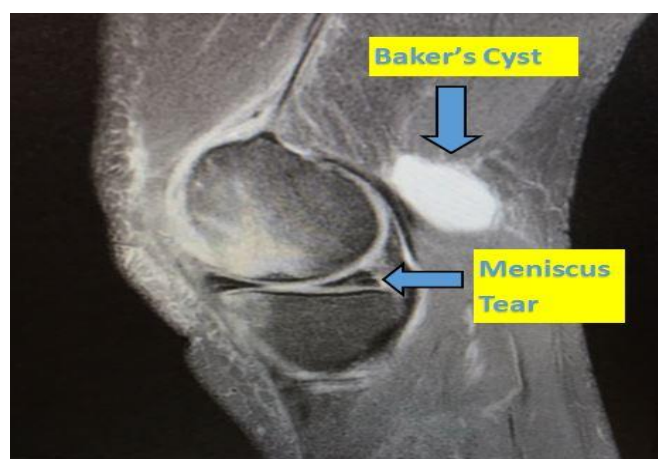
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Introduction

The popliteal (Baker) cyst is the most commonly observed lesion around the knee. Cystic lesions surrounding the knee might occur as a painless palpable mass, with discomfort, or can be identified during the usual MR imaging of the knee with suspected internal joint derangement.^{1,2} Baker's cyst (BC) is another typical discovery at the knee joint. This fluid is restricted in the popliteal fossa and communicates with the knee. BC can cause knee pain and locking, although it can also occur asymptotically. Cysts can be tiny or large, posing a risk of rupture and deep venous thrombosis. Baker's cyst (BC) is another typical discovery at the knee joint. This fluid is restricted in the popliteal fossa and communicates with the knee. BC can cause knee pain and locking, although it can also occur asymptotically. Cysts can range in size from tiny to large, posing a risk of rupture and deep vein thrombosis. Multiple studies demonstrate that intraarticular

disturbance is crucial in the aetiology of popliteal cysts. In 87-98% of patients, MR examinations of the popliteal cyst revealed the presence of intraarticular lesions such as osteoarthritis or inflammatory arthritis, as well as joint effusion, meniscus tear, and joint degeneration.³ There are few studies addressing the association between meniscus tear and Baker’s cyst. In our study, we evaluated prospectively the association between Baker’s cyst and meniscaltear utilising MRI in patients with knee pain.



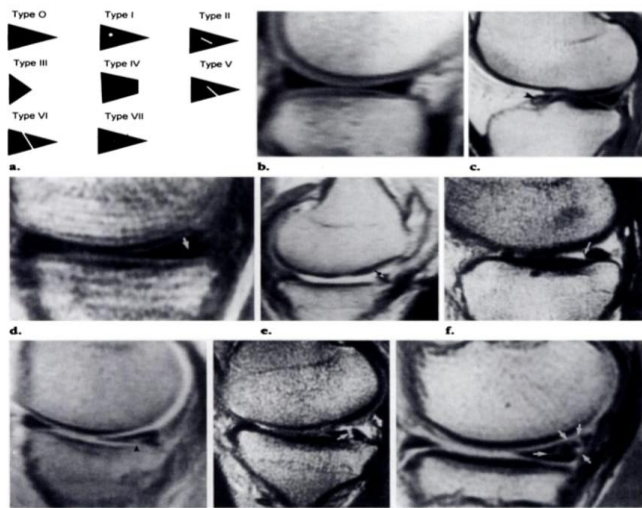


Figure 1. (a) Diagram demonstrates a new classification of meniscal MR imaging findings. (b) MR image (spin-echo [SE] 700/28 [repetition time, 700 msec; echo time, 28 msec]) shows type 0 findings, indicating a normal meniscus. (c) SE image (700/28) shows type I, a punctate intrameniscal signal intensity (arrowhead) that does not form a band and does not extend to either surface of the meniscus. (d) SE image (700/28) shows type II, a bandlike intrameniscal signal intensity (arrow) not extending to the surface of the meniscus. (e) SE image (2,000/60) shows type III, an unusually short meniscus (arrow) with a tapered apex. (f) SE image (2,500/100) shows type IV, a truncated or blunted apex of the meniscus (arrow). (g) SE image (2,000/28) shows type V, a bandlike increased signal intensity extending to one surface of the meniscus (arrow-head). (h) SE image (2,500/100) shows type VI, a bandlike increased signal intensity extending to two surfaces (arrow). (i) SE image (2,500/30) shows type VII, a comminuted increased intrameniscal signal intensity extending to one or both surfaces (arrows).

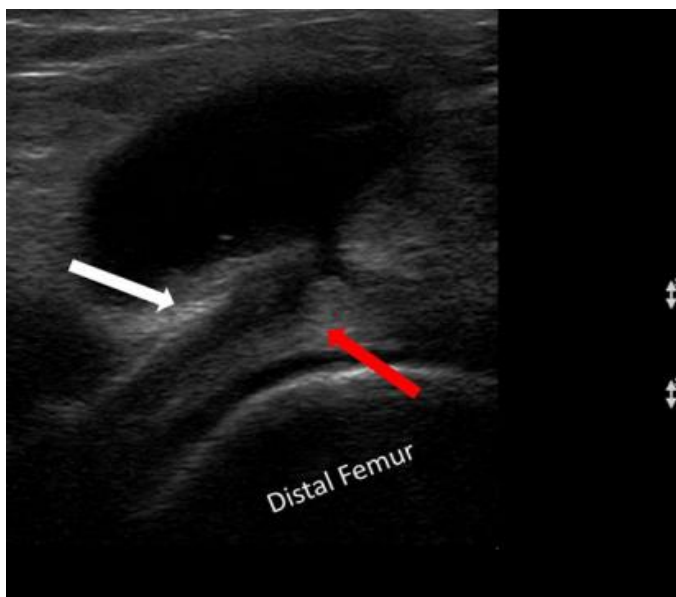


Figure 2: Baker's cyst: a cyst that is lying in the posterior medial knee and connected to the knee cavity with a neck that is lying between the semi membranous tendon (white arrow) and the medial gastrocnemius muscle (red arrow).

Methodology

A retrospective observational study was conducted in a Government tertiary care centre and Medical college, with duration 1st June 2023 to 31st December 2023.

Patients had thorough evaluation of the knee. Eventually patients were divided in two groups; group 2 included those with Baker's cyst and group 1 included those patients without Baker's cyst.

Inclusion Criteria

1. Patients from age 25-50
2. Grade 1 and 2 OA
3. Complaint of pain and swelling on back of the knee
4. Patient willing to give consent to participate in study
5. Clinically palpable swelling in posterior aspect of knee joint.

Exclusion Criteria

1. Patient less than 20yrs age
2. Grade 3 n 4 OA
3. Patient not giving consent

Baker's cyst defined as a cyst that is medially located in the posterior knee and is connected with the knee itself with a neck that is lying between the semi membranous tendon and the medial gastrocnemius muscle. Patients were divided in two groups; group B included those with Baker's cyst and group A included those patients without Baker's cyst. Baker's cyst was defined as a cyst that is medially located in the posterior knee and is connected with the knee itself with a neck that is lying between the semi membranous tendon and the medial gastrocnemius muscle.

Table 1: Demographic, clinical variables of the patients groups A and B

	Group A (n=60)	Group B (n=31)	Test Statistic
Age	43.1± 8	36.92 ±10	p<0.01,t= 3.2,Significant
Gender (M:F)	28:32	14:17	X ² =0.01,p>0.05,Not significant
Duration of symptoms	2.81±3.4	1.98±3.2	p>0.01,t=1.12,Not Significant
Lt knee :Rt Knee	25:35	11:20	

MR images were obtained with a cp or 8-channel dedicated knee coil at 1.5 T (Magnetom Symphony;

Siemens Medical Systems) with a standard protocol including PD-weighted frequency selective fat suppressed fast SE-sequences in coronal, sagittal and axial plane and T1-weighted coronal SE sequence with a slice thickness of 2.3 to 3.0 mm respectively. On MRI the Baker cyst was presented as a circumscribed mass with low signal on T1-weighted image, intermedial signal intensity on proton density (PD) image and high signal intensity comparing with skeletal muscle on PD-weighted fatsat image. In both groups the size of the Baker cyst was assessed by measuring the distension of the cyst, and large cysts were distended more than 1 cm. Student's t test and chi-square tests were used to compare between the continuous and categorical parameters of the two group.

(Bakerscyst) was found to be 11:20 while in group A it was 25:35. In cases having bakers cyst, 14 cases had large bakers cyst (more than 4cm) & 9 cases were having a medium sized (2cm-4cm) bakers cyst.

Discussion

A statistically significant association was also found between Baker's cyst and age. This study finding was comparable with Artul et al⁴ who found association with age. In our study, we found 77% cases of Baker's cyst in posterior horn of medial meniscus. Similarly, Sasone et al⁵ found 30 patients with the popliteal cyst and 90% had lesion of the posterior horn of medial meniscus. Our results show a statistically significant association between Baker's cyst and Meniscus Tear in patients with knee pain, who were prospectively, evaluated using MRI. This association was still statistically significant after adjusting for potential confounders such as knee effusion, osteoarthritis changes, bursitis, enthesopathy, ligament problems, gender, and age. The correlation with gender was on the edge of statistical significance where women had more Baker's cyst than men. This conclusion is supported by the lack of statistically significant difference in any of these intraarticular pathologies between group A and group B patients. The association between Baker's cyst and Meniscus tear has a significant clinical implication. This means that a thorough MRI evaluation of the knee is required even if the request on the order was a specific one: yes or no Baker's Cyst. A thorough knee evaluation is essential since Meniscus Tear therapy may involve arthroscopy rather than simple fluid aspiration.

Magnetic resonance imaging has become the primary imaging modality of the knee. Its many advantages include its non-invasive nature, excellent soft tissue contrast and multiplanar imaging capabilities. Magnetic

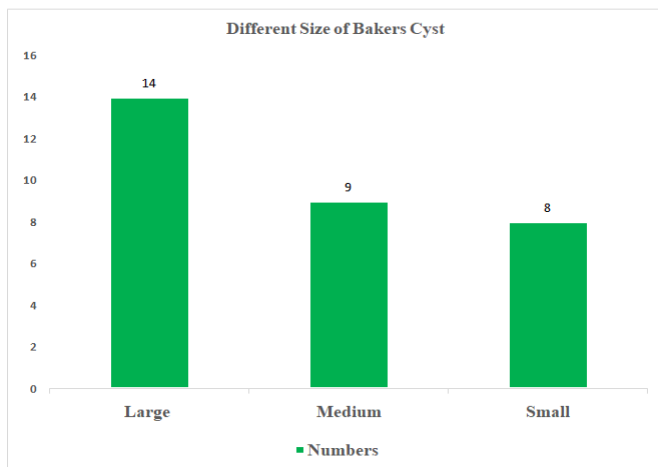


Figure 3: Showing Different Size of Bakers Cyst

Total 91 patients were included in our study. 31 patients (34%) had Baker's cyst (group B) and 60 patients (66% knees) had no Baker's cyst (group A). The mean age for the patients having bakers cyst was found to be 36.92 years while that of other group was found to be 43.1 years. A statistically significant association was also found between Baker's cyst and age. But was not associated with respect to gender & duration of symptoms. Left Knee: Right Knee ratio in Group B

resonance imaging is also able to simultaneously evaluate menisci, cruciate ligaments, periarticular tissue, synovium, and articular cartilage. Because of the tremendous accuracy of MRI, we were able to identify the pathologic changes in knees. It appears that a meniscus tear, due to its proximity to the opening of the popliteal fossa, causes the creation of a "one-way valve," allowing knee joint fluid to enter into the fossa, resulting in the Baker's cyst. Baker's cyst can be treated with ultrasound-guided aspiration and/or corticosteroid injections, arthroscopic expansion of the unidirectional valve, or arthroscopic cystectomy. However, because Baker's cyst is considered a secondary phenomenon, the typical approach is to treat the underlying intraarticular lesion or derangement, such as a medial meniscus tear, in order to ensure a high success rate and/or prevent Baker's cyst recurrence.

A meta-analysis of risk variables for the development of meniscal tears revealed that age (over 60 years), male gender, work-related kneeling or squatting, and climbing stairs (more than 30 flights) were all risk factors for degenerative meniscus tears. Playing football or tennis was also identified as a significant risk factor for acute meniscal tears. Treatment of Meniscus tear includes physical therapy, nonsteroidal anti-inflammatory drugs, hyaluronic acid injections, arthroscopy, or even surgery. Although knee effusion is related with many derangements of the knee joint, including Baker's cyst and Meniscus Tear, our analysis identified no statistically significant link between knee effusion and Baker's cyst. On the other hand, there was a statistically significant link between knee effusion and meniscal protrusion, knee effusion and meniscus tear, and meniscus tear and Baker's cyst.

The findings of our study could be attributed to the small number of knees analysed. More research is needed on this topic and the relationship of other knee derangements in general, employing MRI.

Conclusion

Baker's Cyst has a statistically significant association with meniscus tear and age. Patients with Baker's cyst should get a comprehensive MRI examination, specifically for meniscus tear. Tears in the posterior one-third of the meniscus are prevalent, but they can also occur in other areas, especially the lateral one. We stress two features of MR diagnosis for meniscal tears: the existence of signal in contact with the meniscal surface, coronal MR scans can diagnose just 2% and 4% of medial and lateral meniscal tears, respectively. However, sagittal MR images can detect 31% and 45% of medial and lateral meniscal tears.

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