



VOLUMINOUS BAKER'S CYST IN THE RIGHT KNEE

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ARTIGO ORIGINAL

RESUMO

Contexto: O cisto de Baker, ou cisto poplíteo, é uma das afecções císticas mais comuns na região posterior do joelho. Sua formação ocorre devido ao acúmulo de líquido sinovial na bursa do gastrocnêmio-semimembranoso, frequentemente associado a patologias intra-articulares que elevam a pressão dentro do joelho. Embora muitas vezes assintomático, pode manifestar-se com dor, inchaço e limitação do movimento.

Objetivo: O presente artigo tem como objetivo relatar um caso de cisto de Baker volumoso no joelho direito, destacando suas características clínicas, diagnósticas e a resposta ao tratamento conservador. **Relato de Caso:** Uma paciente do sexo feminino, de 54 anos, que se apresentou com queixa de dor intensa e uma tumoração palpável na fossa poplíteia direita. A investigação diagnóstica por ultrassonografia revelou um cisto de Baker de grandes dimensões, medindo 7,9 x 1,6 x 5,2 cm, com debris internos. Um achado notável foi a ausência de patologias intra-articulares subjacentes detectáveis pela ultrassonografia, sem aparente osteoartrite. O tratamento foi baseado em anti-inflamatórios não esteroides e fisioterapia, resultando em melhora clínica expressiva da paciente em apenas duas semanas. **Conclusão:** O cisto de Baker pode ser sintomático devido ao seu tamanho ou ao mecanismo de válvula unidirecional, mesmo na ausência de lesões articulares evidentes, reforçando a necessidade de uma compreensão aprofundada desses fatores para um diagnóstico e manejo clínico eficazes.

Palavras-chave: Cisto de Baker, Cisto Poplíteo, Medicina Esportiva, Ultrassom, Joelho, Artroscopia.

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ABSTRACT

Context: Baker's cyst, also known as popliteal cyst, is one of the most common cystic affections in the posterior region of the knee. Its formation occurs due to the accumulation of synovial fluid in the gastrocnemius-semimembranosus bursa, frequently associated with intra-articular pathologies that elevate pressure within the knee. Although often asymptomatic, it can manifest with pain, swelling, and limited movement. **Objective:** This article aims to report a case of a voluminous Baker's cyst in the right knee, highlighting its clinical and diagnostic characteristics and the response to conservative treatment. **Case Report:** A 54-year-old female patient presented with complaints of intense pain and a palpable mass in the right popliteal fossa. Diagnostic investigation via ultrasound revealed a large Baker's cyst, measuring 7.9 x 1.6 x 5.2 cm, with internal debris. A notable finding was the absence of detectable underlying intra-articular pathologies by ultrasonography, with no apparent osteoarthritis. Treatment was based on non-steroidal anti-inflammatory drugs and physical therapy, resulting in significant clinical improvement for the patient within just two weeks. **Conclusion:** Baker's cyst can be symptomatic due to its size or a one-way valve mechanism, even in the absence of evident joint lesions, reinforcing the need for an in-depth understanding of these factors for effective clinical diagnosis and management.

Keywords: Baker's cyst, Popliteal cyst, Sports medicine, Ultrasound, Knee, Arthroscopy

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Introduction

The popliteal cyst, or Baker's cyst, is the most common cystic affliction in the posterior region of the knee. Although often asymptomatic, when symptomatic it can present with pain, swelling, and limitation of movement (Duarte et al., 2024). Its prevalence is notable, varying from 5% to 32% in diverse populations, with incidence increasing with age, osteoarthritis severity, and disease duration (Miller et al., 1996; Handy, 2001; Hayashi et al., 2010; Cao et al., 2014; Abate et al., 2021; Liu et al., 2022; Fu et al., 2025; Anies et al., 2025). Prevalence is significantly higher in patients with knee pain (19.8%) or symptoms of deep vein thrombosis (DVT) (9.5%), compared to healthy volunteers (3.0%) (Labropoulos et al., 2004).

The formation of Baker's cyst is intrinsically linked to the accumulation of synovial fluid outside the articular cavity. Described by Adams in 1840 and detailed by Baker in 1877, its pathogenesis involves the accumulation of fluid in the gastrocnemius-semimembranosus bursa. This is an evagination of synovial tissue through a point of weakness in the posterior wall of the knee capsule (Handy, 2001; Labropoulos et al., 2004), functioning as a one-way valve that allows fluid to flow into the cyst but restricts its return (Wigley, 1982; Yang et al., 2017; Hommel et al., 2020; Abate et al., 2021; Fu et al., 2025). This anatomical point of weakness is located posteromedially, between the expansions of the semimembranosus muscle and the posterior cruciate ligament (Labropoulos et al., 2004).

The etiology of Baker's cyst is often associated with underlying intra-articular conditions, such as osteoarthritis, chondral lesions (85%), inflammatory arthropathies, or meniscal tears (70% of medial meniscus tears) (Rupp et al., 2002; Liao et al., 2010; Anies et al., 2025). In these conditions, increased synovial fluid production and intra-articular pressure drive the protrusion of the joint capsule through the point of weakness (Hommel et al., 2020; Abate et al., 2021; Fu et al., 2025). The herniation forms a sac whose synovial lining can undergo fibrosis. The variation in intra-articular pressure with knee movement, synovial inflammation, and tension from adjacent tissues regulate

the valvar mechanism, facilitating cyst filling and preventing reflux (Duarte et al., 2024; Fu et al., 2025). Understanding these mechanisms is crucial for effective diagnosis and treatment. The objective of our article was to report a case of a voluminous Baker's cyst in the right knee, highlighting its clinical and diagnostic characteristics and the response to conservative treatment.

Case Report

Patient Identification: A 54-year-old female patient with no history of significant comorbidities or continuous medication use.

Medical History: The patient presented to the clinic with a chief complaint of intense pain in her right leg, described as "tiredness" and more pronounced in the posterior region of the knee. She also reported the presence of a visible mass in the right popliteal fossa. She denied fever, chills, chest pain, dyspnea, nausea, vomiting, diarrhea, abdominal pain, headache, and urinary symptoms.

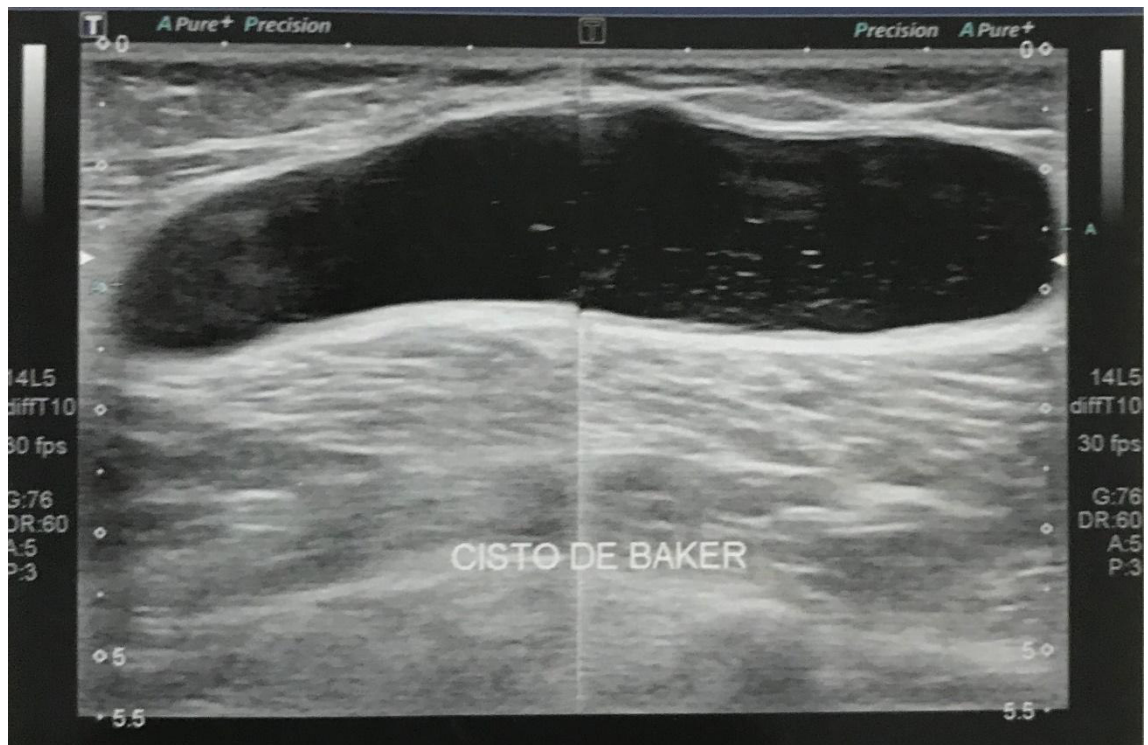
Physical Examination: Upon physical examination, the right knee showed mild edema and slight limitation of range of motion, with no evidence of joint effusion. In the posterior region of the popliteal fossa, a mass interspersed with reticular varicose veins was observed (**Figure 1**). Palpation of the calf and thigh revealed no tenderness or palpable cords. Femoral, popliteal, and pedal pulses were present and of good amplitude. There were no signs or symptoms suggestive of compartment syndrome in the right lower limb. Peripheral circulation was preserved, with normal capillary refill time and absence of neurological deficits such as numbness, tingling, or paresthesia.

Figure 1 – Mass interspersed with reticular varicose veins



Complementary Investigation: Non-steroidal anti-inflammatory drugs were prescribed, and an ultrasound of the right knee was requested. The examination revealed an elongated cystic image with thin, regular walls and some internal debris, located in the gastrocnemius-semimembranosus bursa, in the popliteal region of the right leg. The lesion measured 7.9 x 1.6 x 5.2 cm and was 0.7 cm from the skin, characterizing a voluminous Baker's cyst (**Figure 2**).

Figure 2 - Ultrasound showing a voluminous Baker's cyst.



Management and Outcome: Based on the clinical and ultrasonographic findings, the diagnosis of Baker's cyst was established. The patient was medicated with non-steroidal anti-inflammatory drugs and referred for physical therapy, showing significant clinical improvement within two weeks.

Discussion

The diagnosis of popliteal cyst is based on clinical evaluation and imaging exams, with ultrasonography (US) being the preferred initial method due to its high diagnostic accuracy, accessibility, low cost, and ability for dynamic and real-time assessment (Handy, 2001; Nanduri et al., 2021; Liu et al., 2022; Hasan et al., 2025). US reveals the cyst as a fluid collection (anechoic or hypoechoic), typically located in the posteromedial region, between the semimembranosus and medial gastrocnemius tendons (Ward et al., 2001; Nanduri et al., 2021; Anies et al., 2025). Its characteristics can vary from anechoic (most common) to hypoechoic or mixed, with septations or internal echoes (debris), common findings in cysts of patients with knee pain or DVT symptoms (Labropoulos et al., 2004; Liao et al., 2010). In the present case, the right knee US revealed a voluminous cyst (7.9 x 1.6 x 5.2 cm) with internal debris, which could justify the symptomatology. Magnetic resonance imaging (MRI) is the gold standard for popliteal fossa masses,

providing superior soft tissue contrast and crucial anatomical details for differentiating other conditions (Handy, 2001; Marra et al., 2008). MRI describes the cyst as a unilocular or multilocular cystic mass, well-circumscribed, posteromedially, originating between the semimembranosus tendon and the medial head of the gastrocnemius (Beaman & Peterson, 2007; Marra et al., 2008; Anies et al., 2025), exhibiting signal intensity characteristic of fluid in all sequences (Marra et al., 2008; Stacy & Kapur, 2011; Anies et al., 2025). Although MRI provides more detail, in our case, US was sufficient for diagnosis and did not reveal intra-articular pathologies.

The absence of articular lesions such as osteoarthritis is a relevant point in our case. Although Baker's cyst formation is frequently attributed to intra-articular pathologies that increase synovial fluid production and pressure (Handy, 2001; Anies et al., 2025; Fu et al., 2025), intra-articular pressure variation with knee movement also contributes to cyst filling (Duarte et al., 2024). Approximately 50% of Baker's cysts may not communicate with the knee, and in some cases, they can occur without apparent intra-articular pathology (Handy, 2001; Abate et al., 2021). The persistence of Baker's cysts, even after treating the intra-articular pathology, is observed in a significant percentage of patients (33% after nearly 5 years of follow-up in a post-total knee arthroplasty study) (Hommel et al., 2020). The non-identification of underlying pathology in the patient may indicate that the one-way valve mechanism or the sheer size of the cyst were the predominant factors for the symptoms, or that the intra-articular lesion was subtle and not detectable by US.

For differential diagnosis, it is crucial to rule out conditions that mimic Baker's cyst, with deep vein thrombosis (DVT) being the most relevant due to its risks of pulmonary embolism and the danger of misguided heparin treatment, which can induce compartment syndrome in case of cyst rupture (Handy, 2001; Tejero et al., 2018; Nanduri et al., 2021). US is particularly useful, allowing simultaneous evaluation of the popliteal fossa and leg veins (Handy, 2001). Other possibilities include cystic masses (synovial or ganglion), solid masses (sarcomas, lymphomas), and popliteal artery aneurysms (Handy, 2001; Marra et al., 2008; Arumilli et al., 2008). US can generally aid

in differentiating between cystic and solid masses (Arumilli et al., 2008). The distinction is critical, as therapeutic management differs significantly.

The treatment of Baker's cyst, especially when symptomatic and voluminous, ranges from conservative to surgical approaches. Conservative management, preferred for mild or asymptomatic cases, includes rest, anti-inflammatory drugs (oral or injectable, corticosteroids or hyaluronic acid), and physical therapy (Handy, 2001; Van Nest et al., 2020; Nanduri et al., 2021; Abate et al., 2021; Duarte et al., 2024; Fu et al., 2025). This approach proved effective for the patient in this study, leading to significant improvement within two weeks. The likelihood of cyst resolution is higher for smaller cysts (83.7%) than for larger ones (52.1%), and a significant reduction in average size can be observed with conservative treatment (Hommel et al., 2020). For patients with associated osteoarthritis, combined intervention can bring significant improvements (Abate et al., 2021). For refractory cases or with obvious compressive symptoms, surgery is considered (Fu et al., 2025). Minimally invasive approaches, such as arthroscopy, allow for cyst treatment (internal drainage and debridement of the cystic wall) and correction of concomitant intra-articular pathologies, crucial for preventing recurrence, even in the absence of pathology, by re-establishing bidirectional communication (Handy, 2001; Yang et al., 2017; Van Nest et al., 2020; Fu et al., 2025). In contrast, isolated cyst excision without treating the underlying cause presents high recurrence rates (Handy, 2001; Rupp et al., 2002).

Conclusion

This case study corroborates the relevance of ultrasonographic diagnosis for large Baker's cysts and the favorable therapeutic outcome achieved with conservative management, even in the absence of detectable underlying intra-articular lesions. It is also important to highlight the significance of differential diagnosis and the evolution of therapeutic approaches, emphasizing the need for an in-depth understanding of Baker's cyst pathophysiology to optimize clinical outcomes.

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CONFLICT OF INTERESTS

The authors declare no conflict of interests.

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