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Case Report

Hemorrhagic Popliteal Cyst as a Rare Complication of Rheumatoid Arthritis: A Case Report

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Abstract

Hematomas are a relatively common but often underrecognized cause of compressive neurovascular symptoms. Patients with rheumatoid arthritis (RA) are predisposed to hematoma formation due to vascular inflammation, platelet dysfunction, impaired coagulation factor synthesis, and pharmacologic therapy. We report a 17-year-old male with RA who presented with progressive swelling, pain, and plantar flexor weakness in the right lower leg, without preceding trauma. MRI demonstrated a 1.2 × 1.0 × 3.0 cm mass in the right popliteal fossa, in close proximity to the popliteal artery and tibial nerve. Electrodiagnostic studies confirmed tibial neuropathy at the knee level. Surgical excision resulted in near-complete resolution of symptoms, and histopathological analysis confirmed an organized hematoma. This case highlights the importance of considering organized hematomas in RA patients presenting with ruptured popliteal cyst. Prompt imaging and timely surgical intervention can achieve favorable functional outcomes.

Keywords: *Rheumatoid Arthritis; Hematoma; Popliteal Cyst*

Introduction

Musculoskeletal masses may exert compressive effects on adjacent anatomical structures, including nerves, vessels, and soft tissues [1]. Nerve compression commonly presents with neuropathic pain, paresthesia, or weakness [2], while vascular compression may lead to ischemic pain, swelling, or skin discoloration [3]. Soft tissue compression can cause localized pain or restriction of joint mobility [4]. The presence of such symptoms should raise suspicion of mass effect.

Among compressive lesions, hematomas represent a frequent yet underrecognized etiology [5]. They typically develop after trauma, surgery, or inflammatory processes and may evolve into organized masses capable of exerting pressure on adjacent neurovascular structures [6]. In rheumatoid arthritis (RA), the risk of hematoma formation is increased due to multiple factors, including vascular inflammation, platelet dysfunction, impaired coagulation factor synthesis, and the use of agents such as NSAIDs, corticosteroids, or DMARDs [6].

This case describes a 17-year-old male with RA who developed vascular and neurological deficits in the right lower limb secondary to compression of the popliteal artery and tibial nerve by an organized hematoma within the popliteal fossa.

Case Report

A 17-year-old male with a 5-year history of rheumatoid arthritis, well controlled on methotrexate therapy, presented with a two-month history of progressive swelling, weakness, and persistent pain in the right lower limb, without antecedent trauma. The pain was diffuse, non-dermatomal, rated 3/10 on the numeric rating scale, and persisted at rest.

On clinical examination, swelling of the right leg was observed. Muscle strength testing revealed plantar flexion weakness (manual muscle test grade 3) with diminished Achilles tendon reflexes, while sensory examination was unremarkable.

Laboratory studies demonstrated elevated inflammatory markers (CRP 3.87 mg/dL, ESR 89 mm/h) and positive autoimmune markers (rheumatoid factor 142.1 IU/mL, anti-cyclic citrullinated peptide antibody 500 U/mL). Other autoantibodies were negative.

Venous Doppler ultrasound of the lower extremities demonstrated no evidence of deep venous thrombosis. Nevertheless, Doppler evaluation of the right popliteal fossa revealed a heterogeneous, hyperechoic fluid collection communicating with the synovial cavity via a narrow channel, consistent with a ruptured hemorrhagic popliteal cyst (Figure 1).

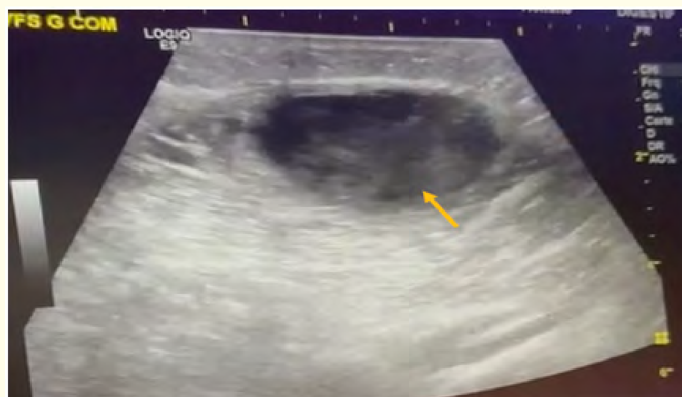
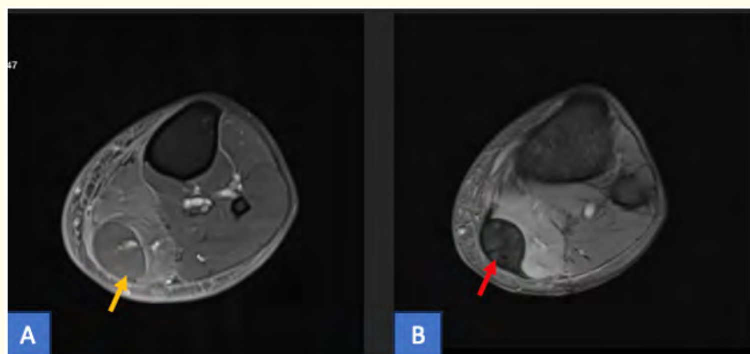


Figure 1: *Grayscale ultrasound of the right popliteal fossa demonstrating a heterogeneous, hyperechoic fluid collection (yellow arrow) located between the gastrocnemius and semimembranosus muscles, consistent with a ruptured hemorrhagic popliteal cyst.*

MRI of the right knee identified a well-encapsulated mass measuring 1.2 × 1.0 × 3.0 cm in the posterior intercondylar region of the tibia. The lesion appeared hypointense on T1-weighted images and hyperintense on T2-weighted and proton density fat-suppressed sequences (Figure 2).



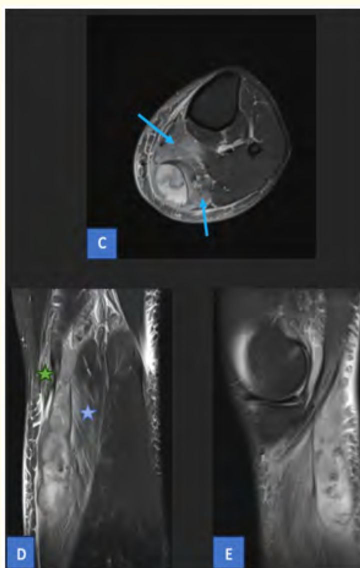


Figure 2: *Axial (A, B, C) coronal (D) and sagittal (E) MRI sequences of the right knee demonstrating a ruptured popliteal cyst with hematoma. T1-weighted image showing a well-defined, hypointense mass in the posterior intercondylar region (yellow arrow). T2-weighted image displaying relative hypointensity, reflecting the hemorrhagic and organized nature of the cyst content (red arrow). STIR sequence highlighting surrounding edema (blue arrow) and the extension of the hematoma between the gastrocnemius (blue asterisk) and semimembranosus (green asterisk) muscles, consistent with a ruptured hemorrhagic popliteal cyst.*

The patient underwent complete surgical excision under general anesthesia. Postoperative rehabilitation allowed early mobilization, with full weight-bearing achieved at one week.

Histopathological examination confirmed a well-organized hematoma with chronic inflammatory cell infiltration, neovascularization, and hemosiderin deposition. PCR testing for Mycobacterium tuberculosis and non-tuberculous mycobacteria was negative.

At one week postoperatively, leg pain and swelling had resolved, and plantar flexion strength improved from grade 3 to grade 4. Following complete wound healing, sutures were removed. The patient remains under outpatient follow-up in the rehabilitation medicine department for functional recovery of plantar flexion and continues rheumatology care for ongoing management of rheumatoid arthritis.

Discussion

In adults, popliteal cysts are frequently associated with underlying joint disorders, including rheumatoid arthritis, meniscal lesions, osteoarthritis, and nonspecific synovitis [7]. The widely recognized pathophysiological mechanism involves a unidirectional valvular process. In this setting, intra-articular effusion builds up within the knee due to joint pathology, and the elevated intra-articular pressure drives synovial fluid into the gastrocnemius-semimembranosus bursa (GSB) through a slit-like communication. Because the fluid cannot return into the joint cavity, a cyst gradually forms and persists [8]. When rupture occurs, patients often present with acute calf pain, swelling, warmth, erythema, and tenderness-symptoms that can closely mimic other conditions of the lower limb, particularly deep vein thrombosis or thrombophlebitis [9]. While rupture is a well-documented complication, the occurrence of hematoma in the lower extremity secondary to a popliteal cyst is exceedingly uncommon, with only a handful of cases reported in the literature [10].

In RA, chronic synovial inflammation and angiogenesis predispose to fragile microvascular networks within synovial tissue [11]. Endothelial damage may result in periarticular hemorrhage and hematoma formation. With time, these hematomas may undergo organization and fibrosis, thereby increasing their compressive effect on surrounding structures.

This case underscores the considerable risk of misdiagnosing deep vein thrombosis (DVT) of the lower extremity as a popliteal cyst. Various imaging modalities, including lower extremity vascular ultrasonography, contrast-enhanced computed tomography (CT), and magnetic resonance imaging (MRI), can assist in the differential diagnosis of popliteal cysts. Among these, vascular ultrasonography provides a reliable method to definitively exclude DVT [12] and serial bedside ultrasonography can further improve diagnostic accuracy [13].

MRI offers superior characterization of cyst morphology, extent, and the relationship between the cyst and any associated hematoma. Typically, Baker's cysts demonstrate low signal intensity on T1-weighted images and high signal intensity on T2-weighted images due to their fluid content. In contrast, a ruptured Baker's cyst with an associated calf hematoma exhibits low-to-intermediate signal intensity on T1-weighted sequences and intermediate-to-high signal intensity on T2-weighted sequences within the hematoma region [14]. The intermediate-to-high T2 signal often indicates the presence of hemorrhage within the lesion. Careful differentiation between these entities is essential, as an incorrect early diagnosis may lead to ineffective or potentially harmful management.

The optimal management of ruptured popliteal cysts with intermuscular calf hematomas remains undefined, and treatment is guided by symptom severity and underlying pathology. Surgical options, including open or arthroscopic cystectomy/synovectomy and biomechanical valve excision, have demonstrated favorable outcomes [15], with arthroscopic approaches preferred for their minimally invasive nature [16]. In this case, we performed arthroscopic drainage of the popliteal cyst combined with open evacuation of the calf hematoma to reduce recurrence risk and alleviate swelling. Isolated arthroscopic cyst drainage may be insufficient in the presence of intermuscular hematoma and could exacerbate compartment pressures, increasing the risk of compartment syndrome [17].

Conclusion

This report presents a rare case of hematoma of the knee and lower calf caused by rupture of a Baker's cyst with dissection into deep muscle. The unusual feature of this case was its close resemblance to deep vein thrombosis, which initially led to inappropriate management. Accurate diagnosis requires careful consideration of early symptoms supported by imaging, ultrasound, and laboratory studies. In this patient, combined arthroscopic drainage and open calf fasciotomy achieved a favorable outcome. This case highlights the importance of clinical vigilance, aiming to prevent misdiagnosis and provide further evidence for management and prognosis of this uncommon complication.

Bibliography

1. Choi KH Park., *et al*. "Myositis ossificans causing ulnar neuropathy: A case report". *Journal of International Medical Research* 49.3 (2021): 3000605211002680.
2. Kwak S and Chang MC. "Compression of the lateral antebrachial cutaneous nerve due to leakage of iron after an intravenous iron infusion". *Diagnostics* 10.8 (2020): 516.
3. Sakamoto A., *et al*. "Vascular compression caused by solitary osteochondroma: Useful diagnostic methods of magnetic resonance angiography and doppler ultrasonography". *Journal of Orthopaedic Science* 7.4 (2002): 439-443.
4. Achar S., *et al*. "Soft tissue masses: evaluation and treatment". *American Family Physician* 105.6 (2022): 602-612.

5. Davis DD and Kane SM. “Muscular hematoma”. In StatPearls [Internet] StatPearls Publishing: Treasure Island, FL, USA (2025).

6. Ohta N., *et al*. “Clinical and pathological characteristics of organized hematoma”. *International Journal of Otolaryngology* (2013): 539642.

7. Nakamura J., *et al*. “Ruptured Baker’s cyst in rheumatoid arthritis”. *Internal Medicine* 58.3 (2019): 455.

8. Lindgren PG. “Gastrocnemio-semimembranosus bursa and its relation to the knee joint. III. Pressure measurements in joint and bursa”. *Acta Radiologica: Diagnosis (Stockh)* 19.2 (1978): 377-388.

9. Abdelrahman MH., *et al*. “Proximal dissection and rupture of a popliteal cyst: a case report”. *Case Reports in Radiology* (2012): 292414.

10. Yoo MJ., *et al*. “Baker’s cyst filled with hematoma at the lower calf”. *Knee Surgery and Related Research* 26.4 (2014): 253-256.

11. Chauhan K., *et al*. “Rheumatoid arthritis”. In StatPearls [Internet] StatPearls Publishing: Treasure Island, FL, USA (2025).

12. Tai FWD and McAlindon ME. “Non-steroidal anti-inflammatory drugs and the gastrointestinal tract”. *Clinical Medicine* 21.2 (2021): 131-134.

13. van Delft MAM and Huizinga TWJ. “An overview of autoantibodies in rheumatoid arthritis”. *Journal of Autoimmunity* 110 (2020): 102392.

14. Holers VM and Banda NK. “Complement in the initiation and evolution of rheumatoid arthritis”. *Frontiers in Immunology* 9 (2018): 1057.

15. Abate M., *et al*. “Baker’s cyst with knee osteoarthritis: clinical and therapeutic implications”. *Medical Principles and Practice* 30.6 (2021): 585-591.

16. Yoo MJ., *et al*. “Baker’s cyst filled with hematoma at the lower calf”. *Knee Surgery and Related Research* 26.4 (2014): 253-256.

17. Yang JH., *et al*. “Successful arthroscopic treatment of refractory and complicated popliteal cyst associated with rheumatoid arthritis in combination with osteoarthritis: case series and literature review”. *Rheumatology International* 39.12 (2019): 2177-2183.

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