Ruptured Septic Popliteal Cyst Associated With Psoriatic Arthritis

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CASE REPORT

Popliteal cyst (Baker’s cyst) was first described by Adams in 1840, popularized by Baker in 1877, and was theorized as an enlarged gastrocnemius-semimembranosus bursa that communicated with the knee and trapped synovial fluid. Numerous bursae are located in the popliteal space between the knee ligaments, hamstring tendons, gastrocnemius muscle, and collateral ligaments.

The two proposed etiologies of Baker’s cyst include an abnormal herniation of synovial fluid through the posterior knee capsule into the popliteal space or fluid escape from the knee through a normal communication with a bursa located in the popliteal space. This bursa has been reported as the gastrocnemius bursa (located behind the medial head of the gastrocnemius) or semimembranosus bursa (between the semimembranosus and medial head of the gastrocnemius). A valvular mechanism allows fluid to pass into the cyst but not escape. Intra-articular pathology (meniscal disease, degenerative joint disease, rheumatoid arthritis, patellofemoral arthritis, or any chronic synovitis) is commonly associated with Baker’s cyst.

Popliteal cyst dissection has been infrequently reported throughout the literature, mostly in cases of rheumatoid arthritis, juvenile rheumatoid arthritis, gonococcal arthritis, and Reiter’s syndrome. Clinically, they mimic deep venous thrombophlebitis. Popliteal cyst infections also have been reported; however, they are a rare complication of septic arthritis.

This article presents a patient with psoriatic arthritis who underwent dissection of a ruptured septic popliteal cyst.

CASE REPORT

A 69-year-old man with insulin-dependent diabetes, psoriasis, and myelodysplastic anemia presented with a swollen right knee after twisting and falling. No obvious abrasions to the knee were noted, and the knee was stable. No history of swelling, masses, or infection of the knee were reported. He was given crutches and a knee immobilizer and instructed to follow-up with his primary care physician.

Ten days after initial injury, the knee was still swollen and painful, and swelling and erythema of the entire calf, ankle, and foot were noted. No fever or systemic signs of infection were present. A lower extremity ultrasound revealed a popliteal cyst that tracked caudally approximately 10 cm into the calf.

Symptomatic treatment with rest, ice, and anti-inflammatory medications was prescribed. Three weeks after initial trauma, the patient presented with continued pain localized to the knee, popliteal fossa, and posterior aspect of the leg. On physical examination, his temperature was 97°F with stable vital signs. Significant tenderness to palpation of the calf and popliteal fossa was noted, and the knee and calf were warm to the touch. Significant knee effusion, erythema, and swelling of the leg extending to the ankle with painful range of knee motion were noted. Knee extension lacked 30° and flexion was approximately 60°.

Several psoriatic plaques were noted over the anterior aspect of the right lower extremity.

Laboratory values on admission included white blood cell count 7.0 with a normal differential and an erythrocyte sedimentation rate of 69. The right knee was aspirated with return of 25 cc of yellowish, purulent material. Gram stain revealed 4+ gram positive cocci with final cultures growing Staphylococcus epidermidis sensitive only to vancomycin.

Computed tomography (CT) of the right leg, performed due to the unavailability of magnetic resonance imaging (MRI), revealed a significant collection localized to the popliteal fossa tracking distally to within 5 cm of the ankle consistent with a ruptured septic popliteal cyst. From the Department of Orthopedics, Brown University School of Medicine, Rhode Island Hospital, Providence, RI. Reprint requests: Robert Z. Tashjian, MD, 593 Eddy St, APC 7—Dept of Orthopedics, Rhode Island Hospital, Providence, RI 02903.

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Irrigation and debridement of the knee was performed through a medial arthrotomy with placement of vancomycin impregnated cement beads. Repeat irrigation and debridement of the knee along with debridement of the Baker’s cyst were performed the following day. The cyst was approached through a posterior approach to the knee where a significant amount of pus and cyst cavity lining, which extended distally within the deep posterior compartment of the leg, were removed. The wounds were bead pouched, and a delayed closure was performed within the next 72 hours. A 6-week course of vancomycin was prescribed. Total knee range of motion was approximately 70°.

Within 6 months, a recurrence of knee sepsis required arthroscopic and open irrigation and debridement and intravenous vancomycin. A heel ulcer on the injured side became infected with vancomycin-resistant Enterococcus. Residual knee motion was approximately 20°. Within 2 weeks of discharge, the patient fell, sustaining an intertrochanteric hip fracture on the same side. Given the persistent infection, severely compromised knee, and ipsilateral hip fracture, the patient underwent above-the-knee amputation. The hip fracture was treated nonoperatively. The amputation site has subsequently healed. The hip fracture has healed in good position. He is currently being fitted for a prosthesis.

**DISCUSSION**

Since the last literature review by Drees et al.,7 who noted a total of 18 reported cases of septic popliteal cysts, 2 other cases have been reported. A 45-year-old man with Neisseria gonorrhoeae septic arthritis and popliteal cyst was treated with ceftriaxone and doxycycline, and a 60-year-old woman with mitral valve endocarditis and Aerococcus viridians-induced septic arthritis and popliteal cyst was treated with irrigation and debridement, penicillin, and cefotaxime.8,9 (Medical literature review using PubMed/National Library of Medicine from 1966-2001.)

Our report is the twenty-first recorded case and the first in a patient with psoriatic arthritis. Previously reported organisms include Staphylococcus aureus, Bacteroides species, Escherichia coli, Echinococcus, Clostridium perfringens, Aspergillus fumigatus, Mycobacterium tuberculosis, Brucella abortus, N gonorrhoeae, and A viridians. Staphylococcus epidermidis has not been previously noted as a causative organism.

An infected, ruptured popliteal cyst presents with pain, swelling, and a localized mass in the calf. An associated painful knee effusion also may be present. Confusion with deep vein thrombosis (DVT), most notably in patients with rheumatoid arthritis, has been cited and some authors have suggested the use of the physical finding of ecchymosis to differentiate it from a DVT or cellulitis.10 As a result, and as in this case, care may be delayed due to a difficult diagnostic dilemma.11

Diagnostic modalities for evaluating an infected popliteal cyst include arthrography, ultrasonography, scintigraphy, CT, and MRI. Arthrography has been used to show communication of a known septic knee with a popliteal cyst.12 On ultrasonography, a typical Baker’s cyst appears well-defined and anechoic whereas increased echogenicity with multiple internal echoes can be seen with hemorrhage into the cyst, infection, or synovitis.13,14 Tc-99m three-phase bone scan is a useful screening examination for infected cysts; however, it usually is performed to evaluate for other possible knee pathology or septic arthritis. Magnetic resonance imaging is the imaging method of choice with the added benefits of determining any internal derangement of the knee, the anatomy of the ruptured cyst, and coexisting osteomyelitis.7,13 Due to the unavailability of MRI at the hospital where the care of this patient was given, CT was performed preoperatively to define the extent and anatomy of the ruptured cyst.

Treatment for septic popliteal cysts has ranged from intravenous antibiotics, irrigation and debridement with intravenous antibiotics, to primary amputation.7,9,11,12,15-20 In the present case, a staged procedure was performed during debridement with antibiotic beads because of the patient’s immunocompromised status. A majority of the reported outcomes of patients with septic Baker’s cysts have been promising with resolution of symptoms or mild stiffness. The poor results of this patient are likely due to the initial delay in treatment combined with his significant immunocompromised status.

This case represents a relatively uncommon complication of septic arthritis. Similarly, no previous reports of ruptured infected popliteal cysts in psoriatic arthritis or with positive cultures for S epidermidis have been reported. The outcome of this patient reflects the difficult nature of dealing with this problem in
immunocompromised patients and the urgency with which treatment should be sought despite difficult diagnosis.

REFERENCES