

Acute Febrile Calf: Early Diagnosis in the Emergency Department of One Patient with Ankylosing Spondylitis with a Ruptured Baker's Cyst

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Acute rupture of a Baker's cyst can cause sudden-onset swelling and pain in the affected calf, and may be confused with symptoms of deep vein thrombosis. We describe a case of a young man presenting with an acute febrile calf at our emergency department where multidetector computed tomography (MDCT) with coronal reformation was performed. A ruptured Baker's cyst was diagnosed. After admission, ankylosing spondylitis was diagnosed by advanced clinical and radiological examinations. It is important to ensure that patients afflicted with a ruptured Baker's cyst are diagnosed early, typically by the application of appropriate and useful clinical imaging modalities (e.g. MDCT) in the emergency department.

Key words: Baker's cyst; Deep vein thrombosis; Ankylosing spondylitis; Computed tomography

INTRODUCTION

An obvious shape and palpable mass over the semi-membranous gastrocnemius bursa is known as a Baker's (popliteal) cyst, which may eventually rupture, resulting in a swollen and painful calf¹. Baker's cyst is frequently encountered in outpatient clinics, but it seems to be uncommon in the emergency department (ED), where physicians have to make an accurate differential diagnosis. A ruptured Baker's cyst is clinically indistinguishable from deep vein thrombosis (DVT), necessitating a detailed examination of the patient and the application of appropriate imaging techniques. If a ruptured Baker's cyst is inadvertently diagnosed as DVT, the administration of an anticoagulant to the patient will increase the risk of developing an acute posterior compartment syndrome². Herein, we present a case of an acute febrile calf in a young man who visited the ED. We were able to distinguish a ruptured Baker's cyst from DVT by multidetector computed tomography (MDCT) with coronal reformation.



Fig. 1 Photograph of the posterior knees and calves: Obvious swelling in the left calf near the popliteal region.

CASE REPORT

A 23-year-old man with a four-week history of intermittent low-grade fever attended our ED with acute pain, distension, and heat in his left calf (Fig. 1) of three days' duration. The pain was exacerbated while extending the left knee and walking (Foucher's sign). Persistent irritable pruritus on the skin of the left calf was also noted. The patient had suffered from intermittent low back pain for six months, especially in the morning. He had no history of

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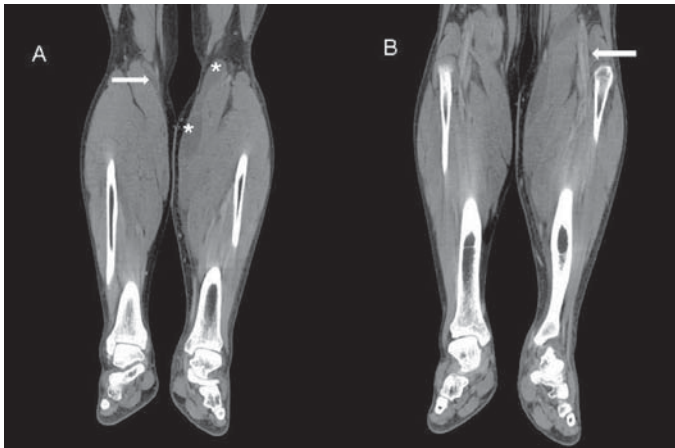


Fig. 2 (A) Multidetector computed tomography (MDCT) with coronal reformation of the knees: Ruptured Baker' cyst in the left knee dissecting into the left calf muscle is demonstrated (white asterisks). A well-defined cystic structure without extension in the right knee is also illustrated (white arrow). (B) MDCT with coronal reformation in a contrast-enhanced venous phase: Patent venography revealing the absence of any thrombosis or obstruction (white arrow).

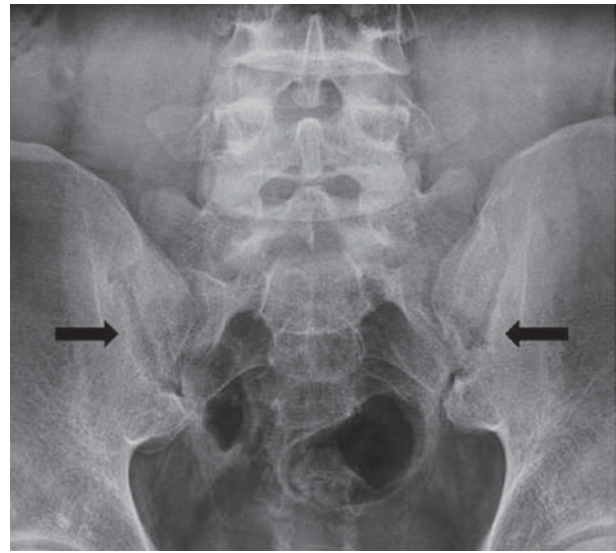


Fig. 3 Radiograph of the pelvis: Such pelvic radiography reveals bilateral grade 2 sacroiliitis with erosions, bony sclerosis and joint-width irregularities (black arrows).

local trauma or predisposing factors for DVT but had a family history of low back pain.

His vital signs were normal, except for a body temperature of 38.1°C. On examination we noted blanching erythematous skin lesions on his lower legs, especially on the left leg just below the knee. A musculoskeletal examination revealed a swollen, warm and diffusely tender left calf. Calf circumference was 38 cm on the right, but 43.5 cm on the left. Homan's sign was positive on the left leg. Under appropriate stress testing, no abnormal findings were noted for his cruciate and collateral ligaments.

A complete blood count revealed a white blood cell count of 14,900/ μ L with a predominance of neutrophils. The erythrocyte sedimentation rate was 50 mm/h and the C-reactive protein level was 6.58 mg/dL. Urinalysis and all biochemical parameters tested showed normal results.

MDCT with coronal reformation of the knees disclosed a popliteal cyst communicating with the semimembranosus gastrocnemius bursa over the posterior — medial aspect of the left knee and the upper third of the calf. Irregular synovial thickening in the popliteal cyst (Fig. 2A) was also noted. Contrast-enhanced imaging of the popliteal vein revealed its patency (Fig. 2B). The patient underwent arthrocentesis in the ED. Yellowish and turbid synovial fluid was obtained, and tested negative with a Gram-stain examination. The white blood cell count in the synovial fluid was 32,000/ μ L. We treated the patient with 30 mg of

intravenous ketorolac and admitted him to the rheumatology ward.

Serological tests for both rheumatoid factor and anti-nuclear antibodies were negative. Ankylosing spondylitis was diagnosed according to the modified New York criteria, associated with a six-month history of low back pain with morning stiffness, and bilateral grade 2 sacroiliitis (Fig. 3). Oral sulfasalazine 500 mg twice a day and diclofenac were added to his treatment. Following 10 days of medical treatment and an intraarticular injection of corticosteroid, the patient was discharged without any further symptoms.

DISCUSSION

Acute calf infection is frequently encountered in the ED. Fever and swollen legs are major symptoms that may lead ED physicians to primarily consider an infectious origin. In contrast, a ruptured Baker's cyst is easily missed. We point out that early application of an appropriate radiological examination may give an early diagnosis of a ruptured Baker's cyst.

Baker's cysts are usually related to osteoarthritis, rheumatoid arthritis, or, less commonly, to certain infections, trauma, and other causes of arthritis³. Treatments for a Baker's cyst include bed rest, icepacks, leg elevation, the administration of nonsteroidal anti-inflammatory drugs, aspiration of the cyst fluid, and intraarticular corticosteroid

injections. However, treating the underlying disease is mandatory for the prevention of recurrence. A large Baker's cyst may rupture and thus cause further complications. Pseudothrombophlebitis syndrome is the most dramatic complication of an acute ruptured Baker's cyst⁴.

DVT is the most common cause of swollen legs, being responsible for 44.8% of diagnoses, while ruptured Baker's cysts are responsible for only 2.4%⁵. Clinically, it is necessary to distinguish a ruptured Baker's cyst from DVT. A single CT slice through a swollen calf has been suggested to differentiate between a cyst extension, hematoma and venous or lymphatic obstruction, but it does not provide the facility to detect DVT⁶. Ultrasonography, arthrography, and MRI may provide more assistance in differentiating between these two entities⁷. However, MRI is relatively expensive and typically unavailable in most EDs, while ultrasonography and arthrography are technically dependent on the operating individual's expertise, and may not always be available in an ED. MDCT, which allows for a shorter acquisition time, greater coverage, and superior image resolution is potentially the method of choice for the evaluation of a ruptured Baker's cyst, particularly for patients who feature somewhat equivocal clinical presentations. In previous reports, MDCT has proven to be very useful for diagnosing myocardial infarction, aortic disease, and acute appendicitis in the ED⁸⁻¹⁰.

Fever is the most frequent chief complaint of patients visiting the ED, and concomitant with a presentation of a tender swollen calf, several differential diagnoses should be made. For the acute febrile calf, other possibilities should be considered including murine typhus, polyarteritis, and leptospirosis¹¹⁻¹³. We emphasize that all potential causes of inflammatory soft tissue disease, including a ruptured Baker's cyst, must be considered by ED physicians. Baker's cysts can remain undetectable during the clinical examination even if the cysts have ruptured¹⁴. A positive Foucher's sign is a specific test eliciting knee pain during leg extension or even when walking that favors the diagnosis of ruptured Baker's cyst¹⁵. Persistent pruritus on the skin of the affected leg caused by the irritation of inflammatory synovial fluid is another important clinical feature of a ruptured Baker's cyst¹⁶.

Since there are many predisposing factors that may produce a Baker's cyst, early detection and appropriate diagnosis of the underlying disease are vital. Ankylosing spondylitis is one of the rheumatic diseases that may develop an early ruptured Baker's cyst, but it is very uncommon¹⁷. Symptoms of persistent calf skin pruritus and a positive Foucher's sign are important in suggesting the diagnosis of ruptured Baker's cyst. In addition, it is

imperative that a suspected DVT patient should not be treated with an anticoagulant until DVT has been confirmed; as such treatment could contribute to the deterioration of the clinical course (i.e., acute posterior compartment syndrome) of a ruptured Baker's cyst².

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Early diagnosis of a ruptured Baker' cyst

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