



> THE PATIENT

5-year-old boy

> SIGNS & SYMPTOMS

- Bilateral calf pain
- Fever
- Cough and rhinitis

CASE REPORT



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> THE CASE

A 5-year-old previously healthy white boy presented to clinic with bilateral calf pain and refusal to bear weight since awakening that morning. Associated symptoms included a 3-day history of generalized fatigue, subjective fevers, cough, congestion, and rhinitis. The night prior to presentation, he showed no symptoms of gait abnormalities, muscle pain, or weakness. There was no history of similar symptoms, trauma, overexertion, foreign travel, or family history of musculoskeletal disease. He was fully immunized, except for the annual influenza vaccine. He was not taking any medications. This case occurred before the onset of the COVID-19 pandemic.

Objective findings included fever of 101 °F, refusal to bear weight, and symmetrical bilateral tenderness to palpation of the gastrocnemius-soleus complex. Pain was elicited with passive dorsiflexion. There was no erythema, edema, or sensory deficits, and the distal leg compartments were soft. There was normal range of motion of the hips, knees, and ankles. Dorsalis pedis pulses were 2+, and patella reflexes were 2/4 bilaterally.

Lab results included a white blood cell count of 2500/μL (normal range, 4500 to 11,000/μL); absolute neutrophil count, 900/μL (1500 to 8000/μL); platelet count, 131,000/μL (150,000 to 450,000/μL); creatine kinase level, 869 IU/L (22 to 198 U/L); and aspartate aminotransferase level, 116 U/L (8 to 33 U/L). A rapid influenza swab was positive for influenza B. Plain films of the bilateral hips and lower extremities were unremarkable. C-reactive protein (CRP) level, urinalysis, and renal function tests were within normal limits. Creatine kinase (CK) level peaked (1935 U/L; normal range, 22 to 198 U/L) within the first 24 hours of presentation and then trended down.

THE DIAGNOSIS

The patient's sudden onset of symmetrical bilateral calf pain in the setting of an upper respiratory tract infection was extremely suspicious for benign acute childhood myositis (BACM). Lab work and radiologic evaluation were performed to rule out more ominous causes of refusal to bear weight. The suspicion of BACM was further validated by influenza B serology, an elevated CK, and a normal CRP.

DISCUSSION

BACM was first described by Lundberg in 1957.¹ The overall incidence and prevalence are unclear.² A viral prodrome involving rhinorrhea, low-grade fever, sore throat, cough, and malaise typically precedes bilateral calf pain by 3 days.²⁻⁴ Myositis symptoms typically last for 4 days.³ While several infectious etiologies have been linked to this condition, influenza B has the greatest association.^{5,6}

CONTINUED



While several infectious etiologies have been linked to benign acute childhood myositis, influenza B has the greatest association.

■ **Patient population.** BACM occurs predominately in school-aged children (6-8 years old) and has a male-to-female ratio of 2:1.^{3,5,6} In a retrospective study of 219 children, BACM was strongly associated with male gender and ages 6 to 9 years.³ In another retrospective study of 54 children, 80% of patients were male, and the mean age was 7.3 years.⁵

■ **Key symptoms and differential.** The distinguishing feature of BACM is bilateral symmetric gastrocnemius-soleus tenderness.^{2,4} Additionally, the lack of neurologic symptoms is an important differentiator, as long as refusal to bear weight is not mistaken for weakness.⁶ These features help to distinguish BACM from other items in the differential, including trauma, Guillain-Barre syndrome, osteomyelitis, malignancy, deep vein thrombosis, and inherited musculoskeletal disorders.²

■ **Laboratory evaluation** will often show mild neutropenia, thrombocytopenia, and mild elevation in CK.^{7,8} CRP is typically normal.^{4,7,9} In a retrospective study of 28 admissions for BACM from 2001 to 2012, common findings included leukopenia (35%), neutropenia (25%), and thrombocytopenia (21%). The median CK value was 4181 U/L.⁴ In another analysis of BACM cases, mean CK was 1872 U/L.⁵

■ **Biopsy** is unnecessary; however, calf muscle samples from 11 of 12 children with suspected BACM due to influenza B infection were consistent with patchy necrosis without significant myositis.¹⁰

■ **Complications.** Rhabdomyolysis, although rare, has been reported with BACM. In 1 analysis, 10 of 316 patients with influenza-associated myositis developed rhabdomyolysis; 8 experienced renal failure. Rhabdomyolysis was 4 times more likely to occur in girls, and 86% of cases were associated with influenza A.⁶ Common manifestations of rhabdomyolysis associated with influenza include diffuse myopathy, gross hematuria, and myoglobinuria.⁶

■ **Treatment** is mainly supportive.^{4,8,9} Antivirals typically are not indicated, as the bilateral calf pain manifests during the recovery phase of the illness.^{4,9,11} BACM is self-limited

and should resolve within 3 days of myositis manifestation.² Patients should follow up in 2 to 3 weeks to verify symptom resolution.²

If muscle pain, swelling, and tenderness worsen, further work-up is indicated. In more severe cases, including those involving renal failure, intensive care management and even dialysis may be necessary.^{4,6}

■ **Our patient** was hospitalized due to fever in the setting of neutropenia. Ultimately, he was treated with acetaminophen and intravenous fluids for mild dehydration and elevated CK levels. He was discharged home after 3 days, at which time he had complete resolution of pain and was able to resume normal activities.

THE TAKEAWAY

Benign acute childhood myositis is a self-limited disorder with an excellent prognosis. It has a typical presentation and therefore should be a clinical diagnosis; however, investigative studies may be warranted to rule out more ominous causes. Reassurance to family that the condition should self-resolve in a few days is important. Close follow-up should be scheduled to ensure resolution of symptoms.

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