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Case Presentation

Inflammatory Myopathy Causing Leg Pain in a Soccer Player: Case Report and Return-to-Play Considerations

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Abstract

Leg pain is a common condition in athletes as well as in the general population, and has a broad differential diagnosis that includes musculoskeletal, vascular, rheumatologic, and neurologic etiologies. Idiopathic inflammatory myopathy (IM) is a relatively uncommon but recognized etiology of leg pain. In this case, we describe an acute presentation of IM in an athlete resulting in leg pain and activity limitation. The available literature suggests that moderate-intensity exercise is safe and beneficial in idiopathic IM, but studies to date have not assessed the effects of high-intensity exercise in IM or provided recommendations for return to competitive contact sport in this population.

Introduction

Leg pain in the athlete has a broad differential diagnosis, including the following: musculoskeletal etiologies (tendinopathy, enthesopathy, myopathy, muscle strains, periostitis, stress reactions, stress fractures, bursitis, and chronic exertional compartment syndrome); vascular etiologies (endofibrosis, popliteal artery entrapment syndrome, cystic adventitial disease, adductor canal syndrome, effort thrombosis, and peripheral vascular disease); and neurologic etiologies (spinal stenosis, radiculopathy, plexopathy, mononeuropathy, polyneuropathy, and peripheral neuropathy) [1]. Accurate diagnosis relies on knowledge of common and rare causes of leg pain, careful clinical evaluation, and informed application of imaging, electrodiagnostic, and laboratory studies. Idiopathic inflammatory myopathy (IM), an uncommon but recognized etiology of leg pain, is a group of rare, heterogeneous, autoimmune skeletal muscle disorders characterized by muscle weakness, fatigue, and diminished aerobic fitness. Although studies suggest moderate physical activity is safe and beneficial in patients with IM, there is a paucity of literature available to inform decisions on return to competitive contact sport. Herein we describe a diagnostically challenging case of IM-related leg pain in a competitive soccer player and the athlete's successful return to vigorous exercise and contact sport.

Case Presentation

A 17-year-old female high school soccer player presented to our sports medicine clinic with bilateral posterior leg pain, swelling, and tightness. Symptoms had first been noted after an uneventful mid-season soccer game 9 days before presentation. She denied any significant leg trauma or strain during the game. There was no history of previous leg symptoms, but she later recalled transient circumferential right forearm swelling and pain following a soccer game the week before her leg symptoms, again without any trauma.

The initial leg pain and swelling progressed over 5 days to the point of hindering walking, and she initially sought care in an emergency department. Leg radiographs were normal except for mild subcutaneous edema posterior to the gastrocnemius muscles. She was discharged with axillary crutches, an oral nonsteroidal anti-inflammatory drug, and a follow up appointment in a sports medicine clinic.

At presentation to the sports medicine clinic 9 days after the initial symptoms, the leg pain and swelling had slightly improved. She denied paresthesias, back pain, bowel or bladder symptoms, hematuria, dyspnea, skin changes, or constitutional symptoms. Past medical history was significant only for seasonal allergies. Medications included diphenhydramine and loratadine.

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Examination identified diffuse tenderness with palpation of the posterior calf musculature bilaterally. Leg muscle bulk was normal and symmetric. There was no leg edema, distention, or firmness. The knees, ankles, and toes demonstrated full range of motion except for passive and active ankle dorsiflexion, which both exacerbated the calf pain. Toe walking also provoked pain. Lower limb muscle stretch reflexes, strength, and sensation were normal. Distal pulses were intact. There were no skin abnormalities. Initial laboratory evaluation revealed a normal urinalysis and serum creatine kinase, electrolytes, and creatinine.

Given the patient's symptomatic improvement and normal initial testing, no intervention or further studies were initiated. Over the next 10 days, her symptoms continued to improve, and use of crutches was discontinued. Unfortunately, the leg pain and swelling gradually recurred over the next several days, this time without exertion. Subsequent physical examination findings were similar to those at initial presentation, with diffuse posterior calf tenderness and mild swelling but supple leg compartments. Given the severe progressive pain and difficulty walking, superficial and deep posterior compartment pressure testing was performed, which revealed pressures well within normal limits (4-12 mm Hg).

Additional laboratory workup showed an elevated erythrocyte sedimentation rate (ESR) of 31 mm/h (normal 0-29 mm/h), elevated C-reactive protein (CRP) level of 16.3 mg/L (normal $\leq$ 8.0), weakly positive antinuclear antibodies of 1.1 (normal $\leq$ 1.0, weak positive 1.1-2.9), and mild thrombocytosis of 470 $\times$ 10^9/L (normal 150-450 $\times$ 10^9/L).

Bilateral leg magnetic resonance imaging (MRI) showed diffuse, patchy areas of increased T2 signal, involving muscles within all compartments of both legs but greatest in the posterior compartments (Figures 1 and 2). The bilateral distal thigh subcutaneous tissues and musculature exhibited similar patchy T2 hyperintensity. In the clinical context, the MRI findings were suggestive of IM or vasculitis. Eosinophilic fasciitis was believed to be less likely given the disproportionate muscle involvement. The patchy intramuscular findings were also atypical for delayed-onset muscle and denervation changes, which typically involve the muscles more diffusely. Given the MRI findings, specialists in neurology and rheumatology were consulted to aid in diagnosis and development of a management plan. Electrodiagnostic testing showed slightly short duration motor unit potentials in lower leg muscles, suggestive of a focal myopathic process without features of fiber-splitting or necrosis. There was no compelling evidence of a diffuse myopathic process. A left lateral gastrocnemius biopsy identified scattered necrotic muscle fibers and heavy inflammatory exudate consistent with a severe, active, immune-mediated, undifferentiated IM. Laboratory workup for a paraneoplastic process and a positron emission tomography (PET) scan were negative.

Treatment was initiated with oral prednisone (40 mg daily), slowly tapered over 14 weeks. The leg pain and swelling quickly improved, and within a few weeks of initiating therapy the patient returned to jogging without pain. After 8 weeks of treatment, she was progressed to high-intensity exercise and subsequently returned to unrestricted soccer practice without difficulty. The patient returned to high-level sport participation and went on to play intercollegiate level soccer without recurrence of activity-limiting leg symptoms at a 2.5-year follow-up.

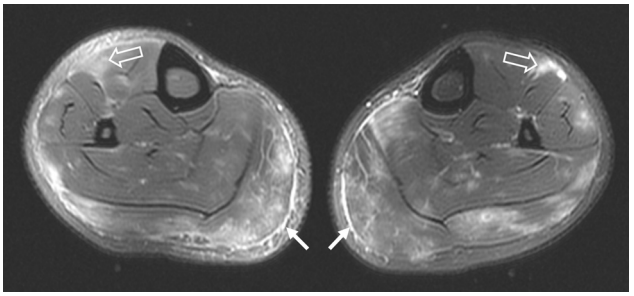

Figure 1. Axial T2-weighted fat saturated image of the mid calves demonstrates prominent scattered intramuscular edema. The muscle changes involve both the anterior and posterior compartments, but the changes are most notable in the gastrocnemius muscles. Mild fascial edema is evident along the superficial fascia of the medial gastrocnemius muscles (arrows).

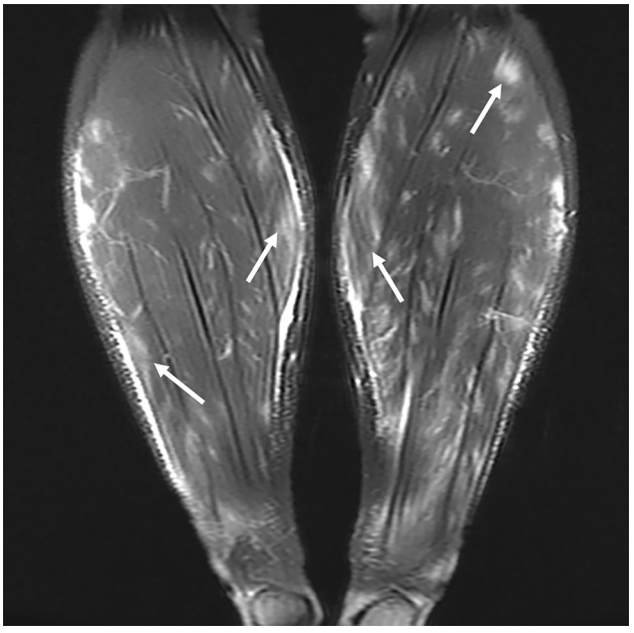

Figure 2. Coronal T2-weighted fat saturated image through the posterior compartment of both calves demonstrates scattered areas of intramuscular edema (arrows) in both calves. These findings are nonspecific and can be seen in the case of inflammatory myopathy, diabetic myonecrosis, or vasculitis.