Bilateral Exertional Leg Pain in an Adolescent Female Soccer Player

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Disclosures

• Financial
  • Nothing to disclose

• Conflicts of Interest
  • None
Presentation to Sports Medicine Center

- 17 year old female soccer player
- Bilateral posterior leg pain/swelling/”tightness”
  - Symptoms improving
- Symptom onset 9 days earlier after an uneventful soccer game
- Denied significant leg trauma or acute injury
Additional History

- Emergency Department 5 days prior
  - Initial progression of leg swelling and pain made walking difficult
- Leg radiographs - mild subcutaneous edema posterior to the gastrocnemius muscles
- Released from ED with axillary crutches and oral pain medications
  - Sports Medicine follow up appointment
X Ray Images
Additional History

• Pain slowly improving
  • Exacerbated with walking and ankle/toe flexion, at times without precipitating activity

• Denied
  • Any constitutional symptoms or changes
  • Paresthesias
  • Back pain
  • Bowel or bladder symptoms
  • Hematuria
  • Dyspnea
Physical Examination

• General: Fit-appearing adolescent female, no apparent distress.

• Skin: No erythema, ecchymosis, or rash about the bilateral lower legs.

• Vessels: Normal posterior tibial and dorsalis pedis pulses bilaterally. Good capillary refill in all toes.

• Gait: Significantly antalgic, unable to rise onto toes due to pain, normal heel walking.
Physical Examination

• Musculoskeletal:
  • Diffuse tenderness to palpation about the mid muscle belly of the gastrocnemius and soleus bilaterally.
  • Normal and symmetric calf muscle bulk, tone, and strength.
  • No calf muscle firmness.
  • Active and passive ankle dorsiflexion reproduced calf pain on each side at the extreme of range.
  • Pain reproduced with resisted plantar flexion
• Neurologic
  • Strength: Activated all major muscle groups in the bilateral lower limbs. Plantar flexion 4/5 on each side, seemingly due to pain.
  • Sensation: Intact to light touch in the dermatomes of lower legs bilaterally.
  • Reflexes: Bilateral muscle stretch reflexes physiologic and symmetric in affected area. Plantar responses downgoing bilaterally.
Questions?

• Interval Summary
  • 17 year old female soccer player
  • 9 days of BL calf pain and tightness
  • No known trauma

• Diffuse bilateral mid-muscle belly gastrocnemius and soleus tenderness
• Calf pain limits passive and active ankle dorsiflexion and ability to rise onto toes
Pertinent Differential Diagnosis

• Musculoskeletal etiologies
  • Muscular strains
  • Chronic exertional compartment syndrome
  • Myopathy
  • Bone stress injuries
  • Rhabdomyolysis

• Vascular etiologies
  • Endofibrosis
  • Popliteal artery entrapment syndrome
  • Peripheral vascular disease
Pertinent Differential Diagnosis

- Neurologic etiologies
  - Spinal stenosis
  - Radiculopathy
  - Plexopathy
  - Mononeuropathy
  - Polyneuropathy
  - Peripheral neuropathy
Interval History

• Initial laboratory tests normal
  • CK (91), Cr, electrolytes, UA

• Plan
  • Continue partial weight-bearing with axillary crutches
  • Close ATC follow up through school
Follow up 10 days later

- Symptoms improved over 10 days
  - 70% better, no limp, only mild pain with single leg calf raise
  - “When can I start playing soccer?”
Symptom Recurrence

- Over next several days, leg pain and swelling without exertion reoccurred
- Diffuse posterior calf tendernessness and mild swelling, but supple leg compartments

- Oh, and by the way…
  - Transient right forearm swelling and pain the week prior to leg symptoms
Further Evaluation

• Compartment pressure testing performed
  • Superficial and deep
  • Measurements (4-12 mm Hg), well within normal limits.

• Venous US showed patent deep veins without thrombosis
Further Evaluation

- ESR 31 (normal 0-29 mm/1 hour)
- CRP 16.3 (normal $\leq 8.0$ mg/L)
- Anti-nuclear antibodies 1.1
  - (normal $\leq 1.0$, weak positive 1.1-2.9)
- Platelets 470 x $10^9$/L (normal 150-450 x $10^9$/L)
MRI Bilateral Legs – Coronal T2
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MRI Bilateral Legs

- Non-specific diffuse patchy areas of increased T2 signal involving the muscles and subcutaneous tissues of all leg compartments.
Consultation and Further Testing

- Rheumatology consultation
  - ESR 60, CRP 56
- Differential Diagnosis
  - Inflammatory myopathy
  - Dermatomyositis
  - Eosinophilic fasciitis
  - Too much muscle involvement
- Electromyography
  - Borderline short duration, low amplitude motor units in multiple calf muscles
Gastrocnemius Biopsy (Left Lateral)

- Scattered necrotic muscle fibers
- Heavy inflammatory exudate

- Severe, active immune-mediated inflammatory myopathy
Further workup

- Normal paraneoplastic Ab, HIV Ab
- PET scan – no malignancy
Treatment Plan

• Oral prednisone (40 mg daily) with a slow taper over 14 weeks
• Refrain from sport
Outcome

- Leg pain and swelling quickly improved
- Jogging pain-free within a few weeks
- After 8 weeks of treatment
  - Released to high-intensity contact activity
  - Returned to soccer practice without difficulty
- Completed the next year’s season with no recurrence
Questions & Discussion