

The Resilient Specialist: What Happens When Grit Meets a Lower-Leg Injury



An Exercise in Advanced Clinical Decision-Making

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Learning Objectives

At the conclusion of this session, participants will be able to:

- Identify key subjective and objective findings in a complex lower-leg injury.
- Develop and refine a differential diagnosis as new information is presented.
- Integrate anatomy, biomechanics, and occupational demands into clinical reasoning.
- Discuss the role of interprofessional collaboration in optimizing outcomes.
- Apply evidence-based load management strategies to endurance and tactical athletes.

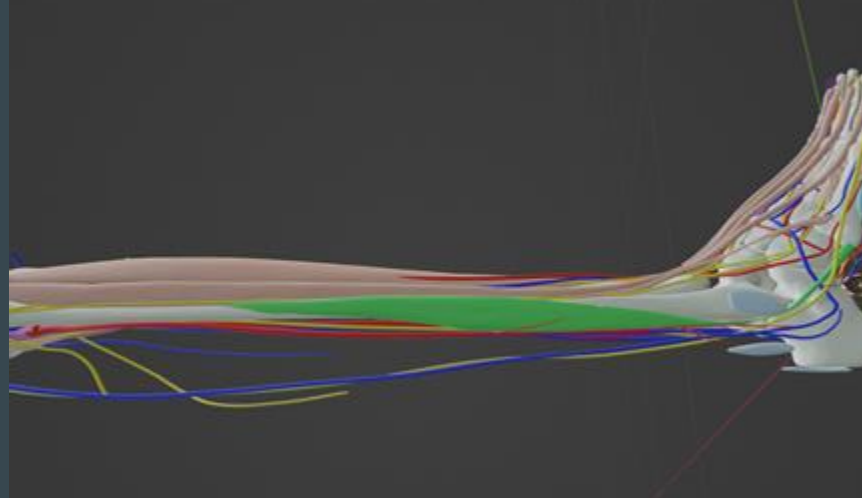
Patient Background

- 36 y/o male SERE Specialist training for a 125 mile Sedona Canyons ultra
- Weekly mileage about 85 with 10% weekly increase
- High elevation trail terrain with frequent climbs and descents
- Sudden right-sided lower leg pain during a 12 mile training run
- Described as “fullness” medially with 8/10 pain by end of run
- Reported numbness in posterior leg and plantar foot
- Unable to continue running and walked back to vehicle



Initial Differential Reasoning

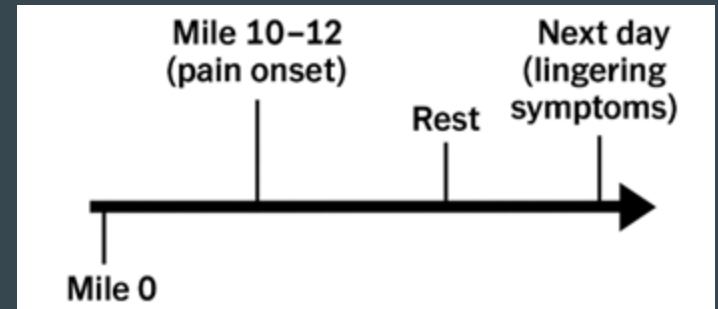
- 3 most likely diagnoses
- 3 less likely diagnoses
- 1-2 non-musculoskeletal possibilities



What Would You Ask Next

You are now taking the history. Which subjective questions would help you?

- Rule out bone or stress injury?
- Rule out tendon or muscle pathology?
- Rule out neural or vascular involvement?



Subjective Findings

- Pain onset: gradual between miles 10-12 of 12 mile run
- Location: medial right lower leg, between ankle and calf
- Description: fullness
- Pain intensity: 8/10 at end of run, resolved with rest
- Residual: numbness and pain limited plantarflexion/inversion for several days
- No trauma, night pain, or morning stiffness
- No prior history of similar symptoms
- Re-order your differential list

Objective Exam - What Would You Test

You have completed the subjective exam and updated your differential diagnosis list.

What tests or measures would help you?

- Rule in/out BSI
- Assess for tendinopathy or muscular overload
- Screen for neural or vascular involvement
- Detect possible compartment dysfunction

Objective Findings

- Gait: antalgic, pain during toe-off
- No visible swelling or deformity
- Palpation: deep tenderness posterior medial tibia (distal $\frac{1}{3}$)
- Strength: weakness in PF/IV
- Pain reproduced with overpressure into PF/IV
- Neural Screen: tibial-bias slump causes symptoms in deep posterior calf
- Sensation: decreased light touch over right medial plantar surface

Functional Testing & Image Findings

Functional Testing

- Pre-run: FHL and FDL 5/5, pain 5/10
- 5 minute treadmill run with immediate MMT, strength 4/5 with pain and “fullness”
- Palpation: increased tenderness distal posteromedial tibia post run
- No visible swelling, redness or temperature change

Imaging

- MRI: no cortical or marrow edema, no periosteal reaction
- No structural or soft tissue abnormalities detected
- Used to rule out BSI, not confirm compartment syndrome

Anatomy Review - Deep Posterior Compartment

Muscles

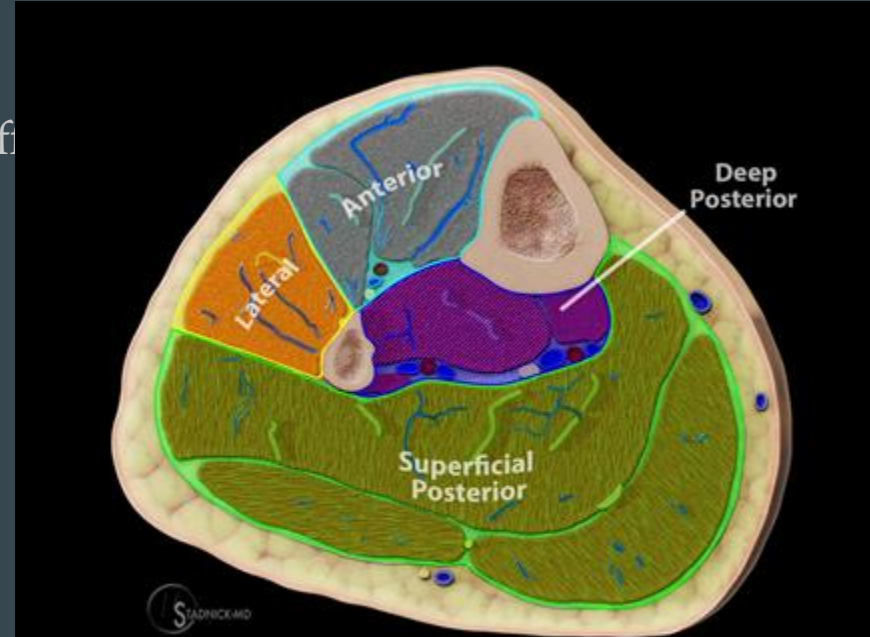
- Tibialis posterior - inversion, arch support
- Flexor digitorum longus - toe flexion
- Flexor hallucis longus - great toe flexion, push off power
- Popliteus - IR tibia

Neurovascular

- Tibial nerve
- Posterior tibial artery and vein

Function: PF/IV, and dynamic arch stability

Enclosed by dense fascia, limiting capacity to expand



Treatment Planning - What Would You Do Next

You've ruled out BSI and suspect deep posterior compartment syndrome.

How would you treat this athlete conservatively?

- Activity/load modifications
- Manual or mechanical interventions
- Neurodynamics
- Strength & conditioning focus
- Team collaboration

What We Did - Actual Treatment Plan

Multimodal Intervention

- Extracorporeal Shockwave (ESWT): 4000 pulses @ 1 bar, then 2000 pulses @ 1 bar
- Dry needling & e-stim: targeted tibialis posterior, FDL, FHL region
- IASTM: right posterior leg for fascial mobility
- Compression Therapy: GameReady, post session and at home 3-5x per day
- Blood Flow Restriction (BFR): cycling, 20 min @ 60 watts, 80% diastolic occlusion
- Activity Modification: no running x 1 wk, then return to run on AlterG @ 60% BW, progressive return
- Neural Mobility: tibial nerve glides
- Follow-up: 5x per week x 2 weeks, then 2-3 for another 4 weeks

Progression & Collaboration Phase

Multimodal Intervention

- Reduced frequency to 2-3x per week
- AlterG progression to outdoor running
- Continued: ESWT, neurodynamics, recovery devices
- S&C Coach: structured run programming
- PCSM: confirmed improvement, held compression testing
- BFR cycling: 1-2x per week

Outcome & Case Resolution

- Returned to full training within 3 weeks
- Completed 125 mile Sedona Canyons ultra
- No recurrence of “fullness” or exertional pain
- Remained on Active Duty - No duty restrictions



Key Takeaways & Teaching Reflections

- Pattern recognition starts with the story, not the tests
- Hypothesis-driven exams are more efficient and accurate
- Collaborative care enhances outcomes and accountability
- Functional testing bridges diagnosis and performance
- Understand the “why” behind tests and interventions, not just the “what”
- Expert clinicians adapt reasoning, not protocols

Clinical Tools & Techniques Reference

- Extracorporeal Shockwave Therapy (ESWT)
 - Acoustic waves to stimulate microcirculation, tissue compliance, and pain modulation
 - Used here for: deep posterior compartment perfusion and fascial mobility
- Blood Flow Restriction Training (BFR)
 - Low load exercises with vascular occlusion (80%-100%)
 - Promotes hypertrophy, aerobic stimulus, and perfusion without full mechanical stress
- Dry Needling + Electrical Stimulation
 - Intramuscular needling to reduce neuromuscular tone or pain
 - Low frequency e-stim between needles promotes circulation and motor reactivation

A silhouette of a person running on a hill during a sunset or sunrise. The runner is on the left side of the frame, moving towards the right. The background features a warm, orange and yellow sky, distant mountains, and some sparse vegetation on the right. A semi-transparent dark rectangle is overlaid in the center, containing the word "QUESTIONS" in white, bold, sans-serif capital letters.

QUESTIONS