

Foot and Ankle Injuries: The Sports Medicine Approach

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Objectives

- Outline a clinical approach to ankle and foot pain
- Review the anatomy of the foot and ankle
- Review diagnosis and treatment strategies for ankle sprains and plantar fasciitis

Managing Foot and Ankle Injuries

- Make the appropriate diagnosis
 - Classify common problems
 - Understand the anatomy
 - Understand basic biomechanics
 - Perform appropriate H &P
 - Consider diagnostic imaging options
- Address patient's expectations
- Consider treatment options
- Apply injury prevention and rehabilitation strategies

Acute Ankle Pain (Common Causes)

- Lateral ankle sprain
- Medial ankle sprain
- Tibiofibular ankle sprain: "high sprain"
- Fractures
 - Tibia and fibula
 - Metatarsal
 - Osteochondral injury to the talor dome
- Achilles tendon rupture

Acute Ankle Pain (Less Common Causes)

- Fracture of the os trigonum

- Soft tissue impingement
- Peroneal tendon subluxation
- Peroneal nerve injury

Ankle Bones

- Key Structures
 - Tibia
 - Fibula
 - Talus
 - Calcaneous
 - Medial arch
 - Accessory bones

Lateral Ankle Sprain

- Key Structures
 - Anterior talofibular lig
 - Calcaneofibular lig
 - Posterior talofibular lig

“High Ankle Sprain”

- Key structures
 - Ant tibiofibular Ligament
 - Posterior tibiofibular ligament
 - Tibiofibular syndesmosis

Medial Ankle Sprain

- Key structures
 - Deltoid lig complex
 - Tibionavicular
 - Tibiocalcaneal
 - Posterior tibiotalar
 - Anterior tibiotalar

“Sprain” Differential Diagnosis/Complications

- Acute symptoms
 - Fractures of the tibia and fibula
 - Fracture of 5th metatarsal
 - Achilles tendon rupture

“Sprain” Differential Diagnosis/Complications

- Acute or chronic symptoms
 - Fracture of the os trigonum
 - Osteochondral lesions of the talus
 - Soft tissue impingement
 - Peroneal tendon subluxation
 - Peroneal nerve traction injury

Differential Diagnosis/Complications

- Acute symptoms
 - Fracture of the tibia or fibula
 - “Chip fracture”
 - Bimalleolar
 - Trimalleolar
 - Maisonneuve fracture
 - Fracture of the the base of the 5th metatarsal
 - Achilles tendon rupture

Diagnosing Ankle Sprains

- Talor tilt test
- Anterior drawer test
- Cotton test

Anterior Drawer Test

- Stabilize the tibia and fibula and pull the foot forward.
- Increased motion compared to the uninjured side indicates injury to the anterior talofibular ligament

Talor Tilt Test

- Stabilize the tibia and fibula while inverting the foot
- Increased motion indicates injury to the calcaneofibular ligament

Tibiofibular Stress Test

- Dorsiflex and externally rotate the foot
- Increased pain may indicate disruption of the tibiofibular ligaments

When to X-ray: Ottawa Ankle Rules

- Unable to bear weight or walk five steps
- Excessive swelling
- Tenderness over the posterior aspect of the tibia or fibula
- Metatarsal tenderness

Acute Management

- Prevention of further injury
- Rest
- Ice
- Compression
- Elevation
- Splint

Acute Management

- Horseshoe splint

Acute Management

- NSAIDs?
- Surgery?

Splints and Braces

- Early use of a supportive brace allows more comfortable ambulation

Splints and Braces

- Lace-up type splints help protect the ankle from eversion or inversion movements.
- They can be used as an alternative to taping

Rehabilitation Exercises

- Strengthening
- Proprioception

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- Strengthening
- Proprioception

Return to Participation

- Pain resolved
- Rehabilitation program completed
- Able to demonstrate normal function (use of tape or brace OK)

Plantar Fasciitis

- One of the most common foot complaints

Plantar fasciitis: Common Presentation

- Posterior heel pain
- Pain on weight bearing after rest (particularly with first steps in the morning)
- Chronic pain with weight bearing

Anatomy

- Key structures
 - Calcaneous

- Lateral plantar nerve
- Plantar fascia

Plantar Fasciitis: Differential Diagnosis

- Sciatica
- Tarsal Tunnel Syndrome
- Entrapment of the Lateral Plantar Nerve
- Plantar Fascia Rupture
- Calcaneal Stress Fracture
- Calcaneal Apophysitis
- Systemic Disorders

Physical Exam

- Palpation
 - Plantar fascia
 - Calcaneous
 - Metatarsals
- Screening neurologic exam
- Inspect for foot pronation and leg length discrepancy

Diagnostic Imaging

- X-ray
- Ultrasound
- MRI
- Bone Scan

Plantar Fasciitis: Treatment Options

- Rest
- Anti-inflammatory medications
- Arch taping
- Orthotics
- Stretching
 - Achilles
 - Plantar fascia
- Night Splints
- Extracorporeal shock wave therapy
- Prolotherapy
- Steroid injection
- Surgery

Arch Taping

- Anchor strip
- Place proximal to the metatarsal heads

Arch Taping

- Anchor strip
- Place proximal to the metatarsal heads

Arch Taping

- Heel lock strip
- Start lateral and bring tape around the heel and over the metatarsal heads
- Keep the foot in a talor neutral position

Arch Taping

- Heel lock strip

- Start lateral and bring tape around the heel and over the metatarsal heads
- Keep the foot in a talor neutral position

Arch Taping

- Repeat applying 4 overlying strips

Arch Taping

- Add an anchor layer to hold heel lock strips in place.
- These should not be placed tightly
- Overlap strips by 50%
- Avoid wrinkles

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Stretching

- Achilles tendon

Stretching

- Achilles
- Plantar fascia

Stretching

- Achilles
- Plantar fascia

Night Splint

- Keeps a gentle stretch on the plantar fascia during the night
- Helps prevent tearing of the healing fascia when stepping out of bed in the morning

Shock Wave Therapy

- High frequency ultrasound pulses
- Thought to produce inflammation and subsequent healing
- Mixed reviews in literature

Orthotics

- Supports the plantar fascia

- Helps correct foot pronation

Additional Therapies

- Prolotherapy
- Steroid injection
- Surgery

Return to Participation

- Inflammation reduced
- Able to participate with minimal or decreasing pain
- Attention to altered biomechanics