

# Common Work Related Foot and Ankle Problems

Dr. George H. Theodore

Massachusetts General Hospital  
 Harvard Medical School  
 Foot and Ankle Consultant  
 Boston Red Sox  
 New England Patriots  
 Boston Bruins

## Anatomy



- Bones
  - Ankle
    - Tibia
    - Fibula
      - 1/6 total body weight
  - Talus
    - 3/5 cartilage
    - No muscle insertion
  - Foot
    - 26 bones
    - Calcaneus is largest
    - 7 tarsal
    - 5 Metatarsals
    - 14 phalanges

## Anatomy



## Anatomy

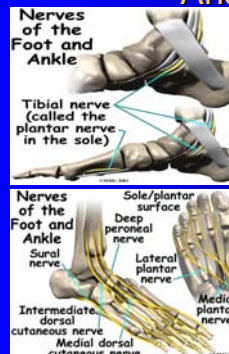


## Anatomy



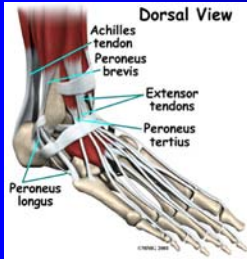
- Ligaments
  - Lateral
    - Anterior talofibular (ATFL)
    - Posterior talofibular (PTFL)
    - Calcaneofibular (CFL)
  - Medial
    - Deltoid
  - Syndesmosis
    - Anterior inferior tibiofibular (AITFL)
    - Posterior inferior tibiofibular (PITFL)
  - Foot
    - tarsometatarsal

## Anatomy



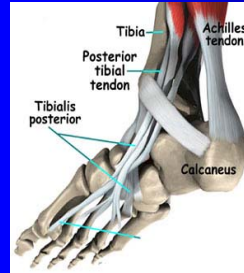
- Nerves
  - Medial
    - Tibial
      - Medial and lateral plantar nerves
      - Tarsal tunnel is created by medial malleolus, flexor retinaculum, and posterior talus-calcaneus
  - Anterior
    - Deep peroneal
    - Superficial peroneal
  - Lateral
    - sural

## Anatomy



- Tendons
  - Lateral
    - Peroneal
      - Plantar flexes-everts the foot
  - Anterior
    - Tibialis anterior
      - Dorsiflexes the foot
    - Extensor tendons
      - Extends the toes

## Anatomy



- Tendons
  - Medial
    - Posterior tibial
      - Supports the arch
      - Inverts the foot
  - Posterior
    - Achilles
      - Plantar flexes-inverts the foot

## Anatomy



- Plantar aspect of the foot
  - Plantar fascia
  - Interdigital nerve

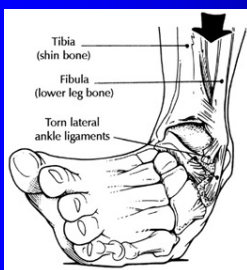


## Ankle Sprains



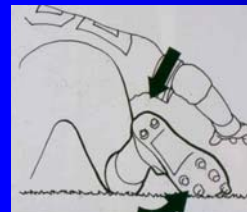
- Ankle sprains
  - Most common musculoskeletal injury seen in practice
  - 25,000 per day
  - 90% are inversion injury
  - 80% lateral ankle ligaments
  - Most heal uneventfully

## Ankle Sprains



- Inversion injury
  - 90% sprains
  - lateral “low” ankle sprain
  - Injures ATFL, sometimes CFL

## Ankle Sprains



- Eversion injuries
  - 10% sprains
  - Produces “high” ankle sprain
  - Injures syndesmotic ligament complex



## Ankle Sprains

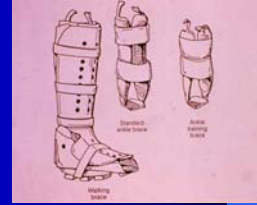
- Physical examination
  - Tenderness
  - Deformity
  - Difficulty bearing weight
- Radiographs
  - Do not miss fracture



fracture

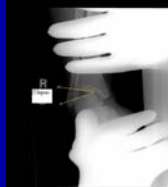
## Ankle Sprains

- Nonop treatment
  - Individualize treatment
    - RICE
    - Immobilization
      - Mild: ace wrap
      - Moderate: stirrup
      - Severe: walking boot
    - Physical therapy
    - Bracing
      - Chronic instability



## Ankle Sprains

- Operative treatment
  - Persistent ankle instability
  - Repair of ankle ligaments
    - Anatomic
      - Brostrom type repair
    - Nonanatomic
      - Usually peroneal tendon augmentation



## Achilles Tendon Dysfunction



- tear
- tendonitis
- tendinosis
- Retrocalcaneal bursitis

## Achilles Tendon Dysfunction

- Tendonitis
  - Inflammation of tendon sheath
  - Overuse injury
- Tendinosis
  - Intrinsic degeneration
  - Older patients with comorbidities



Sheath swelling



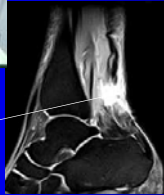
tendon thickened

## Achilles Tendon Dysfunction

- Treatment
  - Heel lift
  - Modification of activities
    - Identify workplace stressors
  - NSAID
  - Bracing
    - AFO
  - Surgery
    - Tendon sheath release
    - FHL transfer



## Achilles Tendon Dysfunction



tear

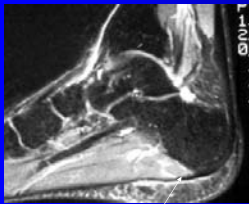
- Acute rupture
  - Middle aged males
  - Pain in the back of calf
  - Palpable defect
  - Positive Thompson's test
  - Surgery vs. cast

## Plantar Fasciitis



- Most common cause of heel pain
- Affects 2 million Americans per year
- Females more than males
- No correlation with a heel spur
- Usually self-limited condition

## Plantar Fasciitis



Thickened fascia

- Etiology
  - Microtear in fascia
- Presentation
  - Pain with first steps in the morning and after rising from the seated position
- Evaluation
  - Foot pronation
  - Tight achilles
  - Exclude rheumatologic and neuropathic conditions

## Plantar Fasciitis

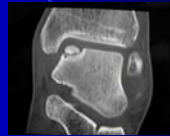


- Treatment
  - Nonoperative
    - Heel lifts
    - Physical therapy
    - Cortisone
    - Cast/splint
  - Operative
    - fasciotomy
  - ESWT
    - 70% success

## Osteochondral Lesions

### Presentation

- 10% of all OCD
- Males>females
- Location
  - Posteromedial 60%
    - Inversion injury to plantarflexed ankle
  - Anterolateral 40%
    - Eversion injury to the dorsiflexed ankle
- Symptoms
  - Pain
  - Swelling
  - locking



## Osteochondral Lesions

### Treatment

- Nonoperative
  - Asymptomatic: no treatment.
    - No evidence of increased arthritis
  - Symptomatic: small stable lesions
    - Grades I and II
    - Cast 3-6 weeks
    - Physical therapy
    - Orthotics
    - No good studies



## Osteochondral Lesions

- Treatment
  - Operative
    - Open repair
      - Young patients
      - Acute displaced large lesions > 2 cm
      - Headless screw fixation
    - Arthroscopy
      - Removal loose body
      - Excision osteochondral fragment
      - synovectomy
      - Chondroplasty-microfracture
      - Retrograde drilling




## Osteochondral Lesions




## Peroneal Tendon Problems

- Tears
  - Acute rupture
    - rare
  - Longitudinal attritional
    - 15% incidence in cadavers
    - Symptoms of retrofibular pain, swelling, and eversion weakness
  - Treatment
    - Acute rupture
      - acute repair
    - Longitudinal
      - <50% diameter: debride and repair
      - >50% diameter: tenodesis




## Peroneal Tendon Problems

- Instability
  - Causes
    - May result from non-concave shape of the peroneal sulcus
    - Disruption of superior peroneal retinaculum
  - Examination:
    - Resisted eversion of the foot with the ankle dorsiflexed
  - Treatment:
    - Repair of superior peroneal retinaculum
    - Groove deepening
    - Bone block procedures



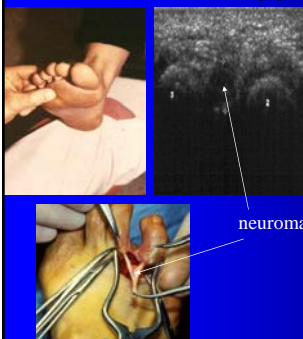
## Metatarsalgia

- Discomfort in the region of the metatarsal heads and metatarsophalangeal joints
  - Hallux rigidus
  - Stress fracture
  - Joint synovitis
  - neuroma



## Neuroma

- Most common nerve entrapment syndrome
  - Perineural fibrosis
  - 2<sup>nd</sup>-3<sup>rd</sup> or 3<sup>rd</sup>-4<sup>th</sup> space
- Presentation
  - Burning plantar pain
  - improved by shoe removal
  - Positive Mulder's click
  - Positive ultrasound
- Treatment
  - Metatarsal pad
  - Cortisone injection
  - Shoe with wide toe box
  - surgery



## Fractures



- Ankle
  - Most need referral
  - Surgical fixation
    - Unstable injuries
    - Loss of reduction of ankle joint mortise



- Foot
  - Phalanges-buddy tape
    - Refer for intra-articular
  - Metatarsal
    - Refer for Jones fracture
  - Treatment
    - Rigid soled shoe
    - Cast walker

Thank you

