

FOOT & ANKLE DISEASES AND INJURIES

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THE FUNCTIONAL FOOT

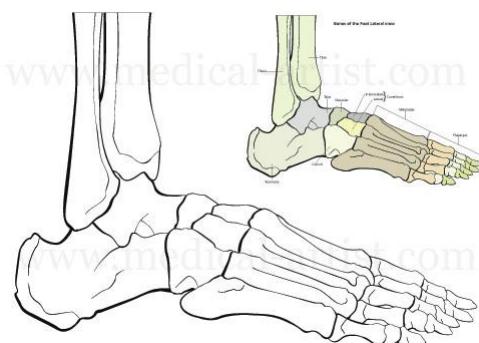
- Painless
- Mobile
- Stable
- Plantigrade

SYMPTOMATOLOGY

- Pain
- Stiffness
- Instability
- Deformity
- Swelling
- Numbness

PARTS OF THE FOOT

- Hindfoot
- Midfoot
- Forefoot



ANKLE DISORDERS & INJURIES

- Ankle sprain
- Ankle instability
- Ankle impingement
- Osteochondral lesion of the talus (OLT)
- Ankle arthritis

ANKLE SPRAIN

- Most common – Lateral ankle sprain
- Lateral ankle ligament
 - Anterior talofibular ligament (ATFL) : mostly injured
 - Calcaneofibular ligament (CFL)
 - Posterior talofibular ligament (PTFL)
- Mechanism
 - Inversion injuries



ANKLE SPRAIN

- Grading
 - I Ligament stretching
 - II Partial rupture
 - III Complete rupture

American Medical Association (AMA) Standard Nomenclature System

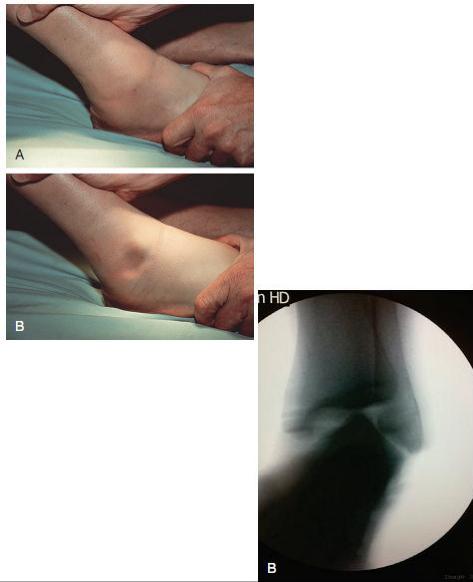
- Imaging
 - Plain film to R/O Fx
 - No role MRI in acute injuries

ANKLE SPRAIN

- Treatment
 - Functional treatment
 - RICE (Rest / Ice / Compression / Elevation)
 - Brace / splint
 - Physiotherapy
 - NSAIDs
 - Avoid rigid immobilization eg. casting
 - If not improved after 6 wks : further investigations
 - Operative treatment
 - Large bony avulsion
 - Associated OLT

ANKLE INSTABILITY

- Presentation
 - Feeling of looseness
 - Giving way
 - Recurrent ankle sprain
 - Anterior drawer test
 - Inversion stress test

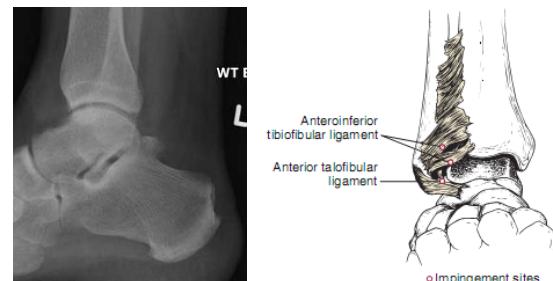


ANKLE INSTABILITY

- Treatment
 - Nonoperative
 - Activity modification
 - Physiotherapy
 - Orthosis
 - Ankle-foot-orthosis (AFO)
 - Seldom acceptable on a long-term basis
 - Operative
 - Ligament reconstruction

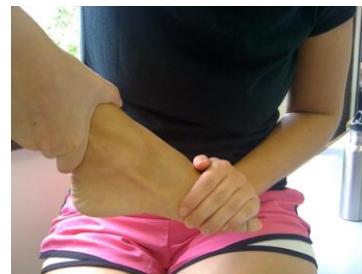
ANKLE IMPINGEMENT

- Anterior impingement
 - Bony impingement
 - Soft tissue impingement
- Posterior impingement
 - Os trigonum



ANKLE IMPINGEMENT

- Presentation
 - Pain
 - Limited ROM
 - Posterior ankle impingement test
- Investigations
 - Plain film
 - MRI
- Treatment
 - Debridement
 - Os trigonum excision



OLT

- Etiology
 - Idiopathic
 - Traumatic
- Presentation
 - Recurrent ankle pain and swelling
 - Mechanical symptoms (catching, clicking, locking)
- Investigations
 - Plain film
 - CT
 - MRI



OLT

- Treatment
 - Nonoperative treatment
 - Nondisplaced lesion
 - Protected weight in boot 3-6 months
 - Operative treatment
 - Debridement
 - Bone marrow stimulation
 - Osteochondral transplantation (mosaicplasty)

ANKLE ARTHRITIS

- Causes
 - Traumatic
 - Degenerative
 - Inflammatory
 - Metabolic
- Presentation
 - Pain, swelling, redness
 - Stiffness in dorsiflexion-plantarflexion
 - Deformity



ANKLE ARTHRITIS

- Treatment
 - Nonoperative
 - Analgesics
 - Injection
 - Physiotherapy
 - Walking aid
 - Ankle brace / support
 - Weight reduction
 - Activity modification
 - Operative
 - Debridement
 - Arthrodesis
 - Arthroplasty



HINDFOOT DISORDERS & INJURIES

- Subtalar arthritis
- Achilles tendon disorders
- Plantar fasciitis

SUBTALAR ARTHRITIS

- Presentation
 - Pain while walking on uneven ground
 - Pain directly over sinus tarsi
 - Pain & stiffness in eversion-inversion
- Treatment
 - Nonoperative
 - Orthotics
 - Operative
 - Subtalar fusion



ACHILLES TENDON DISORDERS

- Achilles tendon rupture
- Achilles tendinopathy
- Haglund's deformity

ACHILLES TENDON RUPTURE

- Presentation
 - Snap / audible pop
 - Acute pain
 - Walking difficulty
 - Weak plantarflexion
 - Palpable gap
 - Thompson's test



ACHILLES TENDON RUPTURE

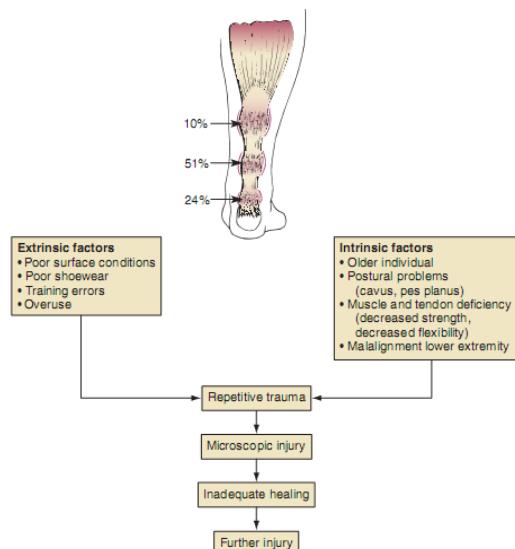
- Treatment
 - Nonoperative
 - SLC in equinus position
 - Complications – residual weakness, rerupture
 - Operative
 - Tendon repair
 - Tendon transfer
 - Complications – wound problems

Table 30-9 Results of Treatment of Achilles Tendon Rupture

Factor	Nonsurgical Treatment	Surgical Treatment
Morbidity	↓	↑
Surgical complications	None	↑
Hospital cost	↓	↑
Physician cost	↓	↑
Strength and endurance	↓	↑
Rerupture rate	18%	2%

ACHILLES TENDINOPATHY

- Location
 - Insertional
 - Non-insertional
- Presentation
 - Posterior heel pain
 - Swelling
 - Activity limitation



ACHILLES TENDINOPATHY

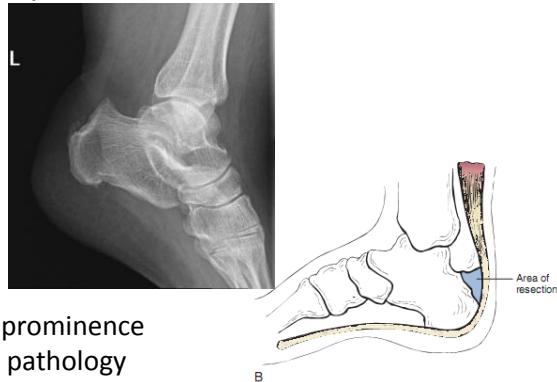
- Pathology
 - Degeneration - tendinosis
 - Inflammation – tendinitis
- Investigations
 - Plain film – calcification, Haglund
 - MRI

ACHILLES TENDINOPATHY

- Treatment
 - Nonoperative
 - NSAIDs
 - Activity modification
 - Walking boot
 - Stretching exercise
 - NTG patch
 - ESWT
 - No steroid injection
 - Operative
 - Gastrocnemius recession
 - Debridement
 - FHL transfer

HAGLUND'S DEFORMITY

- Presentation
 - Bony prominence
 - Retrocalcaneal bursitis
 - Achilles tendinopathy
- Investigations
 - Plain film
 - Ultrasound
 - MRI
- Treatment
 - Nonoperative
 - Resection of bony prominence
 - Rx Achilles tendon pathology



PLANTAR FASCIITIS

- Presentation
 - Plantar heel pain esp. the first step in the morning
 - Tenderness at medial calcaneal tuberosity
- Investigations
 - Usually clinical diagnosis
 - Plain film – heel spur
 - Ultrasound
 - MRI



PLANTAR FASCIITIS

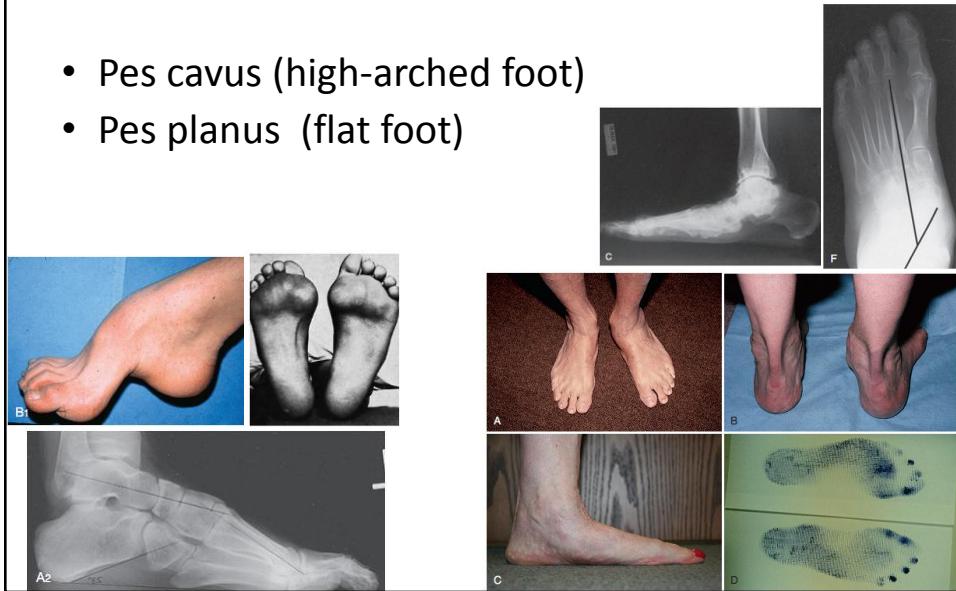
- Treatment
 - Nonoperative
 - NSAIDs
 - Rest
 - Shoe modification
 - Stretching exercise
 - ESWT
 - Avoid steroid injection
 - Operative
 - Gastrocnemius recession
 - Plantar fascia release

MIDFOOT DISORDERS

- Deformities of the arch of foot
- Arthritis

DEFORMITY OF THE ARCH

- Pes cavus (high-arched foot)
- Pes planus (flat foot)



PES CAVUS

- Presentation
 - High-arched foot
 - Heel varus (cavovarus)
 - Claw toes
 - Metatarsalgia & callosity
 - Recurrent ankle sprain (in cavovarus)
 - Possibly progressive : flexible → rigid
- Neuromuscular causes

NEUROMUSCULAR CAUSES OF PES CAVUS

Muscular dystrophies	Duchenne, Becker
Neuropathies	HMSN I and II
Cord lesions	Poliomyelitis, syringomyelia, diastomatomyelia, tethered cord
Cerebral disorders	Cerebral palsy, Friedreich's ataxia

PES CAVUS

- Treatment
 - Neurological evaluation
 - Nonoperative
 - Orthosis
 - No effect on progression
 - Operative
 - Soft tissue release
 - Tendon transfer
 - Osteotomy
 - Triple fusion

PES PLANUS

- Presentation
 - Flatfoot
 - Too many toe sign
 - Heel valgus
 - Forefoot abduction
 - Progressive
 - Ankle involvement
 - Subfibular impingement

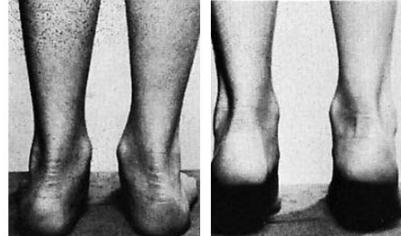


PES PLANUS

- Congenital flatfoot

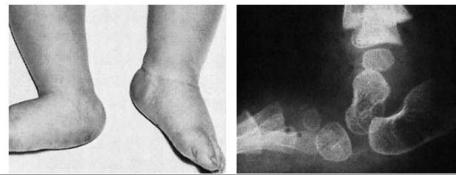
- Flexible

- Part of normal development
 - Tight Achilles tendon
 - Ligamentous laxity
 - Family history



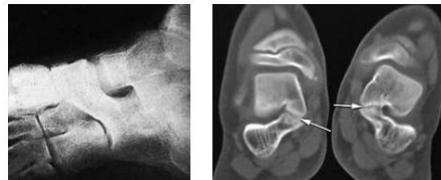
- Rigid

- Congenital vertical talus
 - Tarsal coalition
 - Inflammatory
 - Neurologic



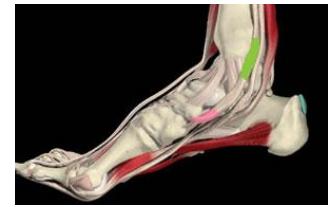
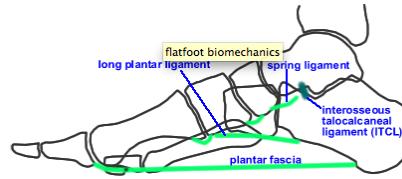
TARSAL COALITION

- Unions between adjacent tarsal bones
- Talocalcaneal, calcaneonavicular, talonavicular
- Congenital but present at adolescents
- Possibly traumatic-related presentation
- Peroneal spasm
- Rigid flatfoot with subtalar/midfoot motion loss



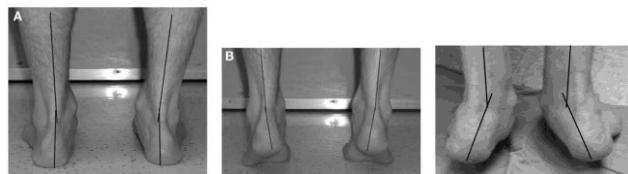
PES PLANUS

- Adult-acquired flatfoot
 - Bony abnormalities
 - Trauma
 - Degenerative
 - Charcot
 - Inflammatory arthritis
 - Soft tissue abnormalities
 - Posterior tibial tendon dysfunction (PTTD)
 - Spring ligament rupture



PTTD

- Posterior tibial tendon function
 - Inversion-plantarflexion
 - Dynamic arch stabilizer
- Evaluation
 - Pain, swelling along posterior tibial tendon
 - Single heel rise
 - Double heel rise
- Investigation
 - MRI



PES PLANUS

- Treatment
 - Nonoperative
 - Stretching exercise
 - Orthotics
 - Goal – stabilization
 - Operative
 - Soft tissue procedures
 - Spring ligament repair
 - Tendon repair / transfer
 - Bony procedures
 - Coalition resection
 - Osteotomy
 - Arthrodesis

ARTHRITIS

- Locations
 - Talonavicular arthritis
 - Calcaneocuboid arthritis
 - Tarsometatarsal arthritis
- Treatment
 - Nonoperative
 - Orthotics
 - Operative
 - Arthrodesis

FOREFOOT DISORDERS

- Hallux valgus
- Hallux rigidus
- Bunionette (Tailor's bunion)
- Lesser toe deformities
- Morton's neuroma

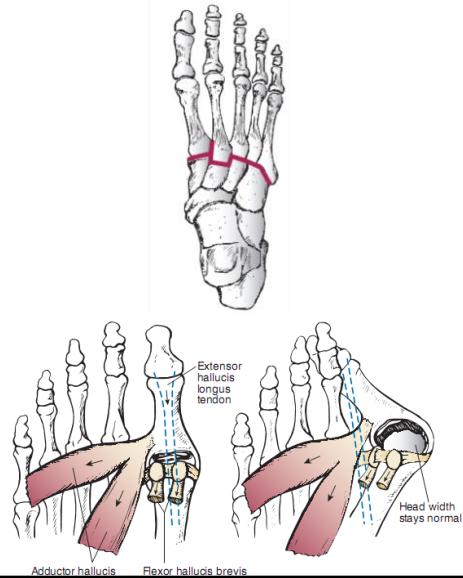
HALLUX VALGUS

- Hallux valgus
 - Lateral deviation of the great toe and medial deviation of the first metatarsal
- Bunion
 - Any enlargement or deformity of the MTP joint



HALLUX VALGUS

- Extrinsic causes
 - Shoewear
 - Trauma
- Intrinsic causes
 - Heredity
 - Hypermobility of TMT
 - Ligamentous laxity
 - Achilles contracture
 - Flatfoot
 - Neuromuscular disease
 - Inflammatory arthritis



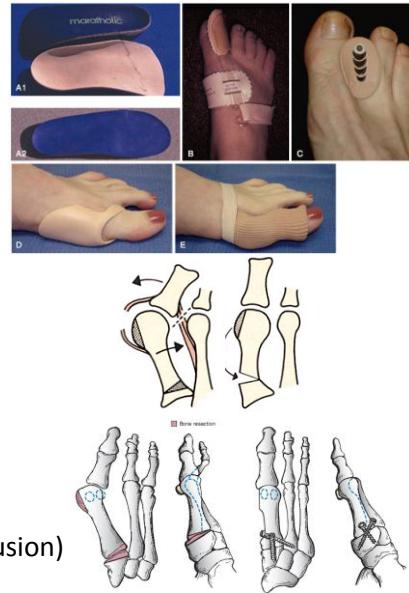
HALLUX VALGUS

- Problems
 - Appearance
 - Shoewear
 - Bunion pain
 - Arthritic pain
 - Transfer lesions
 - 2nd toe deformities



HALLUX VALGUS

- Treatment
 - Nonoperative
 - Orthotics
 - Splint
 - Bunion post
 - Bunion pad
 - Operative
 - Bunionectomy
 - Soft tissue procedure
 - Lateral release
 - Medial capsulorraphy
 - Metatarsal osteotomy
 - 1st TMT arthrodesis (Lapidus fusion)



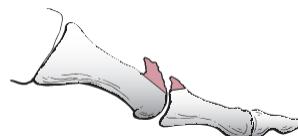
HALLUX RIGIDUS

- Presentation
 - Pain
 - Stiffness esp. dorsiflexion 1st MTP
 - Dorsal bunion



HALLUX RIGIDUS

- Treatment
 - Nonoperative
 - Orthotics
 - Operative
 - Chillectomy
 - MP1 fusion



BUNIONETTE (TAILOR'S BUNION)

- Painful prominence of the lateral eminence of the fifth metatarsal head

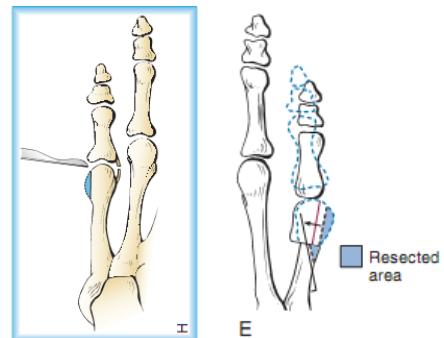


A

B

BUNIONETTE (TAILOR'S BUNION)

- Treatment
 - Nonoperative
 - Orthotics
 - Operative
 - Lateral condylectomy
 - Metatarsal osteotomy



LESSER TOE DEFORMITIES

- Claw toe
 - Hyperextension MTP, flexion IP
 - Multiple digits
 - Neurologic disorders
- Hammertoe
 - Flexion PIP, straight DIP +/- hyperextension MTP
 - One digit
- Mallet toe
 - Flexion DIP



LESSER TOE DEFORMITIES

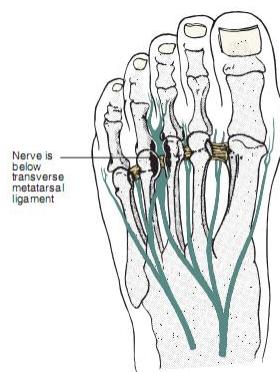
- Treatment
 - Nonoperative
 - Orthotics
 - Operative
 - Surgical correction

MORTON'S NEUROMA

- Interdigital neuralgia

Table 12-1 Preoperative Symptoms of Interdigital Neuroma

Symptom	Patients Affected (%)
Plantar pain increased by walking	91
Relief of pain by resting	89
Plantar pain	77
Relief of pain by removing shoes	70
Pain radiating into toes	62
Burning pain	54
Aching or sharp pain	40
Numbness in toes or foot	40
Pain radiating up foot or leg	34
Cramping sensation	34



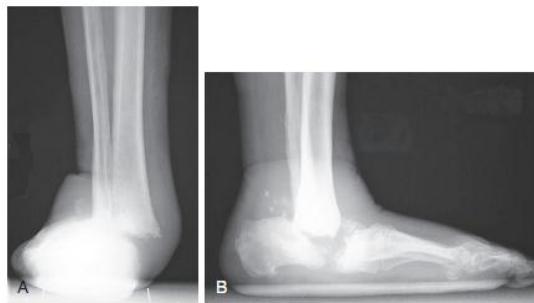
MORTON'S NEUROMA

- Evaluation
 - Deep palpation test
 - Mulder's sign / click
 - Abnormal sensation
- Investigations
 - Usually clinical diagnosis
 - Ultrasound
 - MRI
- Treatment
 - Neurectomy



CHARCOT FOOT

- Neuropathic arthropathy
 - Noninfective bone and joint destructive process associated with peripheral neuropathy eg. DM, Leprosy, Charcot-Marie-Tooth



CHARCOT FOOT

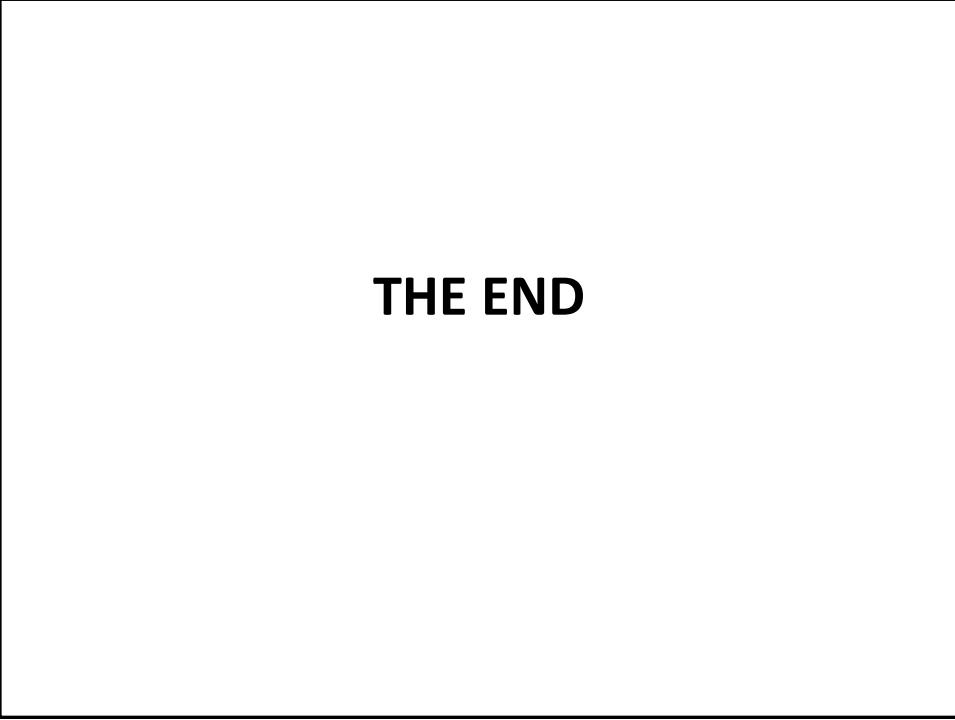
- Eichenholz's temporal staging
 - I Fragmentation
 - Acute inflammatory process
 - Temperature difference
 - II Coalescence
 - Begin reparative process
 - III Consolidation
 - Healed, usually with deformity



CHARCOT FOOT

- Evaluation
 - Neurologic evaluation
 - Vascular evaluation
 - DDx infection : WBC scan, MRI with contrast
 - Deformity evaluation : CT scan
- Treatment
 - Fragmentation
 - Off-loading : total contact cast
 - Consolidation with residual deformity
 - Orthotics
 - Surgical correction





THE END