

# Cavus Foot

# Cavus Foot

## Introduction

- Definition
- Anatomy and Pathomechanics
- Etiology and differential diagnosis
- Evaluation
  - Clinical and radiographic
- Treatment

# Cavus Foot Definition

- Abnormal elevation of the medial arch in weight bearing
- Fore foot equinus relative to hindfoot
- ?what's normal/abnormal

# Normal Anatomy and Biomechanics

- Forefoot deformity and the windlass mechanism of the plantar fascia causative
- Plantar fascia
  - Calcaneal tuberosity – Transverse metatarsal lig – slips to base of prox phalanx
  - Medial and central portions strongest
  - Stabilizes arch and inverts (with tib post) the hindfoot

# Anatomy and Biomechanics

- Chopart's joint supple when hindfoot everted
- Heel strike – hindfoot inverted
- Midstance – hindfoot everted
  - Shock absorption – now hindfoot supple
- Toe off

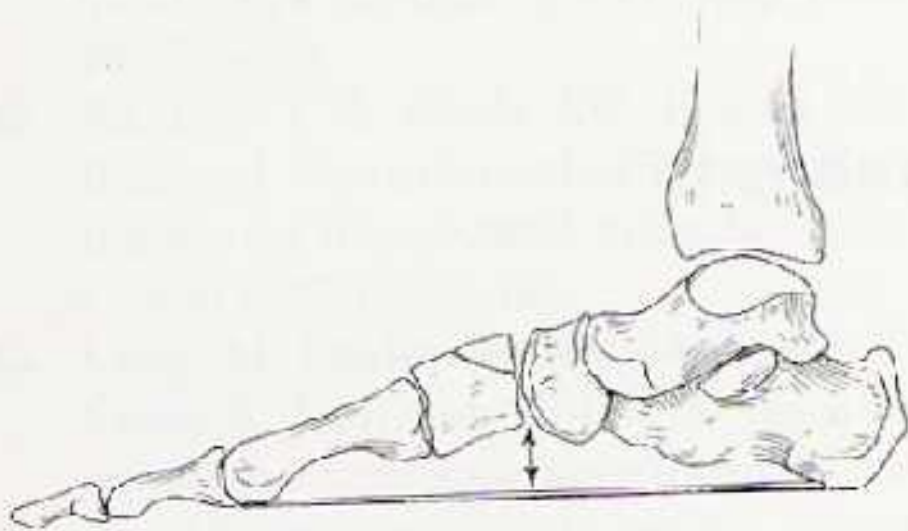
# Anatomy and Biomechanics

- Toe off
  - Toes dorsiflex
  - Tib post fires
  - All to lock hindfoot
  - Gives a rigid, long lever for triceps surae

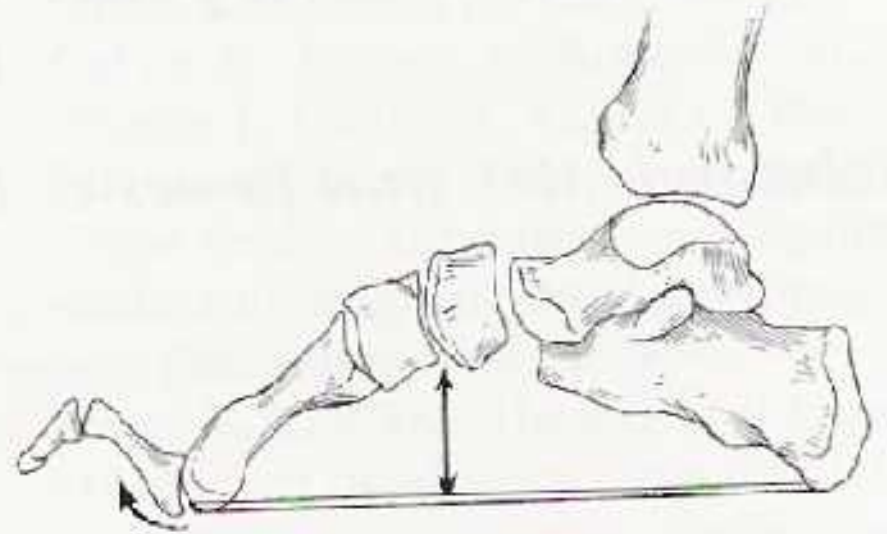
# Pathomechanics

- Foot musculature unbalanced
- Usually intrinsic muscle weakness
- Lumbrical weakness allows EDL to hyperextend the MCP's and FDL to flex the PIP and DIP's
- Exaggeration of the windlass mechanism

# Pathomechanics



A



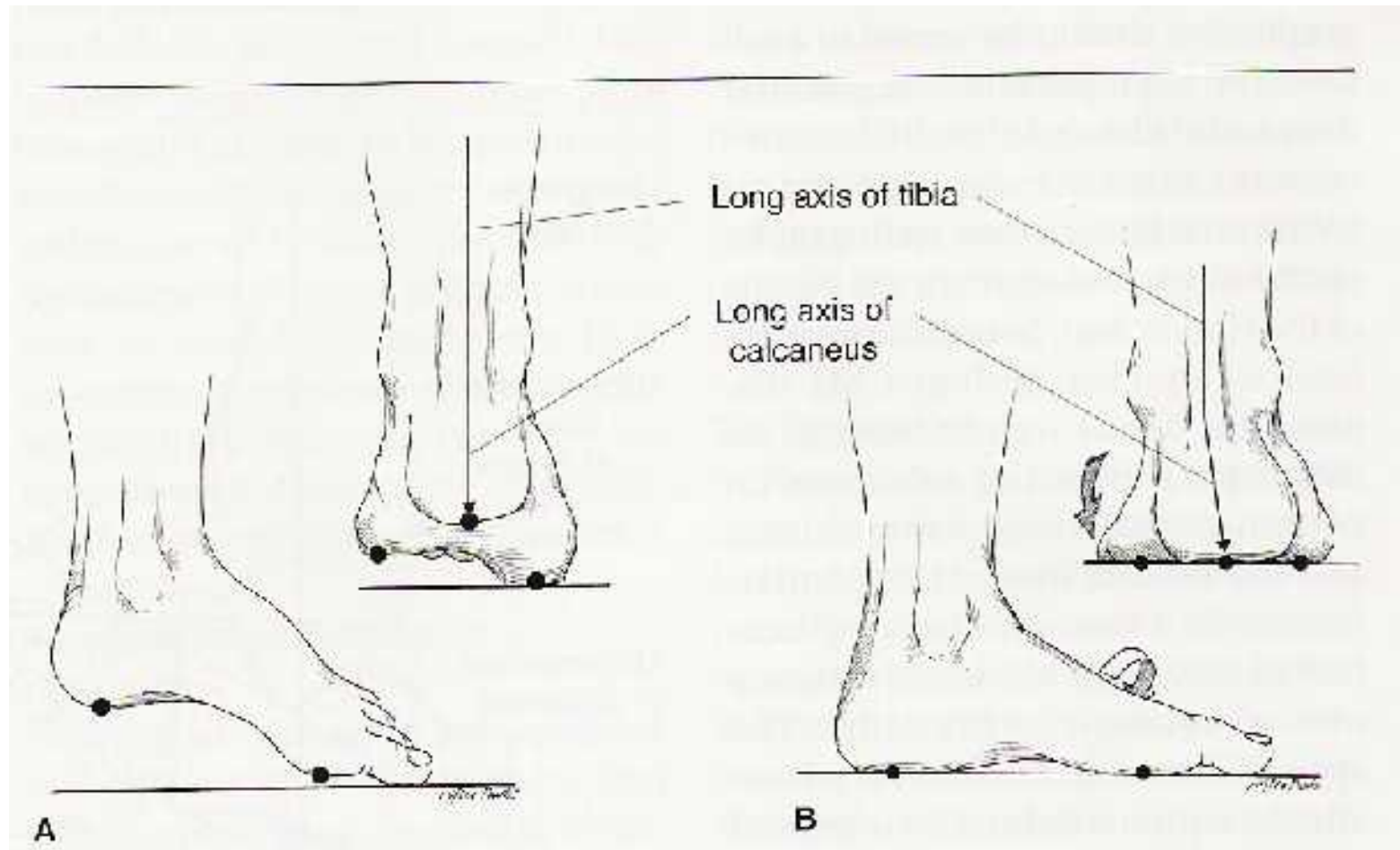
B



# Pathomechanics

- Same applied to EHL and FHL
- 1<sup>st</sup> ray more mobile – makes it worse, forefoot supinates and may become fixed
- Secondary hindfoot varus
- Tripod effect

# Pathomechanics



# Pathomechanics

- So why does it hurt?
  - Inverted hindfoot loses shock absorption ability
  - Recurrent ankle sprains
  - Tripod effects (less surface area)
  - Clawing of toes

# Etiology

- CNS
- Spinal
- Peripheral Nerves
- Other
- Idiopathic

# Etiology - CNS

- CP esp. hemiplegia
  - Spastic tib post
- Friedreich's Ataxia (A. Recessive chrom 9)
  - Triad – ataxia, downgoing Babinski, areflexia

# Etiology - Spinal

- Myelodysplasia
- Syringomyelia
- Polio
- Spinal cord tumors
- Tethered cord
- Guillain-Barre syndrome



# Etiology – Peripheral Nerves

- Hereditary Sensorimotor Neuropathy (HSMN)
- Charcot Marie Tooth



# Etiology - Other

- Traumatic Isolated Tendon Injuries
- Partial Sciatic Nerve injury
- Volkman's Contracture

# Etiology - Idiopathic

- 20-50% of cases - mostly bilateral

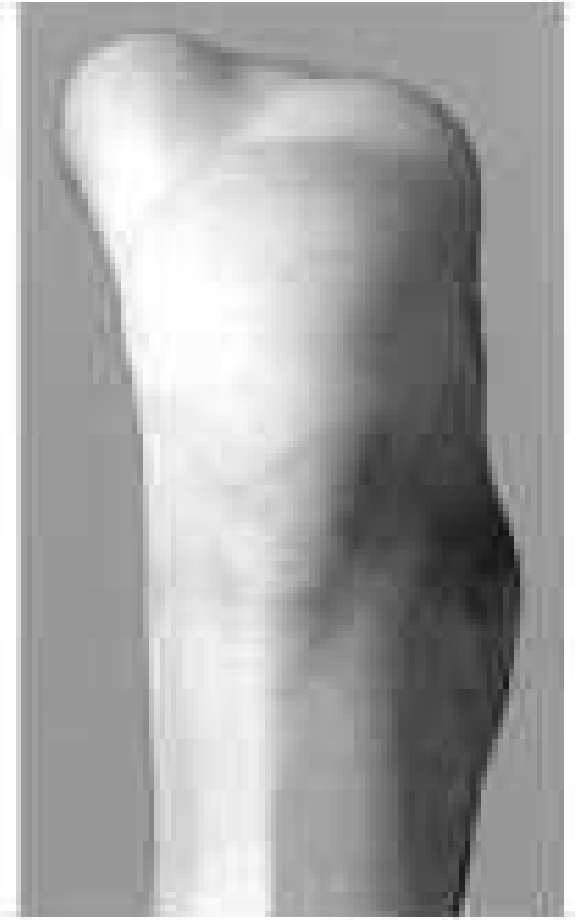
# Clinical Evaluation

- History
  - Other neuro symptoms
    - Ulcers, numbness, bowel, bladder, Dev. Delay
  - Family History
  - Ankle Instability
  - Metatarsalgia

# Clinical Evaluation

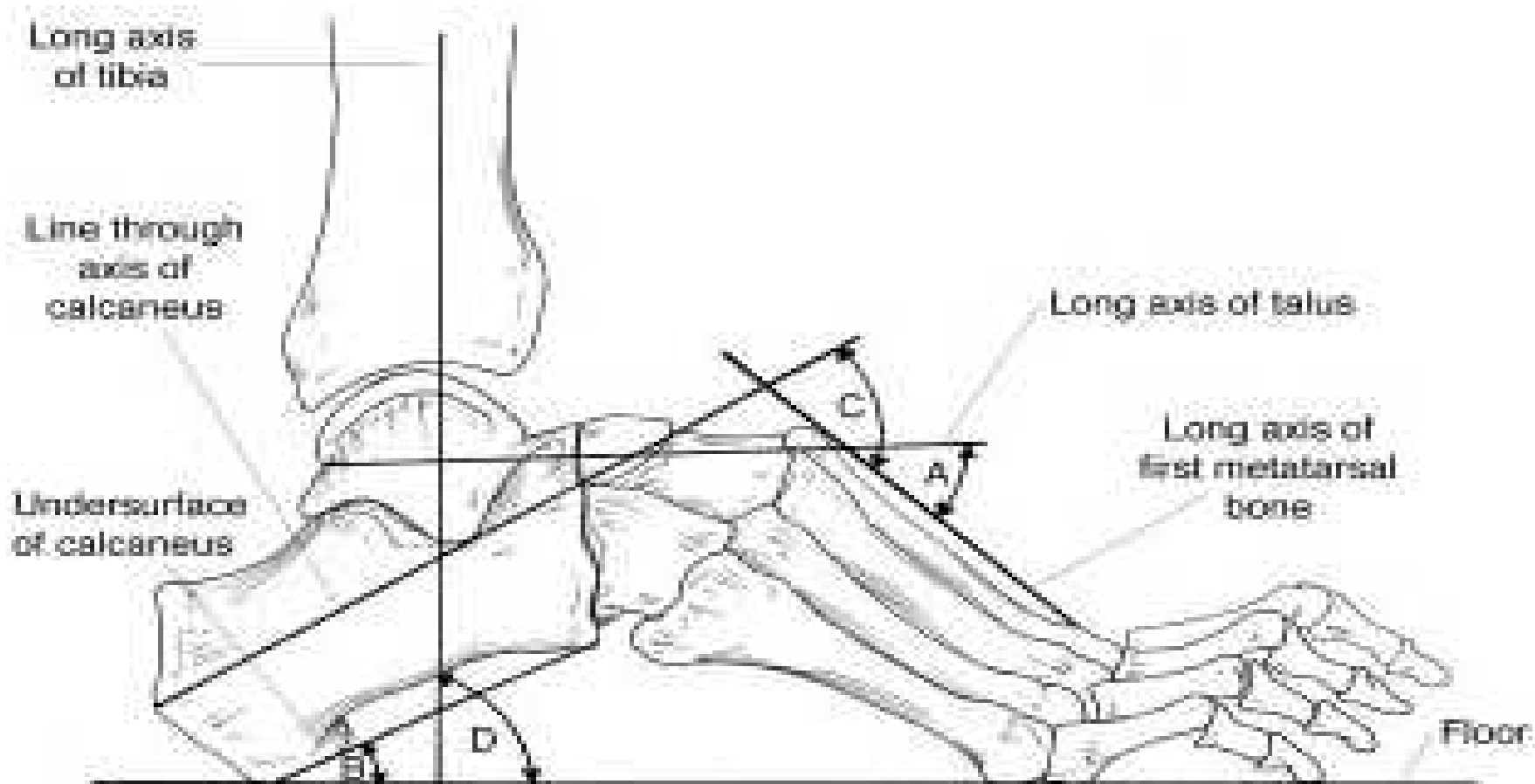
- Physical
  - Dysgraphism
  - Neuro exam
  - Coleman Block Test

# Coleman Block Test



# Radiographic Assessment

- Standing AP and Lateral of Foot and Ankle
  - Assess angles (severity) and any evidence of degenerative change
- Spinal Imaging as required



- A – Meary’s Angle N = 0 – 5 Degrees
- B – Calcaneal Pitch Angle N = 30 degrees
- C – Hibbs Angle N = <45 degrees
- D – Weight Bearing Tibioplantar Angle N = 90 degrees

# Management

- Blah, Blah, Blah
- Orthotics
  - For mild, non progressive deformity
  - Lateral forefoot and hindfoot posting
  - Large toe box shoes



# Management

- Surgical
  - Treat underlying problem
  - Must decide if hindfoot is supple
  - Everyone gets a plantar fascial release
  - Fixed – Supple is often subjective
    - Combination of procedures

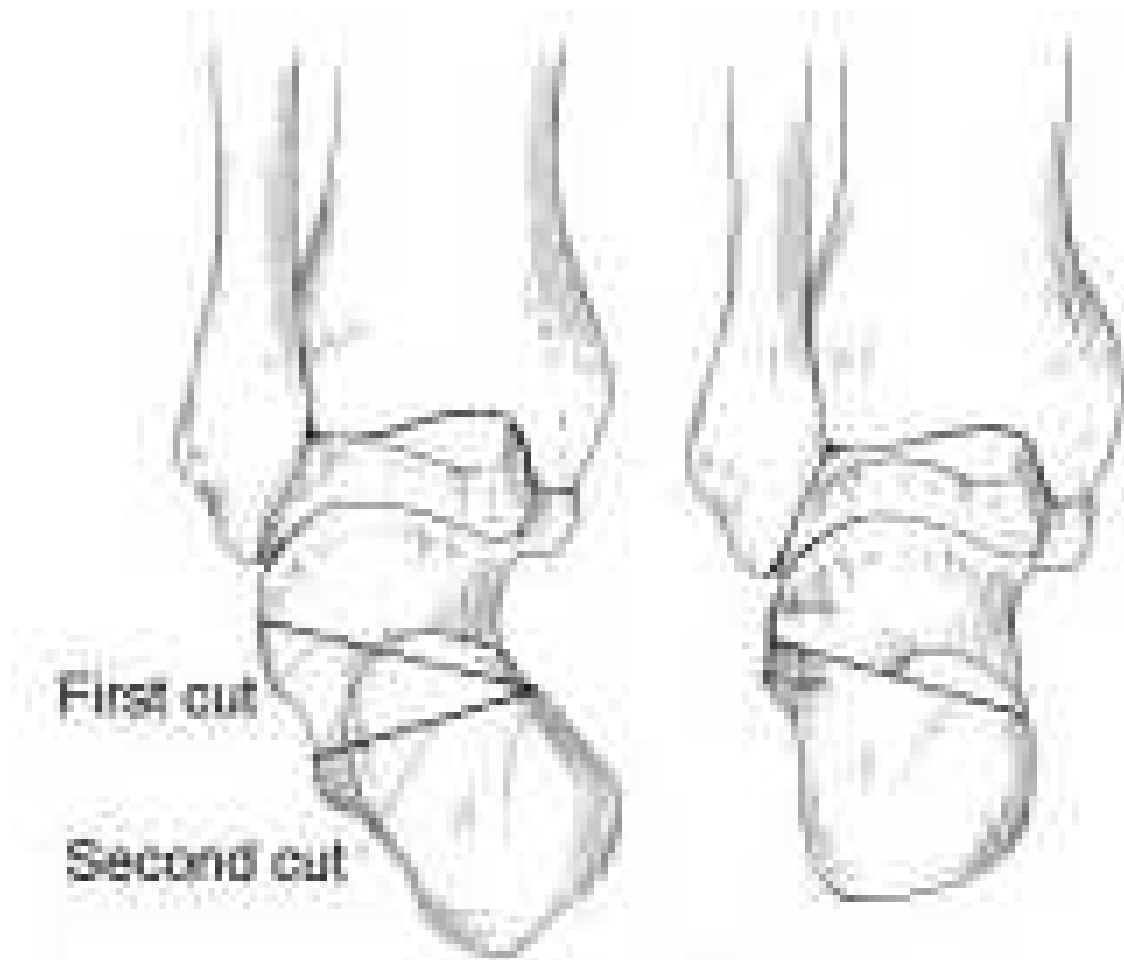
# Management

- Hindfoot supple
  - Toe deformity correction
    - Girdlestone-Taylor
  - Forefoot correction
    - Metatarsal osteotomies
    - Midfoot osteotomy
  - Is there any role for a Jones procedure?

# Management

- Hindfoot supple
- Tendon Transfers
  - If identifiable muscle imbalance
  - Split Tib post to peroneus brevis
  - Peroneus longus to brevis
  - Be careful in progressive disease

# Management Rigid Hindfoot



# Management Rigid Hindfoot

- If deformity severe or Degenerative Changes exist
  - Triple Arthrodesis

# Summary

- Rare problem
- Know causes and clinical assessment
- Principles of treatment