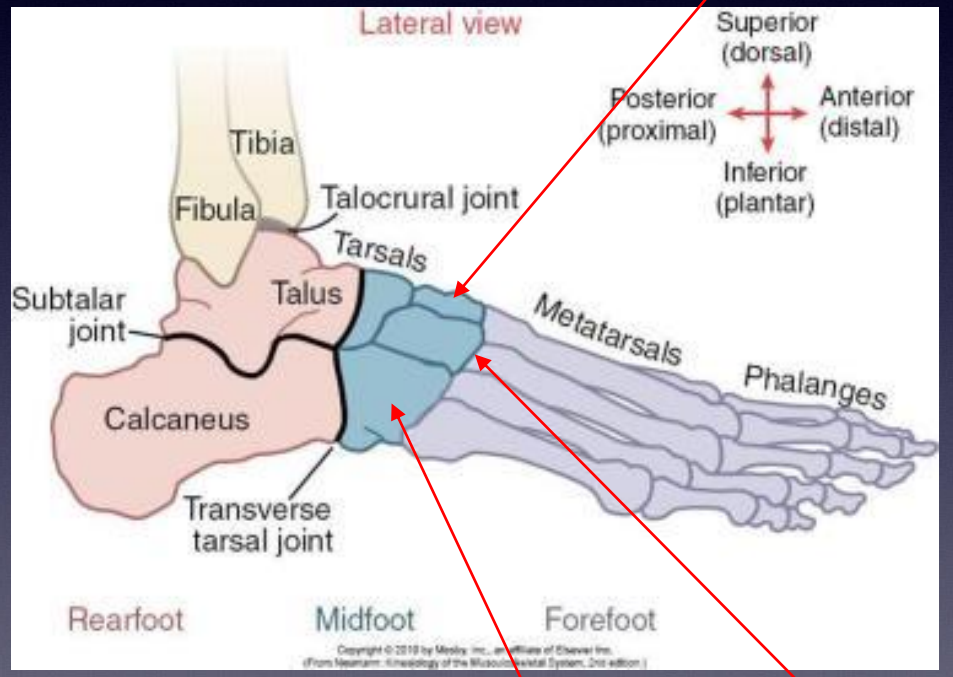
Clubfoot
Congenital Talipes Equinovarus

Fifth Year – Tikrit Medical College

Introduction

- Idiopathic deformity of the foot / unclear etiology
- Incidence … 1:250 to 1:1000 (1:100 in DDH)
- Males > Females (F6;M1 in DDH)
- 50 % bilateral (20% in DDH)
- familial in 25%

Foot anatomy review !!!!!



Middle cuneiform

Froefoot

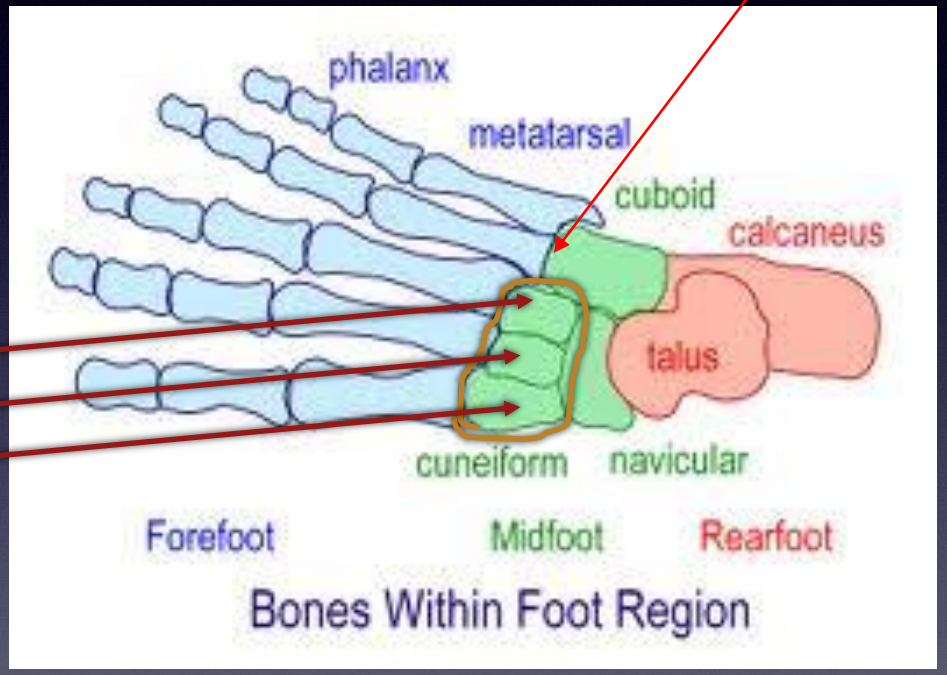
midfoot

hindfoot

cubiform

TMT

Tarsometatarsal joint (TMT)



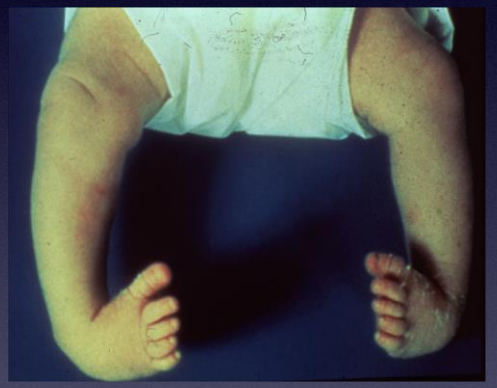
lateral
middle
medial

tarsal

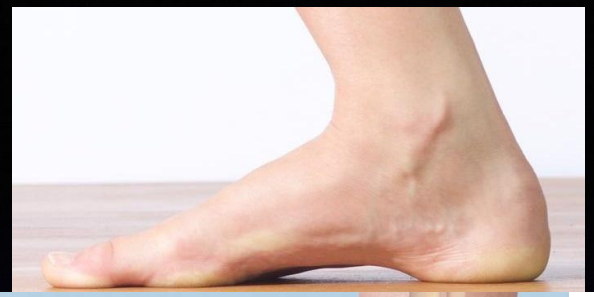
Pathoanatomy

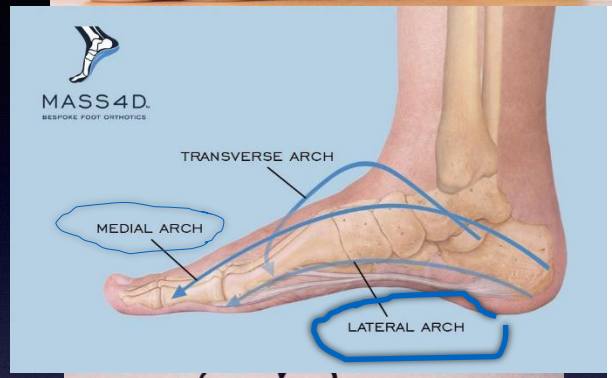
- Muscles contractures lead to the characteristic deformity (***CAVE****); it's abnormal muscle tension > contracture of muscle and joint capsule > if leave it >longstanding process> secondary bony change !!*

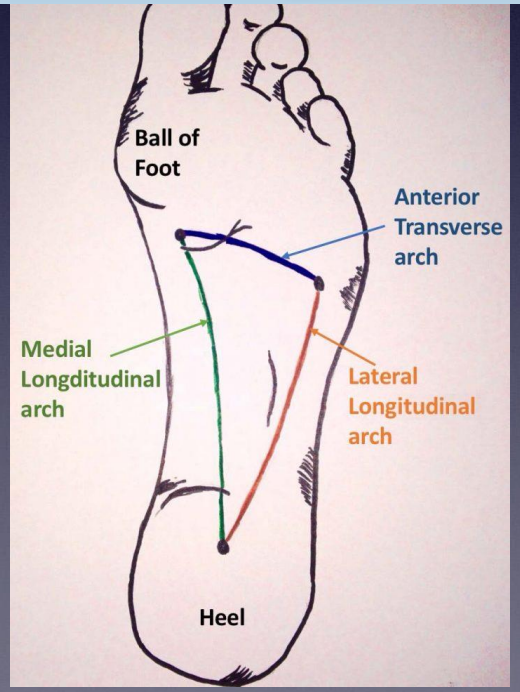
  - *Cavus* midfoot (tight intrinsics, FHL, FDL)
  - *Adducted* forefoot (*from TMT to Fingers*) > tight tibialis posterior .
  - *Varus* hindfoot (tight tendoachilles, tibialis posterior, tibialis anterior)
  - *Equinus* hindfoot (tight tendoachilles)



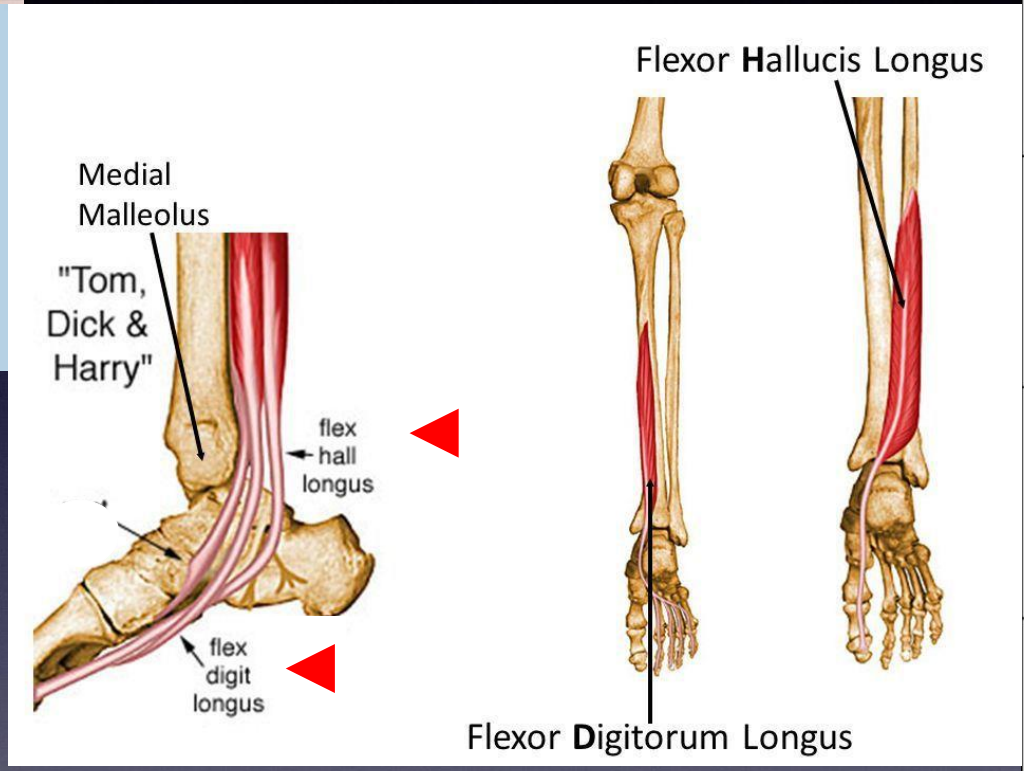
* *Foot is so stiff (may fracture if try to fix it manually).*





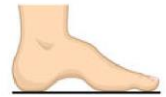


FHL

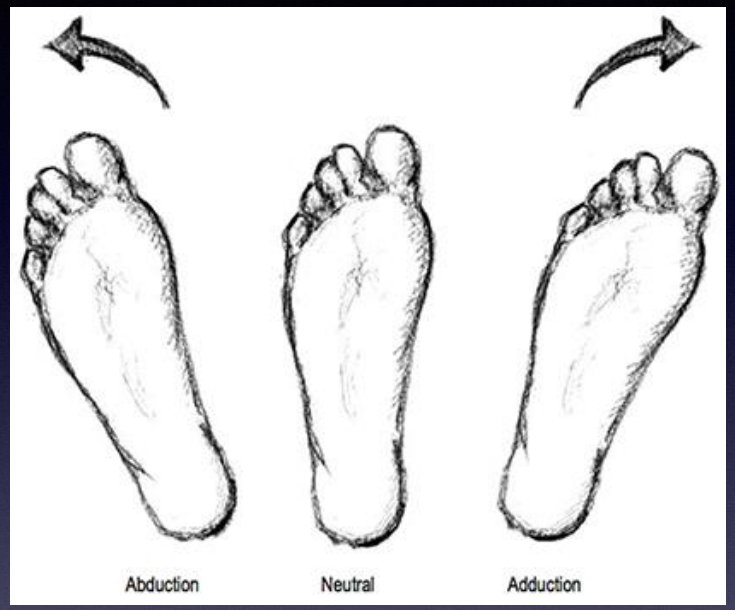


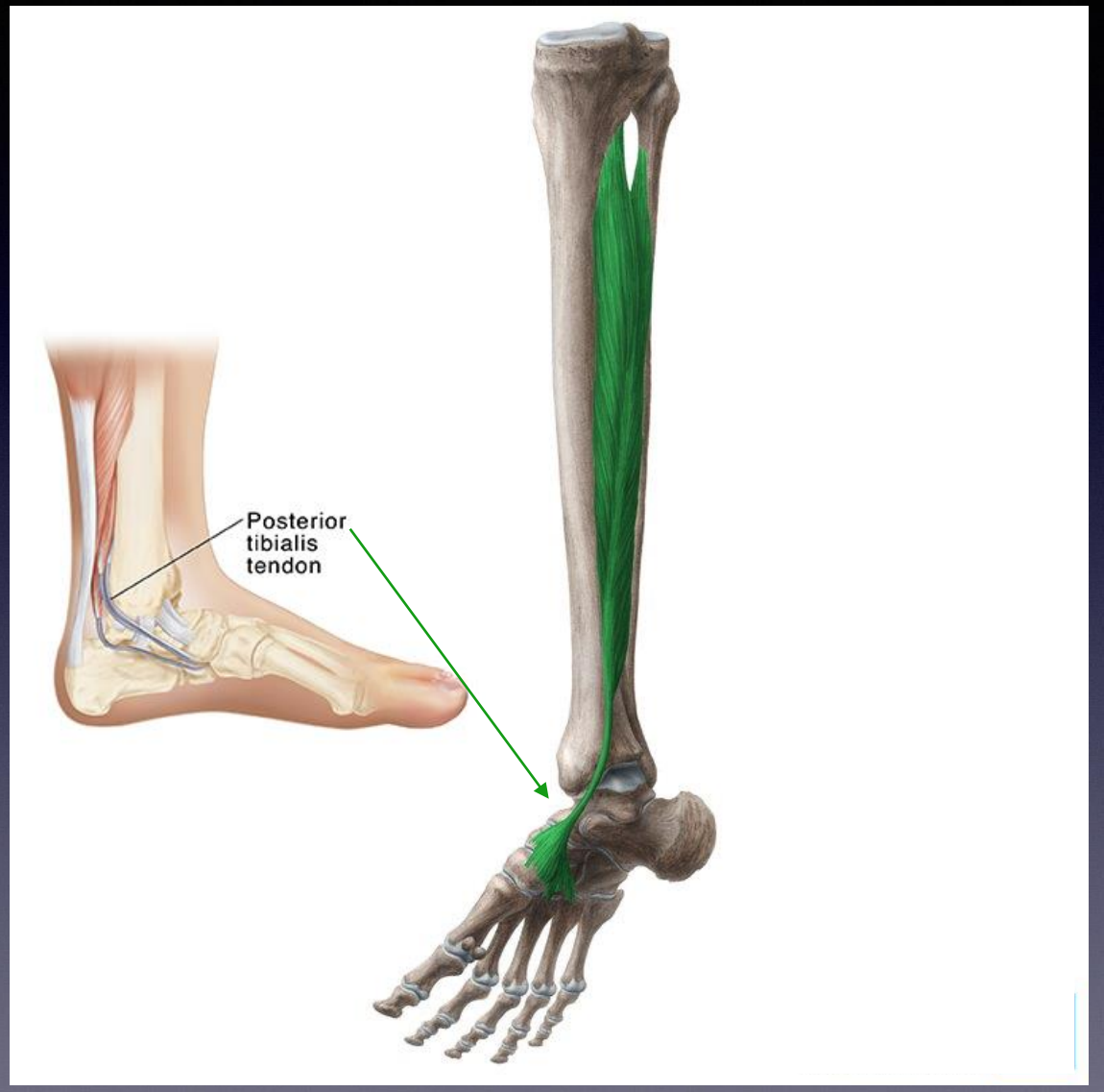
FDL

Foot Types

Flat foot (Fallen arch)			
Normal foot			
Hollow foot (High arch)	cavus		

In midfoot problem



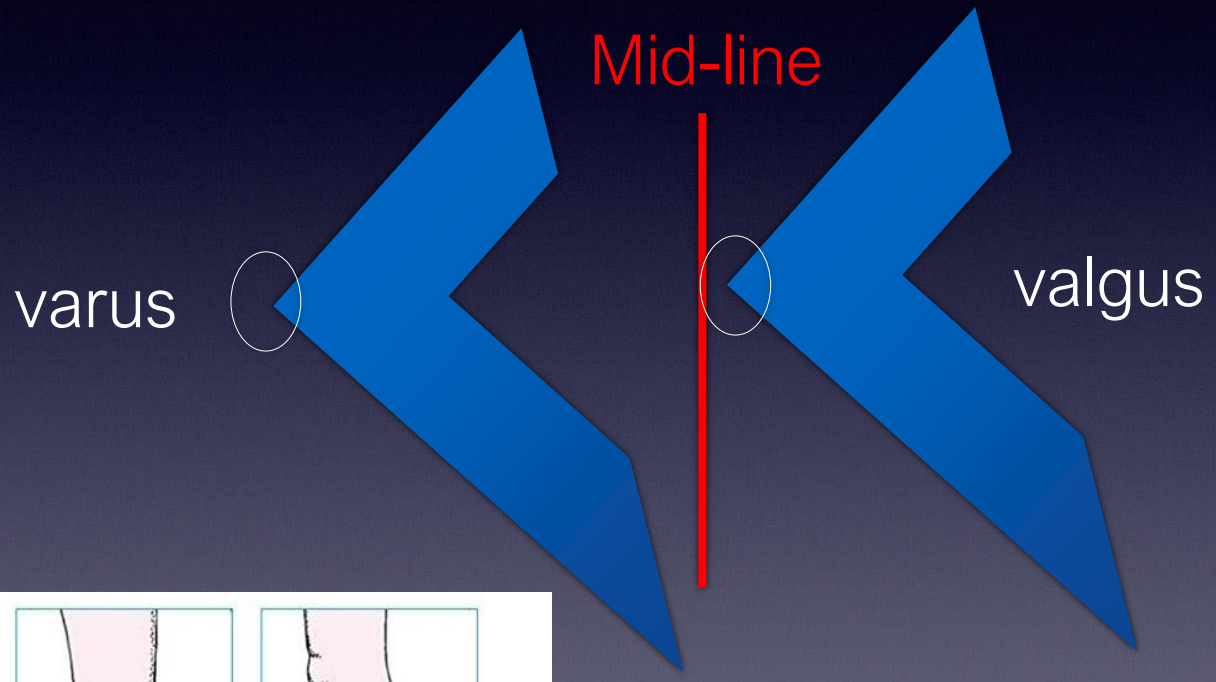


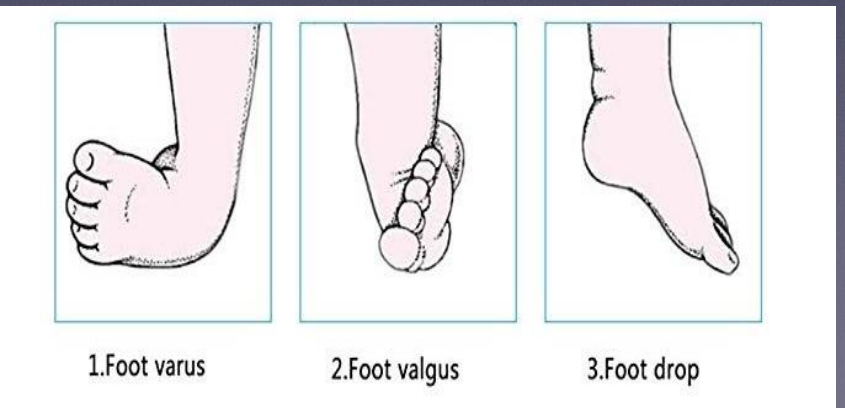
Adducted forefoot;

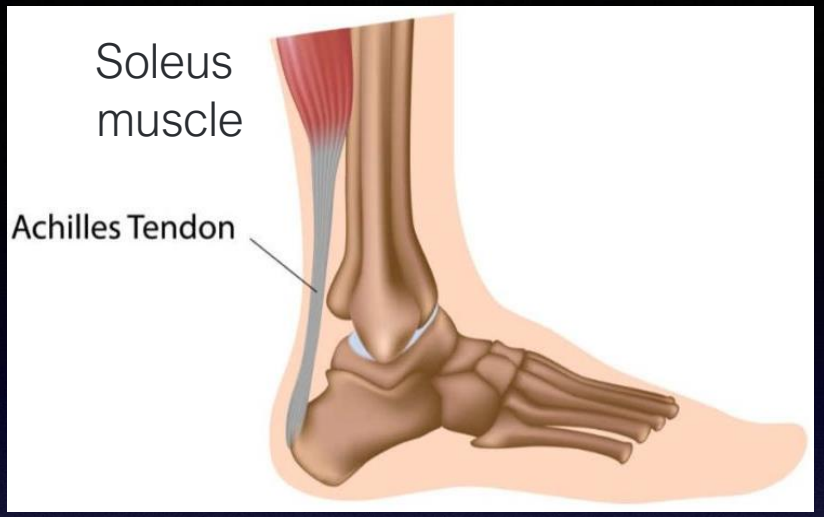
Shift metatarsal to inner side

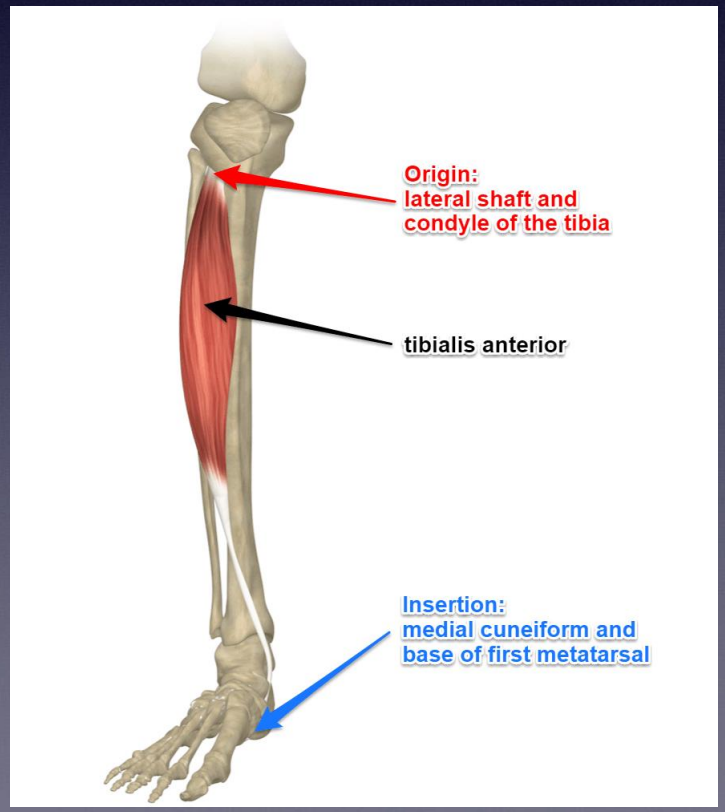
Valgus : angle of joint toward the mid-line
Varus : angle of joint away from the mid-line

Vaglus is normal in upper limbs elbow

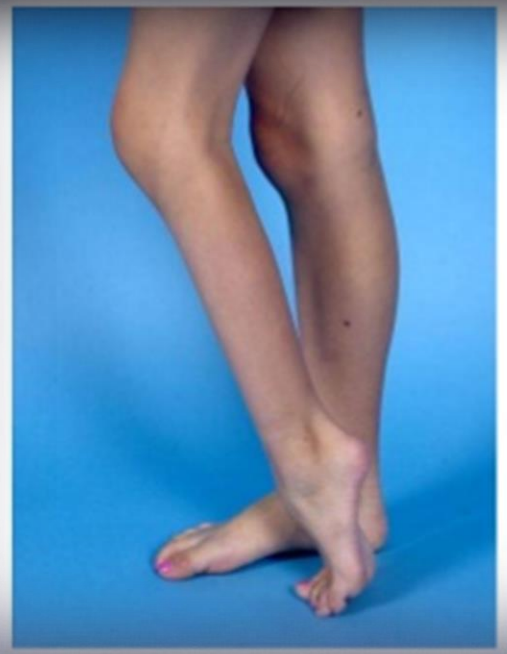






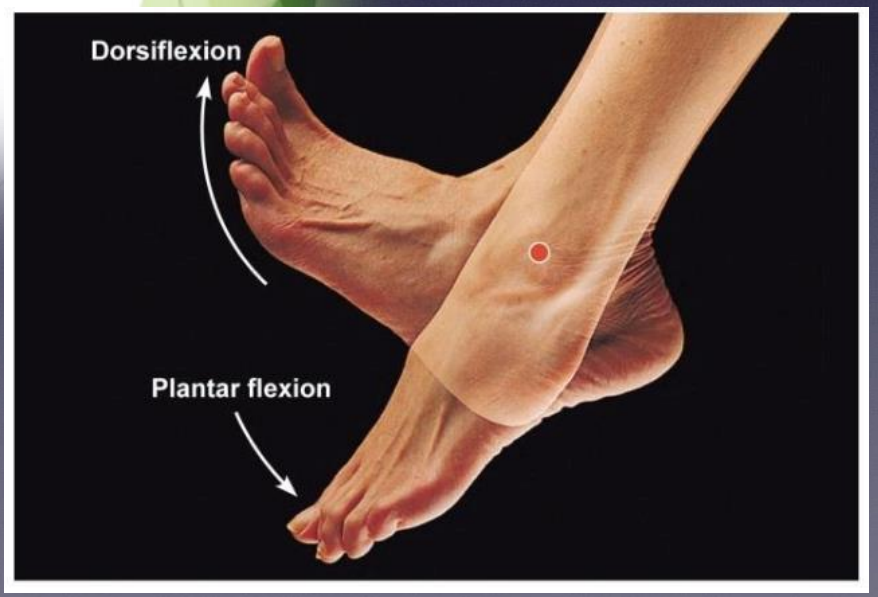


Equinus : is excessive planter flexion (opposite to dorsiflexion).



EQUINUS

Commonest foot deformity

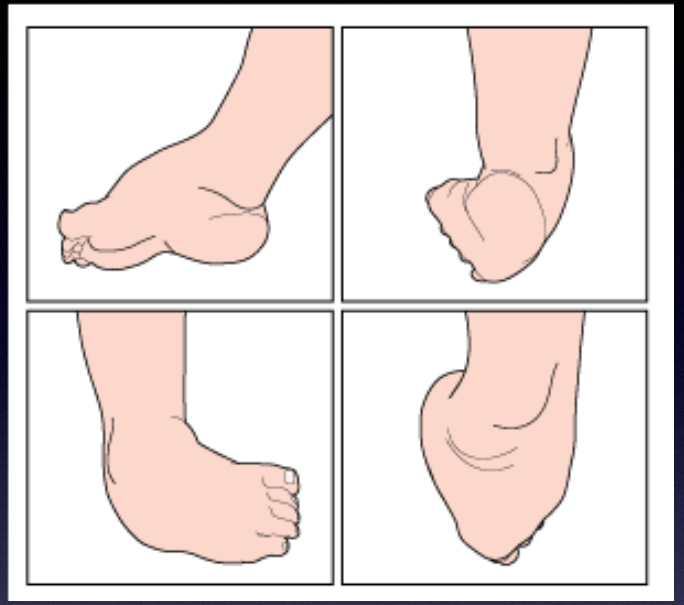


Presentation

- small foot and calf
- medial and posterior foot skin creases
- Rigid hindfoot in equinus and varus
- midfoot in cavus
- forefoot in adduction

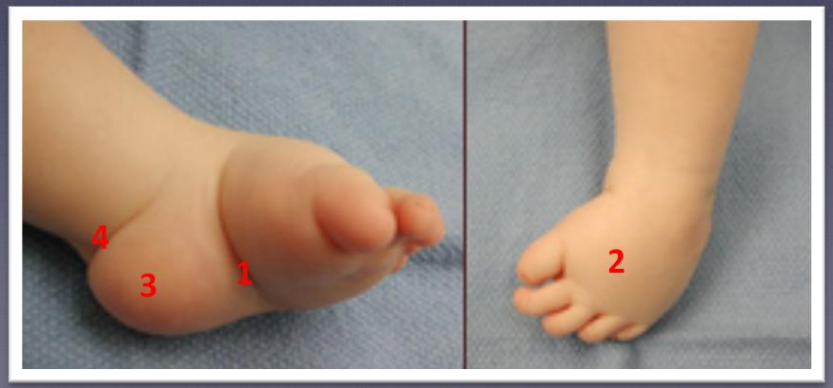
cavus

varus



adduction

Equinus
Planter
Flexed

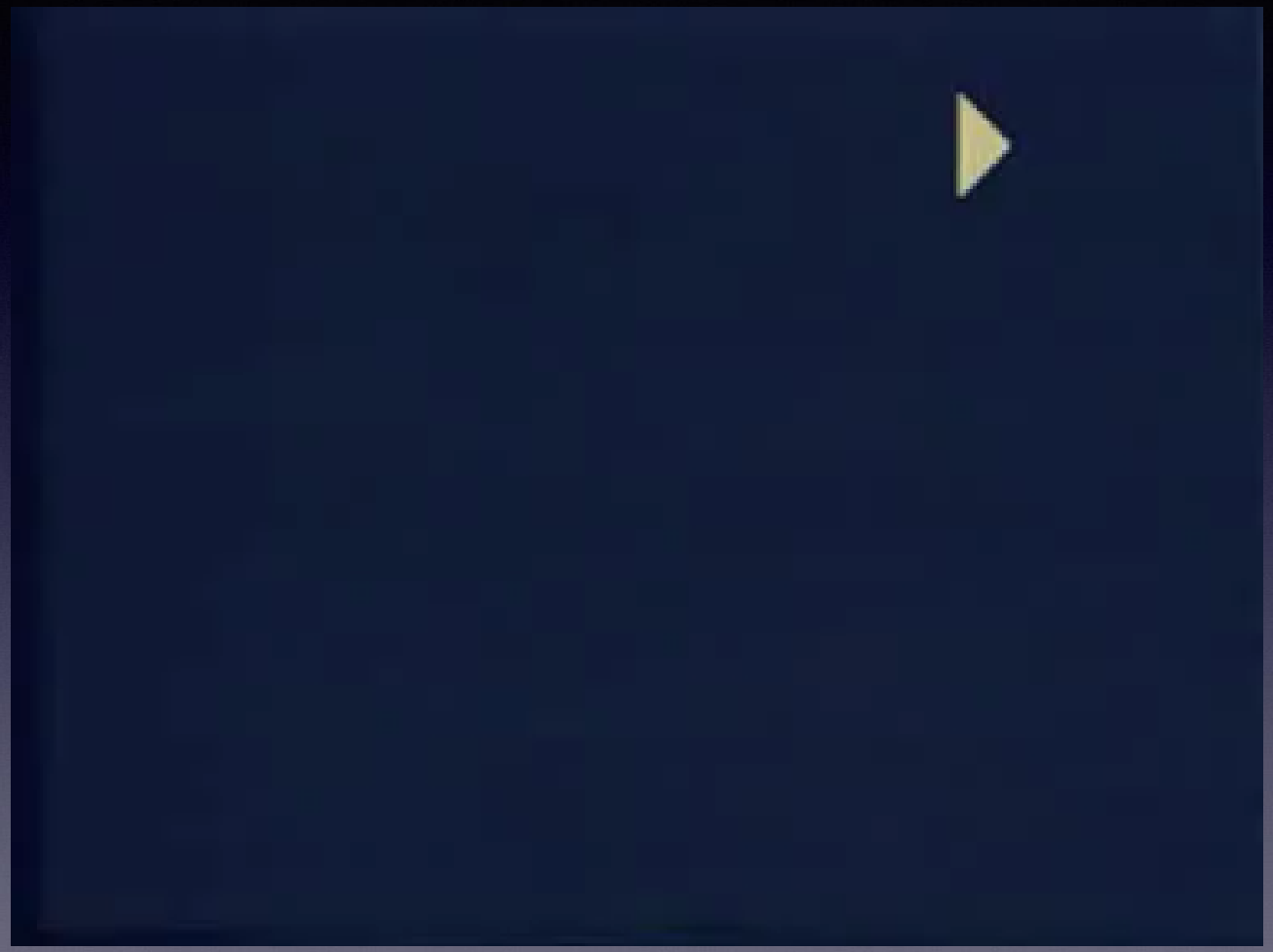


Treatment

1- Non operative

- **serial manipulation and casting (Ponseti method)**
- **Ponseti** method has 90% success rate
- goal is rotate foot laterally around a fixed talus
- order of correction (*CAVE*)
  - midfoot cavus
  - forefoot adductus
  - hindfoot varus
  - hindfoot equinus

Ponseti method



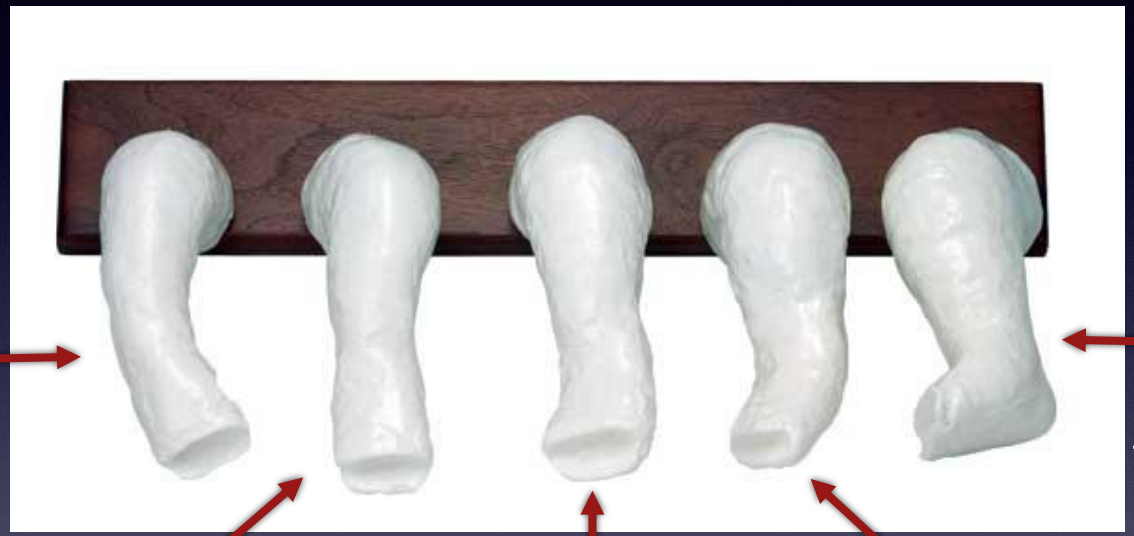
Ponseti method

- Weekly serial casting (with knee in 90° of flexion)
- Correction order in CAVE
- Achilles tenson lengthening at week 8 required

in 80 %

- **Foot abduction orthosis (FAO)**
  - worn after full correction 23 hours / day for 3 months
  - then night time/nap time only until age 4 years

Ponseti is not forceful , it is gradual correction by stretching following by casting.



First week
elevate first metatarsal

Second week
Correction of adduction

Third week
Correction of varus
(slightly valgus)

Fourth week
Over correction of
Varus to valgus

Fifth week-8wks
Correction of equinus by
Elongation of achilles
Tendon (cutting) lengthening
Casting on dorsiflexion

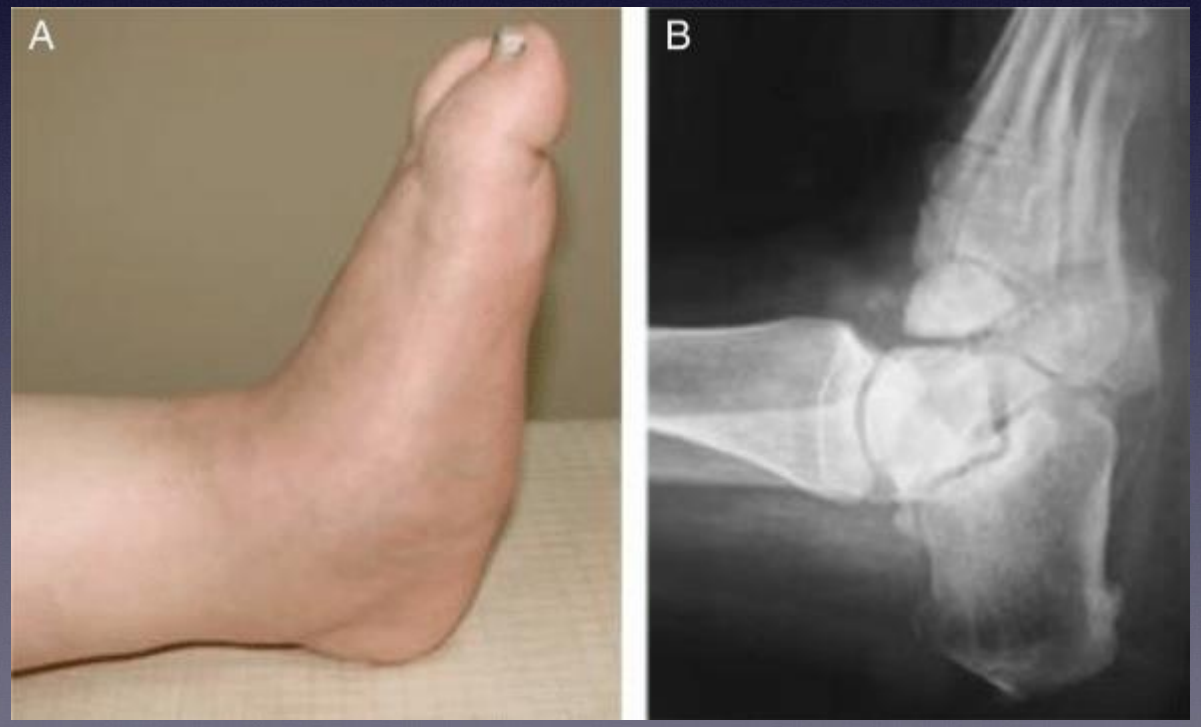
Operative

1- posteromedial soft tissue release and tendon lengthening

- **performed at 9-10 months of age so the child can be ambulatory at one year of age (because at 10 months , foot is sizeable \\ secondly, surgery at 10 months followed by 1.5months casting then the child meet the age of waliking , which help to fix the problem as the body weight pressing the abnormal foot, premature surgery may lead to recurrence of deformity beofore the baby meet the age of walking.).**

- **Indications**
  - resistant feet in young children (failed to respond on ponseti)
  - "rocker bottom" feet that develop as a result of wrong serial casting
  - syndrome-associated clubfoot
  - delayed presentation >1-2 years of age

Rocker bottom foot, also known as congenital vertical talus, is an anomaly of the foot. It is characterized by a prominent calcaneus (heel bone) and a convex rounded bottom of the foot.



operative management in older children

- older children from 3 to 10 years (bony changes occur \ no role of soft tissue release ~ no role of muscle release)
  - medial arch lengthening or lateral arch shortening osteotomy, or cuboid decancellation
- refractory clubfoot at 8-10 years of age
  - triple arthrodesis (partial removal of rigid joint and fuse it in desired position).
- talectomy
  - salvage procedure in older children (8-10 yrs) with an insensate foot

Complications

- **deformity relapse**
  - in child < 2 years → repeat casting
  - relapse in child > 2 years
    - initially with casting
    - then repeat Achilles tendon lengthening +- Tibialis anterior split transfer

- **residual cavus**
- **pes planus from overcorrection**
- **in toeing gait**
- **osteonecrosis of talus (due to forceful ponseti)**