

Congenital Talipes Equino-Varus

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DEFINITION

Talipes: Talus = ankle
Pes = foot

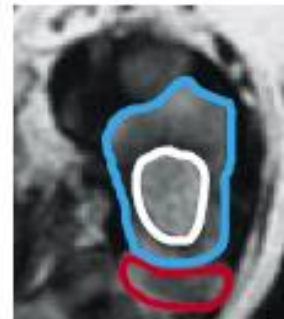
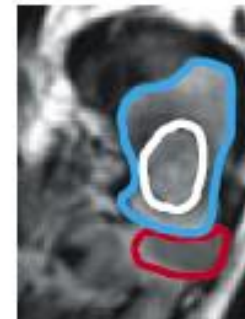
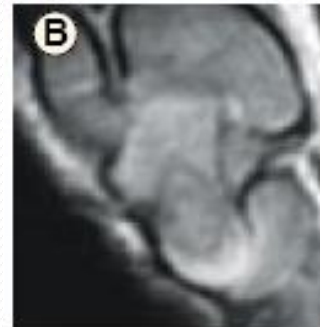
Equinus: (Latin =
horse)
Foot that is in
a position of
planter
flexion at the ankle,
looks like
that of the horse.

Varus: heel going
towards the midline

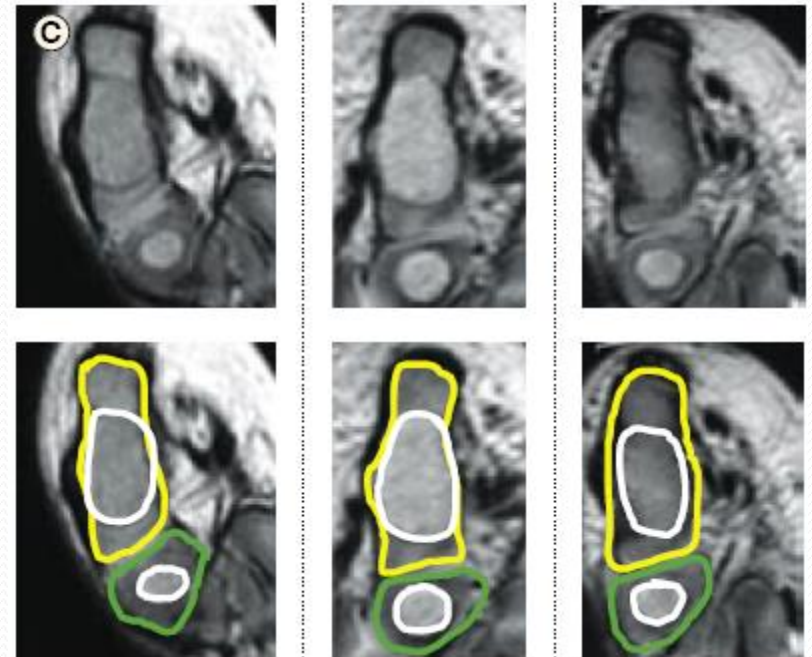


PATHOLOGICAL DEFINITION

- Teratological dislocation of talonavicular joint
- Talus is plantar flexed with its anterior end rotated laterally and its head and neck tilted medially and plantar ward
- Navicular is displaced medially and dorsally



- Calcaneus is plantar flexed with its anterior end rotated medially with a medial spin at subtalar joint
- Cuboid is displaced medially in relation to calcaneus.



Classification

- Postural

Postural or positional talipes can be passively fully corrected or even overcorrected

- Fixed

1. Flexible – correctable with non-operative treatment

2. Resistant - surgery

Incidence

- Male : Female 2:1
- 50% Bilateral
- 10% chance of subsequent child being affected if positive family history
- 2.3% if no family history

Aetiology

- The true aetiology is unknown.
- No identifiable genetic / syndromal / extrinsic cause

Associations:

Extrinsic causes:

- Teratogenic agents eg sodium aminopterin
- Oligohydramnios
- Congenital constriction bands/rings

Associated syndromes

- Arthrogryposis congenita
- Streeters dysplasia
- Diastrophic dwarfism
- Freeman Sheldon syndrome
- Mobious syndrome
- Larson's syndrome
- Long arm 18 deletion syndrome

Pathology

- Shortened ligaments
 - posterior aspect of the ankle
 - medial and plantar aspects of the foot
 - interosseous ligaments in the sub-talar joint.
- Short muscles
 - gastrocnemius muscle
 - tibialis posterior
 - toe flexors.
- Deformed bones
 - Tarsal bones
 - Femur tibia and fibula

Bone

- Femur, tibia and fibula
 - the entire lower limb can be shorter - fibular shortening most common
- Talus - all relationships of the talus are abnormal-including:
 - anterior extrusion of the body of the talus
 - ER of the body in the ankle mortise, equinus
 - medial and plantar deviation of the neck of the talus

- Os calcis - medial rotation, equinus
- Navicular - medial subluxation
- Cuboid - medial subluxation
- Forefoot - adducted and supinated, severe cases have cavus also

Muscles

- Atrophy of the leg especially in peroneal group
 - number of fibres is normal , but are smaller in size
- Triceps surae, Tibialis posterior, FDL, FHL are contracted
- Other soft tissues:
Tendon sheaths frequently thickened, esp. about Tib post and peronei

Joint capsules –contractures

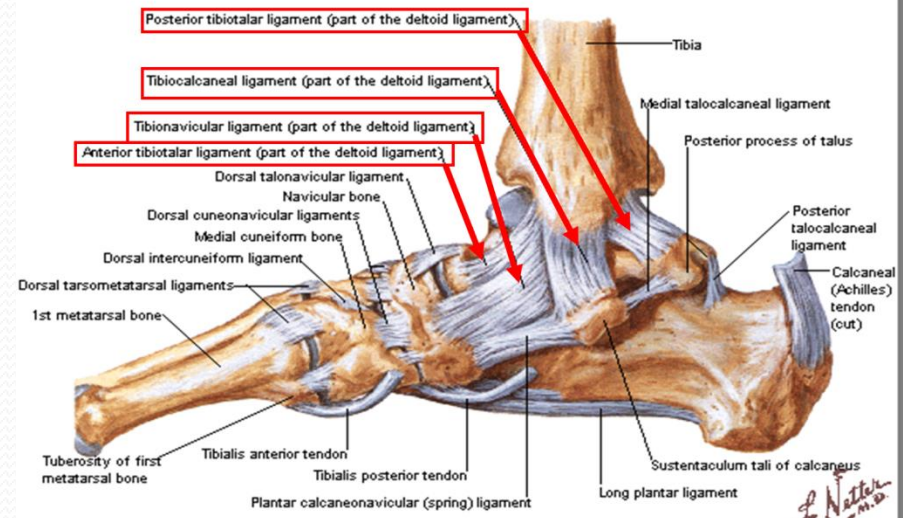
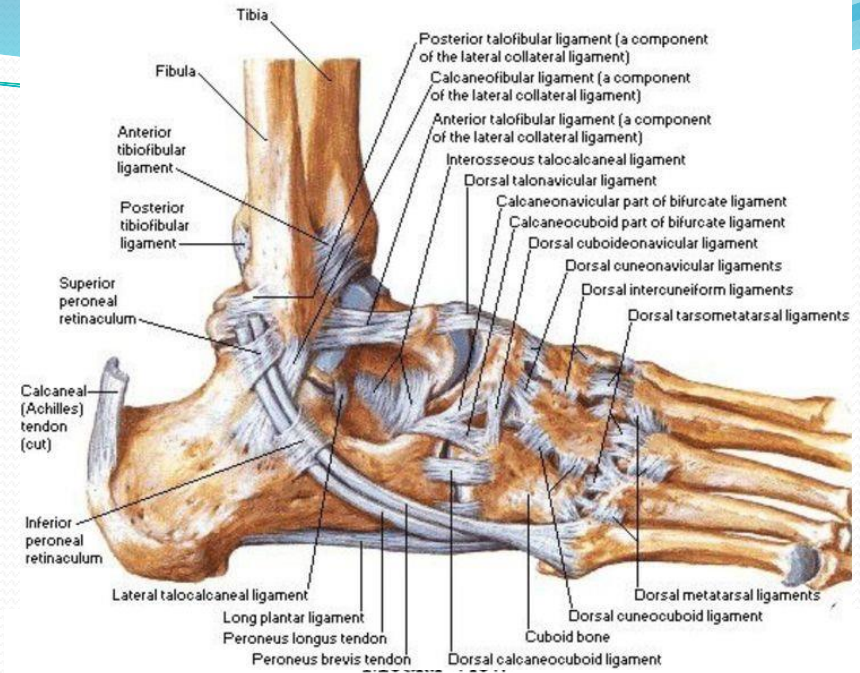
- Ankle
- Subtalar
- Talonavicular
- Calcaneocuboid

Ligaments -

- Calcaneofibular
- Talofibular
- Posterior talocalcaneal
- Bifurcate
- Deltoid
- Long and short plantar
- Spring

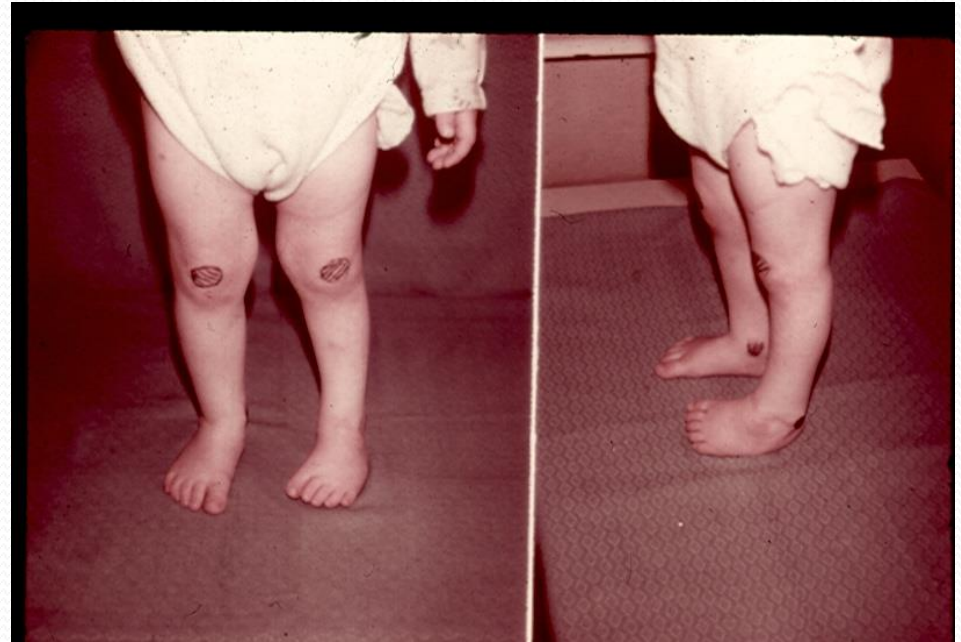
Fascia

- Contracture of fascial planes and of plantar fascia



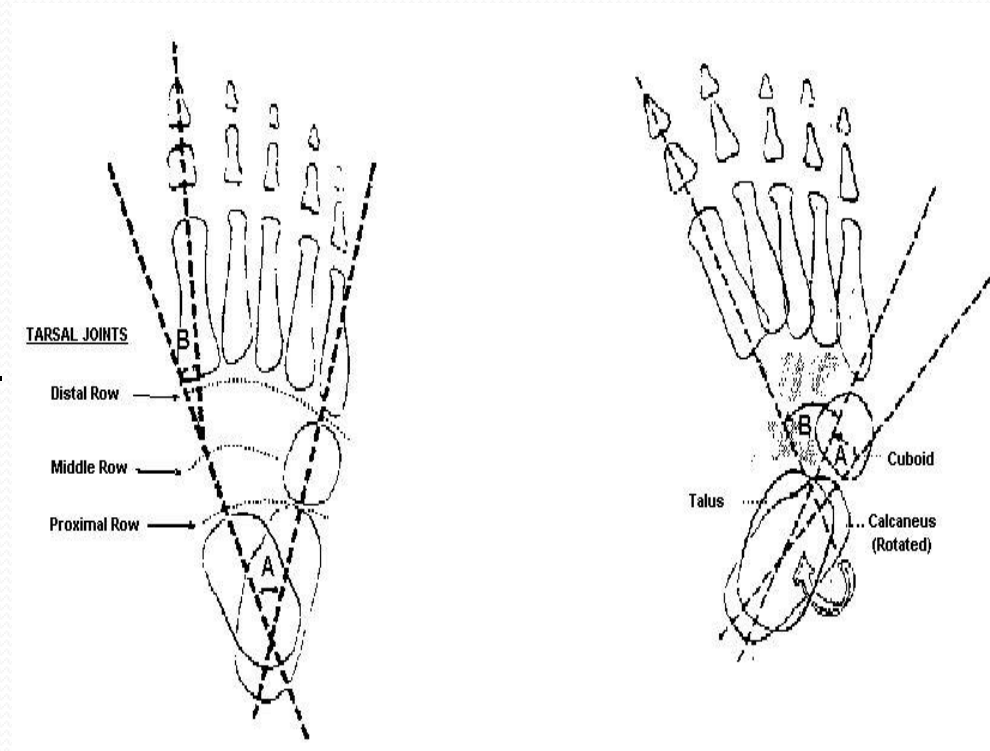
Diagnosis

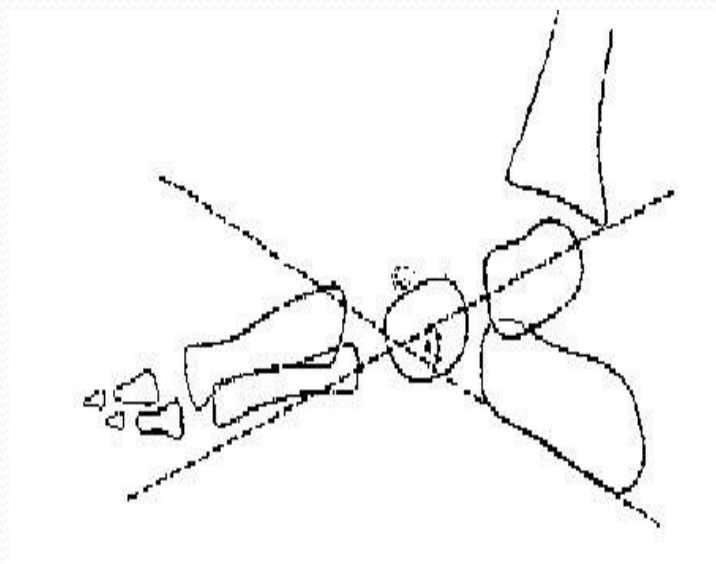
- Short Achilles tendon
 - High and small heel
 - No creases behind Heel
 - Abnormal crease in middle of the foot
 - Foot is smaller
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- Callosities at abnormal pressure areas
 - Internal torsion of the leg
 - Calf muscles wasting



X-Rays

- Simulated weight bearing AP
- Talocalcaneal angle (A) - normal range 20-40° abnormal if <20°





- Lateral film with the foot held in maximal dorsiflexion
- Talocalcaneal angle(A) - normal range 25-50° abnormal if <25°

Treatment

Objectives

- Achieve concentric reduction of the dislocation/ subluxation of TCN joint
- Restore normal articular alignment of talus & ankle.
- To establish muscle balance between the evertors and the invertors and dorsiflexors & plantar flexors
- To provide a normal foot with normal function & weight bearing

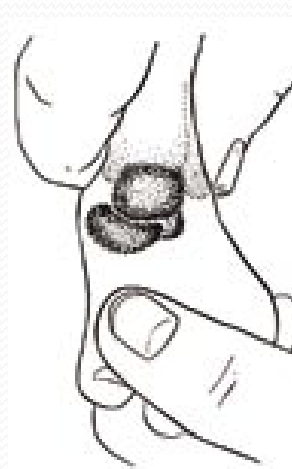
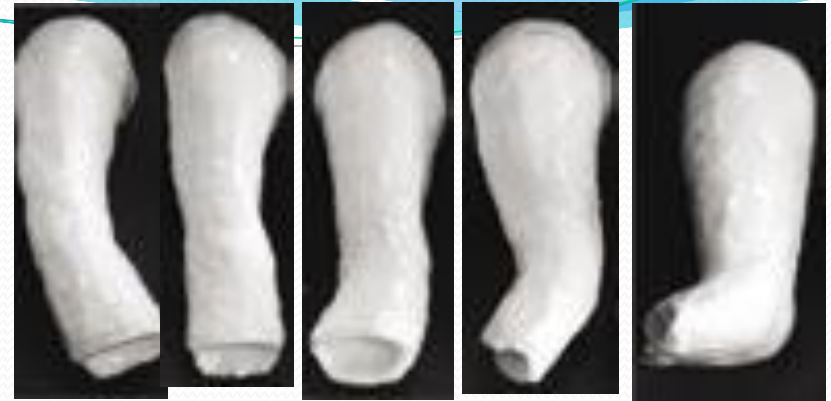
Non-operative treatment

Ponseti Method

- Serial casting after manipulation (Toes to groin with 60 -80 deg knee flexion)
- weekly changes till deformity is corrected
- Followed by an abduction orthosis.



- Simultaneous correction of all the deformities
- Weekly change of cast
- Principle to stretch the ligaments into maximum and maintain position in cast
- Stretching continues after 1 week
- Heel is free to rotate
- May need achilles tenotomy if equinus not corrected



Bracing

- The brace should be worn full time (day and night) for the first 3 months
- After that for 12 hours at night and 2 to 4 hours in the middle of the
- This protocol continues until the child is 3 to 4 years of age.



Problems & complications of conservative mgt

- Persistence of equinus
- Growth disturbance of Ant. Tibial physis
- Flat top talus
- Anterior ankle contracture
- Persistent varus deformity
- Failure to correct medial spin of calcaneous at subtalar joint
- Rocker bottom deformity &
- Medial calcaneocuboid subluxation

Operative treatment

When to operate?

- When a plateau has been reached in non-operative treatment
- When the child is of sufficient size to enable anatomy to be recognised

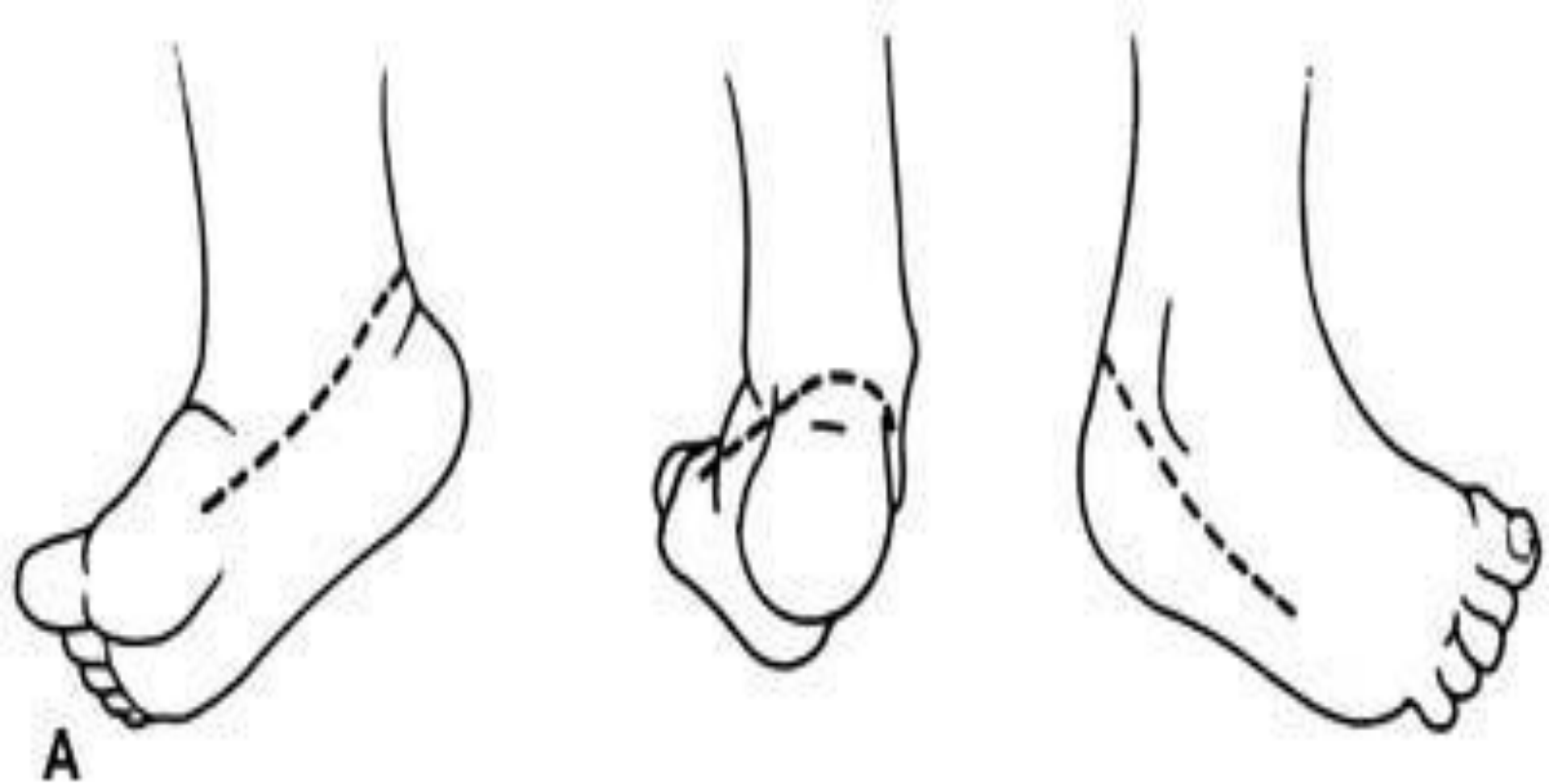
Treatment by age

- Less than 5 years correction can be achieved by soft tissue procedures (Postero-medial release)
- More than 5 years requires bony reshaping, eg dorso-lateral wedge excision of the calcaneo cuboid joint (Evans procedure) or osteotomy of the calcaneum to correct varus
- More than 10 years lateral wedge tarsectomy or triple arthrodesis if the foot is mature (salvage procedures)

Postero-Medial Release Technique (Turco)

Incision

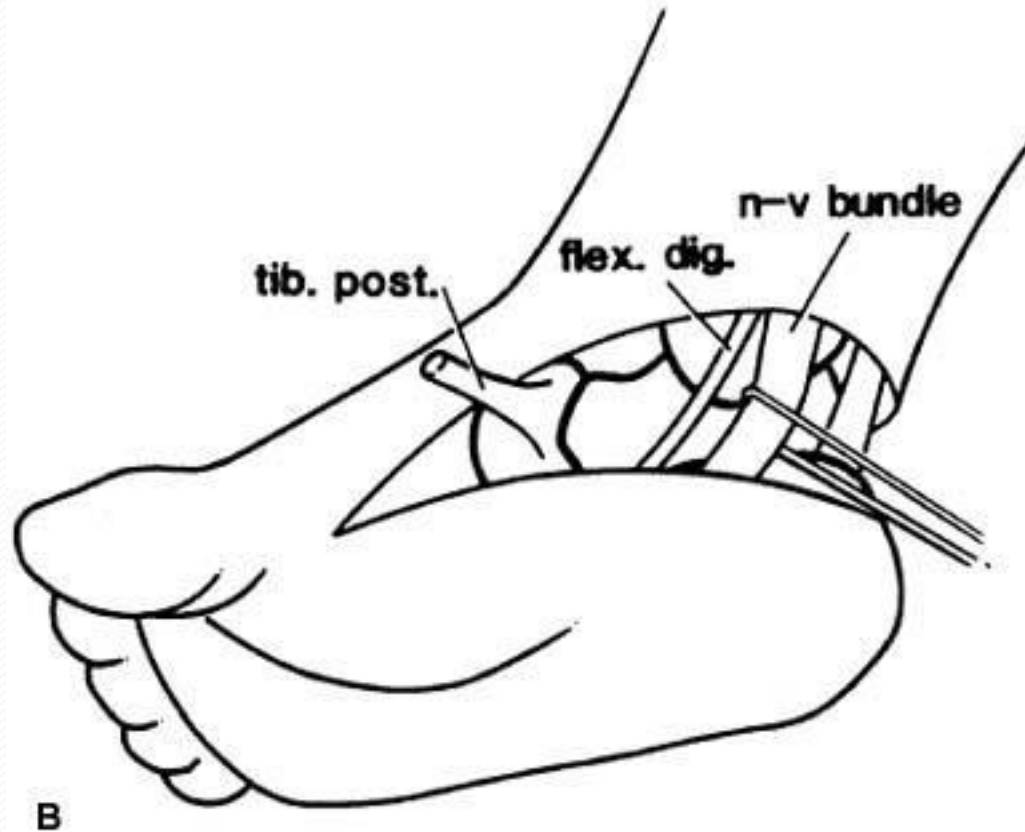
- Cincinnati - Transverse incision around hind foot which gives excellent exposure
- J-shaped or hockey stick incision



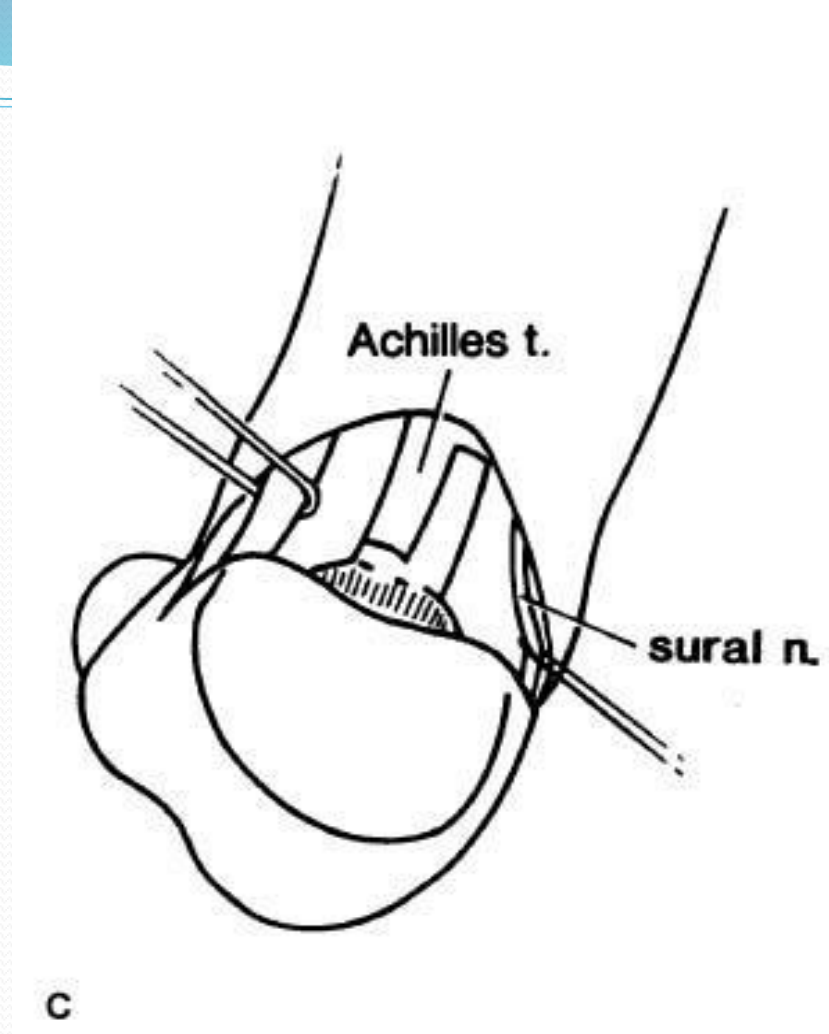
- The Cincinnati incision used for standard clubfoot release.

Procedure

1. Identify and preserve the neurovascular bundle and the sural nerve. Preserve the medial calcaneal branch of the posterior tibial nerve.
2. Care must be taken handling the posterior tibial vessel as the dorsalis pedis artery is often attenuated or absent
3. "Z"-lengthen tendo achilles



- Isolation of the neurovascular bundle and posterior tibial tendon



- Preferred Z-plasty technique for the Achilles tendon

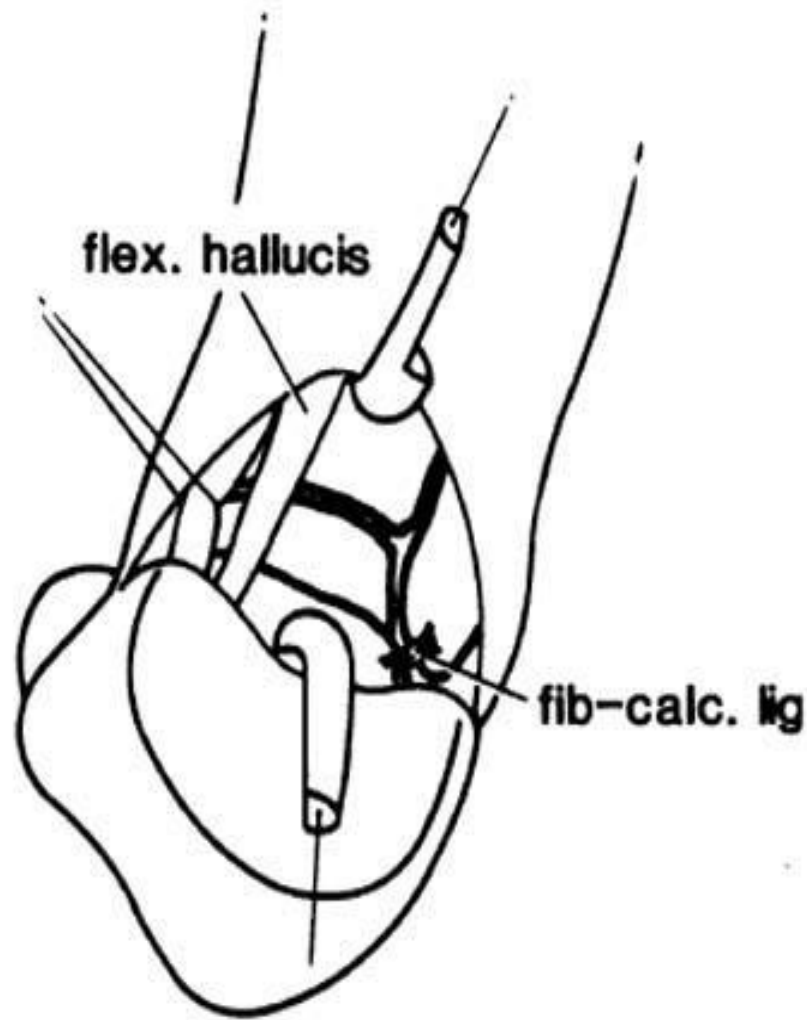
4. Divide and lengthen Tibialis Posterior, FHL and FDL

5. Capsulotomies

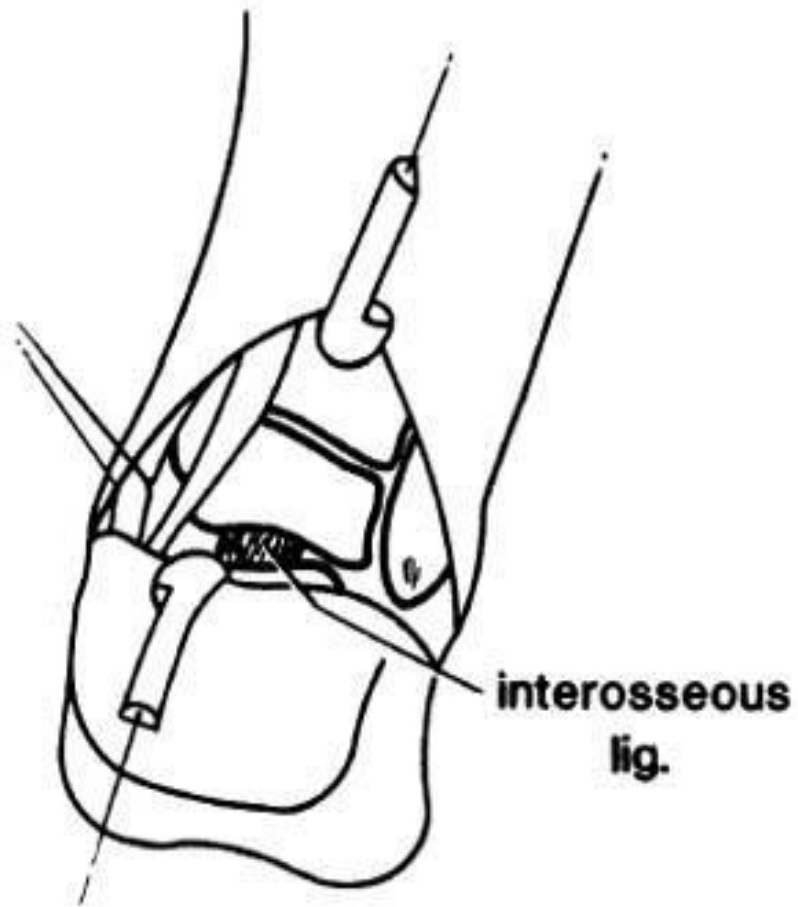
- ankle posteriorly
- subtalar joint
- calcaneocuboid joint

6. release plantar ligament

7. release abductor hallucis & FDB

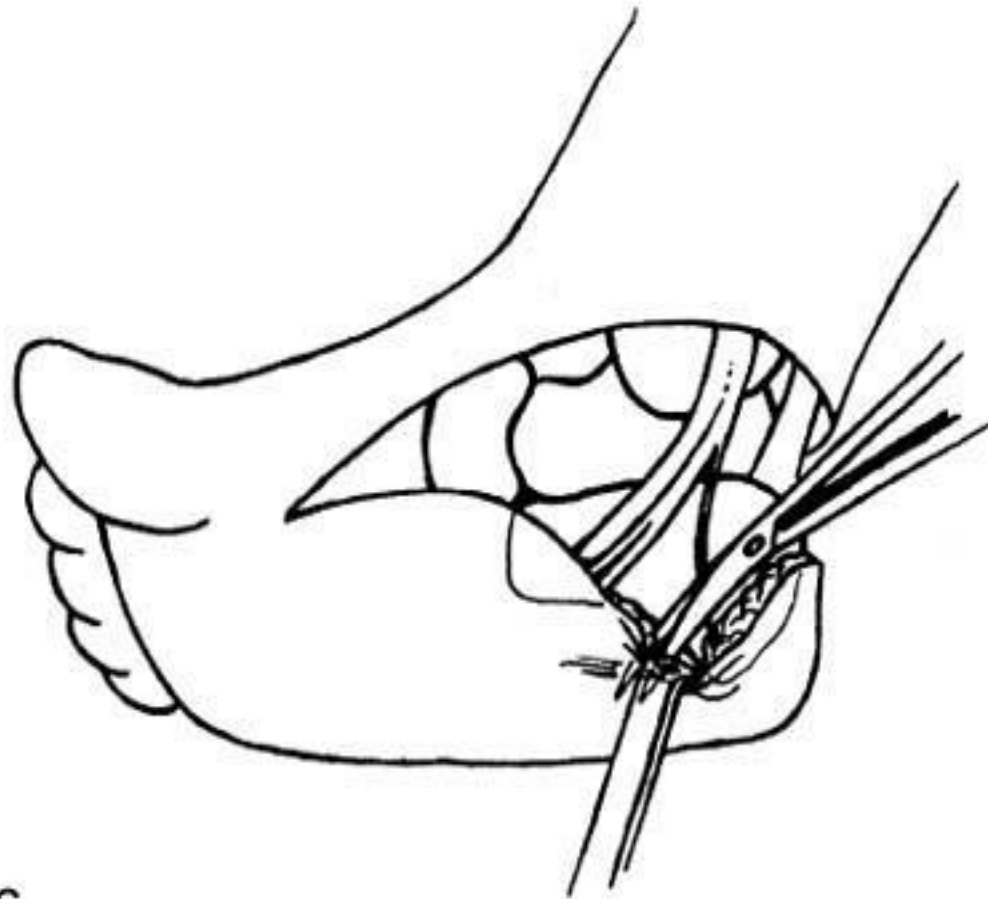


- Incision of the fibulocalcaneal ligament and peroneal tendon sheaths.



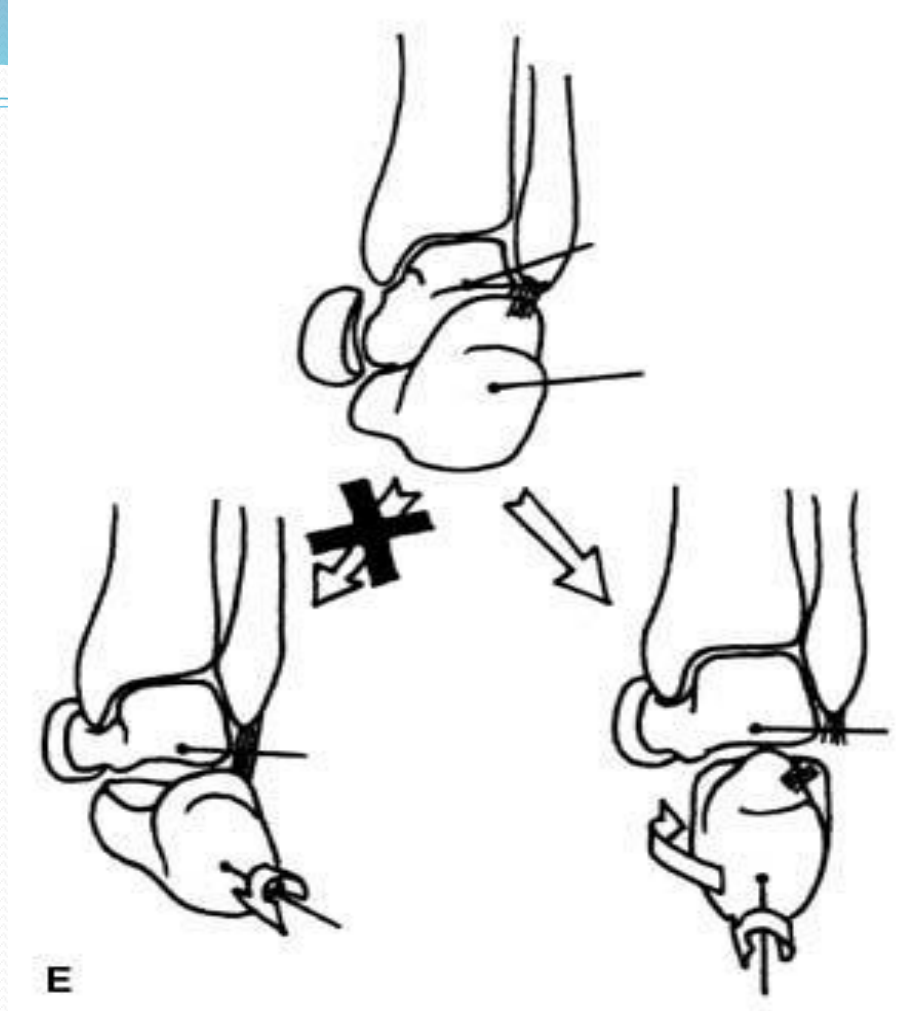
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- The interosseous ligament, seen from the posterior incision.



G

- Release of the plantar fascia in the presence of cavus.



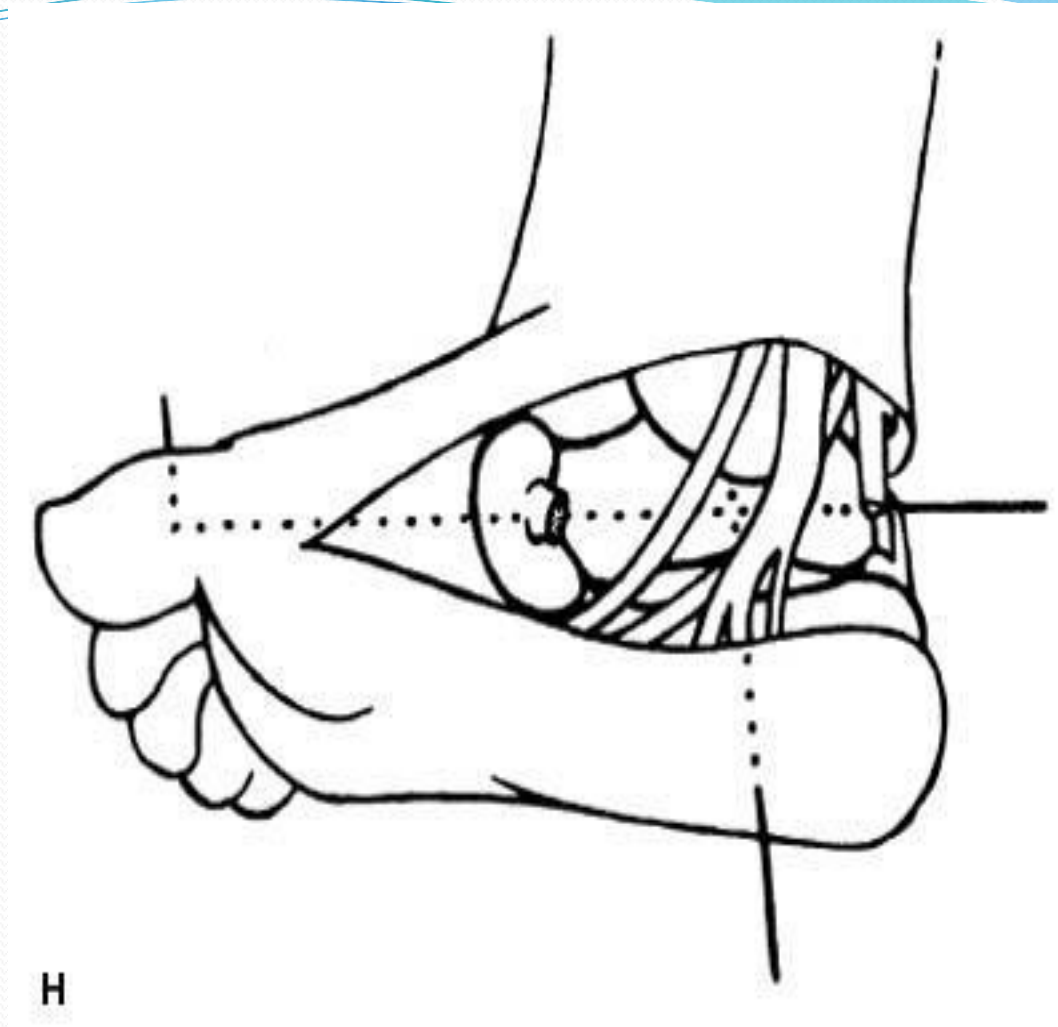
- External rotation of the os calcis during dorsiflexion.



9. peroneal tendon sheath may need release (can release everything except deep deltoid ligament)

10. Tendons are repaired.

11. K-wires may be passed into talus and calcaneus to hold reduction



- Use of two pins to fix the talonavicular joint and subtalar joint.



12. Close skin, but release tourniquet before final skin closure

13. Above knee POP cast in comfortable position for skin closure

14. Change cast at 2-3wks for neutral position

15. Retain cast for 12 weeks total.

Complications

- Infection (rare)
- Wound breakdown
- Stiffness / restricted ROM (early stiffness correlates with a poor result)
- AVN of the talus: Combined simultaneous medial and lateral release- 40% incidence of AVN of the talus
- Persistent intoeing - insufficient external rotation correction of the subtalar joint

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- Overcorrection associated with release of interosseous ligaments in the subtalar joint
 - Overlengthening of tendon units
 - Residual deformity
- Must ensure there is not a neurological cause for recurrence
- eg -tethered cord

Ilizarov method / external fixation(jess)

- can be used as a primary procedure but is normally reserved for recurrent CTEV
- alternative to triple arthrodesis
- soft tissue operation or in combination with a calcaneal osteotomy in late childhood / adolescence.





Thank you