



Idiopathic Flat Feet

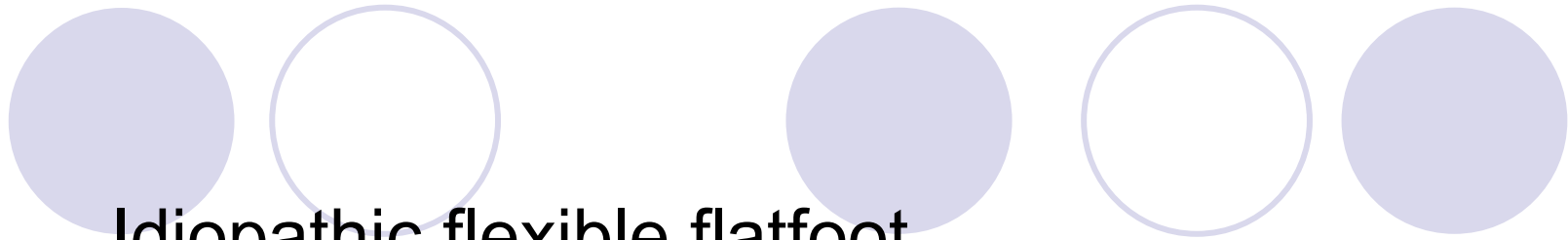
Planovalgus feet

Talkhani
Sunderland Royal Hospital



Flexible / Rigid

- Idiopathic – Flexible Flatfoot
- Infants – vertical talus
- Children - Tarsal coalition
- Accessory Navicular bone
- Adults: Acquired
 - Tib. post disease
 - Charcot / Neuromuscular
 - Post Traumatic
 - Arthritis



Idiopathic flexible flatfoot

- Poorly understood
- Rarely painful
- Even more rarely disabling



Epidemiology

- No clinical or radiographic criteria for defining
- Defined as a weight-bearing foot with an abnormally low or absent longitudinal arch.

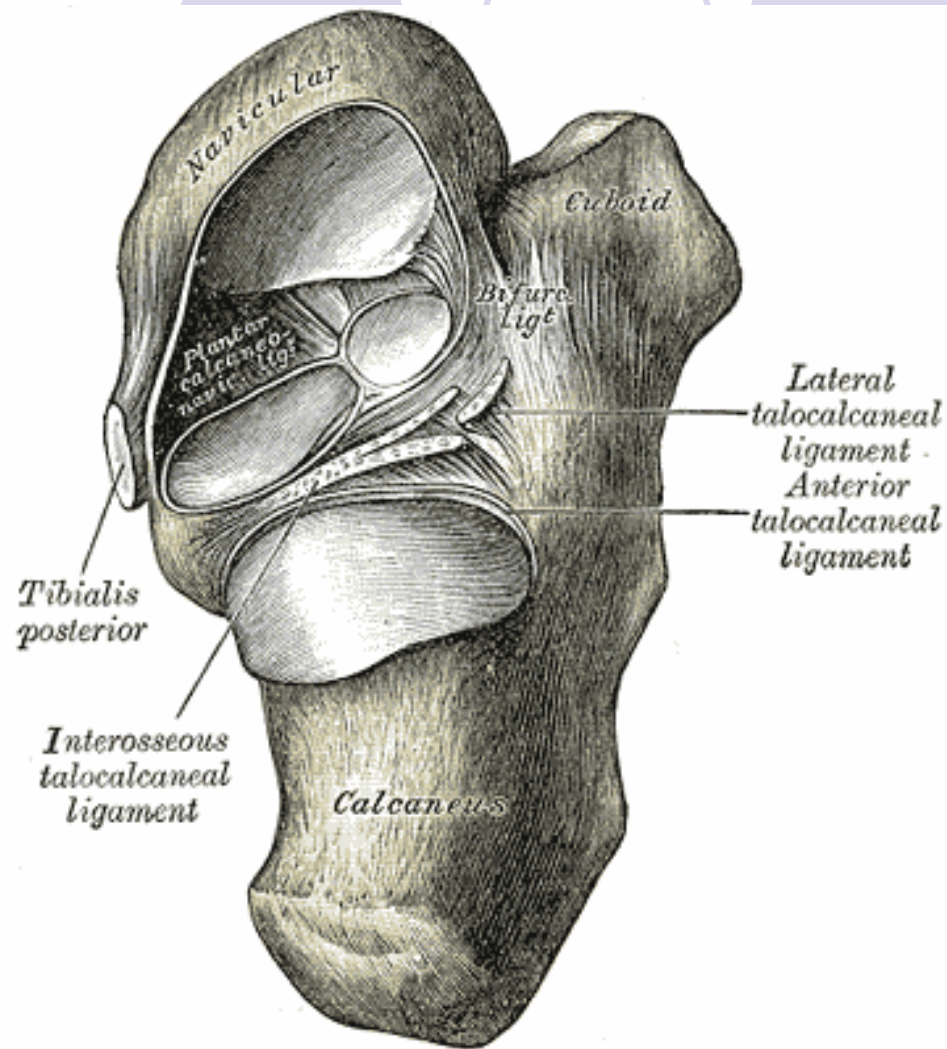
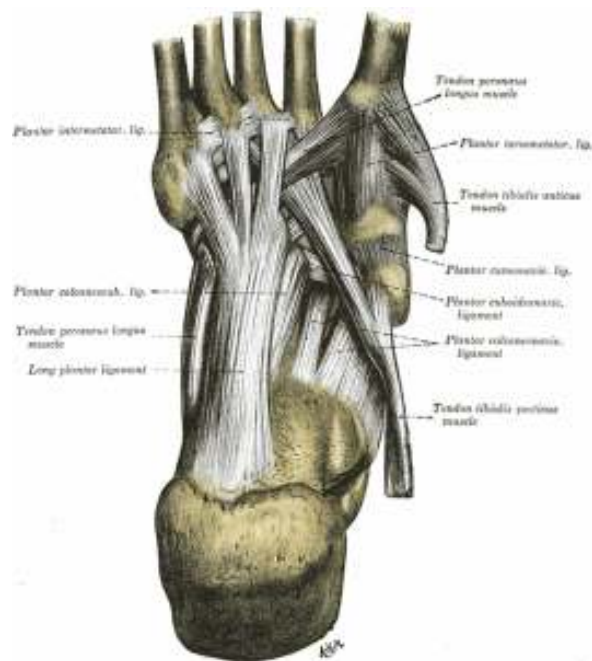
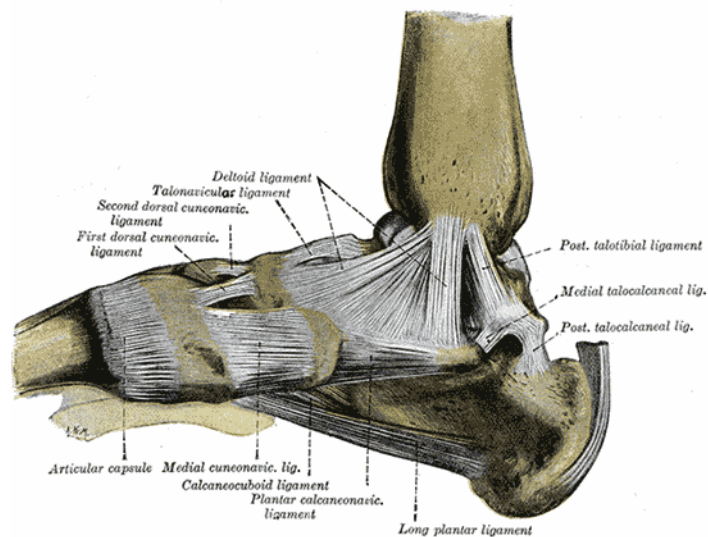
Pathogenesis



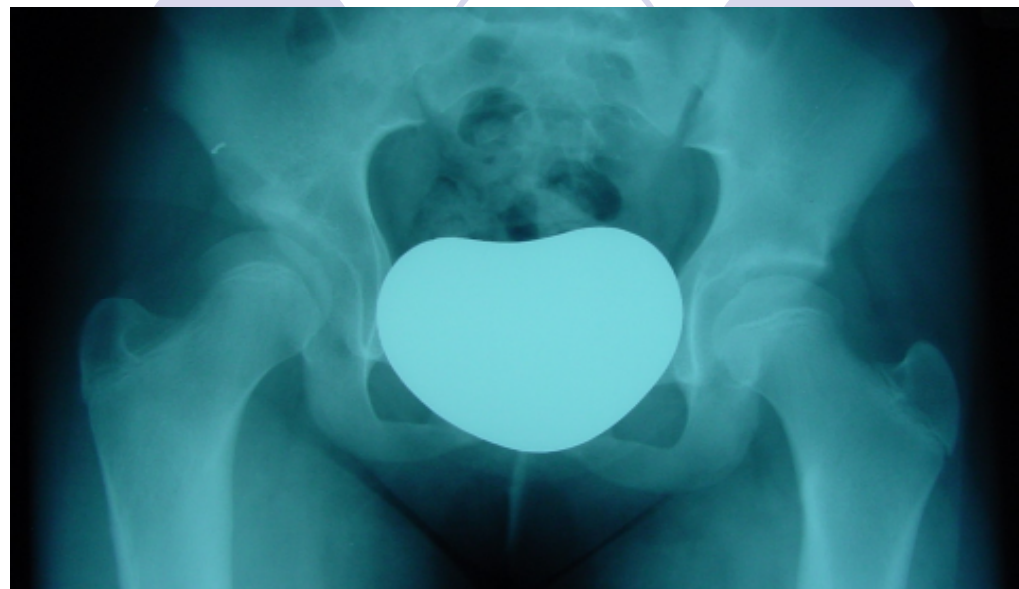
- Lack of muscle coordination / sub-clinical muscle weakness.
- Bone-ligament theory: interrelationship of the bones, coupled with the strength and flexibility of the ligaments
 - ligamentous laxity.

Biomechanics/pathomechanics

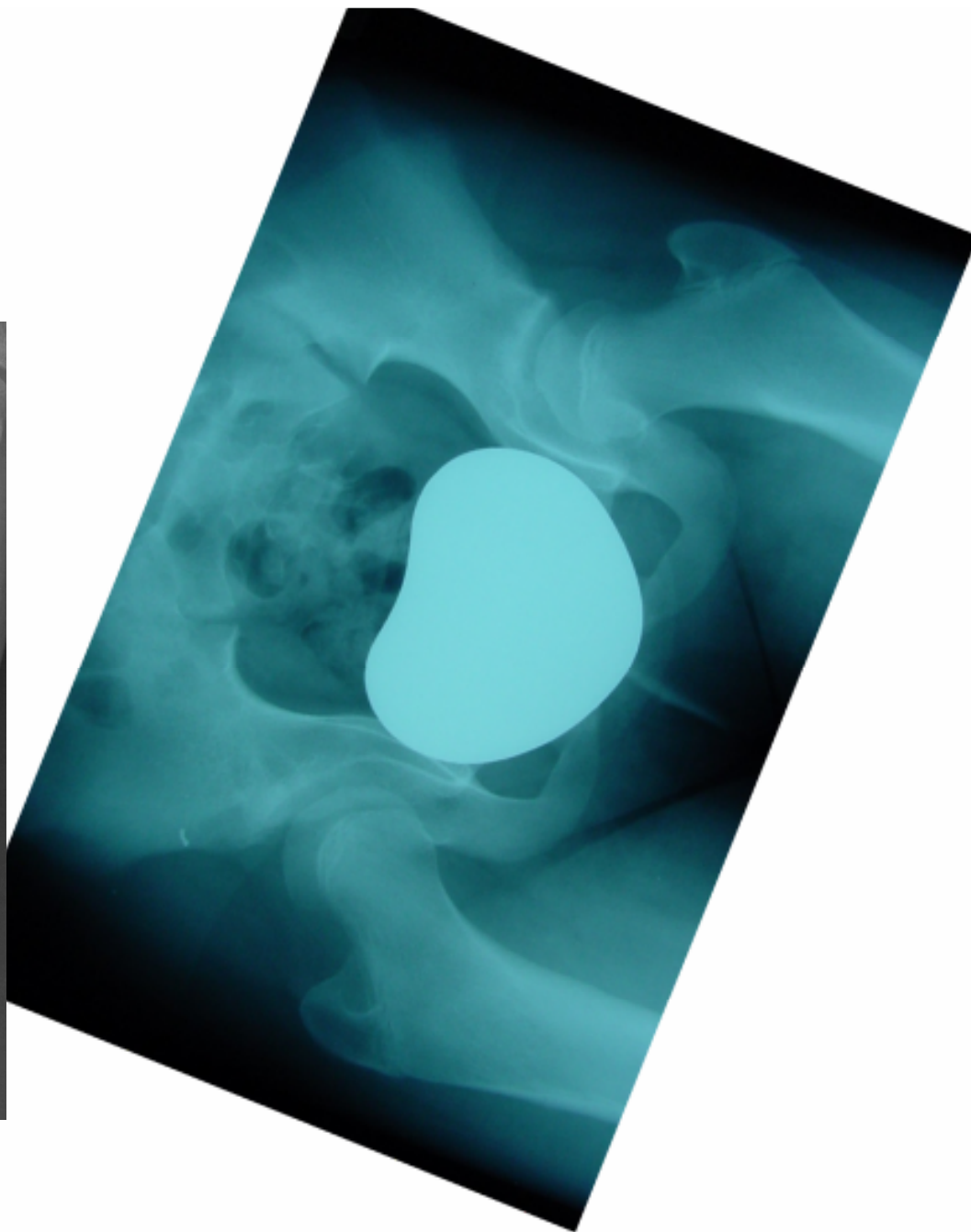
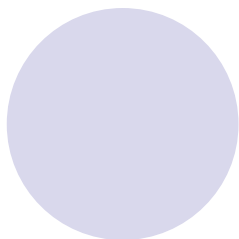
- Subtalar joint complex
 - 3 (?4) bones, spring ligament-calcaneo-navicular ligament, joint capsules = one unit.
 - Talus has no muscle tendon attachment
- Compared with the hip joint.
 - femoral head to the talar head
 - pelvic acetabulum to the so-called
 - “acetabulum pedis,”
- Subtalar joint axis of motion is oblique
 - motions “inversion” and “eversion.”

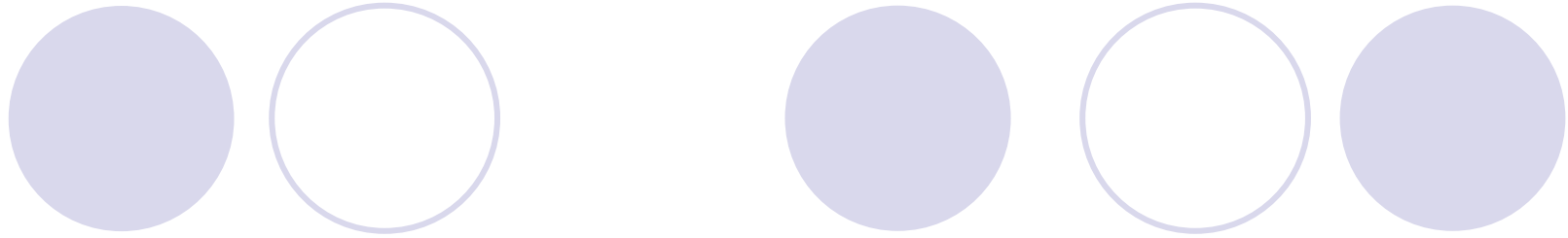


Idiopathic Flat Foot

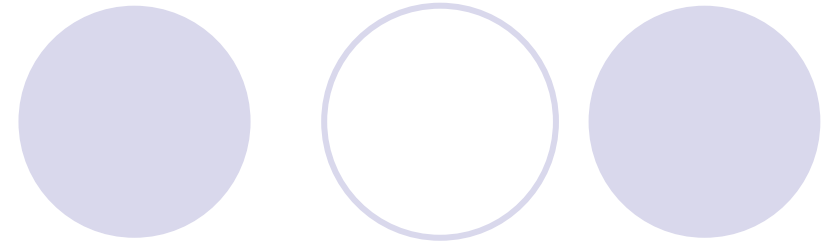


Idiopat





- On weight bearing
 - Talus internally rotates.
 - Calcaneus everts, externally rotates
 - hindfoot placed in valgus - Achilles contracture
 - Naviculus glides dorsally and laterally
 - midfoot collapse



Idiopathic Flat Foot

Clinical features - Pain

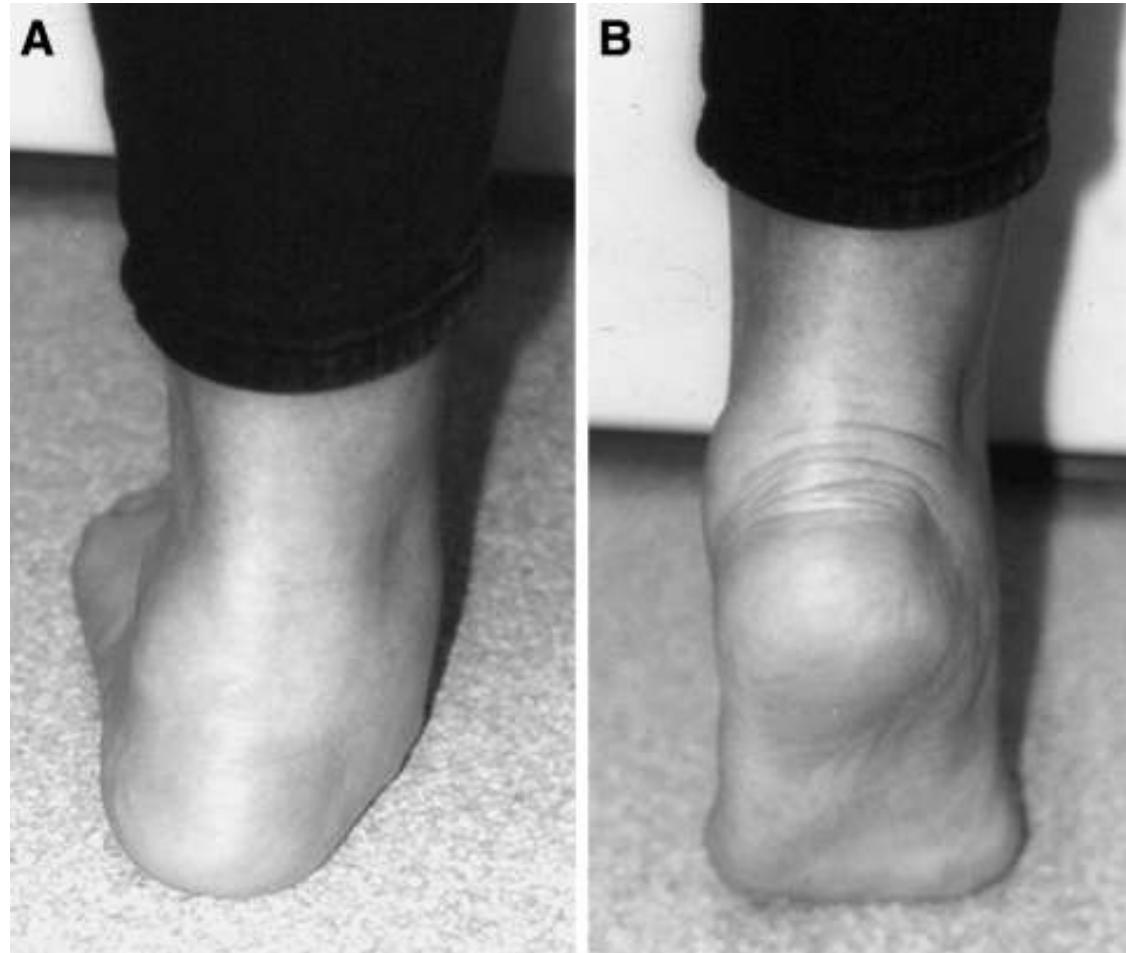
- FFF with Tight TA :
 - plantar-medial aspect of the midfoot
 - occasionally in the sinus tarsi area.
 - Exacerbated by activities and relieved by rest
 - Night pain is extremely unusual
- Rigid flatfoot pain experienced at several sites.

Clinical features

● Patient standing

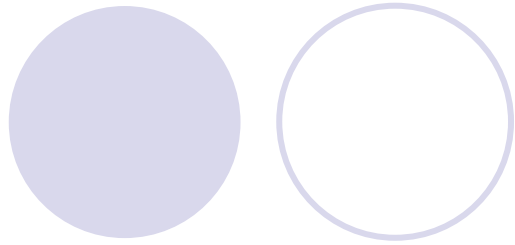
- **Rigid / flexible**
- Infants – vertical talus
- Tarsal coalition
- Tib. post disease
- Arthritis

heel valgus converts to varus and the longitudinal arch can be seen

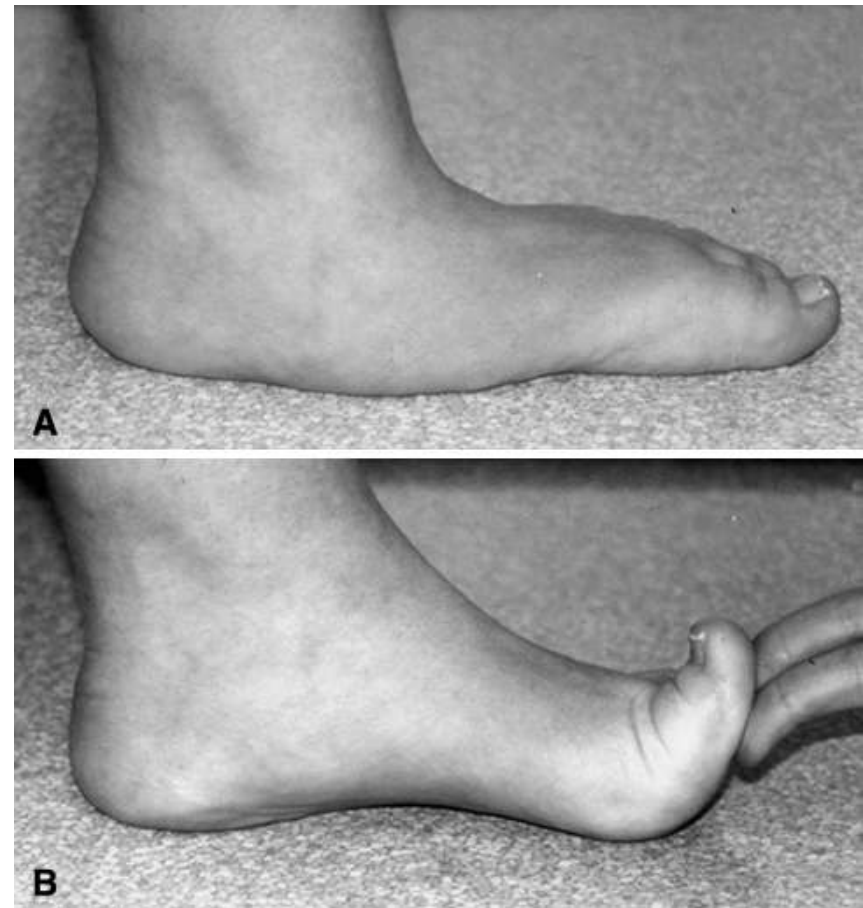
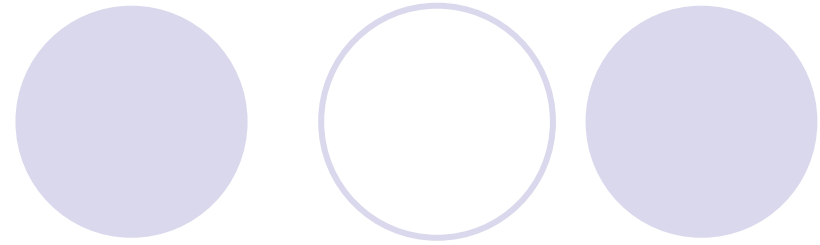


Idiopathic Flat Foot





- The flexibility of flatfoot is a more important feature than the static shape



Idiopathic Flat Foot

Clinical features

- Supine / Prone / Sitting
 - **Rigid / Flexible**
 - Abductor hallucis enlargement
 - Gastroc tendon tightness / Tib post tendon
 - Accessory navicular

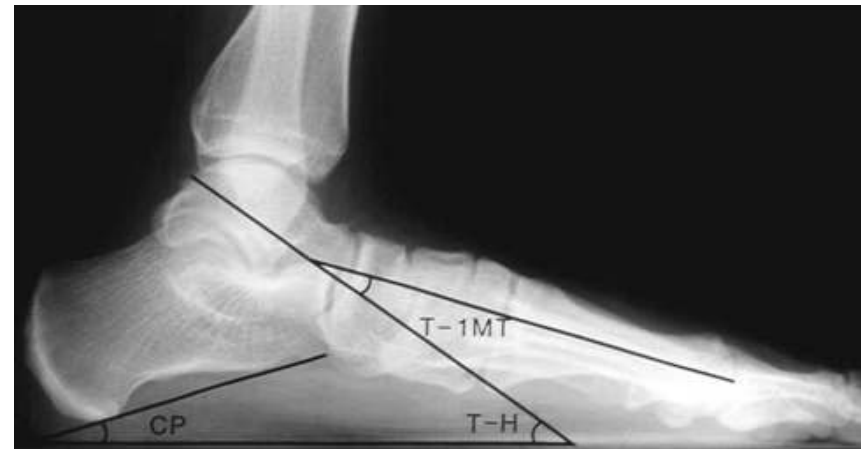
Radiology

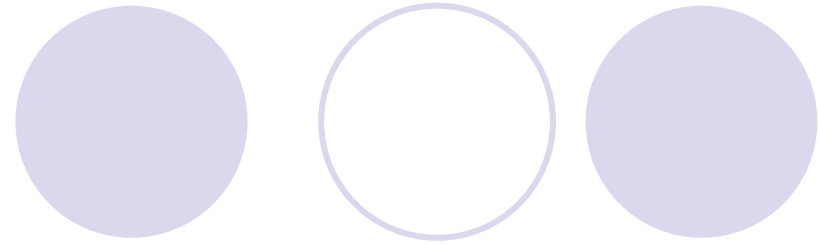
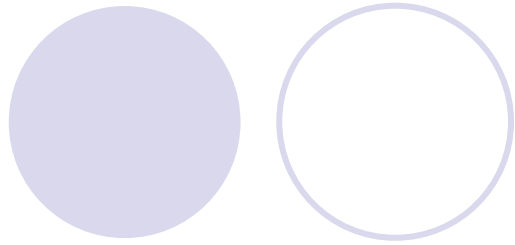


- Radiographic examination A/P weight bearing
- Weight bearing lateral view
 - Calcaneal inclination
 - Beaking of the Talus
 - Talus – 1st MT angle <10 degrees
 - Collapse of tarsal joints
 - Overlap of Metatarsals

Radiographic evaluation

- Standing lateral radiograph showing three fairly reliable angular measurements: the calcaneal pitch (*CP*), talo-horizontal angle (*T-H*), and Meary's talus–first metatarsal angle

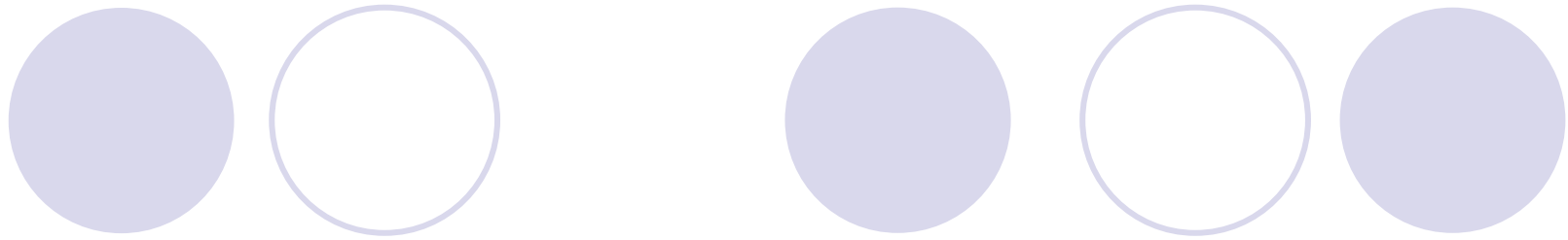




- Flatfoot showing talus and first metatarsal axis lines crossing at the center of rotation in the center of the head of the talus, indicating a single deformity (CORA).



Idiopathic Flat Foot



- Treatment recommendations:
 - Degree of flexibility / rigidity
- Reason to treat – loss of arch resulting in pain
 - Exclude other causes of pain
 - Exhaust conservative measures
- “Not broken do not fix it”

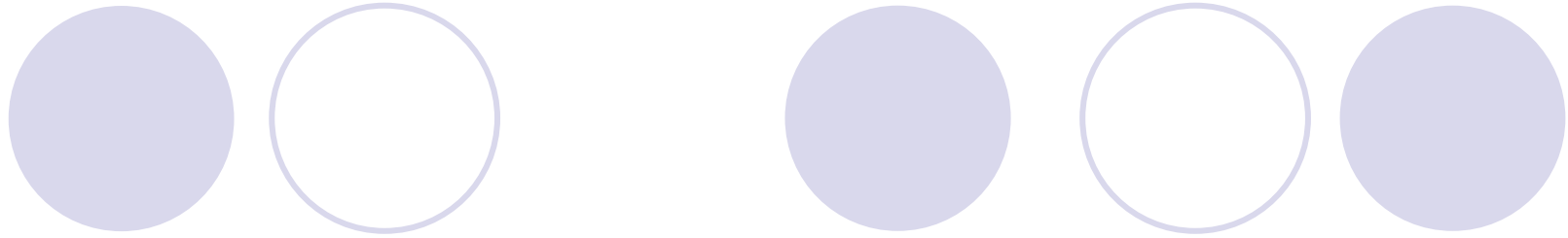
Idiopathic Flat foot - Three types

- Flexible Flatfoot
- Flexible Flatfoot with short TA and functional disability – 25%
- Peroneal spastic or rigid flatfoot. - 9%

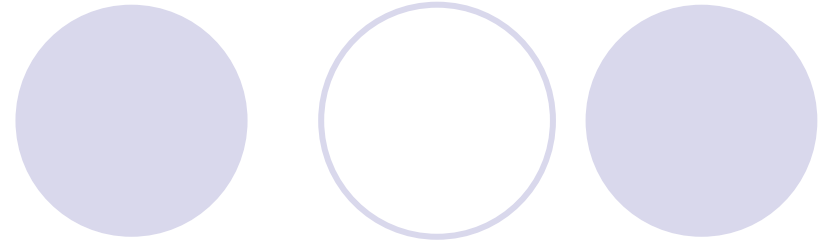
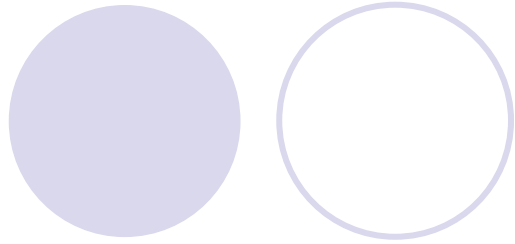
Assessment of true ankle dorsiflexion

- **Subtalar joint neutral position and knee extended - assess ankle dorsiflexion**
- If more than 10° of dorsiflexion with the knee flexed, but less than 10° of dorsiflexion with the knee extended, the gastrocnemius alone is contracted





- Flexible flatfoot with a short Achilles tendon - pain and disability in some.
 - Conservative measures fail
 - Consider surgical correction
 - Rigid supination deformity of forefoot
 - identification and concurrent treatment



- Supination deformity of the forefoot on the hindfoot is revealed when the valgus hindfoot is passively inverted to neutral



Idiopathic Flat Foot

- Short TA →
dorsiflexion force is
shifted to the subtalar
joint which, as a
component of
eversion → enables
dorsiflexion of the
calcaneus
(acetabulum pedis) in
relation to the talus.



Treatment



- Isolated soft tissue procedures
 - unreliable results
- Isolated tendo-Achilles lengthening
 - unsatisfactory results
 - most surgeons combine procedure that changes the shape of the foot
- Pseudoarthrodesis, or so-called arthroereisis
 - no clear consensus



Principles of Osteotomies

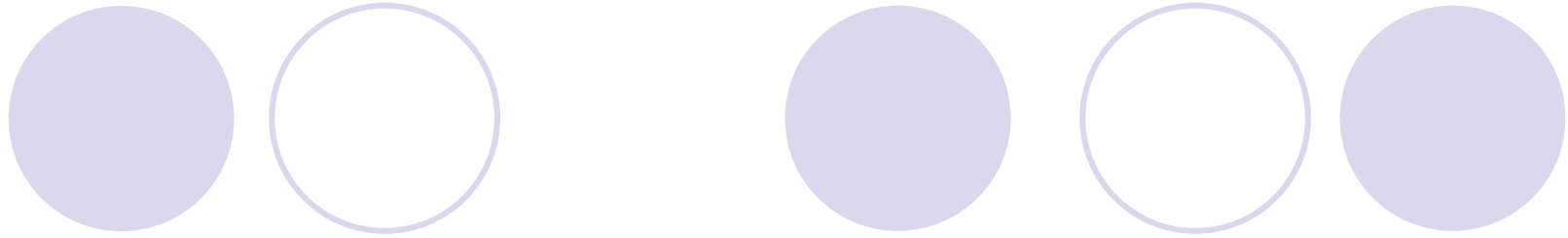
- Lateral column lengthening
 - Calcaneal osteotomies
 - Cuboid Osteotomies
- Medial column shortening
 - Medial cunieform osteotomies
 - Limited arthrodesis
- Soft tissue balancing
 - Tendo achilles lengthening
 - Plication of spring ligament
 - Tibialis post tendon transfer
- Generalised ligament laxity – triple



ML, 24 M

Idiopathic Flat Foot





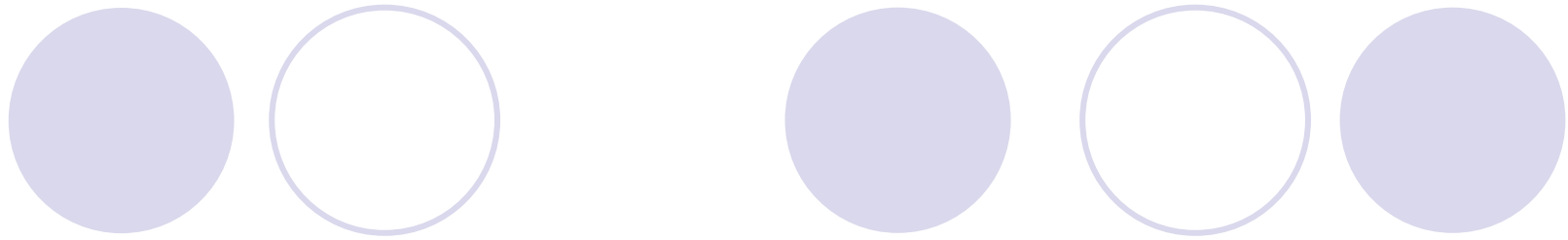
- Triple arthrodesis

- Severe deformity
- Fixed/ partially fixed
- Symptomatic in more than one joint

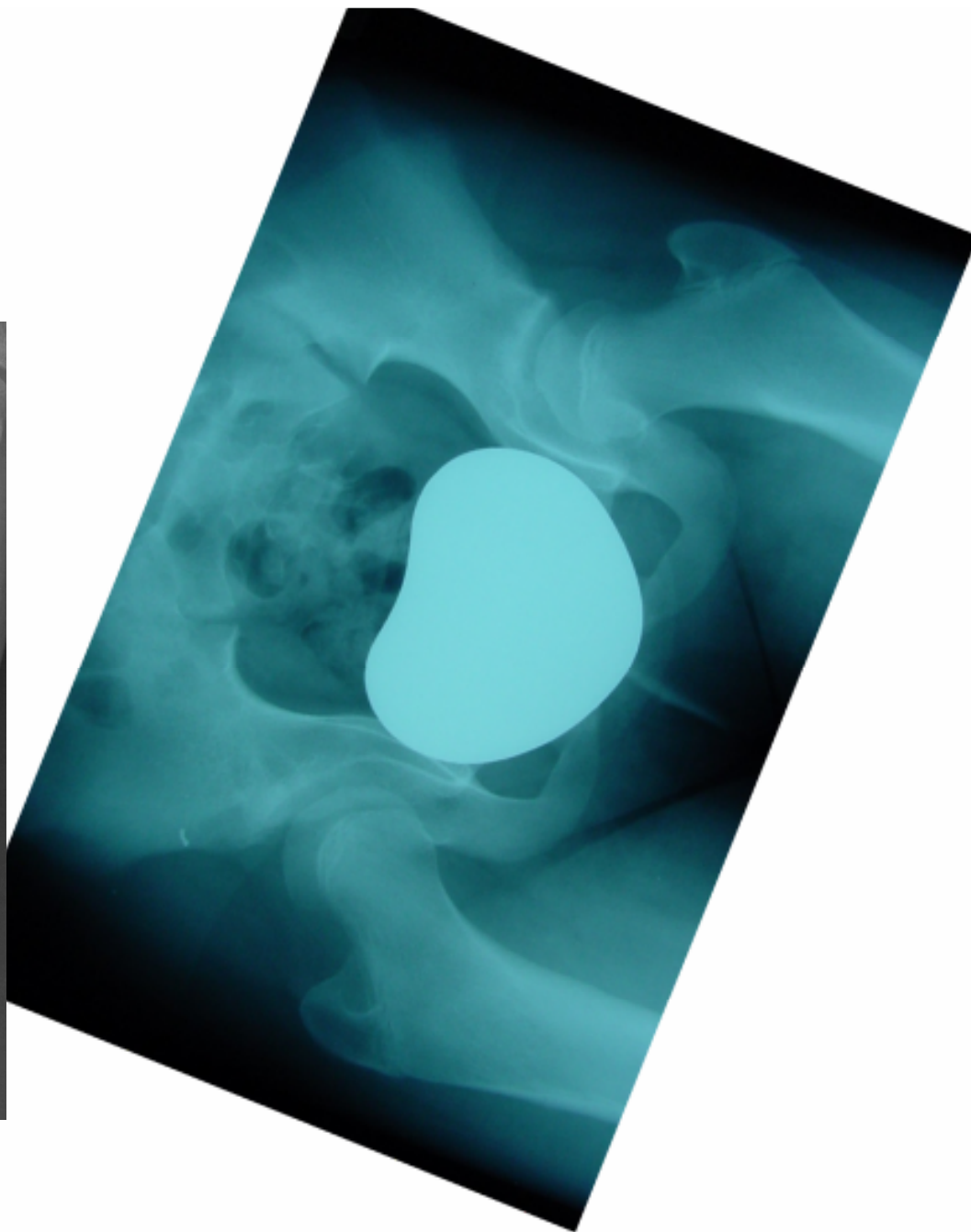
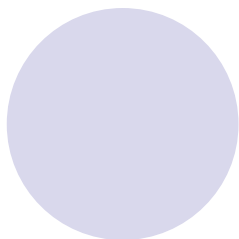
Osteotomies

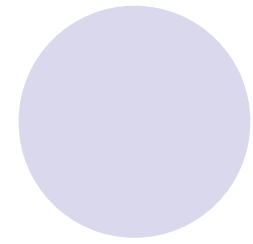
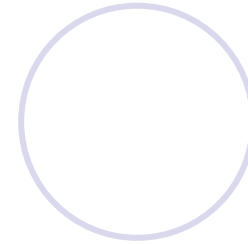
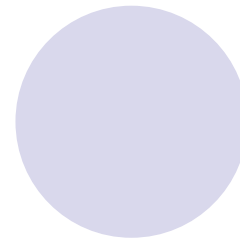
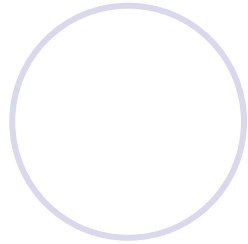
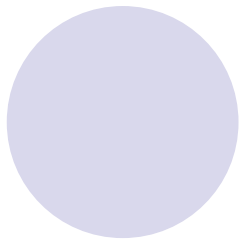


- Osteotomies of the calcaneus
 - Displacement osteotomy –
 - creates secondary deformity
 - does not address subtalar malalignment
 - Modified by medial/lateral wedges
 - calcaneal lengthening osteotomy - evans

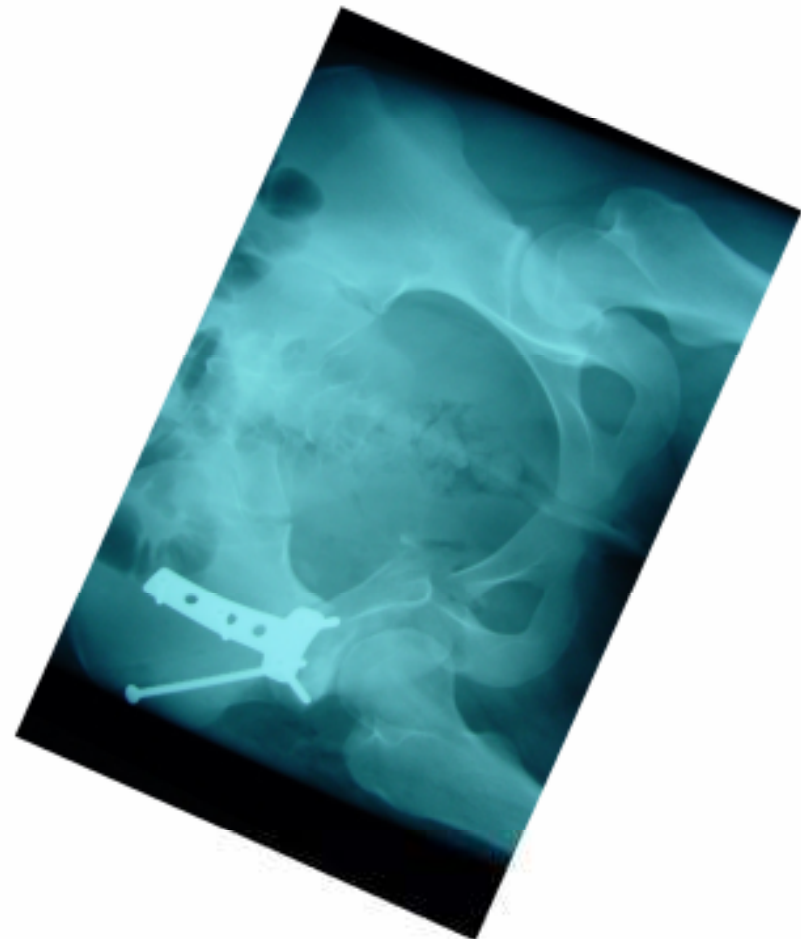
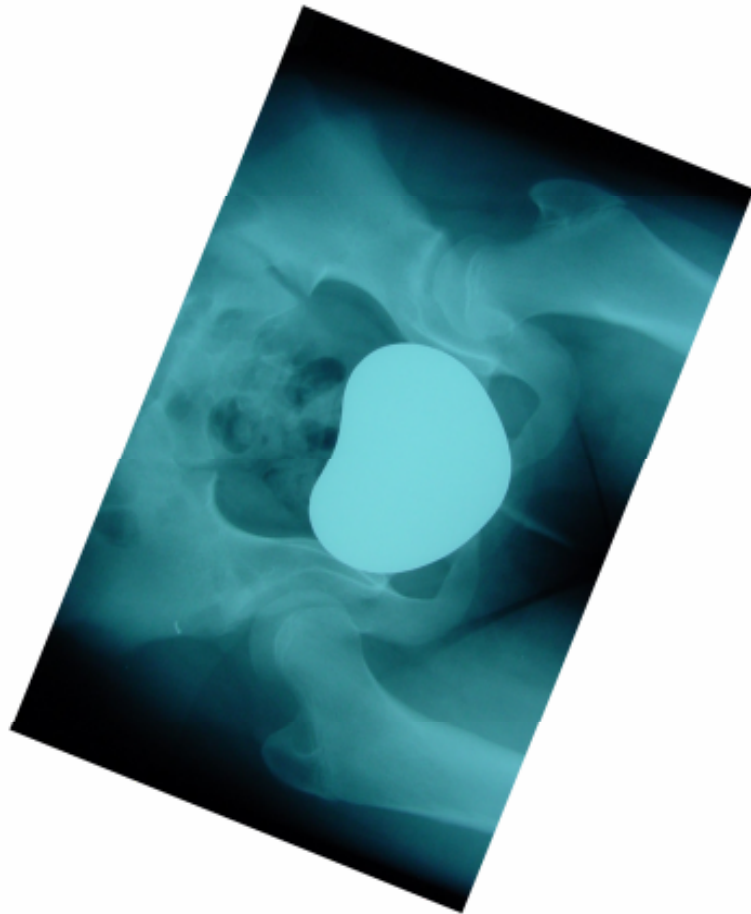


- In 1995, Mosca reported the short-term results of calcaneal lengthening for valgus deformity of the hindfoot from various underlying etiologies
 - dorsiflexion, pronation, and external rotation of the acetabulum pedis around the talar head, at the site of deformity.

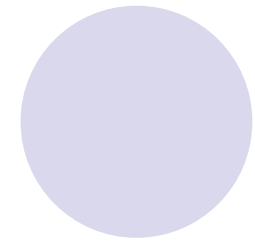
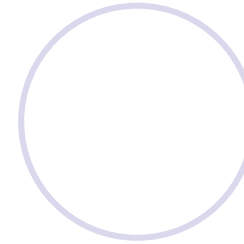
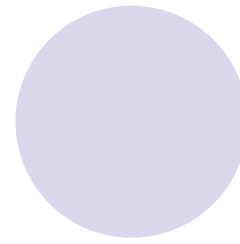
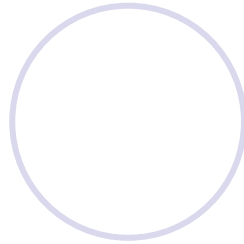
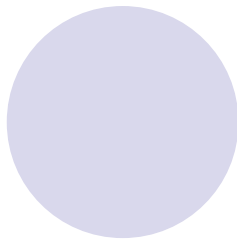




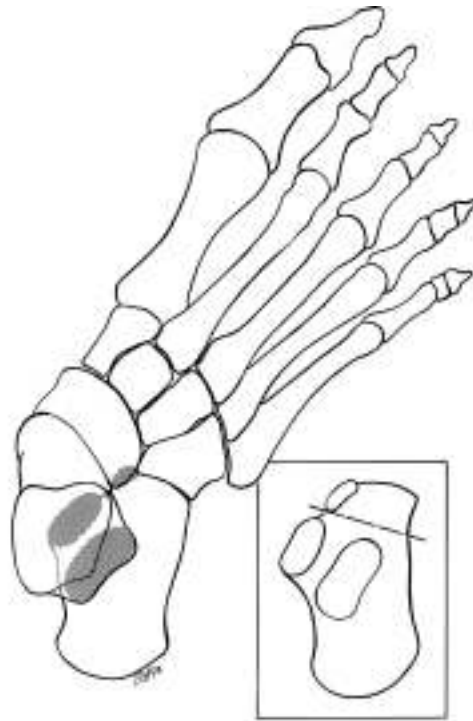
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Idiopathic Flat Foot



A



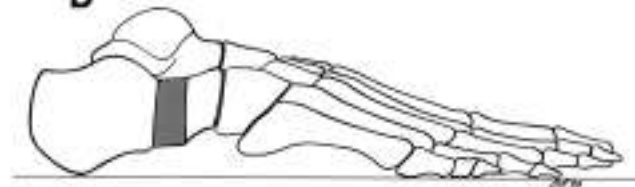
B



C

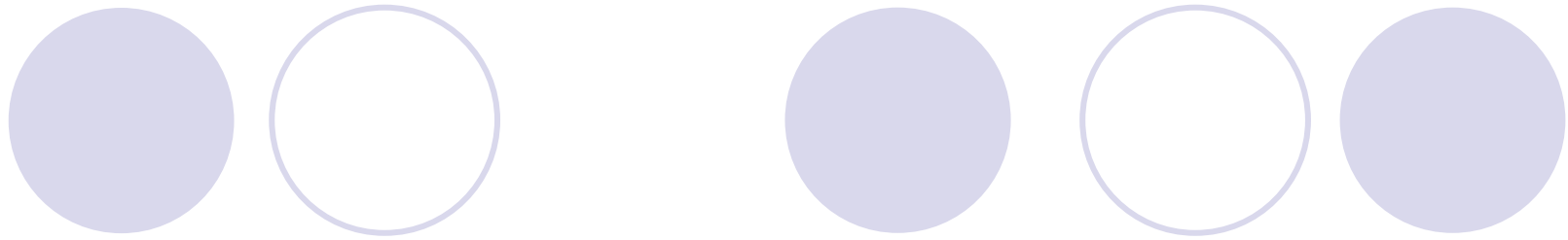


D



Idiopathic Flat Foot

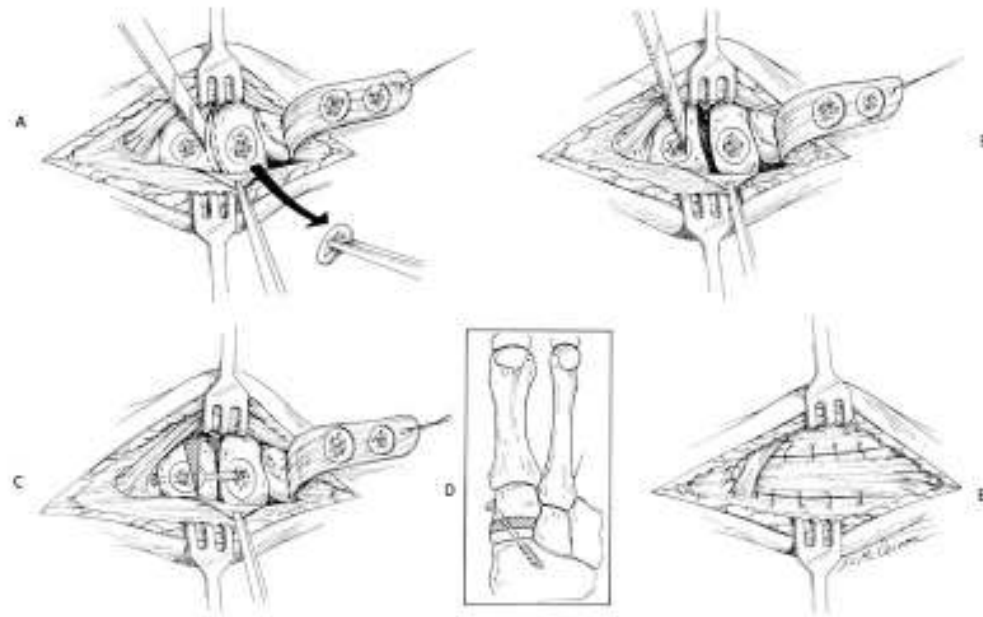
trapazoid



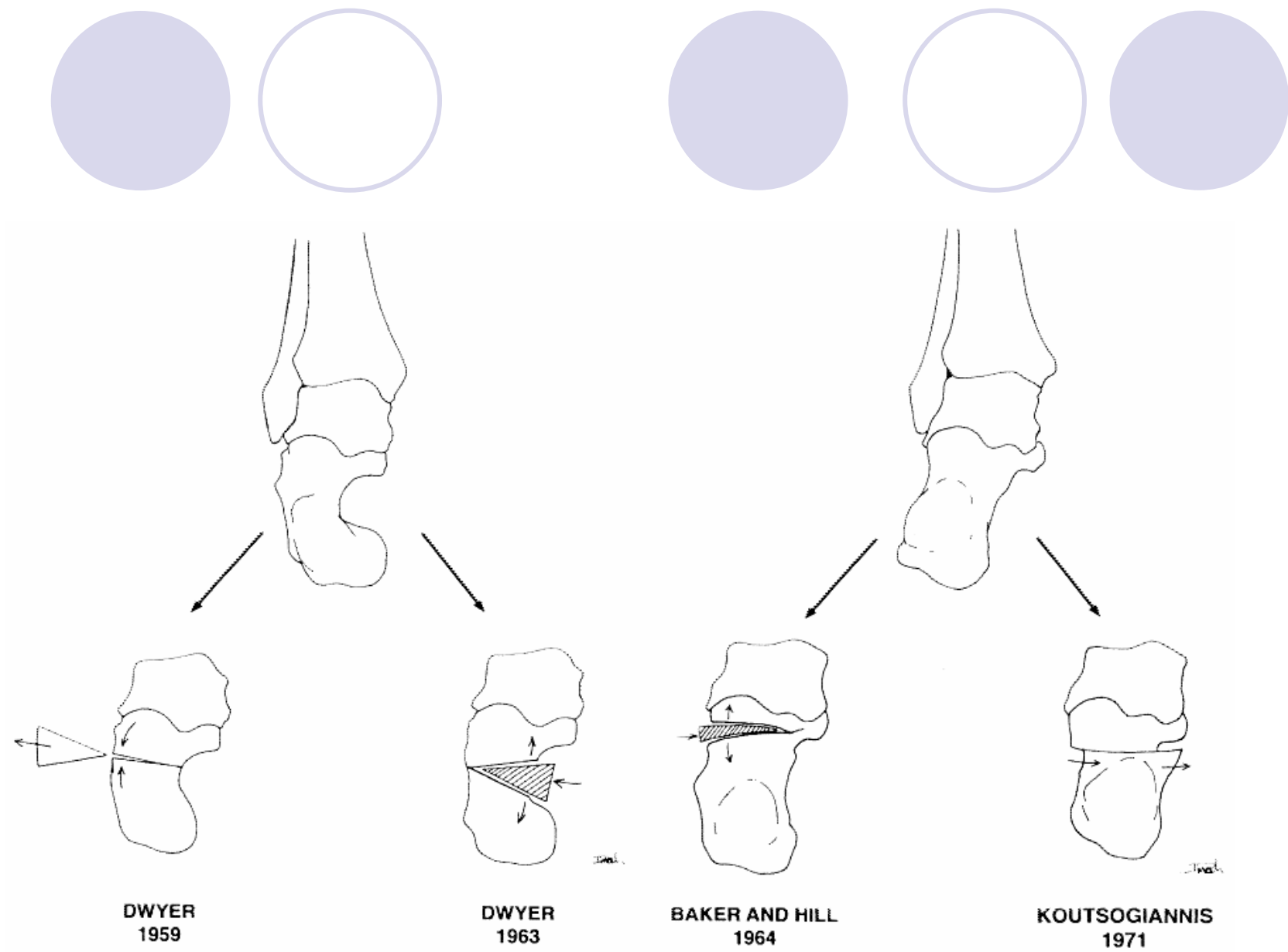
- Rigid forefoot supination is an additional deformity in many flatfeet that, if present, must be identified and treated concurrently during surgical reconstruction.

Flexible flat foot

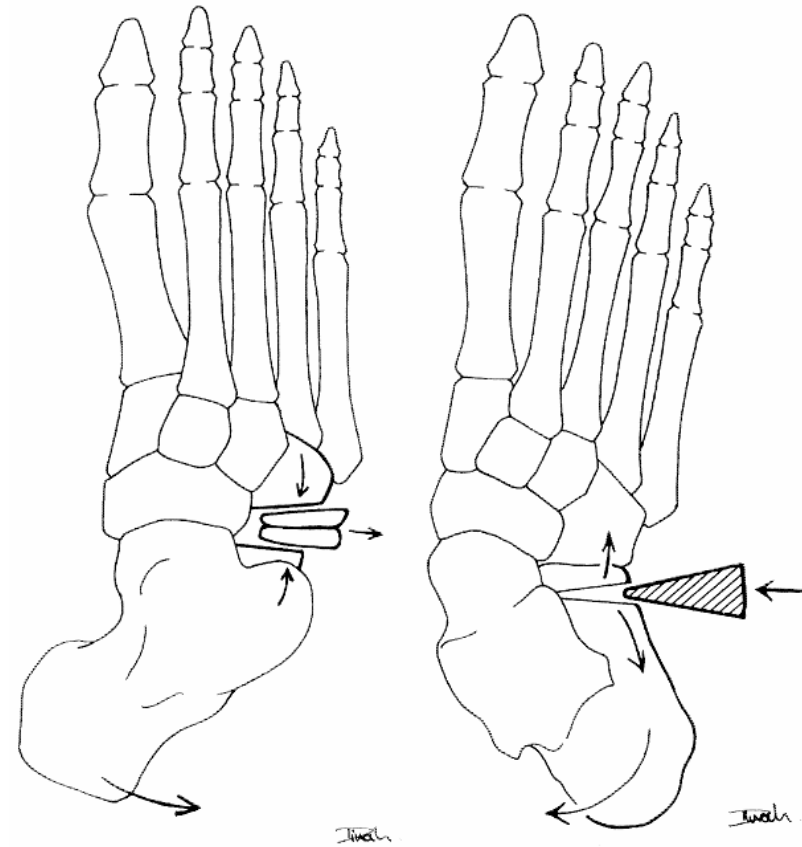
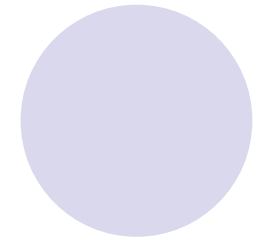
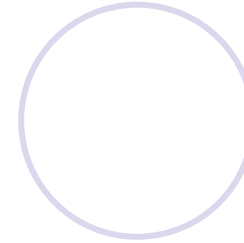
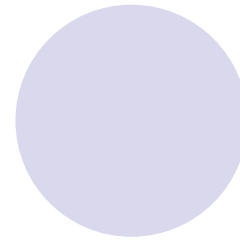
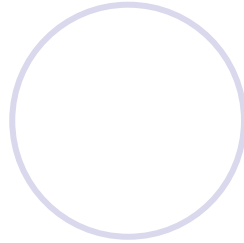
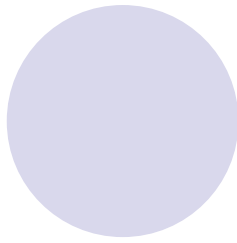
- Hoke's limited mid-tarsal arthrodeses
- Sole procedure
 - unsatisfactory long-term results were reported in 49–80%



Idiopathic Flat Foot



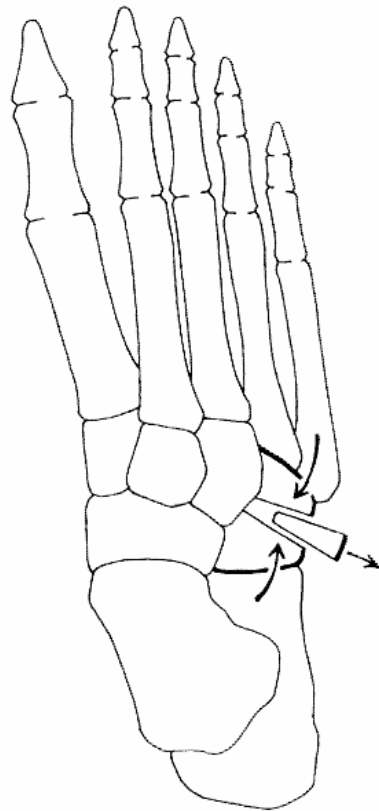
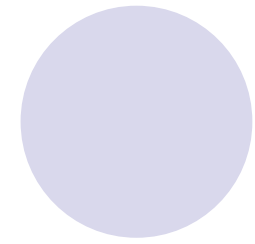
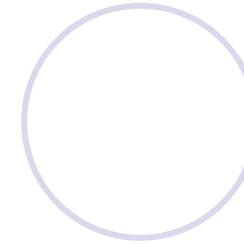
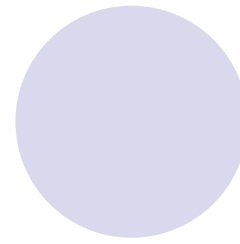
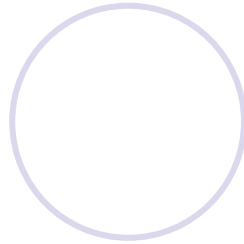
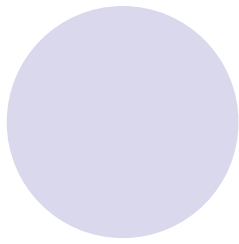
Idiopathic Flat Foot



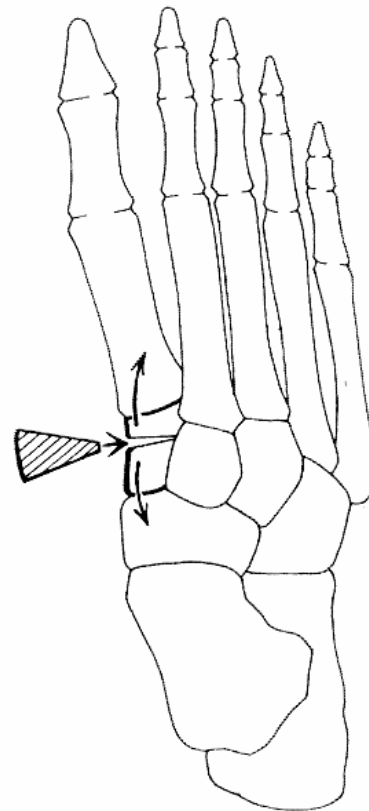
EVANS 1961

EVANS 1975

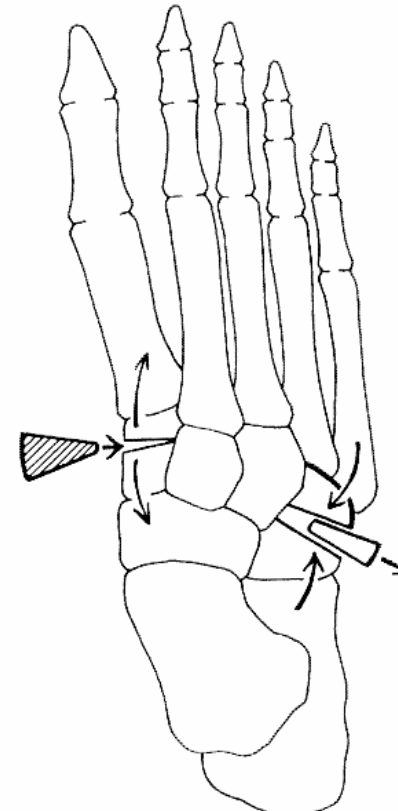
Idiopathic Flat Foot



JOHANNING
1958



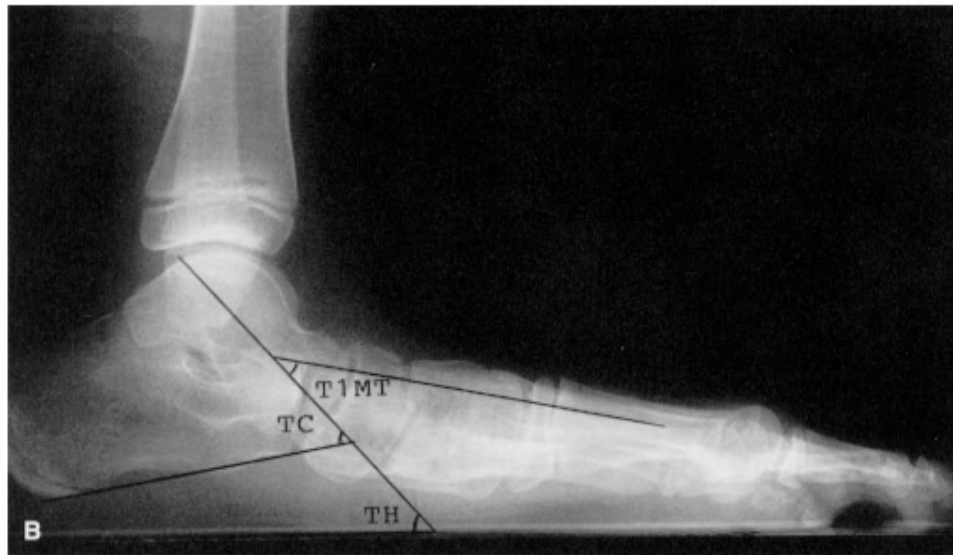
FOWLER
1959



McHALE
1991

Idiopathic Flat Foot

Mubarak



Idiopathic Flat Foot

Principles of Surgical Treatment

- Lateral column lengthening
 - Calcaneal osteotomies
 - Cuboid Osteotomies
- Medial column shortening
 - Medial cuneiform osteotomies
 - Limited arthrodesis
- Soft tissue balancing
 - Tendo achilles lengthening
 - Plication of spring ligament
 - Tibialis posterior tendon transfer
- Subtalar Arthroeresis
- Generalised ligament laxity – triple