

PEDIATRIC FOOT

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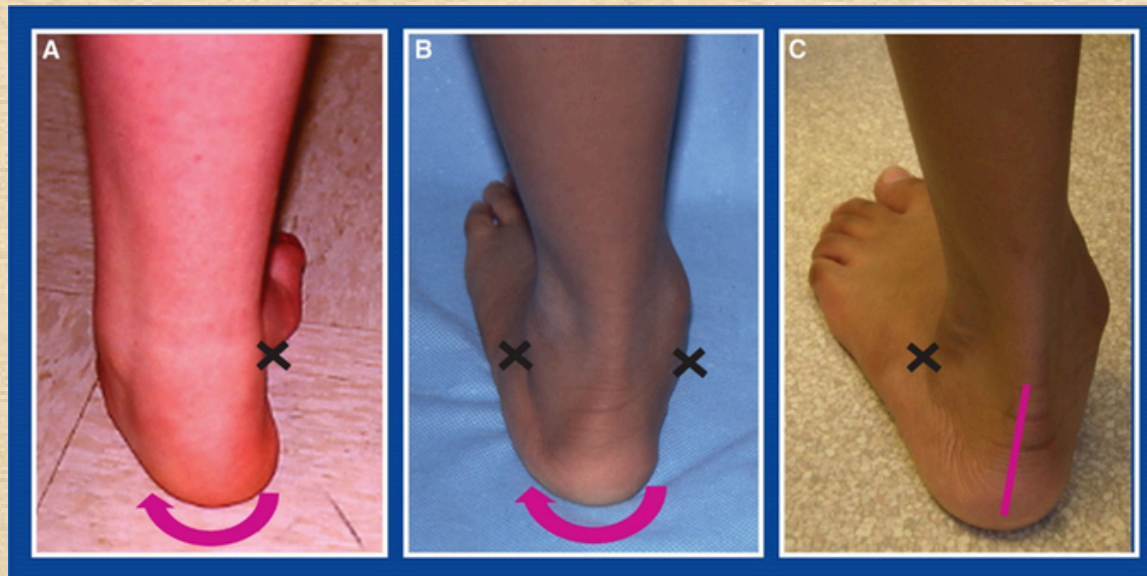
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Rule 1: Age –related anatomic variations

Rule 2: In all congenital and developmental deformities and most malformations of the child's foot, there are at least two segmental deformities that are often in rotationally opposite directions from each other

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Rule 3: The default position of the subtalar joint is valgus/everted



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Rule 3:

The clinical importance

Whereas medial soft tissue release is an important first step_in correcting **CAVOVARUS** deformity, lateral soft tissue release does_nothing to correct **flatfoot** deformity

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Rule 4:

- I. Cavus deformity means hollow or excavated foot .
- II. It is manifested by plantar flexion of the forefoot on the hindfoot.
- III. The plantar flexion may be along the medial column of the foot or across the entire midfoot.
- IV. The subtalar joint may be in varus, neutral, or valgus. The ankle joint may be in plantar flexion (equinus), neutral, or dorsiflexion (calcaneus).

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Rule 4:



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Rule 5:

The foot deformity may be the primary problem
or the result of the primary problem, **So**
differentiation is important

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Rule 6:

The clinical foot assessment must be in weight-bearing, not just in supine or sitting positions

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Rule 7:

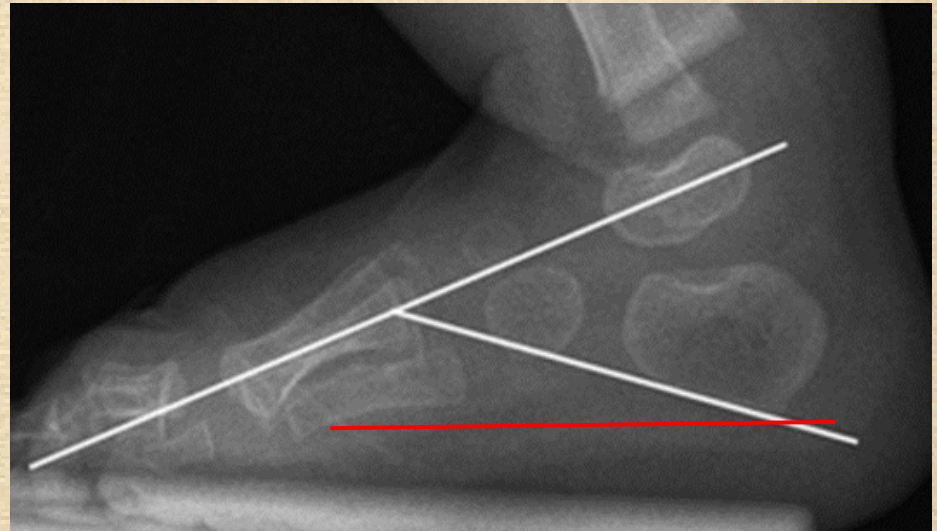
All radiological assessment of foot deformities should be in weight-bearing, or simulated Wt-bearing positions

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Rule 8:

Examine the whole child, and do not focus only on the foot.

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Calcaneovalgus:

Positional

Hyper-dorsiflexion

and valgus deformity

of the hindfoot



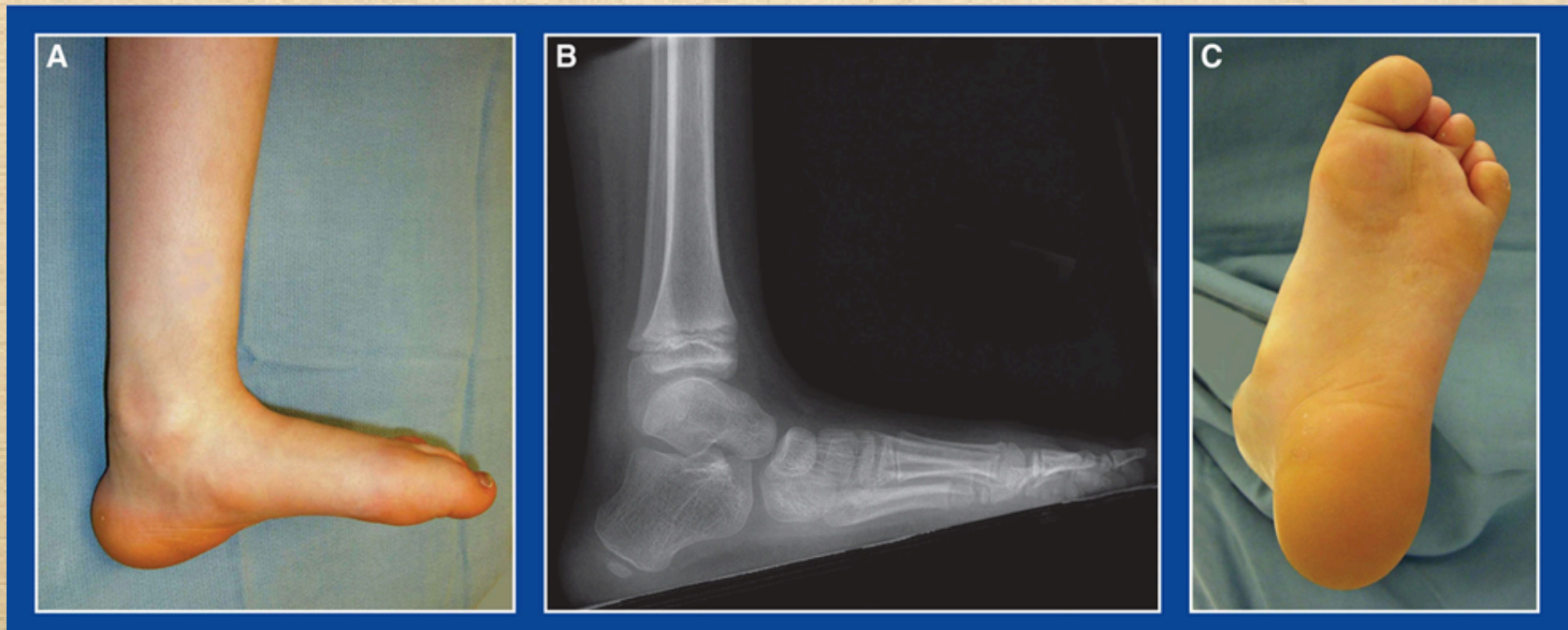
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Acquired Calcaneus deformity:

Hyper-dorsiflexion

Deformity of the ankle

(Weak Triceps Surae
so Strong Tib. Ant.)



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Cavus deformity:

Progressive pronation deformity of the forefoot on the hindfoot that creates cavus deformity of the medial midfoot



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Cavus deformity:

Progressive pronation deformity of the forefoot on the hindfoot that creates cavus deformity of the medial midfoot

Manifestation of a neuromuscular disorder

Natural hx.:

Progressive increase in the severity and rigidity of the deformities with pain. Gait instability and skin pressure injuries



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Cavovarus Foot in CP :

Progressive varus def. of the hindfoot with
2ndry pronation of the forefoot on the hindfoot
that creates cavus deformity of the midfoot

**Contracture of GC or
Triceps is always a
persistent feature**



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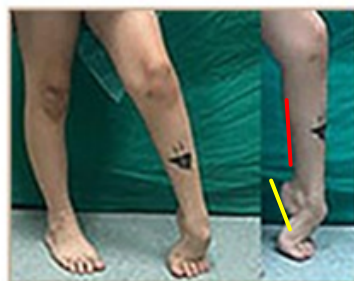


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Nonoperative treatment

1. Physical therapy—stretching
2. Bracing—AFO
3. Injection of botulinum toxin (BOTOX) into the most spastic muscles
4. Serial below-the-knee (short-leg) stretching casts
5. Tone-reducing medications, such as baclofen

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Operative treatment

1. Tendon transfer
2. Tendon lengthening
3. Muscle recession
4. Bone osteotomy
5. Ilizarov correction

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Equinovagovarus in CMT disease



CMT is a group of genetic conditions that affect the peripheral nerves.

CMT is the most common inherited neuropathy

CMT causes a range of sensory and motor symptoms, including numbness, tingling, pain, muscle weakness and atrophy and foot deformities that get worse over time.

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Equinocavovarus in CMT disease



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Clubfoot (Talipes Equinovarus):

Mostly idiopathic cavus, adductus, varus, and equinus deformities that are not passively correctable



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Clubfoot (Talipes Equinovarus):

Mostly idiopathic cavus, adductus, varus, and equinus deformities that are not passively correctable

Natural history

Persistence of deformity with pain, functional disability, and inability to wear normal shoes

Clubfoot (Talipes Equinovarus):

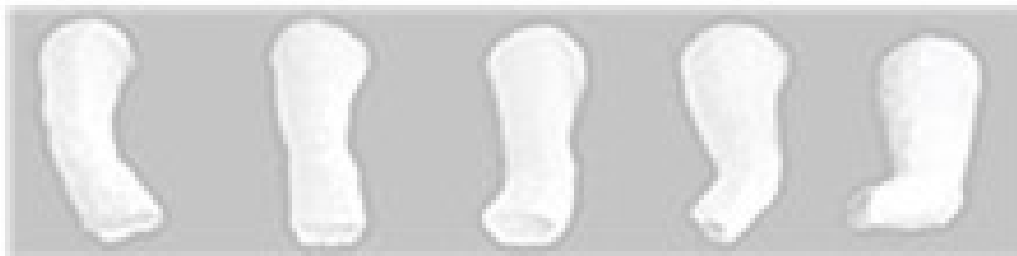
Treatment: Ponseti method of serial stretching and casting



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Clubfoot (Talipes Equinovarus):

Ponseti method is still valid for late presenting & recurred cases of CTEV



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Congenital Vertical Talus

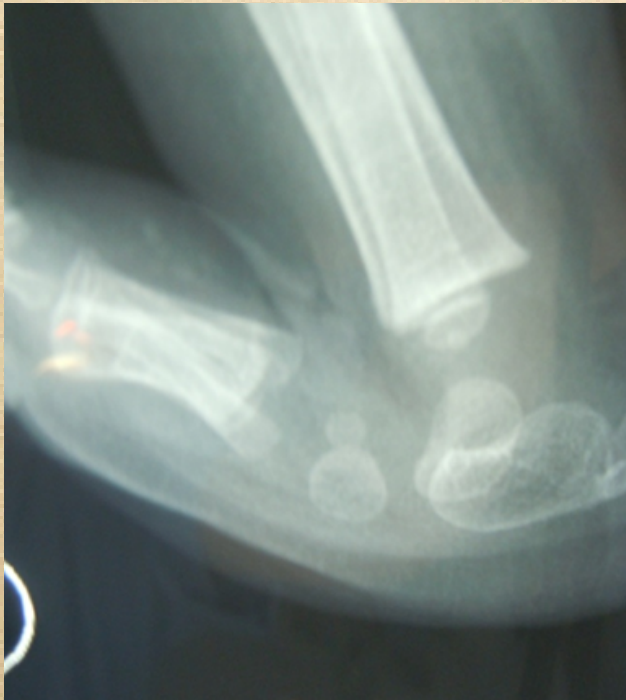
Congenital dorsolateral dislocation of the navicular on the talus with severe eversion of the subtalar joint and rigid plantar flexion of the talus, creating a rocker-bottom appearance of the foot. The talus is vertically aligned with the tibia



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Congenital Vertical Talus

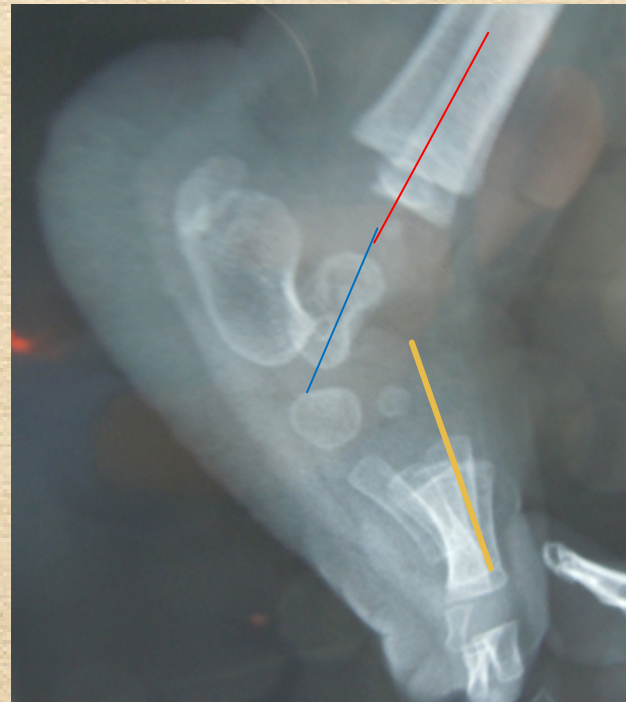
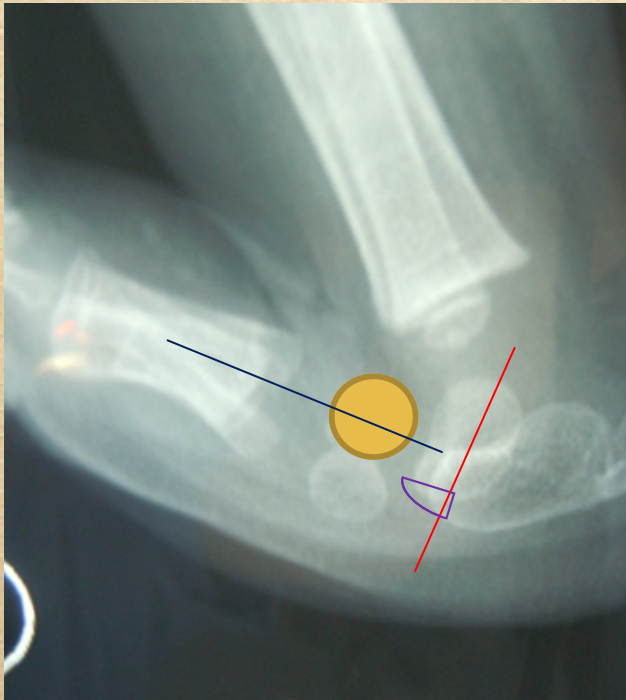
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Congenital Vertical Talus



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Flatfoot

Flexible Flatfoot

Congenital physiologically normal foot shape with valgus alignment of the hindfoot, supination of the forefoot, a low or depressed longitudinal arch, and no contracture of either the gastrocnemius or the entire triceps surae

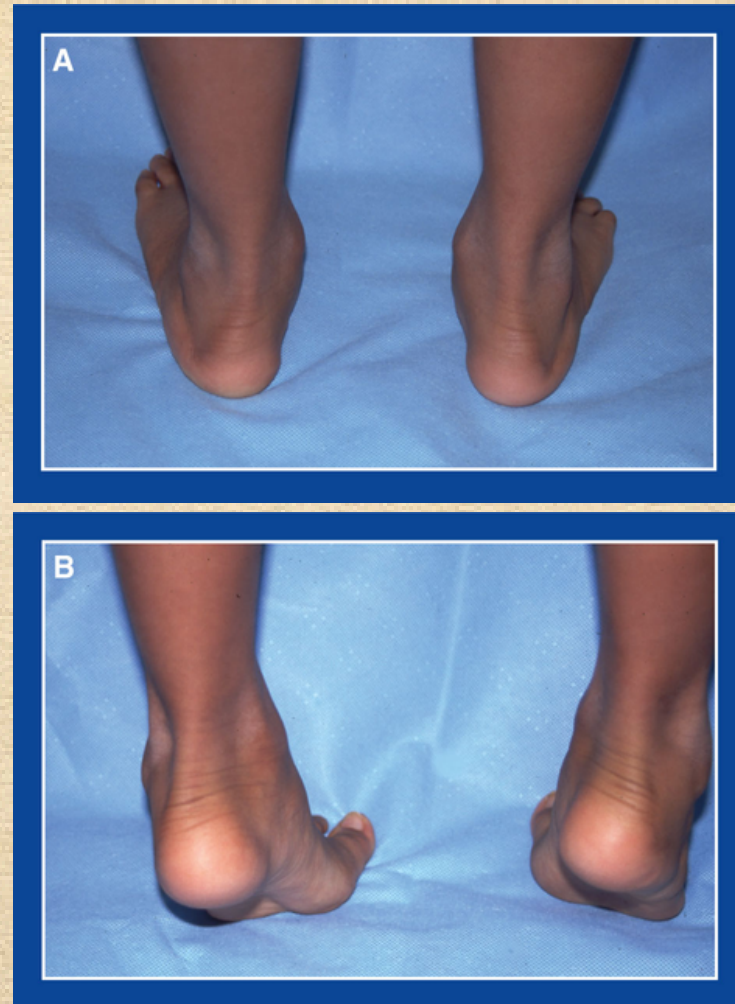


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Flatfoot

Flexible Flatfoot

The arch elevates
and the hindfoot valgus
changes to varus
with toe-standing and
with the Jack toe-raise test
The ankle dorsiflexes
at least 10° above neutral
with the subtalar joint inverted
to neutral (locked) and
the knee extended.



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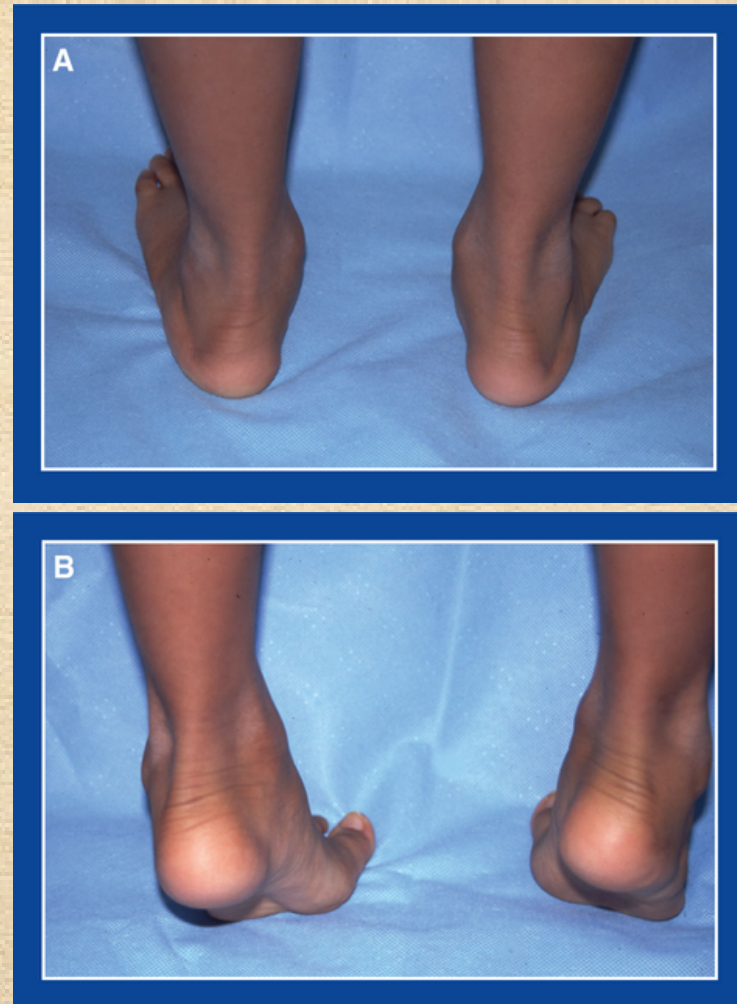
Flatfoot

Flexible Flatfoot

Natural history

Gradual elevation of the longitudinal arch in most children through normal growth and development from birth until early adolescence

For those flatfeet that remain flat, comfort and function are equal to that of feet with average height longitudinal arches



PEDIATRIC FOOT

Flatfoot

Flexible Flatfoot with Short (Tight) Achilles or Gastrocnemius Tendon

The arch elevates and the hindfoot valgus changes to varus with toe-standing and with the Jack toe-raise test **BUT the tendo-Achilles or gastrocnemius tendon is contracted**



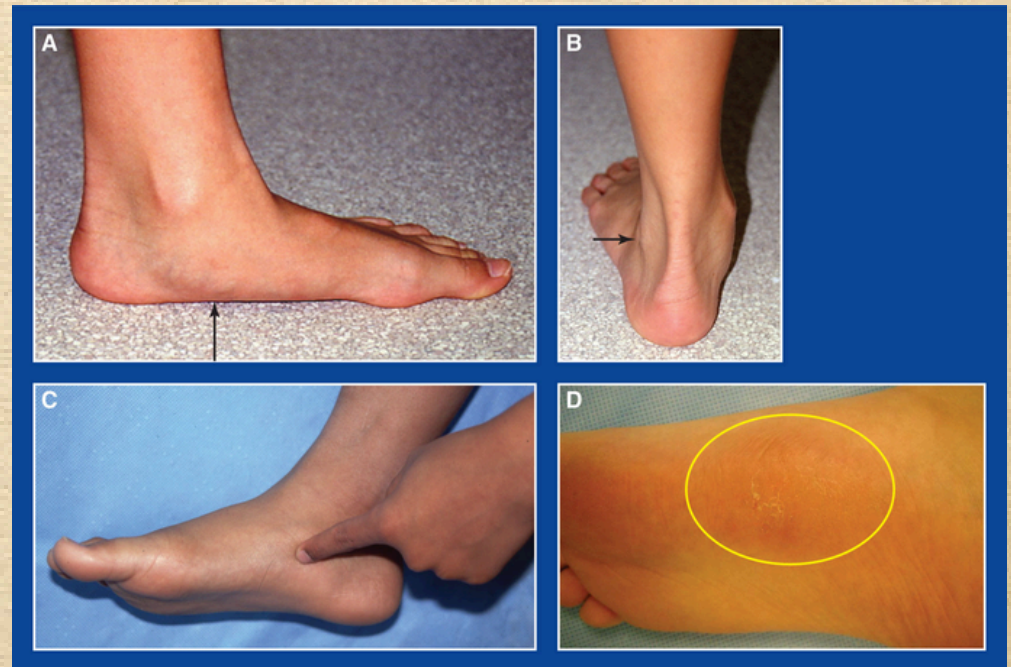
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Flatfoot

Flexible Flatfoot with Short (Tight) Achilles or Gastrocnemius Tendon

Natural history

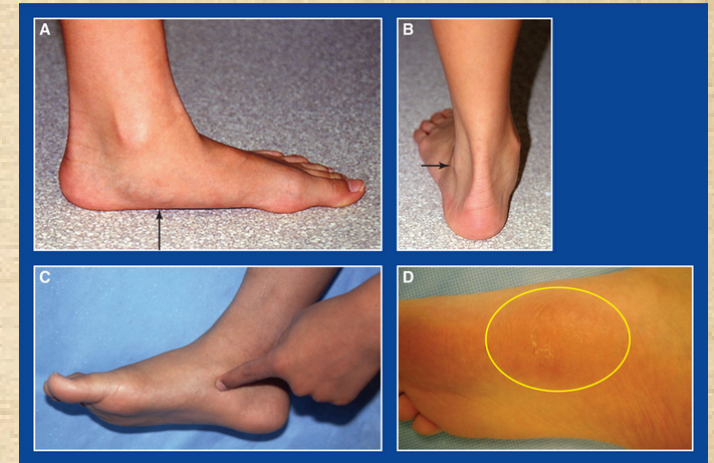
Pain under the head of the talus and/or impingement-type pain in the sinus tarsi area in many/most cases occurring with, or exacerbated by, weight-bearing



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Flatfoot

Flexible Flatfoot with Short (Tight) Achilles or Gastrocnemius Tendon



Nonoperative treatment

1. Heel cord stretching exercises performed with the subtalar joint inverted to neutral and the knee extended
2. Soft, cushioned FLAT orthotics/shoe inserts

Operative indications/treatment

Failure of prolonged nonoperative treatment to relieve the pain under the head of the talus and/or in the sinus tarsi area

Calcaneal lengthening osteotomy
Gastrocnemius recession

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Flatfoot

Flexible Flatfoot

Recent management



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Flatfoot

Flexible Flatfoot

Arthrorreisis



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Flatfoot

Flexible Flatfoot

Arthroereisis



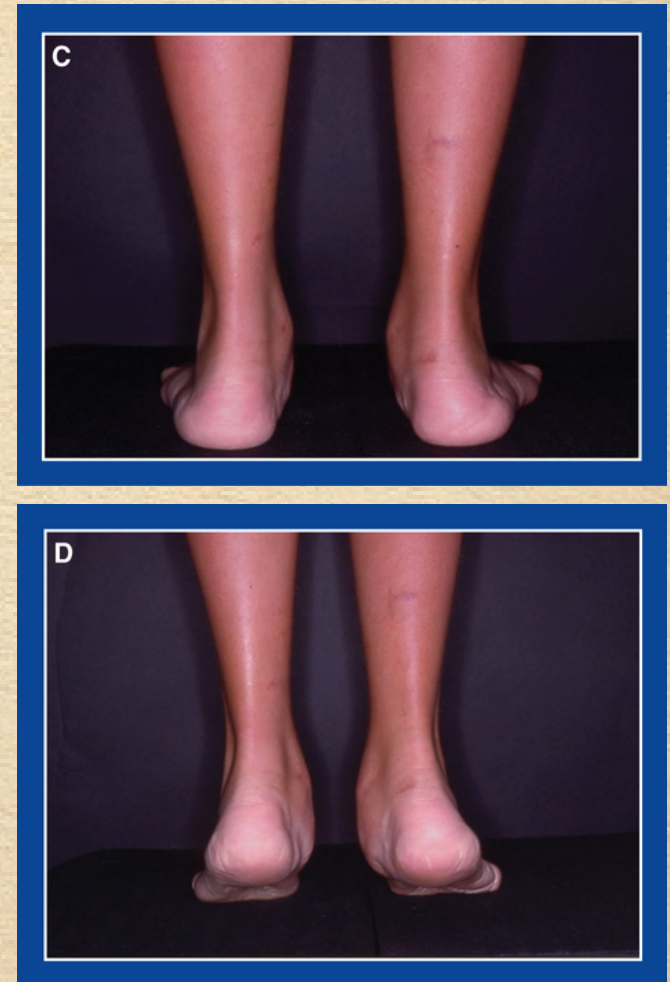
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Flatfoot

Rigid Flatfoot Tarsal Coalition

Autosomal dominant failure of mesenchymal differentiation and segmentation that leads to a progressive, postnatal synchondrosis-to-synostosis of the middle facet of the subtalar joint

with the gradual development of a rigid flatfoot usually between the ages of 8 and 16 years



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Flatfoot

Rigid Flatfoot

Tarsal Coalition (Talocalcaneal)

Autosomal dominant failure of mesenchymal differentiation and segmentation that leads to progressive, postnatal synchondrosis-to-synostosis of the middle facet of the subtalar joint

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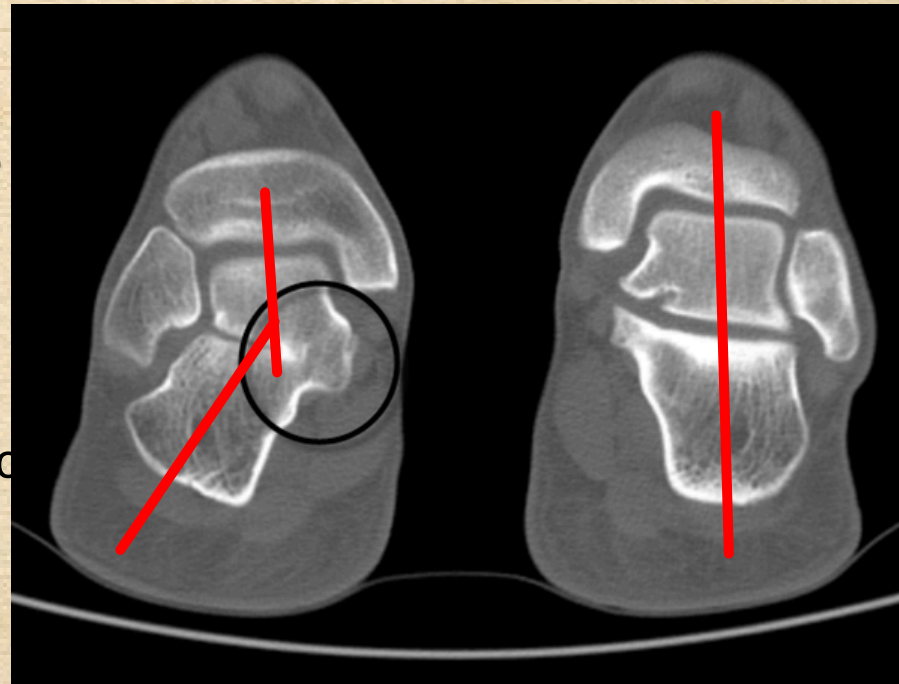
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Flatfoot

Rigid Flatfoot

Tarsal Coalition (Talocalcaneal)

Natural history

Pain, in less than 25% of cases,

Asymptomatic coalitions (75% of cases)— **None indicated**

**Nonoperative treatment that includes Activity modification,
NSAID, Cast**

Operative indications

For nonresponders:

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Flatfoot

Rigid Flatfoot

Tarsal Coalition (Calcaneonavicular)



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Flatfoot

Rigid Flatfoot

Tarsal Coalition (Calcaneonavicular)

Natural history

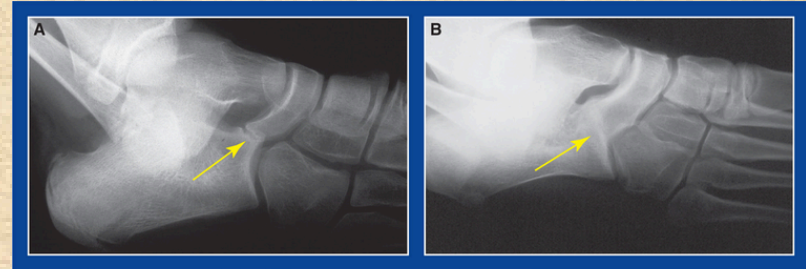
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Asymptomatic coalitions (75% of cases)— **None indicated**

Nonoperative treatment that includes **Activity modification,**
NSAID, Cast

Operative indications

For nonresponders : including resection and interposition graft



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