Congenital Vertical Talus

Synonyms
- Congenital valgus flatfoot with TN dislocation, congenital rigid rocker bottom foot, congenital convex pes valgus, reverse clubfoot, and “Persian slipper foot”

Introduction/Incidence
- Henke (1914) first accurately described CVT
- Extremely rare congenital pedal disorder → Incidence is ~1/10,000
  o Affects males and females with equal frequency
  o 50% have bilateral involvement and right>> left when unilateral
- High incidence (10-50%) with various congenital anomalies and neuromuscular ds
  o Myelomeningocele, arthrogryposis, trisomy 13-15 and 21, Marfan’s, Spina bifida, and CP
- **Hallmark** = irreducible dorsal dislocation of the navicular on the talar head and neck (Type 1)
  o Type 2 – includes deformity of the calcaneocuboid joint

Osseous and Soft Tissue Pathology
- Talus – vertical and flattened dorsally due to hypoplasia of the talar head and neck
- Navicular – rigidly articulates with the dorsolateral aspect of the talar head and neck
  o Becomes wedge-shaped with a hypoplastic plantar segment
- Calcaneus – valgus and equinus, dorsolateral subluxation of the CCJ, no anterior TC articulation, hypoplastic sustentaculum tali, STj abnormalities (absent anterior and middle facets)
- Contracted structures: Ligaments - tibionavicular, dorsal talonavicular, calcaneocuboid, bifurcate, interosseous talocalc, PTFL, and CFL. Muscles: TA, EHL, EDL, PB, PL, and Achilles tendon
- Contracted posterior ankle and STj capsules
- Plantar ligaments are stretched
- Posterior tibial tendon and peroneal tendon are displaced anteriorly → acting as dorsiflexors

Clinical Findings
- Even at birth, flatfoot deformity is rigid (2° to soft tissue and osseous deformities)
- Talus is palpable medially at the sole of the foot and the plantar foot is convex (rocker-bottom deformity). The forefoot is abducted and dorsiflexed at the midtarsal joint and the hindfoot is in equinovalgus. Lateral toes are elevated and clawed
- **Peg-leg gait** results with an uncorrected deformity leading to limited forefoot push-off. The heel does not purchase the ground.

Radiographic Findings
- DP view: ↑ talocalcaneal angle (Kite’s), forefoot abduction
- Lateral view: vertical position of talus, dorsal displacement of navicular/FF on talus, lucent talar notch for navicular, and rocker-bottom appearance
- Lateral plantarflexion view (most important!): ↑ talar-metatarsal axis and ↑ calc-metatarsal axis
  o Eyre-Brook test: forced PF distinguishes CVT from flexible PF talar deformity (olique talus)
- Lateral dorsiflexion view: assesses the degree of fixed equinus of calc (see if rigid or reducible)
**Treatment** – usually a surgical deformity

- Serial casting: birth – 3 to 6 months ONLY, conservative tx rarely works
  - Stretches ST for prep of future sx, reduces talonavicular dislocation, + eliminates FF valgus
- Surgical correction usually done under the age of 2 years
  - 1. Staged multiple-incision technique: 1st extensive soft tissue release then 2nd Achilles lengthening with posterior capsulotomy of the ankle and STJ
    - Most popular surgical intervention
  - 3. Minimally invasive technique with casting: Dobbs (2006) described method of reverse-Ponsetti casting and then minimal sx consisting of percutaneous Achilles tenotomy and percutaneous pin fixation of the TN joint. Limited research
- Post-op complications: AVN of talus, recurrence (higher rates in pts with Spina Bifida)
  - Recurrence: 2-6 yo: Grice – Green procedure (STJ arthrodesis)
  - >6 yo: Triple arthrodesis
  - Severe and recurrent: tallectomy