CLUBFOOT

EPIDEMIOLOGY

Multifactorial

1:1000 live births Caucasians

3:1000 live births Polynesians

Sex: Male: Female 2:1

50% Bilateral

PATHOLOGY

Bones Medial and plantar deviation of the neck of the talus

Contracted tendon Achilles tendon

Tibialis posterior

FDL,FHL

Joints Dislocation of talo-navicular joint [navicle is medial]

Thickened joint capsules: of ankle, subtalar, talonavicular, calcaneocuboid joints

Contracted Ligaments Calcaneofibular ligament

Superficial deltoid ligament

Spring ligament

Long and short plantar ligament

Plantar fascia

Tibio- fibular ligament

Master knot of Henry

Thickened Tendon sheath Peroneal sheath
Sheath of tibialis posterior

Blood vessel 90% deficiency of anterior tibial artery

CLINICAL ASSESSMENT

History Pregnancy, Birth,
Family history, any other syndromal
Any neurological causes like spina bifida or cerebral palsy
Previous treatment

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DEFORMITY Forefoot varus (adduction and inversion)

Heel: Varus

Equinus at the ankle

CLASSIFICATION [HAROLD AND WALKER]

Mild	Varus and equinus deformity which can be manipulated beyond neutral
Moderate	Varus and equinus within 20º short of neutral
Severe	Varus and equinus cannot be reduced within 20º of Neutral

Presence of medial skin crease and small heel size suggest severe type of clubfoot.

Also note that the size of the foot is short and leg appears wasted

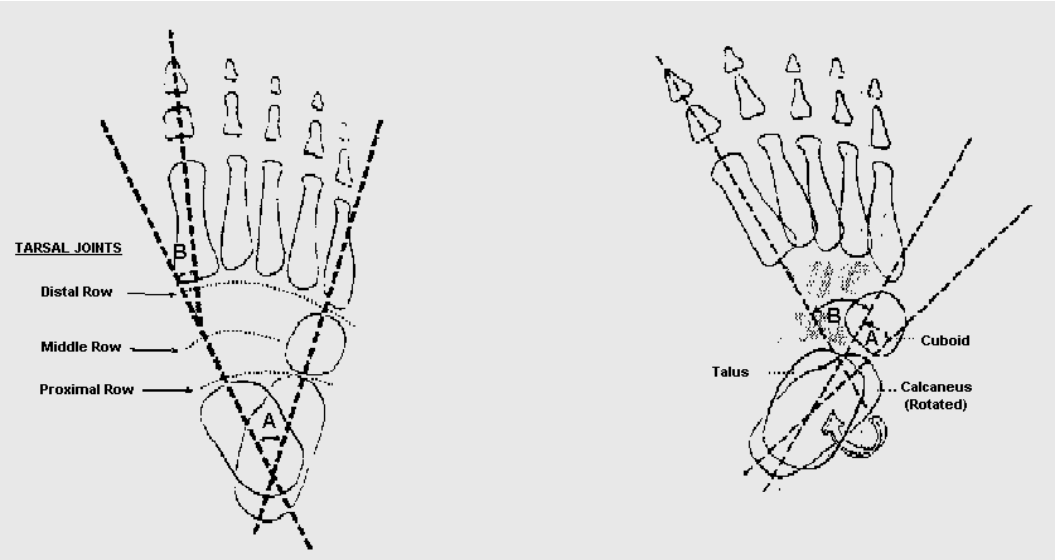
Neurological examination is indicated in case of clubfoot

Check for DH
Spine

Talo-calcaneal angle

Normal 25º-50 º

RADIOLOGICAL CTEV <20®



TREATMENT

<3 months	Ponsetti technique with or without heel cord release
	20% still requires comprehensive release at 6 months
<5 yrs	Postero-medial release: Cincinnati
> 5 yrs	Evans procedure
	Dwyer's (osteotomy of the calcaneum)
	Lengthen medial column and shorten lateral column
	SPLATT is a split tibialis anterior transfer
> 10 yrs:	Lateral wedge tarsectomy or triple if the foot is mature

Results at 30 year follow up.

1. Ponsetti reported Good to excellent in 80% and 30% may have mild osteoarthritis ankle

2. Extensive [Cincinnati]

Good to excellent 30%; and 56% may have moderate to severe osteoarthritis

PONSETTI TECHNIQUE IS COMMONLY USED

Ponsetti technique: Acronym: **CAVE** start at 4 weeks

I The cavus deformity must be corrected with the first cast.

The forefoot is supinated and this tends to exaggerate the appearance.

Next the forefoot adduction is corrected with some hindfoot varus with ankle in equinus

This is followed by Hindfoot varus

Last to be corrected is Equinus

Above knee plaster weekly for 2 months, followed by Dennis Brown splint.
Night splint should be continued for 5 years

In addition, following supplementary procedures are required:

70% needs an Percutaneous Achilles tenotomy

30% required SPLATT at 3 years [Split tibialis anterior transfer]

10-20% may need compressive extensive [cincinatti release]

FACTS 50% of newborn club feet can be corrected by non-operative means

50% had no dorsiflexion beyond neutral

50% needed further surgery after soft tissue release

Most series report 75 - 90% satisfactory results of operative treatment

Recurrence rates of deformity is 25%

COMPREHENSIVE RELEASE [CINCINATTI RELEASE]

Informed consent

Explain about permanent calf atrophy. The foot will be always small

Deformity can recur, needing further surgery

May need SPLATT: Dynamic means muscle imbalance

Irrespective of good surgical correction, patient may have decreased physical endurance [Sports, walk, run, squatting, jump, stairs]

Principle 4 regions:
Posterior release
Medial release
Plantar release: Plantar fascia
Lateral release: Calcaneo-Cuboid joint

Cincinnati approach
Skin incision: Head of the I Metatarsal, Below medial malleolus then above the heel crease, below the lateral malleolus to the base of the V Metatarsal

Identify and preserve the neurovascular bundle [posterior tibial artery and nerve] and the sural nerve. Take care to preserve the medial calcaneal branch of the post tibial nerve

Release all tight structures

Z lengthen: Achilles tendon, Tibialis Posterior, FDL and FHL

Release posterolateral corner [posterior fibulo-talar ligament], peroneal sheath

Release tibio-fibular syndesmosis

Superficial Deltoid ligament but retain deep ligament

Capsulotomy of Posterior subtalar and ankle joint

Capsulotomy of Talonavicular joint (capsulotomy medially, superiorly, inferior)

Rarely release calcaneo-cuboid joint and interosseous ligament between calcaneus and talus

Reduce talo-navicular joint and fix with a K wire

Complications

Infection (rare) ;Wound breakdown

Ischemia: Dorsalis Pedis Artery may be absent in CTEV.

Overcorrection or under correction

Recurrence of deformity in 40%

Stiffness

Persistent intoeing is quite common which is not due to tibial torsion but rather insufficient external rotation correction of the subtalar joint

Revision surgery: 25% of the feet have a recurrence

<2 yrs: Repeat complete soft tissue releases

2-4 yrs: cuboid enucleation [shorten lateral column + Medial soft tissue release]

>4 yrs: open medial wedge + close lateral wedge

Salvage surgeries

Forefoot equinus:	Metatarsal osteotomy is better than Heyman's capsulotomy of MTP because of high rate of recurrence with the later procedure
Forefoot supination	SPLATT [Gaceau] split tibialis anterior
Residual cavus	Steindler's release
Hindfoot varus	Calcaneal osteotomy
Forefoot adduction	Calcaneo-cuboid arthrodesis