

The Neglected Clubfoot

More than 2/3 of all children born with clubfoot deformity live in circumstances where they do not have access to specialized medical care. Therefore neglected clubfoot deformity is common worldwide in developing countries. Practitioners in developed countries are increasingly seeing children referred with neglected clubfeet due to immigration, adoption, and medical transfer.

What is the upper age limit for starting Ponseti treatment?

Experience in Brazil, Nepal, India, Africa and elsewhere is showing that manipulation and casting can be effective to a surprisingly older age group.

Lourenço, A. F., & Morcuende, J. A. (2007). Correction of neglected idiopathic club foot by the Ponseti method. *The Journal of Bone and Joint Surgery. British volume*, 89(3), 378-81

17 patients ages 1.9 to 9 years of age. 16/17 corrected, mean time in casts 3.9 months. 5 patients relapsed requiring posterior release.

Spiegel, D. a, Shrestha, O. P., Sitoula, P., Rajbhandary, T., Bijukachhe, B., & Banskota, A. K. (2009). Ponseti method for untreated idiopathic clubfeet in Nepalese patients from 1 to 6 years of age. *Clinical Orthopaedics and Related Research*, 467(5), 1164-70

171 patients presenting at 1-6 years. Mean of 7 casts required with no difference between age groups. 95% underwent heelcord lengthening. 8% needed posterior release and 6% posteromedial release.

Khan, S. A., & Kumar, A. (2010). Ponseti's manipulation in neglected clubfoot in children more than 7 years of age: a prospective evaluation of 25 feet with long-term follow-up. *Journal of Pediatric Orthopaedics. Part B*, 19(5), 385-9.

21 children older than 7 years at presentation, mean follow-up 4.7 years. 18 feet (85%) achieved full correction. Recurrence in 6 feet (24%)

The capsular contractures can be stretched with casting. The heel cord always requires tenotomy. There are diminishing returns on correcting bony deformity by casting alone and likely no bone remodeling happens after age 8. A greater incidence of relapse, therefore, is to be expected as the bone settles back into pre-corrected position. Severe cavus might require plantar fascia release.

Casting in walking age children.

- Longer casting period.
- More casts required.
- Logistically more difficult for parents.
- Barriers of time and transport in developing countries. Some form of hostel accommodation facilitates the program (Ronald McDonald House equivalent).
- Increasing need for supplementary surgery with increasing age.

- Potentially higher risk of relapse due to bony deformity.
- Difficult logistics of post-correction bracing.

Advantages of preliminary casting.

ALL clubfoot corrections should start with a trial of Ponseti casting.

- Minimizes the need for open procedures.
- Foot adduction deformity corrects significantly.
- Stretches the medial skin reducing the risk of skin breakdown with open surgery
- Allows for healing of calluses and ulcers before surgery

Procedure algorithm:

- Ponseti casting until no further correction
- Percutaneous tenotomy if forefoot completely corrected (local, sedation, or GA).
- Continue weekly casting post-tenotomy to gain further equinus correction
- Posterior/posteromedial release if tenotomy not enough (complete subtalar release almost never required anymore)
- Tib Ant transfer if child over age 2.5
- Lateral column shortening if soft tissue release not enough
 - Closing wedge anterior process of calcaneus
 - Litchblau procedure (excision anterior process of calcaneus)
 - Evans calcaneo-cuboid wedge resection
 - Cuboid decancellation is NOT recommended (wrong side of the deformity)

The child with rigid neglected clubfoot, marked cavus (foot facing backward), over age 6, developing country with limited resources, outreach surgery.

- Triple arthrodesis.
 - This is the most expeditious way to gain correction with least complications.
- Modified Lambrinudi approach.
- Personal experience has shown that extensive soft tissue release with osteotomies results in a foot just as stiff as with triple, more complications, particularly with the skin, much longer operative time.
- Growth of the foot is not affected any more than with osteotomy procedures.

Technique of modified Lambrinudi procedure

Penny, J. N. (2005). The Neglected Clubfoot. *Techniques in Orthopaedics*, 20(2), 153-166.

- Medial soft tissue release not necessary
- Ollier lateral incision
- Transverse excision anterior process of calcaneus

- Oblique excision of head and neck of talus
- Oblique anteriorly based wedge resection of anterior process of calcaneus and subtalar joint
- Decortication of cuboid and navicular
- Dorsal and lateral displacement of forefoot on rear foot corrects the deformity as pseudo-rockerbottom foot.
- Fixation where available. Careful cast correction without fixation in children still gives an acceptable result.

Bracing logistics

Is it possible to brace a walking age child full time? Probably not practical!
There is a need for research to identify if the 3 months full-time brace use after initial correction is necessary in this age group.

My practice:

1. Night and nap bracing in walking age children until age 3 or 4 years.
2. Children over age 3 at time of correction:
 - Where operative facilities available: heel cord tenotomy under GA with immediate tibialis anterior tendon transfer.
 - Tib Ant transfer bypasses the need for Foot Abduction Bracing
 - Postop AFO until outgrown, night bracing and part-time day use (few hours out of brace per day to facilitate mobility)
3. Children over age 3 where bony corrections have been performed:
 - Consider Tib Ant transfer at the time of correction.
 - AFO postop until outgrown, night bracing and part-time day use.

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June 22, 2011