



Case Report

Ponseti method of Clubfoot Treatment

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ABSTRACT

Fifteen paediatric patients with congenital Talipes Equinus Varus with unilateral and bilateral involvement were treated with a classic technique of Ponseti method of treatment at Al Batnan Medical Center, Tobruk, Libya, during Jan'2010 - Jan'2011. The patients were aged between 3 months to 6 months. After a mean follow-up of 24 months (range 2—24 months) all patients had full correction of ankle and foot. No patient had recurrence in our study. Objective: Our study was to treat patient on Out patient basis, economy to patient, effective, no need of any surgery and efficient. Result: Results were good with this method and parents were very happy.

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1. Patients and Method

The Congenital Clubfoot:

Clinical / Pathologic anatomy
The complex three dimensional deformity

- Cavus
- Adductus
- Varus
- Equinus

Functional Anatomy: Kinematic Coupling of Subtalar joint:

- Calcaneal adduction, inversion and flexion
- Calcaneal abduction, eversion and extension,
- Foot abduction causes calcaneal abduction
- Calcaneal abduction corrects heel varus and calcaneal flexion

Correction of Pathologic anatomy:

- Cavus ----- Elevate 1st Metatarsal
- Adductus ----- Abduct Midfoot
- Varus ----- Evert Calcaneus
- Equinus ----- Dorsiflex Talus

Ponseti method Ponseti treatment in newborns :

By weekly manipulations and long leg casting.

General Principles:

- Cavus corrected by supinating forefoot in proper alignment with the hindfoot.
- Adduction corrected by abducting the entire foot under the talus with the foot in slight supination
- Heel varus will be corrected when the entire foot is fully abducted
- Equinus is corrected by dorsiflexing the foot (facilitated by percutaneous tenotomy of the tendo Achilles)
- Well moulded plaster casts are applied after manipulations complete

casting with correction every two weeks

1 2 3 4 5



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1.The Ponseti Method: manipulative correction of cavus

2.The Ponseti Method: manipulative correction of adductus/heel varus

- The whole foot abducted under the talus
- Thumb on head of the talus, not the calcaneus.
- The heel is not touched

3. Manipulative correction of adductus & varus

- The entire foot is abducted between 50 to 60 degrees.
- The foot should never be everted.
- The navicular moves away from the medial malleolus.
- The head of the talus covered.

4.The Ponseti Method: casting

- Above knee plaster cast for 5 to 7 days
- Ligaments loosen

5.The Ponseti Method: casting

- The last cast before tenotomy.
- The foot is rotated 60-70 degrees external with respect to the thighs.

6. The Ponseti Method: casting

- The last cast before tenotomy.
- The foot is rotated 60-70 degrees external with respect to the thighs.

7.The Ponseti Method: Equinus correction-Tenotomy

- Complete section of the tendon heals lengthened in three weeks under Local anaesthetic.

8. The Ponseti Method: tenotomy & final cast

- The last cast in 70 degrees external rotation and 10 degree dorsiflexion

- The corrected foot after removal of the last cast.

9. Denis Brown Foot Abduction Brace:

- Maintains correction
- 3 months full time
- 2-4 yr. night time
- Bar as wide as shoulders
- Externally rotate 70 degrees
- Dorsiflex 10-15 degrees
- Heelcup
- Failure to wear is the most common cause of recurrence



1.UNILATERAL-LEFT



2. BILATERAL



3. BILATERAL



4. UNILATERAL-LEFT



5.BILATERAL



6. UNILATERAL-RIGHT



7. BILATERAL



8. BILATERAL



9. UNILATERAL-RIGHT



10. UNILATERAL-RIGHT



11. UNILATERAL-LEFT

Above knee plaster cast for 5 to 7 days



Subcutaneous tenotomy under local anaesthesia: After serial casting



Denis Brown Splint:
Abduction to be kept at Shoulder level with 40 degree at normal & 70 degree at affected side. FOR 2-3 MONTHS 24 Hrs & followed by night splint for 2-3 yrs



Results After full correction of club foot with Ponseti's Method





Pirani's severity score:

Midfoot score

Three signs comprise the Midfoot Score (MS), grading the amount of midfoot deformity between 0 and 3.

- Curved lateral border [A]
- Medial crease [B]
- Talar head coverage [C]

Hindfoot score

Three signs comprise the Hindfoot Score (HS), grading the amount of hindfoot deformity between 0 and 3.

- Posterior crease [D]
- Rigid equinus [E]
- Empty heel [F]

2. Results

This Study shows following results after two years follow up;

Results of Club foot treatment in our study:

- Excellent = 84 %
- Good = 16 %

3. Discussion

Ponseti Treatment of 15 idiopathic clubfeet in 11 infants less than 6 months of age in our study.

For our study all the steps and method were taken into consideration, which were used by Ponseti;

- Early age group of infants,
- Above knee casting,
- Weekly changing of plaster as per the method,
- if necessary Tenotomy under local anaesthesia, and
- using of Denis Brown Splint.
- The Pirani's Severity Score was used to assess the deformity correction of mid foot and Hind foot

Common Errors in the treatment of the congenital clubfoot & how to avoid them.

- Frequent manipulations not followed by immobilization.
- Application of below knee instead of toe to groin casts.
- Attempts to correct the equinus before the heel varus and foot supination are corrected will result in a rocker bottom deformity
- Failure to use a foot abduction brace for three months full-time and at night for two to four years.
- Attempts to obtain a perfect x-rays. Long term follow up x-rays are abnormal. No correlation between the radiographic appearance of the foot and long-term function.
- Failure to treat recurrence at earliest presentation

The Ponseti Method of treating the congenital clubfoot deformity is; 4 'E'

Easy

- Outpatient clinic

Effective

- Good/Excellent results

Efficient

- Complete correction in 2-3 months

Economical

- No major surgery required

4. Reference:

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| [1] Morcuende & Ponseti, Iowa: 256 feet, 98% success | [5] Frick, S. Carolina: 38 feet, 100% success (12 >6mo.) |
| [2] Herzenberg, Baltimore: 27 feet, 96% success | [6] Crawford, New Zealand: 50 feet, 92% success |
| [3] Lehman et al, New York: 50pts, >90% success | [7] Penny & Pirani, Uganda: 171 feet, 93% success |
| [4] Dobbs, St.Louis: 95 feet. 100% initial success | [8] Mkandiwire, Malawi: 40 feet, 83% success |