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To evaluate the ponseti method of manipulation for treatment of rigid, neglected, recurrent cases of clubfoot in children between age of 02-10 years

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Abstract

A prospective study to determine effectiveness of Ponseti method in correcting clubfoot in children aged 2-10 years and failed or recurrent clubfoot in children aged 2-10 years was done at Department of Orthopaedics & Traumatology.

A total of 375 casts have been applied for 25 patients (40 feet).

Mean of 9.375 cast per foot.

Pre-cast PIRANI SCORE (mean): total pre cast pirani score/total no. Of feet =206/40 =5.15

Post-cast PIRANI SCORE (mean): total post cast pirani score /total no. of feet =47.05/40 =1.17625.

Keywords: Ponseti method, clubfoot, children & recurrent

Introduction

Clubfoot is a common birth defect that affects one in thousands live births. It is characterized by adduction, varus, equinus and cavus deformities.

Clubfoot has been existent and known since time of Egyptians and similar is the duration of controversies it carries within itself.

The first written record of clubfoot treatment is found in the works of Hippocrates from around 400 BC. Hippocrates was the first to advocate Orthopaedic treatment of clubfoot by gentle manipulation and bandaging ^[1].

Long back in 1960s, Dr. Ignacio Ponseti (3 June 1914–18 October 2009), a Spanish physician, specializing in Orthopaedics, devised his method of conservative treatment of Congenital Talipes Equinovarus which starts from day one of age and is based on the fundamentals of kinematics and path anatomy of the deformity and successfully realigns clubfoot in infants without extensive and major surgeries. High Success rate of the Ponseti method has made it the most widely practiced treatment for CTEV in modern era. Classic Ponseti method involves weekly plaster change with gradual abduction of foot ^[2, 3].

Material & Method

A prospective study to determine effectiveness of Ponseti method in correcting clubfoot in children aged 2-10 years and failed or recurrent clubfoot in children aged 2-10 years was done at Department of Orthopaedics & Traumatology, M.G.M Medical College and Maharaja Yeshwantrao Hospital, and tertiary Government care center Indore. The duration of study was from August 2014 to August 2016 and includes 25 patients (40 feet).

Each patient registered was given a Clubfoot clinic number and detailed personal history was recorded including the name, age, sex, name of parents, laterality, address, date of first reporting, age at reporting detailed history of any previous treatment etc. A Club Foot Clinic card containing all the required information was issued and pamphlets containing all the required information's in the local language were given to attendants. The patients were followed up regularly at the clinic and assessed.

Inclusion criterion

- Idiopathic clubfoot
- Age 2-10 years
- Pirani score more than 4 (rigid foot).

Exclusion Criterion

- Children with clubfeet below 2 years and above 10 years
- Secondary Club feet
- Local non healing wound
- Pirani score less than 4

Our protocol

1. A thorough general examination of the child was done so as to detect any associated congenital anomalies.
2. A complete clinical assessment of all feet made precast and post cast.
3. Aim of treatment is to achieve a functional, pliable, painless, plantigrade and cosmetically acceptable looking foot.
4. During the entire period of treatment, we try to educate and counsel the parents about clubfoot, importance of early treatment, bringing the child regularly for follow up.

Pirani score

Dr. Shafique Pirani, Clubfoot clinic of Royal Columbian Hospital Canada developed a valid, reliable method of clinically evaluating the severity of a virgin clubfoot. A child's total score can be between 0 to 6 depending on severity.

Method

The foot is evaluated every visit during serial cast treatment. The child is kept supine at the end of examination table and is relaxed.

Look

- CLB (curved lateral border)
- MC (medial crease)
- PC (posterior crease)

Feel

- LHT (lateral head of talus)
- EH (emptiness of heel)

Move

- RE (Rigidity of equinus)

1. Curved lateral border (CLB)

Look at the plantar surface of the foot at rest and gauge the curvature of the lateral border of the foot by placing a straight edge along lateral border.

2. Medial crease (MC)

Assessed with the foot in maximum correction and looking at the longitudinal arch of the midfoot.

3. Posterior crease (PC)

Assessed with the foot in maximum correction and looking at back of the heel.

4. Lateral part of head of talus (LHT)

Assessed with the foot in deformed position, lateral head of talus is palpated and foot is everted.

5. Emptiness of heel (EH)

Assessed with the foot in maximum correction, with the examining finger placed on corner of the heel and applying gentle pressure.

6. Rigid equinus (RE)

Assessed with the baby supine, knee extended and foot in maximum correction from lateral side.

Results

Table 1: Laterality

S. No	RT/LT/BL	Total no. of feet 40
1	Right	6
2	Left	4
3	Bilateral	15

Table 2: Follow Up

Total number of patients	Maximum	Minimum	Mean
25(40 feet)*	1 year (21 Patients)	3 month (3 Patients)	10.8 Months

*One patient did not come to follow up after foot abduction brace was given.

Table 3: Mean pre and post cast pirani score

Pre Cast Mean Pirani Score	Post Cast Mean Pirani Score
5.15	1.17625

A total of 375 casts have been applied for 25 patients (40 feet).

Mean of 9.375 cast per feet.

- Pre-cast PIRANI SCORE (mean): total pre cast pirani score/total no. Of feet =206/40 =5.15
- Post-cast PIRANI SCORE (mean): total post cast pirani score /total no. of feet =47.05/40 =1.17625

Follow up after 1 year



Fig 1

- 4 Year /Male
- Deformity on Both Side.
- Pre Cast Pirani Score 6 For Each Foot
- Total 15 Cast Applied By Ponseti Method.



Fig 2: Serial casting and tenotomy done in order to achieve the correction of deformity



Fig 3: After removal of final cast foot abduction brace was given.

Discussion

Treatment for neglected clubfeet ranges from extensive soft tissue release to complex correction using different types of external fixator, corrective osteotomy and triple arthrodesis. However, these techniques are long and costly and have significant rates of complications. The results of our study have shown that neglected clubfeet can be successfully treated non operatively using the Ponseti method. All our patients except 2 (4 feet) achieved full correction with a mean of 9.375 casts. Children after correction wore normal shoes, did not complain of pain, were able to walk without a limp, and participated in the normal activities of daily living. Both children and their parents were very satisfied with the result of treatment ^[4].

Laurenco *et al.* (2007) described successful results from Brazil after Ponseti treatment in 17 children (24 feet) with an average age at presentation of 3.9 (1.2–9.0). A painless plantigrade foot was achieved in 16 feet without the need for extensive surgery and those who eventually needed surgery ended up with a lesser surgical intervention. One-third of the patients had recurrence. The best results were achieved in the youngest group. The authors also achieved only 40 degrees of abduction in the older group, which was the same as we observed ^[5].

In Malawi, adequate correction was achieved in 98 of 100 feet (in 75 children). The mean age at presentation was 11.5 weeks. 19 patients (25%) were in the age group between 18 and 48 months, so some of these children must have been neglected even though they were much younger than our patients ^[6, 7].

Conclusion

The ponseti method of manipulation and correction is being used successfully for Idiopathic Congenital talipes equinovarus foot below 2 years children along with maintenance by foot abduction brace supports. In cases of neglected club foot there occurs severe capsular ligamentous contracture with adapting bony changes with the effect of weight bearing leads to significant amount of deformities. Treatment for neglected feet ranges from extensive soft tissue release to complex correction using different types of external fixator, corrective osteotomy and triple arthrodesis. However, these techniques are lengthy and costly and have a significant rate of morbidity and complications. This diverted our attention to search out easier simple and cost effective method to treat the neglected, rigid, and recurrent cases of clubfeet. We have also decided to carry out this cast effective procedure. Few studies have been carried out by using the ponseti method in children above 2 years of age

with limited surgical procedure to correct the deformities. the importance of ponseti method for treatment of neglected, rigid, and recurrent cases of Clubfeet.

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