

OUR EXPERIENCE WITH PONSETI TECHNIQUE IN IDIOPATHIC VIRGIN CLUBFOOT OF CHILDREN BELOW 2 YEARS OF AGE

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Abstract: The Ponseti technique is a well-known and technically easy way of managing paediatric clubfoot deformity with fantastic results. It doesn't have foot stiffness and persistent pain which are common with surgical management.

PATIENTS AND METHODS: In our study we performed Ponseti casting on 34 CTEV patients and 2 lost in follow up and 4 are failures. Patients are followed up prospectively for 6months and correction of deformity compared with Pirani scoring.

RESULTS: The mean age at initiation of treatment for 32 patients (37 feet) was 192 days (range 4 days to 2 years). The mean initial Pirani severity score for 37 feet was 4.30 (out of maximum possible score of six). After full correction by Ponseti technique (with or without percutaneous tenotomy) the final mean score was found to be 0.17 and the mean change in score was found to be 4.13. This was analysed by the paired t- test and the p value was < 0.005 which is significant.

CONCLUSIONS: Early treatment of Idiopathic CTEV by Ponseti technique results in good correction of the deformity with minimal need for surgery and percutaneous tenotomy of tendo Achilles is required in considerable number of cases to achieve good correction. Parent compliance plays an important role in maintenance of the deformity correction and it is definitely an effective and affordable technique.

Keywords: Clubfoot-Foot deformities -Ponseti technique-Results.

1. INTRODUCTION

Congenital talipes equino varus is probably the most common congenital pathological condition. The term was first described by Hippocrates. It was Nicolas Andry in his "Orthopaedicia" described the term "PedisEquinal" which meant the foot resembling the foot of the horse. The term "talipus equinovarus" is derived from latin :Talipes , a combination of words- Talus (ankle) and pes (foot) ; equinus meaning "horse like"(the heel in plantar flexion) and varus meaning inverted and adducted.

The incidence of CTEV is approximately 1 – 1.4 cases per 1000 live births¹. Boys are affected twice as often as girls¹. The etiology of club foot is still obscure although too many theories have been proposed. A higher incidence of CTEV was also noted in patients with a positive family history^{1,2}.

The theories proposed in the etiology of CTEV are mechanical factors in utero, neuromuscular defect, primary germ plasm defect, arrested fetal development, hereditary, etc. Irrespective of the etiology, the patho-anatomic changes associated with CTEV include ankle equinus, a calcaneum that is in equinus and inverted position beneath the talus and

the talar head prominence at the dorsolateral midfoot, navicular medial and plantar to the talar head, cuboid medial and in 2 front of calcaneum, medial tilting of anterior part of talus, shortened talar neck, narrow posterior ankle mortise, talar tilt out of ankle mortise³.

The aim of treatment in Idiopathic CTEV is to obtain painless, pliable, plantigrade and cosmetically acceptable foot. The recommended treatment of CTEV ranges from non-operative casting & stretching to complete peritalar surgical release and bony procedures for neglected CTEV cases.

The methods of J.H.Kite³, Ignacio V. Ponseti⁴ and French methods as described by Masse & Bensahel⁵ are examples of non-operative methods of correction of CTEV. The technique of gradual and simultaneous correction of all deformities of CTEV using manipulation and casting at weekly interval described by Dr. Ignacio V. Ponseti has gained wide acceptance throughout the world.

He described the Kite's method of correction in which the abduction of calcaneus under the talus was prevented by applying counter pressure over the calcaneocuboid joint as "Kite's error". This is very essential in correction of heel varus as the calcaneus can't be everted unless it is fully abducted under the talus. In this study, we have attempted to analyse the functional outcome of Idiopathic clubfoot using Ponseti's technique in children presenting to us within the first two years of age without any prior treatment.

2. PONSETI METHOD

Ponseti published his first article on CTEV correction in The Journal of Bone and Joint Surgery in March 1963 which was not widely accepted. However his article in 1995 on the long term follow up of CTEV cases by his technique created a new path in the treatment of CTEV by non-operative method⁶.

It consists of serial manipulation and casting with gradual and simultaneous correction of all deformities of CTEV.

Order of correction-

- Cavus
- Fore foot adduction
- Hind foot varus
- Ankle equines

Manipulations and casting are done at weakly intervals with POP immobilization. Equinus is the only residual deformity, which is to be corrected by percutaneous tenotomy of tendo Achilles^{7,8}. This is followed by POP casting for three weeks. Then the baby is subjected to bracing protocol which consists of Denis –Brown shoes attached to a bar for full time for the first three months and twelve hours at night and two to four hours in the middle of the day for 3 years.

3. MATERIALS AND METHODS

Thirty four patients entered the study after explaining the study protocol and the possible necessity for Achilles tenotomy and foot abduction orthosis till the age of four years. Twenty eight patients (twenty three unilateral and five bilateral CTEV) completed serial castings with or without Achilles tenotomy and were given foot abduction orthosis. Four patients who did not achieve the required degree of correction at the end of ten castings were considered as failure cases and were referred for posteromedial soft tissue release. Two patients were non-compliant and dropped out in the middle of the treatment. These patients are followed-up in a prospective manner for a period of six months. All were assessed for associated syndromic pathology and only those infants with idiopathic CTEV were included in the study. Before cast application every week the degree of deformity was graded according to Pirani severity scoring system.

INCLUSION CRITERIA: 1. Adduction, Supination and varus deformity of the foot with or without wasting of calf muscles. 2. Age less than two years. 3. Virgin club foot.

EXCLUSION CRITERIA: 1. Postural club foot. 2. Syndromic club foot. 3. Neglected club foot. 4. Relapsed club foot.

STATISTICAL ANALYSIS:

The results were analysed using SPSS 10 software. T-Test paired samples analysis was done to find out the difference between the means of values (before casting, after casting and follow up castings).

4. RESULTS

In this study full correction of the deformity was obtained in thirty three feet (23 unilateral and 5 bilateral CTEV). 6 feet achieved full correction without percutaneous tenotomy and 27 with percutaneous tenotomy. Four feet were not corrected with Ponseti method and were considered as failure cases. They were referred for posteromedial soft tissue release. Two patients were non-compliant and dropped out in the middle of the study.

The most common age group was 0-6 months with 12 (37.5%) patients and most of the patients (59.4 %) were less than 1 year of age. The minimum age was 4 days and the the maximum age was 730 days (2 years).The mean age at initiation of treatment for the 32 patients was 192 days (range 4 days-730 days).There were 11 females (34.4%) and 21 males (65.6%). The male to female ratio was 1.9: 1. Five cases were bilateral (15. 6 %) and 27 (84.4 %) cases were unilateral. Right to Left ratio was found to be 3.6:1.

The mean initial Pirani severity score for 37 feet was 4.30 (out of maximum possible score of six). After full correction by Ponseti technique (with or without percutaneous tenotomy) the final mean score was found to be 0.17 and the mean change in score was found to be 4.13. This was analysed by the paired t test and the p value was < 0.005 which is significant.

The mean value of Pirani score at 6 months follow up was 0.11 which shows a change of 4.19 from the initial score. This change also has a p value of < 0.005 which is also significant.

75 % of patients needed percutaneous tenotomy of tendoachilles at the end of casting. Total number of casts required for the study was 284 with a mean of 8.88.

Our results were successful in 87.5 % of the patients with no major adverse events and the results were certainly encouraging.

5. OBSERVATIONS

We found the following factors contributed to the success of CTEV correction by Ponseti technique: TM

- Earlier the child started on treatment better are the results. TM
- The milder the severity of deformity
- Strict adherence to the sequence of correction as advised by Ponseti. TM
- Removal of the cast just before applying the subsequent cast.
- Regular follow-up by the patients.
- Compliance of the parents in maintaining the cast as well as the Dennis Browne splint.
- Absence of complications.

6. CONCLUSIONS

Early treatment of Idiopathic CTEV by Ponseti technique results in good correction of the deformity with minimal need for surgery. Percutaneous tenotomy of tendo Achilles is required in considerable number of cases to achieve good correction. Forefoot adduction is the frequently observed residual deformity at the end of the treatment and extensive soft tissue release surgeries like posteromedial soft tissue release is rarely required for correction of the deformity avoiding long term complications. The complication which we encounter frequently is pressure sore and can be dealt successfully by skipping the casting for one or two weeks. Parent compliance plays an important role in maintenance of the deformity correction and it is definitely an effective and affordable technique.

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