



THE EVALUATION OF THE RESULTS OF NEGLECTED CLUBFOOT MANAGED BY PONSSETI METHOD

Orthopaedics

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ABSTRACT

Background: Congenital talipes equinovarus is the most common congenital foot disorder. neglected of clubfoot deformity occurs after the treatment by Ponseti method. we evaluate the relapse pattern of clubfoot basis of bhasker et al then treat the patient by Ponseti technique. **Methods:** This is a Prospective study .We are conducting a clubfoot clinic since 2013 in Department of Orthopaedics Gandhi medical college Bhopal . We register all clubfoot patient at our clubfoot clinic on his/her first visit. All the clubfeet assessed with Pirani scoring system on the initial presentation to our institution and treat by Ponseti method. During this study there were a total of 558 children with 713 idiopathic clubfeet registered at our clinic. A total of 80 neglected clubfeet in 56 children presenting with neglected clubfeet were included in our study. **Results:** We found that The neglected feet in our study is (80 feet out of 713 feet. The male patient is 38 (67.86%) and female patient is 18 (32.14%). Male were predominantly involved as compared to female. The post treatment Pirani score after relapse treatment is 0.40 **Conclusion:** Ponseti technique is a simple, effective, inexpensive method for treatment of clubfeet there is, no requirement of special setup with limited resources and less rate of recurrence/complication than the surgical treatment It has been concluded that Ponseti method is a effective technique to treat congenital idiopathic clubfeet with success rate is 94.65% in our study

KEYWORDS

INTRODUCTION

Neglected clubfoot still remains a great problem in developing countries like India especially in the rural population with limited access to modern healthcare.[1,2]

Neglected clubfoot is defined as the foot which has not experienced or minimally experienced, surgical or non surgical treatment upto the 9 months of age[3]. Globally, neglected clubfoot is the most serious cause of physical disability among congenital musculoskeletal disorders. Most of the literature on treatment of neglected clubfoot focuses on soft tissue release, surgery, osteotomy or fixators. Non-operative treatment of clubfoot provides a lower complication rate, less pain, and higher function as the patient ages than operative treatment. Dimeglio and Pirani scoring is used to assess the severity of clubfoot [4]. The Ponseti method is fast becoming the gold standard for the virgin clubfoot as well as neglected clubfoot treatment and is currently being implemented all over the world.

Congenital club foot is a complex deformity with four components Cavus: Increase in the height of the medial arch of the foot break in the foot sole plan; the forefoot in relation to the mid foot is in pronation. Mid foot strong supination and forefoot less supination (Ponseti, 2003). Adductus: Medial deviation of the distal part of the foot (Ponseti, 2009). Varus: supination and adduction of the calcaneus. Calcaneus is locked under the talus (Ponseti, 2003). Equinus: Severe planter flexion in the ankle joint. Talus is in severe flexion (Ponseti, 2003). The Ponseti method for treatment of clubfoot involves the use of serial casts, percutaneous Achilles tenotomy in most cases and bracing with an abduction orthosis to prevent relapse.

MATERIAL AND METHODS

The study was conducted in the department of Orthopaedics, Gandhi Medical College bhopal on the patients of neglected clubfoot. They are selected on the basis of following inclusion criteria.

Sample Size: 80 feet

INCLUSION CRITERIA

1. All cases of idiopathic clubfoot not treated upto the age of 1 year (walking age).
2. All cases of idiopathic clubfoot inappropriately treated upto age of 1 year and presenting in our hospital after that age.

EXCLUSION CRITERIA

1. Age below 1 year
2. Syndromic clubfoot

3. Acquired clubfoot
4. Cases with history of previous surgeries

Clinical assessment

Quantification of various components of clubfoot deformity was done using the Dimeglio's score as well as Pirani score.

PIRANIScore

Pirani 1995 described a system for grading of clubfoot. It is composed of 6 different physical examination findings, each scored 0 for no abnormality, 0.5 for moderate abnormality, or 1.0 for severe abnormality. Each foot was assigned a total score of less than or equal to 1, a higher score indicating a more severe deformity.

OBSERVATION AND RESULTS

Table no. 1 sex distribution

Sex	No. Of cases	Percentage
male	38	67.86
female	18	32.14
total	56	100

Table no. 2 Distribution of cases according to side

Age group	bilateral	unilateral		total
		right	left	
1-2	5	4	3	12
2-5	10	6	6	22
5-10	7	6	4	17
>10	2	2	1	5
total	24	18	14	56

Table no. 3 Distribution of patient according to no. Of cast

Age group	No. Of cast
1-2	8.9
2-5	12.6
5-10	15.3
>10	20.4

Table no. 4 Pretreatment Dimeglio grading

Age group yr	Grade no. Of feet			
	I	II	III	IV
0-10	0	4	71	5

Table no. 5 post treatment dimeglio grading

Age group yr	Grade no. Of feet			
	I	II	III	IV
1-10	67	13	00	00

Table no. 6 pre treatment and post treatment pirani score

Age group in year	Pre- treatment	Post treatment
1-2	4.8	0.22
2-5	4.1	0.42
5-10	3.84	0.47
>10	3.63	0.46

DISCUSSION

This study was conducted in the department of Orthopaedics, Gandhi Medical College, bhopal on 56 patients amounting to a total 80 clubfeet. All patients those are either not treated since their birth or inadequately treated, presented to our hospital after the age of 1 year (after walking age). All patients are treated according to the standard Ponseti technique with minor modifications. At the time of presentation a thorough clinical examination of every patients as well as clinical pictures of every feet was taken. Dimeglio as well as Pirani scoring was done at the time of presentation and at every subsequent visit prior to application of every cast.

As standard Ponseti technique cavus was corrected first by supinating the forefoot. Then adduction and varus was corrected simultaneously followed by equinus in the last when sufficient amount of abduction (30-40°) was achieved. Tendoachilles tenotomy was performed in each and every patient on day care basis in minor operation theatre by using 15 number scalpel blade. After tendoachilles tenotomy serial casting was continued on weekly basis for 3 weeks. For younger children age 4-5 years a foot abduction brace was given and advised to wear full time (day and night) for 3 months and only night time for next 3 years. In older children, 3 weeks after tenotomy a below knee walking cast was given to maintain the correction and to start early mobilization of the child. Below knee walking cast was removed after 3 weeks and a foot abduction brace was given for night and a CTEV shoes for day time. It was advised to continue it at least for 3 years to maintain the correction as well as mobilization of child. While evaluating the age in this study the average age of presentation came out to be 4.8 years.

The average age of presentation in our study was higher than that of most the different study. AF Lourenco (2007) [5] calculated the age of presentation 3.9 years, while Abhinav Sinha and Anil Mehtani (2016) [6] calculated the average age 3.02 years. Verma A et al [7] calculated the average age of presentation 2.03 years. Khan and kumar [8] looked 21 patients (25 neglected) with mean age 8.9 years , whereby 18 feet had full correction 6 feet had recurrent deformity.

In our study 42.85% (24 patients) cases are bilateral while 57.15% (32) was unilateral with predominance of right foot in unilateral cases. Right feet was 18 (56.25%) and left feet 14 (43.75%). This is quite similar to the studies conducted by different authors. Dr. Arun Kumar Seshadrinath N (2017) [9] found 35% unilateral and 65% bilateral patients. Birhanu Ayana and Peter J Klungsoyr (2014) [10] concluded 50% both unilateral as well as bilateral feet in their total 22 patients study.

There was a male preponderance in our study which is supported by different authors. In our study males were 38(67.86%) and females were 18 (52.14%) which was quite similar to the study conducted by Dr Arun kumar Seshadrinath N (2017) [9] they found 24 (656) males and 13 (35%) females.

In our study majority of the patients affected were first order borne child (37.5%) while second order borne were 26.78%, third order born 26.78% and 26.78% of children were either fourth or beyond that order.

Out of 56 patients, 6 (10.71) patients had family history of club feet in order which 4 cases were their siblings and 2 patients were their patients.

A higher incidence of family history was noted by Dr Arun kumar Seshadrinath N (2017) [9] found family history in 9 (24%) patients. In our study average number of cast applied was 13.31 which is quite higher than other studies like Abhinav Sinha and Anil Mehtani (2016) [6] calculated average number of cast 12.8, Dr Arun kumar Seshadrinath N (2017) calculated average number of cast 7.6. Amr S Elgazzar (2014) [11] applied a mean 10 casts. In our study the average number of cast applied was higher this may be because of following reasons. Our study was conducted on comparatively older children with mean age 4.8 years (1-15 yrs). The second reason was that the

casts has been changes on weekly basis contrary to most of the authors who used to change the cast at every 2 weeks.

Third reason is that in our study after tenotomy the cast was changed on weekly basis for next two weeks. As in standard Ponseti protocol post tenotomy cast is applied for three weeks there after cast is removed followed by braces.

In our study the average duration of immobilization in a cast was 3.1 month which is lower than other studies. while in study conducted by AF Lourenco, JA Morcuende (2007) [12], The average duration of immobilization in a cast was 3.9 months (1.5-6months). Amr S Elgazzar (2014) calculated the mean period of immobilization in a cast of 8.9 weeks.

In our study at the time of presentation most of the feet were graded under Demaglio grade III amounting a total 71 feet (88.75%) while 4 feet (5%) were under Dimaglio grade II and 5 feet (6.25%) were under Dimaglio grade IV. A similar presentation was seen in study conducted by Amr S Elgazzar (2014) who found 94.1% in grade III and 5.9% in grade IV.

In our study there was a significant improvement in Dimeglio grading after completion of treatment. Most of the patients became grade I amounting 67 feet (83.75%) and remaining 13 feet (16.25%) became grade II. This improvement is quite similar to the results of Amr S Elgazzar (2014) who found 82.3% grade I and 17.7% in grade III.

In our study the average Pirani score at the time of presentation was 4.12, which is quite lower than the study conducted by Abhinav Sinha and Anil Mehtani (2016) who found average pirani score 5.41. AF Lorencio, JA Morcuende (2007) [5] found their patients in a range between Pirani score 4-5.

We found lower Pirani score, it may be because of that our study was conducted on relatively older children (average age of presentation was 4.8 years) than Abhinav Sinha and Anil Mehtani (2016), who found average age 3.02 years (1.1-10.3 yrs). This should be noted that pirani score comes falsely low in older children due to absence of posterior and medial crease and empty heel sign irrespective of the severity of the clubfeet. In our study post treatment average Pirani score was 0.40 which is slightly higher than the study conducted by Abhinav Sinha and Anil Mehtani (2016), who found Pirani score 0.12 and slightly lower than Anand verma, Anil Mehtani who found post treatment average Pirani score 0.76.

In our study the average dorsiflexion achieved after completion of the treatment was 13.06°. The average dorsiflexion achieved at the end of the treatment decreases with increasing the age of the children. The average dorsiflexion achieved in age group 1-2 yrs was 20.5°, between 2-5 yrs was 12.6°, between 5-10 yrs was 9.63° and in age >10 yrs was 9.0°.

In elder children it was difficult to achieve dorsiflexion beyond 10° at the end of the treatment, but further dorsiflexion can be achieved by physiotherapy and exercises when child grows up. These results are quite similar to the other studies, Abhinav Sinha and Anil Mehtani (2016) found average dorsiflexion 12.26° at the end of treatment. They also noted a downward trend of average dorsiflexion with age.

In our study 3 patients (5.35%), a total 5 feet (6.25%) were not fully corrected by Ponseti method. All of these patients had rigid or moderately rigid feet. In these patients posteromedial soft tissue release was performed. We have a low rate of posterior medial soft tissue release than the other studies AF Lorencio, JA Morcuende (2007) [12] required posteromedial soft tissue release 33.33% of patients and Shah Alam (2010) [13] required posteromedial soft tissue release in 28% of their patients. Spiegel et al [14] avoid extensive soft tissue release in 94% of his patient aged six years and less. In contrast to kumar and Hassan et al [16], felt that Neglected CTEV deformity had no further potential to manipulative correction and soft tissue require for achieve manipulation.

Although in these patients we were not able to fully correct the feet by Ponseti technique, but serial casting significantly reduces the need of extensive surgeries like corrective osteotomies and triple arthodesis.

In our study 8 patients (14.29%) had dynamic supination during walking. It was not significant in 6 patients means caused no disturbance of gate. 2 patients required tibialis anterior tendon transfer in which tibialis anterior tendon was transfer to the third cuneiform. Residual equinus is common in young children post full soft tissue release [penny nj 17]. Recurrence of deformities (mainly equinus) was seen in 13 patients (23.21%) amounting 17 feet (21.25%).

Out of 13 patients, 5 patients (7 feet) required repeat serial casting followed by repeat tendoachilles tenotomy. 8 patients (10 feet) were simply managed by percutaneous tendoachilles tenotomy. The incidence of relapse in our study was quite low (21.25%) than other studies AF Lorenzo, JA Morcuende (2007) found 62.5% relapse, Shah Alam (2010) found relapse in 24% of feet, Anand Verma and Anil Mehtani found relapse in 27.2% of feet.

Complication of casting were seen in 5 patients (8.93%), they developed redness, swelling and skin erosions which were simply managed by delaying the subsequent cast for 1-2 weeks.

Complications related to tenotomies like infections, neurovascular complications and excessive bleeding were not seen in any patient.

In our study 94.65% patients were fully corrected by Ponseti method, We achieved painless, plantigrade, supple, shoe able and cosmetically acceptable feet without need any Surgery except percutaneous tendo achilles tenotomy,

CONCLUSION

It has been concluded that ponseti method is good technique to treat the congenital idiopathic clubfeet in older children with a success rate of over 94.65% . although results of our study are very encouraging but further studies are needed to find the upper age limit of ponseti method.

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