Original Research Article

Effectiveness of Ponseti Technique In The Management of Idiopathic Clubfoot Deformity At Tertiary Care Hospital (A Descriptive Case study)

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Abstract :

Congenital Clubfoot is one of the most common congenital birth defect. The Deformity in the Clubfoot is combination of adductus, cavusand equinus. The Ponseti method is at present a well established method for management of idiopathic clubfoot deformities. We here report our experience with the ponseti method of casting in the treatment of congenital clubfoot. We had treated 68 clubfeet in 50 childrenby this Ponseti technique between August 2018 and August 2020 in the department of Orthopaedics at Rajindra Hospital, Patiala. Protocol described by ponseti was used and percutaneous tenotomy of tendoachillis was done wherever required. The Pirani score was used for assessment of the deformity and the mean follow up time was 15 months (6 to 30).

Materials and Methods :

Between August 2018 and August 2020 , 50 children with 68 clubfeet were treated by ponseti method at our institution . Severity of the deformity was assessed clinically by Pirani Score and were treated by ponsetiprotocol. Percutaneous tenotomy of tendoachillis was done wherever required.

Results :

InPresentstudyof68feet (50cases;18bilateraland32unilateral) goodorexcellentresults were achieved in 46 feet (67.64%), Fair results in 15 (22.05%) feet and another 7 feet (10.29%) had poor result. The final results were graded as Good, if the Pirani score remained zero; fair with the score one or less (midfoot and hindfoot score) and poor having score more than one.

Conclusion- Our initial experience with the use of ponseti method suggests that it is a simple, cheap and effective method of treating congenital idiopathic club foot. Percutaneous tenotomy was required in most of the cases for the treatment of the equinus component of the deformity.

Key Words :

Congenital talipes equino varus, Pirani scoring, Foot abduction orthosis (FAO)

Introduction

Idiopathic clubfoot or CTEV is the most common orthopaedic congenital condition which has been managed since the time of Hippocrates with unsatisfactory results .Clubfoot deformity may be divided into three parts : adduction, inversion and equinus deformities . The forefoot is adducted when compared with the posterior foot. The oscalcis is rotated inward under the astragalus causing the entire foot to assume an inverted position. The equinus deformity may be divided into two parts : the forefoot is planter-flexed when compared to the posterior foot, giving forefoot equinusand the entire foot is planterflexed in the ankle joint , giving ankle equinus(1). Another component of the deformity is cavus which is an elevation of the medial planter arch of the foot. A well-conducted orthopaedic treatment, based on a sound understanding of the functional anatomy of the foot and on the biological response of young connective tissue and bone to changes in

direction of mechanical stimuli, can gradually reduce or almost eliminate these deformities in most clubfeet(2). Our Aim was to review our experience of treating clubfoot by the ponseti method.

Material and Methods –

This study was conductedat Government Medical College and Rajindra Hospital, Patiala. 50 patients with congenital idiopathic unilateral or bilateral clubfeet after fulfilling the inclusion and exclusion criteria were treated conservatively with Ponseti method after taking written and informed consent. Children with other congenital anomalies , syndromes or the neurological causes of the clubfeet were excluded.

Procedure

1) Clinical examination to assess the condition of skin, extent of deformity, muscle bulk, joint movement and neurovascular status of the foot was done and grading of clubfoot deformity was done as per Piraniscore (3). Each component was scored as 0(normal), 0.5(mildly abnormal) or 1(severely abnormal). Scores were recorded on every clinical visit of the child. The least total score for all categories combined was 0 and the maximum (worst) score was6.
2) The first cast was applied in supination to correct the Cavus deformity and then the subsequent casts were applied in abduction to correct the adduction and varus component of the deformity. Casts were applied from toes to groin and were changed every weekly.
3) Percutaneous tenotomy for correction of the equinus was done prior to the application of the final cast for 3 weeks.
4) After the removal of the final cast, foot abduction orthosis was applied for the maintainence of the correction.

Results

In the present study, mean age at presentation was 20. 10 days . Of the 50 patients , 60% (30) presented within 0-20 days of the birth,12% (6) between 20-40 days, 8% (4) each between 40-60, 61-80, 81-100 days of birth and 4% (2) between 100-120 days of birth.

Out of 68 feet (50 patients), 18 cases were bilateral and 32cases were unilateral . Of the 32 cases with unilateral involvement ,16 had right sided involvement and 16 had left sided involvement . 72 % cases (36 out of 50) were males and 28% cases (14 out of 50) females. In our observation, flexible clubfoot was 5.25 times more common than the rigid type. Mean Pirani score at presentation was 5.58.

Mean number of casts applied was 5.46 for unilateral cases and 5.69 for bilateral cases . Overall mean number of casts applied was 5.57 ranging between 5 to 8. Average duration of treatment was 6.5 weeks before the patient was put on FAO (foot abduction orthosis).

Percutaneous tenotomy was required in 88.20% of the cases.

Table 1 MEAN POST TREATMENT PIRANI SCORE

Post treatment Pirani score	Number of feet	Percentage
0	51	75
0.5	10	14.70
>1	7	10.29

Table 2 RELAPSE OF CLUBFOOT

Relapse	Number of feet	Percentage
Yes	8	11.76
No	60	88.23

Table3 COMPLICATIONS

Complications	Number of feet	Percentage
Skin excoriation	7	10.29
Tight POP	3	4.41

Table 4 EVALUATION OF RESULT OF TREATMENT

Grading	Number of feet	Percentage
Good	46	67.64
Fair	15	22.05
Poor	7	10.29

Discussion -

The method of serial manipulation and casting developed by Ponseti for congenital club foot was instituted in an effort to achieve a plantigrade, functional foot without the need to resort to major surgical intervention. Ponseti and Smoley(4) reported that open surgery was avoided in 89% of cases by this technique of manipulation, casting and limited surgery. Few casting techniques have been described in detail in the literature. Kite(5,6)described his method in 1964. He recommended abduction of the forefoot against pressure at the calcaneocuboid joint. Ponseti explained this manoeuvre as Kite's error because it blocks the correction of hind foot varus and internal rotation.

In the present study, the mean number of casts applied were 5.57 ranging from 5 to 8. Mean number of casts applied were 5.46 for unilateral cases and 5.69 for bilateral cases. Similarly, in the study done by Changulani M. et al in 2006(7), the mean number of casts required were 6 which ranged from 2 to 12.

In ourstudy, percutaneous tenotomy was required in 60 feet out of 68 feet with clubfoot deformity i.e. 88.2%. In study done by Changulani M. et al in 2006(7), percutaneous tenotomy was required in 85 feet out of the total 66 cases (100 feet). i.e., tenotomy was required in 85% of the cases. In a similar study done by Bhaskar A et al in 2006(8), 34 children needed the heel cord tenotomy, 22 in the bilateral group and 12 in the unilateral group.

The average duration of treatment was about 6.5 weeks before patient was put on FAO. Ponseti et al 1963(4),reported five to twelve weeks duration of casts (average 9.5 weeks). In another study by Laaveg et al 1980(9), the average duration was 8.6 weeks.

In the present study 8 out of 68 feet had relapse i.e.9.75% of the total treated clubfeet by Ponseti method. Similarly, in a study conducted by Bhaskar A et al in 2006(8), out of 66 feet, they reported a relapse rate of 15%.

At presentation

1st Cast in Supination

Subsequent Cast in Abduction

Percutaneous tenotomy

Conclusion

Ponsetimethod is a simple, cheap and effective method of treating congenital idiopathic clubfoot. This method is superior to other traditional methods of casting and also requires shorter duration of treatment and lesser number of casts. Ponseti's method of conservative management improves all the 4 deformities associated with patients with idiopathic congenital which is evident by statistically significant improvements as assessed by Pirani severity score. Percutaneous Achilles Tenotomy is a safe and effective technique of correcting residual equinus deformity which is done in most of the patients.

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