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ANALYSIS OF FUNCTIONAL OUTCOME OF CONGENITAL TALIPES EQUINOVARUS BY PONSETI METHOD IN OUR INSTITUTION.

Orthopedics

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ABSTRACT

Introduction:
Clubfoot is among the most common and severe congenital deformities of the foot. The incidence is reported to be 1:1000 live births[1]. Several etiologies have been proposed, and genetic involvement has been confirmed[2,3]. On a pathologic leve1, clubfoot specimens reveal an excess of collagen synthesis and retracting fibrosis in the muscles, fasciae, ligaments and tendon sheaths of the posterior and medial aspects of the foot and leg[4] . The structural deformity that results is a combination of equinus, cavus, adductus and varus. In our study we have recorded the functional outcome of serial cast correction of CTEV by Ponseti method.

Materials and Methods:
In our series, we have treated 71 babies with 109 idiopathic clubfoot by Ponseti method of serial casting. Of the 71 babies, 38 had bilateral affection and 33 had unilateral. 52 of the babies were male and 19 were female. We did tenotomy in all cases.

Results :
We achieved correction in all cases. Children less than 12 months need 5 casts followed by percutaneous tenotomy. More than 12 months old children need additional casts. We had no recurrence. All feet achieved plantigrade correction.

Conclusion:
We conclude that the Ponseti method is a very safe, efficient and economical treatment for the correction of club foot that radically decreases the need for extensive corrective surgeries. The Ponseti method of cast correction is economically beneficial to our Indian population.

KEYWORDS

CTEV, Ponseti method, Pirani scoring, Functional outcome

Introduction

For many centuries, the primary deforming forces as well as the appropriate conservative and surgical treatment of clubfoot have been debated. Manipulation and casting of clubfoot was discussed as early as 400 BC by Hippocrates. The first surgical treatment, consisting of subcutaneous tenotomies, was performed by Lorenz in 1782[5]. Since that time, numerous treatment approaches have been described.

In 1930, Kite described a casting technique which utilizes gentle, progressive manipulation followed by a series of plaster casts. Kite described abduction of the foot at the midtarsal joint, with the thumb pressing in the area of the calcaneocuboid joint. Kite's technique addresses the heel varus separately by everting the calcaneus over many months.

THE PONSETI METHOD

Ponseti, in 1948, described an alternative method of plaster casting based on years of observation of both conservative and surgical clubfoot treatment. The new concept that Ponseti introduced, was that the heel varus can be corrected by abducting the calcaneus under the talus rather than by everting the calcaneus. In the Ponseti method of casting, the navicular, cuboid and calcaneus are gradually abducted, causing simultaneous reduction of the heel varus. Counter-pressure is applied at the head of the talus, which is palpated laterally[6].

Although the Ponseti method of clubfoot casting relies on simultaneous reduction of all the components of the clubfoot deformity, the components will be addressed separately for ease of explanation. As in other methods of casting, gentle manipulation and serial cast applications should be started as early as possible even within the first few days of life. Casts are then applied at weekly intervals. Successful reduction of the deformity is usually achieved with as few as five to six casts[7]. The equinus deformity is not manually reducible and a percutaneous Achilles tenotomy is required.

This is performed in the clinic under local anesthesia and is followed by a final cast which is left on for three weeks. Successful maintenance of correction relies on a foot abduction bar, which the baby must wear at all times for three months and thereafter at night for an additional two years.

Pirani's Method of Clubfoot Evaluation [11]

Dr. Shafique Pirani, Clubfoot Clinic of Royal Columbian Hospital, University of British Columbia, Canada developed this valid, user friendly and reliable method of clinically evaluating the severity of a virgin club foot deformity. He had identified 6 well described clinical signs of clubfoot. Three of these signs indicate primarily Hind Foot Contracture (HFC) and three signs indicate primarily Mid Foot Contracture (MFC).

The abnormal area on the involved foot is compared to normal side (if deformity is not bilateral) and scored:

0 = No deformity
0.5 = Moderate deformity
1 = Severe deformity

Hind Foot Contracture (HFC)
1. Posterior crease (PC)
2. Rigid Equinus (RE)
3. Empty Heel (EH)
Possible HFCSbetween 0 and 3

Mid Foot Contracture (MFC)
1. Curved lateral border
2. Medial crease
3. Coverage of the talar head
Possible MFCS between 0 and 3.
A child's Total Score (TS) is between 0 and 6.

Aim of the Study

To analyse the functional outcome of serial cast correction of Congenital Talipes Equinovarus by Ponseti method.

Materials and Methods

This study was done at our "CTEV Clinic" conducted at Govt. Villupuram Medical College, Villupuram. Study was conducted from June 2015 to June 2017.

Total no of children treated in our hospital is 71 with 109 feet. The following observations were made in our study.

Male children	52
Female children	19
Bilatateral	38
Unilateral right side	21
Unilateral left side	12

ASSOCIATED SYNDROMES

- 3 children with Down syndrome
- 5 children with Congenital band syndrome
- 1 child with Congenital band syndrome with absent metatarsals on that side

Study design

The study is a prospective study,

Inclusion criteria

All children with club foot deformity

Procedure:

Each patient was registered and detailed personal history was recorded including the age, sex, father's & mother's name, address, date of first reporting, age of reporting, detailed history of previous treatment, etc. A thorough general & local examination was carried out & the deformity was scored according to Pirani's classification at each visit before applying cast.

The score was plotted against the time and the trend of score was noted with reference to effect of manipulations or other interventions on deformity.

Manipulations were done by Ponseti's method followed by corrective casts at weekly interval. Patients were followed up weekly for corrective casting till tenotomy and corrective cast was applied for 3 weeks after percutaneous Tendo Achilles tenotomy[8] . We performed the tenotomy under local anesthesia. After 3 weeks of tenotomy, cast was removed and patient was shifted to maintenance phase with bracing.

Bracing Protocol

Three weeks after tenotomy, after obtaining full correction of deformity, babies were shifted to maintenance phase by bracing them in steen bee splint. The splint is to be used 23 hours a day for the first 3 months and then atleast14 hours a day for 3 years.

Then the patients were advised regarding bracing with steen bee splints for 3 months and were instructed to continue night time bracing for 3- 4 years.

Follow up :

The cases were followed up for the period of minimum of 6 months upto 2 years with an average of 7 months

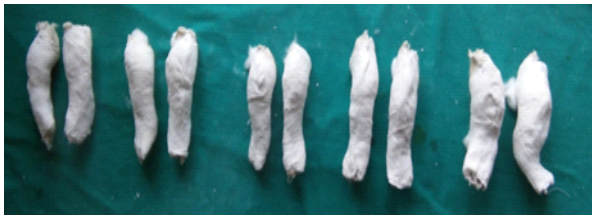
Observation and results:

No of casts required:

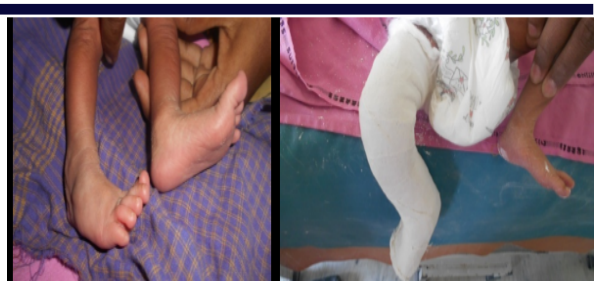
Age of child	No of children	No of casts
Less than 1 year	63	5to 6 casts
1 to 3 years	5	5 to 9 casts
3 years and above	3	10 to 20 casts

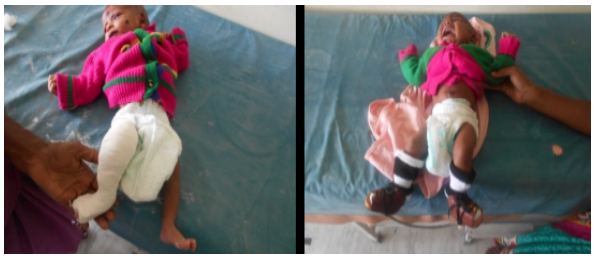
- Percutaneous tenotomy done under local anaesthesia in children < 3 years of age and under caudal anaesthesia in children above 3 years.

Bilateral CTEV Ponseti casts in our study:

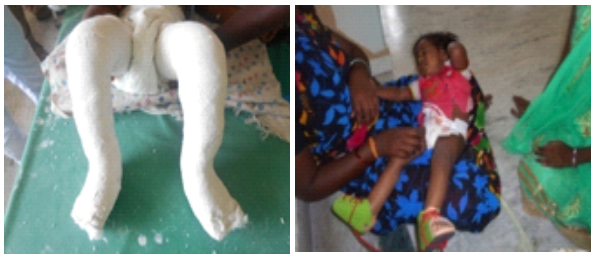


CASE 1:





CASE 2:



All 71 patients were managed by serial cast correction by Ponseti technique, using the Pirani scoring for assessing the results. The age at presentation has significance with respect to outcome. Those children who presented less than 2 months had good results manifested by the difference between initial and final Pirani scoring. Minor complications like pressure sores, pop irritation seen in 8 cases. The superficial sores were managed with cast holiday, allowing the skin to heal.

Discussion:

In our series, we have treated 71 babies with idiopathic clubfoot by Ponseti method by serial casting. Of the 71 babies, 38 had bilateral affection and 33 had unilateral. 52 of the babies were male and 19 were female. We did tenotmy in all cases.

Ponseti has reported a relapse rate of 78% in patients noncompliant with the straight-last shoe and abduction bar regimen and a relapse rate of 7% in compliant patients. All of the noncompliant patients in Ponseti's series were corrected with recasting. Porsche et al described a relapse rate of 28% in his study. We had no recurrence of any deformity, probably reflecting a better compliance with steenbee brace.

Laaveg and Ponseti reported on 104 patients at a follow-up of ten to twenty-seven years. Of the 104 patients, 48 underwent a transfer of the tibialis anterior tendon to the third cuneiform to treat relapse or residual supination. Seventeen (15%) had various other procedures. Only four of the104 patients in their series required posterior medial release." Eighty-eight percent of patients were satisfied with the overall result of treatment. Herzenberg J et al abandoned their protocol of traditional casting followed by posterior medial

release[9,10] and began using the Ponseti method of casting. They found that only one of thirty-four Ponseti-treated feet required PMR, compared to 32 of 34 patients treated with their previous protocol."

Pirani carried out tenotomy in over 90% of his clubfoot patients. Laaveg et al. did tenotomy in 78% cases. In the study by Dobbs et al. tenotomy was required in 91% cases. In our study we did tenotomy for all cases (100%). In our study we have not done any posterior-medial soft tissue release. We need further long term follow up to find any relapses.

Conclusion

Thus we conclude that the Ponseti method is a very safe, efficient and economical treatment for the correction of club foot that radically decreases the need for extensive corrective surgeries. The Ponseti method of cast correction is economically beneficial to our Indian population. If the children are started treatment at the earliest, the functional outcome is excellent. Since Ponseti method of correction is easily reproducible by all surgeons, the results will be excellent in all children. In older children especially after 12 months, we need more patience for correction, as it needs more casts application and more follow up time to achieve plantigrade foot.

REFERENCES

1. Cartlidge 1. Observations on the epidemiology of clubfoot in polynesian and Caucasian populations. J Med Genet 1984;21,:290-2.
2. Rebbeck T, Dietz F, Murrayl, Buetow K. A single-gene explanation for the probabiliry of having idiopathic talipes equinovarus. Am J Hum Genet 199353:1 051 -63.
3. 'Mangl, Palmer R Chung C. The role of major gene in clubfoot. Am J Hum Genet 1988;42:772-6.
4. Ippolito E, Ponseti I. Congenital clubfoot in the human fetus. J Bone Joint Surg An 1980:6):8.
5. Kite J. The Clubfoot. New York; Grune and Stratton; 1!64.
6. Ponseti I, Smoley E. Congenital clubfoot: the results of treatment. J Bone Joint Surg Am 1963;45:261.
7. Ponseti I. Congential Clubfoot - Fundamentals of Treatment, Oxford: Oxford University Press; 1996.
8. Cooper D, Dietz F. Treatment of idiopathic clubfoot: a thirty-year follow-up note. J Bone Joint Surg Am 1995;77:1477 -89 .
9. Laaveg S, Ponseti I. Long-term results of treatment ofcongenital club foot. J Bone Joint Surg Am 1980; 62:23-37.
10. HerzenbergJ, Radler C, Bor N. Ponseti versus traditional methods of casting for idioplathic clubfoot. J Ped Orthop 200222:517-21..
11. Pirani S. A reliable and valid method of assessing the amount of deformity in the congenital clubfoot. Presented at the Pediatric Orthopaedic Society of North America; May St. Louis, 2004.