OUTCOME OF CTEV WITH PONSETI CAST

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ABSTRACT:

Background: Each year, a large number of children are born with congenital clubfoot. CTEV has an incidence of one per 1000 live births. The majority of these children are born in nations where they go untreated or receive inadequate treatment, hence lowering their quality of life. CTEV has existed and been known to humans since time immemorial, as have the disputes that surround it. Numerous studies have been conducted on these subjects, and each has added to our understanding of the pathoanatomy and decision-making regarding appropriate treatment. We examined the functional outcome of serial cast repair of CTEV using the Ponseti approach in our study.

Objective: The purpose of this study was to determine the functional outcome of serial cast repair of congenital talipes equinovarus using the ponseti method.

Study Setting: Name of Hospital

Methods: From June 2017 to December 2019, 60 children were treated with the Ponseti technique. A potential 1.5–2 year follow-up was conducted. Pirani score and goniometry were used to evaluate the deformity before and after therapy, and the data were analyzed using SPSS software.

Results: The average number of casts used prior to complete repair was five. Casts for more than 85% of feet lasted 7 weeks. 94.3 percent of patients required tenotomy prior to achieving complete correction. There was a substantial difference in the Pirani score and goniometry scores between the pre- and post-treatment periods.

Conclusion: The Ponseti manipulation technique and plaster casting are extremely efficient at rectifying clubfoot distortion. It is basic in developing countries, and appropriately prepared doctors and wellbeing staff can effectively oversee cases through control and cast application.

I. INTRODUCTION:

Clubfoot has been an unsolved clinical difficulty for orthopaedic surgeons for a long period of time. The problem is particularly severe in underdeveloped nations due to late presentation; a higher likelihood of treatment discontinuation; and superstitious beliefs associated with this congenital condition1.

Although the writing is packed with data on different treatment modalities going from Hippocrates' gauzes to Kite's cast projects to careful treatment, there is no single methodology that can profess to accomplish a definitive objective of treatment, specifically a functional, pain free, plantigrade foot with great portability and no calluses. Nonsurgical therapy frequently resulted in insufficient repair, but children with idiopathic clubfoot who
underwent surgery frequently acquired severe soft tissue scarring and chronic pain. However, those who employ the Ponseti approach of serial manipulation and casting typically ignore these remarks1,2,3.

Ponseti states that his procedure of control, project casting, and restricted a medical procedure permits him to keep away from medical procedure in 89% of occasions. Cooper and Dietz investigated Ponseti's cases and found that 78% of patients had astounding or great functional and clinical outcomes, contrasted with 85% in a placebo group without inborn foot disfigurement1.

A thorough examination of the Ponseti method and the aftereffects of control were led fully intent on deciding the viability of Ponseti’s mortar cast application procedure in the treatment of idiopathic clubfoot. Evaluating the deformation with the Pirani severity score and goniometry and endeavoring to correspond the goniometric outcome with the Pirani severity score1,5.

II. METHODS:
The investigation took place between June 2018 and December 2020. Sixty cases with 73 clubfeet were enrolled in the study, which was conducted prospectively. A formal ethical committee approval was obtained prior to the trial.

The inclusion criteria were as follows: age less than two years, unilateral or bilateral idiopathic clubfoot, and willingness to participate in the study.

The exclusion criteria were as follows: age greater than two years, previous treatment with other methods of plaster cast application, prior surgery for clubfoot, concomitant major illness, atypical or secondary clubfoot, and unwillingness to participate in the study.

Patients went through a careful history and physical assessment. They had routine blood and urine tests to preclude any related clinical or surgical issues. Every clubfoot remembered for the examination was evaluated by the Pirani Severity score for the rear foot, mid foot, and generally speaking score, as well as goniometric appraisal of clubfoot irregularities. On the cases, the Ponseti strategy of control and projecting was utilized6,7.

The Ponseti procedure comprises of two phases:

The treatment phase, during which the deformity is repaired

The maintenance phase, during which a brace is used to prevent recurrence.

The therapy phase begins when the youngster's skin condition allows the utilization of cast’s projects; up to that point, the mother performs normal restorative control of the foot. The treatment process begins with the initial cast, which is designed to correct the forefoot, midfoot, and hind foot1,5. This is accomplished by

- Placing the thumb over the lateral section of the talus's head and stabilizing it.
- Elevating the first ray results in the forefoot becoming supinated in relation to the midfoot and rear foot.
- By maintaining this posture and shaping it nicely, you may put on a well-padded plaster cast.
The cavus is thus rectified, often after a single cast.

After one week, the first cast is removed and, if the cavus has been rectified, a brief period of manipulation is followed by the application of the second toe-to-groin plaster cast.

- Placing the thumb on the lateral part of the talus's head stabilizes it.
- While applying the cast, keep the supinated foot in abduction.
- By retaining the corrected position and moulding it properly, apply a well-padded plaster.

The Ponseti technique is unique in that the heel is never directly manipulated. Due to the connection of the tarsal bones, heel varus and ankle equinus correction occur concurrently. Weekly plasters are applied until the supination angle reaches 70 degrees.

The majority of children treated with the Ponseti procedure retain some degree of equinus deformity at the ankle. A percutaneous surgical release of the tendon corrects this residual abnormality, allowing the ankle to be positioned at a right angle to the leg.

The final cast is put with the foot at 70 degrees of abduction and 10–15 degrees of dorsiflexion following the tenotomy. This cast is intended to be worn for three weeks. After the final cast is removed, an orthosis is utilized to keep the foot in its proper position. Typically, this consists of shoes fastened to a bar.

In our investigation, successive plaster casts were applied for five weeks in accordance with Ponseti's protocol. Correction casts were continued until the tenth week in cases where correction was not attained. At each follow-up, the foot was analyzed for distortion rectification utilizing the Pirani score and a chart paper-based goniometric appraisal of the deformation. At the point when the rear foot score was more prominent than 1 and the mid-foot score was under 1, an achilles ligament tenotomy was performed. Following the final cast, all children received orthosis to preserve correction, as outlined in the Ponseti procedure. For the first three months, the orthosis was worn 23 hours a day; after that, it was worn solely at night for two to four years. Once the youngster began walking, the child was fitted with custom-made clubfoot shoes. Patients who did not achieve adequate correction by the end of the tenth week were subjected to surgical deformity treatment.
III. RESULTS:

The outcome measure score criteria to evaluate the prognosis of the patient is listed below:

<table>
<thead>
<tr>
<th>Outcome measures</th>
<th>Ankle dorsiflexion</th>
<th>Heel varus</th>
<th>Adduction of the forefoot</th>
<th>Tibial torsion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good prognosis</td>
<td>10</td>
<td>0</td>
<td>0–10</td>
<td>Absent</td>
</tr>
<tr>
<td>Moderate prognosis</td>
<td>0–10</td>
<td>0–10</td>
<td>10–20</td>
<td>Moderate</td>
</tr>
<tr>
<td>Bad prognosis</td>
<td>0</td>
<td>&gt; 10</td>
<td>&gt; 20</td>
<td>Severe</td>
</tr>
</tbody>
</table>

When the Wilcoxon Signed Rank Test was used to evaluate the Pirani scores and goniometric measures in the study, the Z value was more than zero, indicating that the test was significant, i.e. there was a significant difference after treatment.

<table>
<thead>
<tr>
<th></th>
<th>MS R</th>
<th>HS R</th>
<th>TS R</th>
<th>MS L</th>
<th>HS L</th>
<th>TS L</th>
</tr>
</thead>
<tbody>
<tr>
<td>Z Asymp. Sig. (2-tailed)</td>
<td>−4.2</td>
<td>−4.1</td>
<td>−4.1</td>
<td>−4.6</td>
<td>−4.3</td>
<td>−4.6</td>
</tr>
</tbody>
</table>

The resultant prognosis of the patients treated with ponseti technique is shown below:
The club feet congenital irregularity treated with casting showed the prognosis illustrated below:

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Clubfeet Deformity in Numbers</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good Prognosis</td>
<td>66</td>
<td>90.4%</td>
</tr>
<tr>
<td>Moderate Prognosis</td>
<td>4</td>
<td>5.4%</td>
</tr>
<tr>
<td>Bad Prognosis</td>
<td>3</td>
<td>4.1%</td>
</tr>
</tbody>
</table>

IV. DISCUSSION:

Clubfoot is a complex foot condition that requires a lot of time and exertion with respect to the getting doctor and guardian’s right. To proceed with treatment of clubfoot disfigurement with the Ponseti technique, sequential remedial projects with long term support consistence are required. Although investigators’ instructions for patient selection and treatment technique differ, in general, treatment should begin as soon as possible and be closely monitored

In contrast with the Cowell and Wein and Yamamoto series, this series has a high male to female proportion (male: female 4:1). (Male: female 3:1). Palmer tended to this by expressing that young ladies require a more noteworthy number of inclining conditions to foster a clubfoot distortion than guys do. In our area, social predisposition and consideration regarding men may represent the expanded recurrence of guys in our investigation. The request for birth appears to affect the pervasiveness of clubfoot, with 65.0 percent of cases happening in the principal conceived youngster, which relates to various different explores. There was no connection amongst clubfoot and birth type. Due to a successful reference framework, 87.5 percent of kids with clubfeet introduced to us inside about a month and a half of birth. We dispersed clubfoot mindfulness banners during Pulse Polio programs and educated the administrators at these camps to evaluate every kid for the distortion, report any events, and elude them to our medical clinic right away. Moreover, we made unique clubfoot facilities in which groups of follow-up patients examined their encounters with new patients’ folks and consoled them about the treatment, while at the same time rousing them and featuring the meaning of incessant development. The outcomes were improved if this sort of treatment was started as before long conveyance as could really be expected. At one years old week, the main cast was applied. A half year was the most extreme age at which a cast might be forced

Three to ten casts each foot were used in our investigation (average 5). Ponseti et al. determined the number of casts per foot to be between five and ten (average 7.6). Laaveg et al, in another investigation, found that the average number of casts used throughout treatment was seven. Morcuende observed that 90% of patients required no more than five casts. Over time, as people gained skill, they began altering plaster casts at shorter intervals. In our study, the foot that required the most casts had a Pirani score of 6 at the start of treatment. Casts were...
worn for less than seven weeks on more than 85.0 percent of feet. The duration decreased over time as we improved our skill and began receiving more accurate corrections earlier.

Ponseti et al. reported that casts lasted between five and twelve weeks (average 9.5 weeks). Laaveg et al. found that the average duration was 8.6 weeks. In the same study, Morcuende et al reported an average time of 16 days from the first cast to tenotomy for one group and 24 days for another. Their study demonstrated that by utilising the accelerated Ponseti protocol for clubfoot treatment, the period of plaster casts might be reduced. Tenotomy was required in 94.3 percent of cases in our study, and these patients had an initial Pirani score of >5. It demonstrates that tenotomy was necessary in those patients who presented with significant deformity at the outset. Tenotomy is recommended following forefoot abduction. Pirani tenotomized more than 90.0 percent of his clubfoot patients. In 78.0 percent of cases, Laaveg et al. performed tenotomy 13, 17, 18.

Thacker et al. treated 44 patients with idiopathic clubfeet utilizing the Ponseti method followed by the Steenbeek foot abduction support. The feet of patients who were disciple with the support remained more rectified than the feet of resistant patients. Our examination additionally incorporated the use of a Steenbeek foot abduction support. Following a half year of treatment (during which patients wore night braces), the Pirani score was zero, suggesting that the clubfoot deformity had been successfully corrected. As Pirani instructed, graphs were created for each patient20.

Lastly, readers may be interested in learning about the French Functional (Physical Therapy) Method, an uncommonly utilised practise with a limited body of empirical evidence to support it. This method includes daily manipulations of the infant's clubfoot, stimulation of the foot muscles to maintain the reduction achieved through manipulation, and immobilisation of the foot with non-elastic adhesive bands to prevent the foot from moving. A typical course of treatment lasts around two months, after which it is gradually tapered off over a period of time. Similarly to the Ponseti Method, development is typically seen within three months, albeit at a more leisurely rate19.

Foot treated with the Ponseti Method showed marginally better clinical outcomes than the French Method after an average follow-up of 51.4 months (p = 0.31), but the results were extremely similar (p = 0.31). Richards and colleagues (2008) conducted a comparison of the Ponseti and French Methods. The Ponseti Method received a 'Good' rating from 72 percent of participants, 12 percent gave it a fair rating, and 16 percent gave it a poor rating. The French Method received a 'Good' rating from 67 percent of participants, 17 percent of participants, and 16 percent of participants, respectively. They hypothesise that this is due to the time and effort required to teach parents how to carry out the daily stretching, taping, and splinting for up to two years on a consistent basis18,19.

Clubfoot is a good condition to treat with the Ponseti technique. In several studies, patients treated for this deformity were followed for over forty years, and these people are now living a normal life. It eliminates surgical problems and results in a painless, mobile, normal-looking, functional foot that does not require special shoes and allows for reasonable mobility. The results of our study on clubfoot therapy using the Ponseti technique were favourable, and all clubfeet are now treated with this technique at our hospital18,19. This procedure is a very safe, simple, effective, and affordable form of clubfoot management in a non-industrial nation like Pakistan and provincial spots. The investigation exhibits that dealing with a positive reference through suitable training and inspiration, just as reconciliation into different projects, further develops the result as far as age at show, yet in addition as far as deformation amendment. Fitting inspiration and persuading guardians to acknowledge long haul support treatment empowers the remedy to be kept up with for a more drawn out measure of time and forestalls repeat20.

V. CONCLUSION:

“Thus, we conclude that the Ponseti approach is an extremely safe, effective, and cost-effective treatment for club foot correction that significantly reduces the need for expensive corrective surgery. The Ponseti method of cast correction is critical, particularly in underdeveloped nations, due to its efficacy and low cost. When treatment is initiated early, the results are excellent.”

REFERENCES:


Ponseti IV. Correction of the talar neck angle in congenital clubfoot with sequential manipulation and casting. Iowa Orthop J. 1998;18:74–75. [PMC free article] [PubMed] [Google Scholar]


