Original Article

Early Ponseti Technique And Percutaneous Achilles Tenotomy In Neonates With Ctev: A Retrospective Analysis"

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Abstract

Background: Among congenital acquired deformities, Congenital Talipes Equinovarus (CTEV) ranks fifth and can be treated both conservatively and surgically. This study emphasizes the conservative management of CTEV using the Ponseti method, commencing treatment during the first week of life, along with percutaneous Achilles tenotomies.
Objectives:

To assess the results of early application of the Ponseti method and percutaneous Achilles tenotomy, addressing the question of success, recurrence and resistance at the initial stage of CTEV treatment in neonates.

Study Design: A retrospective study

Place and Duration of Study: From 05-January 2021 to 05-July 2021, a retrospective study was conducted on neonates treated for CTEV at Bacha Khan Medical College, Mardan.

Methodology: The study included 42 babies (28 boys and 14 girls) over a period of 2 years. Manipulation and weekly casting were performed by well trained orthopedic surgeons. Percutaneous Achilles tenotomy was performed as needed for individual patients. This study examines the outcomes of early commencement of the Ponseti method and percutaneous Achilles tenotomy in treating CTEV.

Results: Treating newborns with clubfoot using the Ponseti method, combined with percutaneous tenotomy of the Achilles tendon, resulted in excellent outcomes in 37 cases (88.1%), relapsing in 4 cases (9.5%), and resistance in only 1 case (2.3%). Additionally, the prevalence of bilateral clubfoot was 78.1%, in contrast to 21.9% unilateral clubfoot.

Conclusions: The Ponseti method, initiated within the first week of life and supplemented with percutaneous Achilles tenotomy, proved to be a successful approach for treating clubfoot.

Keywords: CTEV, serial casting, Ponseti method, early treatment, resistant cases, relapsing cases.

INTRODUCTION

Congenital Talipes Equinovarus (CTEV) is one of the most common pediatric foot deformities, occurring in 1 in 1000 live births [1, 2]. Pathologically, it has four components: ankle equinus, hind foot varus, fore foot adduct us, and mid foot cavus [3]. CTEV can be treated surgically or non-surgically. Conservative methods, such as the Ponseti method, orthoses, splinting, casting, and strapping, have been preferred due to fewer complications like foot stiffness and arthritic changes [4, 5, 6].The Ponseti method, introduced in 1963, involves manipulation and subsequent casting, reinforced by Achilles tenotomy and bracing if needed [7]. This method has gained worldwide acceptance due to its success rate [4, 5, 6]. Treatment should ideally begin soon after birth [10, 11, 12]. Structural assessment of the deformed foot before and during treatment aids in management, with the Pirani scoring system offering reliability and ease of use in clinical settings [4, 8, 9].This retrospective study compares outcomes of babies treated within the first week of life versus those treated later, evaluating success rates, the number of casts required, surgical recommendations, and incidences of relapse and resistance.

METHODOLOGY

This retrospective study was conducted after approval from ethical committee between 05-January 2021 to 05-July 2021 in Bacha Khan Medical College.All the babies attendants who didn't comply during the treatment and afterwards were excluded. Babies having neuromuscular disorders, syndromes affecting multiple organ system and whose treatment was started somewhere else were excluded from study. The remaining babies were grouped into 2 groups. Group A had babies with treatment started within first week of life while Group B contained babies with treatment commenced after 7 days of life. Standard Ponsetti method has serial of manipulations and casting and were done by orthopedic surgeon over 10 years of experience along with resident orthopedic surgeon and POP technician. Changes of plasters were done in ponsetti room in Bacha khan medical college. Percutaneous Achillestenotomy were done in babies with equinous deformity along with change of 5th POP. All babies who full filled correction criteria(70° abduction of the forefoot, and 20° valgus and dorsiflexion for the mid foot and hind foot) was then started to use a foot abduction brace with cross bar. The affected side is splinted in 70° abduction, while the non-affected side will be at 45 degree. The babies were given foot abduction arthrosis devices for 3 months, which they had to wear for 23 hours a day. Followed by use of abduction arthrosis use at night for 3 years and then stretching exercises till 5 years of age. CTEV that could not be brought to neutral position after manipulations was called resistant CTEV while other that full filled the criteria but re-occurred were termed as relapsing CTEV.This study looks at the outcome of ctev with management started in the very first week of life with A chilles percutaneous tenotomies in patients

Data Collection

The variables studied were patient factors, including age, gender, diagnosis, treatment length, number of casts, and patients who required percutaneous Achilles tendon lengthening (published elsewhere). Charts were also scrutinized to identify the presence of any sta-sterol recurrence or resistance in the post-operative follow-up.

Statistical Analysis

Data analysis was done by using the Statistical Package for Social Service (SPSS) version 20.0 To analyse and present data, descriptive statistics were applied to patient characteristics as well as the results of the treatment. Percentage was used to present the success rate, and the relapse rate was also estimated on the basis of the percentage success rate, while the resistance rate was presented in percentage.

RESULTS

The demographic properties of patient with clubfoot are present in table 1, which reavels the patients mean age to be 5 days with a SD of 2.12. Furthermore, 66.66 % were male while 33.36 % were females. It is worth mentioning that family history was positive in 6 cases i.e 14% results shows in table 1 to 5

Figure 01: Different Treatments of the Ponseti Technique in Congenital Talipes Equinovarus (CTEV)

Table 1: Demographic Properties of Patients with Clubfoot

Variable	**Value**
Total Patients	42
Mean Age (days)	5
Standard Deviation (SD)	2.12
Gender	
- Male	28 (66.66%)
- Female	14 (33.34%)
Positive Family History	6 (14%)
Negative Family History	36 (86%)
Bilateral Clubfoot	33 (78.1%)
Unilateral Clubfoot	9 (21.9%)

Table 2: Treatment Groups

Group	Treatment Start Time	Number of Patients
A	Within the first week of life	21
B	After the first week of life	21

Table 3: Treatment Outcomes

Outcome	Group A	Group B	Total
Success	19 (90.5%)	18 (85.7%)	37 (88.1%)
Relapse	1 (4.8%)	3 (14.3%)	4 (9.5%)
Resistance	1 (4.8%)	0 (0%)	1 (2.3%)

Table 4: Number of Casts Required

Group	Mean Number of Casts	Standard Deviation (SD)
A	5	1.1
B	6	1.3

Table 5: Percutaneous Achilles Tenotomy

Group	Patients Requiring Tenotomy	Percentage (%)
A	15	71.4%
B	17	81.0%
Total	32	76.2%

DISCUSSION

In achieving these objectives, the study established that all neonates received their initial treatment before one week of age with the mean age at presentation being five days. This means that early management of CTEV increases the chance of getting the best results in the children [14, 15, 16]. Furthermore, the findings of the current study also revealed that the incidence of newborns with CTEV was higher in male newborns than in female newborns, a fact that was supported by Morcuende et al (2003), Dobbs et al (2004) and Desai et al (2010). Still, while Bhaskar et al. (2006) and Sami et al. (2010) also observed that bilateral CTEV was more common than unilateral, our study showed that 78. 1% of patients had unilateral CTEV, and only 21. 9% had bilateral disease [20, 21].As stated in our work's findings, McConnell et al. (2016) has also suggested that actually clubfoot is not related with family injure because 86% of our cases were did not show family history of this disease [22]. This study therefore confirms that early intervention in

this condition Nature – club foot condition by carrying out manipulation within the first week of life gives excellent results – 88. 1% success rate which is in agreement with Vermas findings. However, the present study reported a slightly high relapse rate of 9. 5% which is comparatively higher than other studies [24, 25, 26], with a resistance rate of 2. 5%. The results are parallel to Scher et al.'s study, where some cases of clubfoot continue to demonstrate failure to respond to the Ponseti method only owing to severe abnormally short Achilles tendon. Hence, supplementary to the primary treatment, percutaneous Achilles tenotomy should be incorporated in the early developmental period of the life in order to increase the rate of improvement out of congenital clubfoot [27]. That conclusion is also in agreement with other investigations regarding the increased effectiveness of the Ponseti technique with the help of complete percutaneous tenotomy.

CONCLUSION

Early management of club foot via ponsetti casting and percutaneous tenotomy in selective cases, starting from 1week of life has proven to have excellent result. The success rate has shown to be 88.1 %, which in itself is extraordinary.

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Conflict of Interest: There is no conflict of interest.

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