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Original Research Article

Outcome of treatment with modified Ponseti technique in atypical congenital talipes equinovarus

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ABSTRACT

Background: The atypical congenital talipes equinovarus (CTEV) patients tend to have a different clinical foot presentation with small great toe, deep transverse crease of sole, tender swollen dorsum of foot and rigid equinus.
Methods: This study was conducted in GMC Jammu to evaluate efficacy of modified Ponseti technique in atypical CTEV patients. It was a prospective study and the patient data was collected during OPD visits of patients from August, 2018 to June, 2020. Twenty-one patients were diagnosed as atypical CTEV and were managed with modification of conventional Ponseti technique and percutaneous release of achilles tendon was done in all patients. Three patients were lost to follow-up. Hence, the final number of study participants was 18 (n=18).
Results: With modified Ponseti technique, functional correction was achieved in all the patients in our study. The average number of casts required was 8 (range; 5-10). At final follow-up visit, all feet are functionally corrected. Only one case of relapse was seen.
Conclusions: Early diagnosis and treatment with modified Ponseti technique is an effective and easy method of treatment in atypical CTEV.

Keywords: Modified ponseti technique, CTEV, Achilles tendon tenotomy

INTRODUCTION

Congenital talipes equinovarus (CTEV) is the most common congenital deformity in humans. The deformity is complex and difficult to treat.[1] The etiology of the CTEV is still a mystery. The gold standard treatment of the CTEV presently is a serial casting method which was devised by Ponseti which is followed by a bracing protocol.[2] Surgical treatment is suboptimal and has many complications.[3] A subset of CTEV patients is highly resistant to the conventional Ponseti method of casting and has a varied clinical picture. This subset of CTEV patients is called as atypical CTEV. These patients present clinically with a small great toe, deep transverse crease of sole, tender swollen dorsum of foot and rigid equinus (Figure 1). These typically score 10 on the Carroll severity scale.[4] Various surgeries for the correction of such feet have been performed but the results have been very poor.[5] The present study aimed at studying the results of these atypical clubfeet with a Modified Ponseti method of casting.

METHODS

The present study was a prospective study which was carried out by collecting data during OPD visits of patients from August, 2018 to June, 2020 in the department of Orthopaedics GMC Jammu. We included 21 patients with atypical clubfeet who were managed with modified Ponseti casting method. Three patients was lost to follow-up and were excluded from the study. Hence, the final patient set included 18 patients (n=18).

Inclusion criteria

Atypical clubfoot, unilateral involvement, age <10 months, no prior surgical intervention in the involved foot and patients without associated neuromuscular disorders.

Exclusion criteria

Typical clubfoot, bilateral involvement, age >10 months, prior surgery in the involved foot and patients with associated neuromuscular disorders.

All the patients had been previously managed with above knee or below knee casts for correction of the CTEV and there was history of cast slippage in all the patients. Radiographs were not taken in any of the patients. All the patients were managed with a modified Ponseti casting method. The correction method started with localisation of the lateral head of the talus, which was the point for counter force during abduction of the forefoot. The initial part of the casting was similar to the conventional casting method of Ponseti and involved correction of cavus by gently lifting the first metatarsal. This was followed by correction of adduction by serial abduction casts. The casts were changed after weekly intervals. The abduction was corrected easily but the metatarsals remained in severe planter flexion and the hind foot remained in severe equinus. In order to prevent slippage of cast, the hyperflexion of the metatarsals and the rigid equinus of the hind foot were corrected simultaneously by grasping the foot by the ankle with both the hands while the thumbs under the metatarsals pushed the foot into dorsiflexion. All the casts were above knee with a flexion of around 110 degrees at knee joint. In all the 18 patients, a percutanous Achilles tendon tenotomy was performed followed by a final cast for 3 weeks. The end point of casting was achievement of more than 70 degree abduction and 15 degree dorsiflexion. Once the end point was achieved the patients were started on a bracing protocol to hold the correction (Figure 2). The foot abduction brace was worn for 24 hours till walking age except for morning and evening gap of half an hour period. After the patient started walking the brace was worn only for 12 hours during night. The patients were followed for a period of 1 year. The statistical tools used in the study include percentage, range and mean.

RESULTS

This study included 12 (66.66%) males and 06 (33.33%) female patients (Table 1). The mean age of presentation was 3.2 months (range; 2-10 months). The average number of casts required to achieve target correction in our study of idiopathic atypical CTEV with modified Ponseti casting was 8 (range; 5-10). The average age of starting the treatment was at 4.2 months (range 3.5-9 months). At last follow-up, all the feet were corrected with a mean ankle dorsiflexion of 15 degrees (range; 10-20 degrees). The skin changes resolved in all the patients. One case of relapse was seen which occurred due to non-compliance with the bracing protocol.

Table 1: Gender wise distribution of patients and the number of casts needed for target correction.

Gender	Total	Percentage	Mean number of casts applied	No. of patients in which target correction was achieved	Percentage
Male	12	66.66	8	12	100
Female	6	33.33	8	6	100

Figure 1: Patient with atypical clubfoot on right side with short great toe and a pressure sore on the lateral aspect of foot.

DISCUSSION

CTEV is the most common congenital deformity in humans. The etiology of the CTEV is still unknown. The gold standard treatment of the CTEV presently is a serial casting method which was devised by Ponseti which is followed by a bracing protocol. Surgical treatment is suboptimal and has many complications. A subset of CTEV patients is highly resistant to the conventional Ponseti method of casting and has a varied clinical picture. This subset of CTEV patients is called as atypical CTEV. These patients present clinically with a small great toe, deep transverse crease of sole, tender swollen dorsum of foot and rigid equinus. These typically score 10 on the Carroll severity scale.[4] Various surgeries for the correction of such feet have been performed but the results have been very poor.[5] In the present study, we tried to evaluate the

outcome of modified Ponseti method of correction for the atypical CTEV patients.

This study included 12 (66.66%) males and 06 (33.33%) female patients. The mean age of presentation was 3.2 months (range; 2-10 months).

Figure 2: Patient with foot abduction brace for maintaining the correction achieved by casting.

The average number of casts required to achieve target correction in our study of idiopathic atypical CTEV with modified Ponseti casting was 8 (range; 5-10). The average age of starting the treatment was at 4.2 months (range 3.5-9 months). At last follow-up, all the feet were corrected with a mean ankle dorsiflexion of 15 degrees (range; 10-20 degrees). The skin changes resolved in all the patients. One case of relapse was seen which occurred due to non-compliance with the bracing protocol. The relapsed case was managed with a repeat modified Ponseti casting protocol and target correction was achieved in the same after nine serial above knee casts.

CONCLUSION

Early diagnosis and treatment with modified Ponseti technique is an effective and easy method of treatment in atypical CTEV with minimal complication and very low relapse rates.

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