

Midterm Clinical and Functional Outcomes After Treatment with Ponseti Method for Idiopathic Clubfeet: A Prospective Cohort Study

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Abstract : Idiopathic clubfoot is a common lower extremity deformity with an incidence of 1:500. The Ponseti Method is well known as the gold standard of treatment. However, there is limited functional data demonstrating correction of the clubfoot after treatment with the Ponseti method. The purpose of this study was to study the clinical and functional outcomes after the Ponseti method with the Clubfoot Disease-Specific Instrument (CDS) and pedobarography. This IRB-approved prospective study included patients aged 3-18 who were treated for idiopathic clubfoot with the Ponseti method between January 2008 and December 2018. Age-matched controls were identified through siblings of clubfoot patients and other community members. Treatment details were collected through a chart review of the included patients. Laboratory assessment included a physical exam, gait analysis, and pedobarography. The Pediatric Outcomes Data Collection Instrument and the Clubfoot Disease-Specific Instrument were also obtained on clubfoot patients (CF). The Wilcoxon rank-sum test was used to study differences between the CF patients and the typically developing (TD) patients. Statistical significance was set at $p < 0.05$. There were a total of 37 enrolled patients in our study. 21 were priorly treated for CF and 16 were TD. 94% of the CF patients had bilateral involvement. The age at the start of treatment was 29 days, the average total number of casts was seven to eight, and the average total number of casts after Achilles tenotomy was one. The reoccurrence rate was 25%, tenotomy was required in 94% of patients, and ≥ 1 tenotomy was required in 25% of patients. There were no significant differences between step length, step width, stride length, force-time integral, maximum peak pressure, foot progression angles, stance phase time, single-limb support time, double limb support time, and gait cycle time between children treated with the Ponseti method and typically developing children. The average post-treatment Pirani and Dimeglio scores were 5.50 ± 0.58 and 15.29 ± 1.58 , respectively. The average post-treatment PODCI subscores were: Upper Extremity: 90.28, Transfers: 94.6, Sports: 86.81, Pain: 86.20, Happiness: 89.52, Global: 88.6. The average post-treatment Clubfoot Disease-Specific Instrument scores subscores were: Satisfaction: 73.93, Function: 80.32, Overall: 78.41. The Ponseti Method has a very high success rate and remains to be the gold standard in the treatment of idiopathic clubfoot. Timely management leads to good outcomes and a low need for repeated Achilles tenotomy. Children treated with the Ponseti method demonstrate good functional outcomes as measured through pedobarography. Pedobarography may have clinical utility in studying congenital foot deformities. Objective measures for hours of brace wear could represent an improvement in clubfoot care.

Keywords : functional outcomes, pediatric deformity, patient-reported outcomes, talipes equinovarus

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