



COLLABORATIVE MANAGEMENT OF CONGENITAL CLUBFOOT: INTEGRATING PAEDIATRIC AND ORTHOPAEDIC CARE VIA THE PONSETI TECHNIQUE

Orthopaedics

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ABSTRACT

Background: Congenital Talipes Equinovarus (CTEV), commonly known as clubfoot, affects roughly 1–2 per 1,000 live births and often goes untreated in low-resource settings due to limited awareness and capacity. **Objective:** To evaluate how joint paediatric–orthopaedic collaboration impacts clinical presentation and the effectiveness of the Ponseti method in infants with idiopathic CTEV. **Methods:** In this observational study, 40 infants (60 feet) presenting to the paediatric outpatient department with idiopathic CTEV were referred for Ponseti serial casting, tenotomy when needed, and bracing. Demographic and clinical data were recorded using a structured proforma. Correction was monitored by the Pirani score at each visit. **Results:** Mean age at treatment initiation was 3.5 weeks. Of 40 infants, 29 (72%) were male and 11 (28%) were female; 20 (50%) had unilateral involvement and 20 (50%) had bilateral clubfoot. 7, 8, and 9 casting sessions were required in 09 (22.5%), 20 (50%), and 11 (27.5%) infants, respectively. After correction, 54 feet (90%) achieved a Pirani score < 0.5. Out of 60 clubfoot 15 feet (25%) required tenotomy and 5 feet (8.33%) required posteromedial soft tissue release. **Conclusion:** Early identification of clubfoot by paediatricians and prompt intervention by orthopaedic surgeons using the Ponseti method leads to high rates of correction and minimizes the need for extensive surgery. A structured referral pathway between paediatrics and orthopaedics should be promoted as the standard of care for CTEV.

KEYWORDS

Clubfoot, Congenital Talipes Equinovarus, Ponseti Method, Paediatric–orthopaedic Collaboration

INTRODUCTION

Congenital clubfoot (CTEV) is characterized by forefoot adduction, midfoot cavus, hindfoot varus, and ankle equinus, resulting from in utero malalignment of the calcaneo-talar-navicular complex. In low- and middle-income countries, lack of early recognition and limited APGAR score utilization often lead to neglected deformities by age two, carrying lifelong physical and psychosocial burdens.

Non-operative correction using the Ponseti technique—serial manipulation, casting, percutaneous tenotomy, and foot abduction bracing—has emerged as the gold standard, achieving success rates of 90–98% with minimal surgical morbidity. Early collaboration between paediatricians (for early detection and family counselling) and orthopaedists (for technical execution) may further enhance outcomes.

MATERIALS AND METHODS

Study Design and Setting: A retrospective comparative study was conducted in the Department of Orthopaedics, Kanti Devi Medical College Hospital and Research Center, from May 2024 to April 2025.

Inclusion Criteria: Infants (≤ 12 months) with idiopathic CTEV presenting to paediatric OPD.

Exclusion Criteria: Syndromic or neuromuscular clubfoot.

After consent, each patient's demographic details, family history, prenatal and delivery data, prior treatments, and systemic examination findings were recorded.

Upon referral to orthopaedics, Ponseti casting was initiated within two weeks of birth when possible. Pirani scores were documented before each cast change. A Dennis Brown brace was prescribed with compliance monitored at each follow-up. Relapses were managed with repeat casting.

Ponseti Method

The Ponseti method is a systematic series of casting and bracing that attempt at correcting clubfoot in young children. In this method first manipulation of deformity and then pop casting is done. In cases where tenotomy was done, a cast was applied for three weeks in abduction and dorsiflexion. After cast removal foot abduction brace applied 24 hours a day and later just 3 to 4 hours a day till the age of 3 to 4 years. Deformity was corrected in this sequence C-A-V-E cavus-adductus-varus-equinus.

Pirani Midfoot and Hindfoot Score Table

Component	Clinical Sign	Score 0 (Normal)	Score 0.5 (Moderate)	Score 1 (Severe)
Midfoot Contracture	Medial Crease	Several fine creases	2–3 moderate creases	Deep crease, bottom not visible
	Curved Lateral Border	Straight border	Deviates at metatarsals	Deviates at calcaneo-cuboid joint
	Lateral Head of Talus	Talus sinks completely under navicular	Partially sinks	Fixed, does not sink
Hindfoot Contracture	Posterior Crease	Several fine creases	2–3 moderate creases	Deep crease, bottom not visible
	Empty Heel	Calcaneum easily palpable	Palpable through layer of flesh	Deep under tissue, hard to feel
	Rigid Equinus	>50 Dorsiflexion	Range : 50 Plantar Flexion to 50 Dorsiflexion	> 50 Plantar Flexion

Total Score = MFCS (0–3) + HFCS (0–3) → Maximum: 6, Minimum: 0

Statistical Analysis

Data were entered into SPSS v20.0. Descriptive statistics summarized demographic and outcome variables. Continuous data are presented as means $\pm$ SD; categorical variables as counts and percentages. Chi-square tests were used for group comparisons, with $p < 0.05$ denoting statistical significance.

RESULTS

Patient Demographics and Presentation

- Total infants: 40
- Total clubfeet treated: 60
- Male:Female ratio: 29:11 (72% vs. 28%)
- Unilateral: 20 (50%); bilateral: 20 (50%)
- Mean age at first cast: 3.5 ± 1.2 weeks
- Pirani severity score: <2.5 = 3 patients
3–4 = 7 patients
4–5 = 15 patients
5.5–6 = 35 patients

Casting Sessions Required

Sessions	Infants	Percentage
7	09	22.5%
8	20	50%
9	11	27.5%

Pirani severity score at presentation, after correction and follow up

	Pirani Severity Score (Mean ± SD) (N=60)	Range
Before Treatment	5.28 ± 0.94	2.5–6
After Last Cast	0.40 ± 0.26	0–1
3-Month Follow-Up	0.13 ± 0.25	0–1
6-Month Follow-Up	0.11 ± 0.22	0–1
Latest Follow-Up	0.11 ± 0.22	0–1

Outcome Measures

Outcome Variable	n	%
Feet with Pirani < 0.5 post-treatment	54	90%
Relapsed feet at end of 1-year	6	20%
Casting done	40	66.66
Tenotomy done	15	25%
Posteromedial soft tissue release done	5	8.33%

DISCUSSION

Our study demonstrates that early detection by paediatricians and systematic Ponseti casting yields a 90% rate of near-normal correction (89–98%) [1–7]. The 20% relapse rate aligns with the literature (11–28%), often attributed to variable brace adherence. All relapses in our study were successfully addressed with repeat non-operative measures, reinforcing the versatility of the Ponseti method.

Key Factors for Success Include:

- Initiating treatment within the first month of life
- Strict adherence to casting sequence and brace protocol
- Multidisciplinary counselling to optimize caregiver compliance

Strengths of this study are its real-world setting and structured referral pathway. Limitations include a modest sample size and challenges maintaining long-term follow-up in a resource-constrained population.

CONCLUSION

A coordinated paediatric–orthopaedic approach to CTEV management using the Ponseti method is highly effective, dramatically reducing the need for extensive surgery. Embedding this collaboration into standard practice—especially in low-resource regions—can ensure timely correction and better long-term function for affected children.

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