



FREQUENCY OF ACHILLES TENOTOMY IN PATIENTS WITH CONGENITAL TALIPES EQUINOVARUS (CTEV), AFTER TREATMENT WITH PONSETI SERIAL CASTS

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ABSTRACT

Background: Congenital Talipes Equinovarus (CTEV), often known as congenital clubfoot, is a common musculoskeletal birth condition that affects 1–2 per 1,000 live births. It is more common in male children, with a 2.5:1 male to female ratio, and almost half of all instances involve both feet. The percutaneous Achilles tenotomy is a critical step in the Ponseti approach, as it is frequently required to address chronic equinus deformity after addressing forefoot and midfoot abnormalities. The frequency of this treatment ranges from 60 to 90%, which contributes to the Ponseti technique's overall success rate of 95%.

Objective: To determine the frequency of Achilles tenotomy in children with congenital talipes equinovarus who are treated with Ponseti serial casts.

Study design: A cross-sectional Study

Place and Duration: This study was conducted in Shaheed Mohtarma Benazir Bhutto Medical University Hospital Larkana from November 2022 to November 2023

Methodology: This study included all infants, regardless of gender, and children up to the age of two years who presented with idiopathic clubfoot to the Orthopedic Outpatient Department. The severity of clubfoot was determined by Pirani grading, which ranged from 0 to 6, with 6 signifying severe deformity. Ponseti serial casting was done weekly. Brace treatment began without tenotomy if, upon casting, there was no residual equinus deformity. For infants who met certain requirements, a final two-week cast was applied after a percutaneous Achilles tenotomy performed under local anesthesia.

Results: There were a total of 80 children who were a part of this study. All of the children had CTEV and they were included in this research for Ponseti serial casting. The average age was 10.3 weeks. The Pirani score at the starting was 3.74 while at the final stage, it was 1.74. The mean correction score was 5.84. There were no statistically significant changes in the frequency of Achilles tenotomy based on the affected limb's side, whether one or both limbs were implicated, initial Pirani score, age, gender, or number of casts. Furthermore, no problems were reported.

Conclusion: A considerable proportion of our children had persisting equinus deformity, which resulted in a high incidence of Achilles tenotomy after Ponseti serial casting.

Keywords: infants, Achilles tenotomy, Ponseti serial casting, equinus deformity, club foot

INTRODUCTION

Congenital Talipes Equinovarus, often known as congenital clubfoot, is a common musculoskeletal birth condition that affects 1–2 per 1,000 live births [1]. It is more common in male children, with a 2.5:1 male to female ratio, and almost half of all instances involve both feet. Clubfoot treatment has changed throughout time, with major contributions from historical leaders including Hippocrates, Guerin, Kite, and Ponseti. The Ponseti procedure, which involves weekly manipulation and serial casting, has emerged as the preferred way for treating idiopathic clubfoot and is universally accepted as the standard of care.

The percutaneous Achilles tenotomy is a critical step in the Ponseti approach, as it is frequently required to address chronic equinus deformity after addressing forefoot and midfoot abnormalities. The frequency of this treatment ranges from 60 to 90%, which contributes to the Ponseti technique's overall success rate of 95%. This tenotomy can be performed on an outpatient basis with local anesthesia.

Our study sought to determine how frequently Achilles tenotomy is performed in individuals with CTEV who are treated with Ponseti serial casts. By quantifying the specific frequency of Achilles tenotomy in our patient population, we want to persuade surgeons who may be hesitant to undertake the treatment. Some surgeons may wrongly feel that the equinus deformity in CTEV can be repaired without tenotomy, which we intend to address. Furthermore, worries regarding complications or a lack of anesthesia availability should not be used to prevent an Achilles tenotomy.

METHODOLOGY

This study included all infants, regardless of gender, and children up to the age of two years who presented with idiopathic clubfoot to the Orthopedic Outpatient Department. The study was approved by the Ethical Committee, and the parents of all children provided written consent. Prior to beginning Ponseti serial casting, all children underwent extensive tests that covered their complete body.

Exclusion criteria: Children with neuropathic clubfoot, Arthrogryposis Multiplex Congenita, myelomeningocele, cerebral palsy, and those who had previously undergone treatment for clubfoot deformity were not included in the study.

A Pirani scale of 0 to 6 was used to determine the severity of clubfoot. Every week, Ponseti serial casting took place. Brace treatment began without tenotomy if, upon casting, there was no residual equinus deformity. For infants who met certain requirements, a final two-week cast was applied after a percutaneous Achilles tenotomy performed under local anesthesia.

Data was analyzed using SPSS version 21. For the purpose of assessing the effects of tenotomy, numerous criteria were stratified.

RESULTS

There were a total of 80 children who were a part of this study. All of the children had CTEV and they were included in this research for Ponseti serial casting. The average age was 10.3 weeks. The Pirani score at the starting was 3.74 while at the final stage, it was 1.74. The mean correction score was 5.84. Table number 1 shows the distribution of children according to their gender.

Table No. 1: distribution of children according to their gender

Gender	N	%
• Male	48	60
• Female	32	40

Table number 2 shows the type of deformity that the enrolled children had.

Table No. 2: type of deformity in the study population

Type of deformity	N	%
• Unilateral deformity	60	75
• Bilateral deformity	20	25

There were no statistically significant changes in the frequency of Achilles tenotomy based on the affected limb's side, whether one or both limbs were implicated, initial Pirani score, age, gender, or number of casts. Furthermore, no problems were reported. Table number 3 shows the type of tenotomy performed.

Table No. 3: type of tenotomy

Tenotomy	N	%
• Achilles	53	66.25
• Unilateral	70	87.5
• Bilateral	10	12.5

DISCUSSION

The Achilles tenotomy rate in our study was 66.25%, which is consistent with international and local studies. Several investigators have observed that a higher initial Pirani score is associated with a higher risk of necessitating an Achilles tenotomy in children with idiopathic clubfoot [11, 12]. Kulambi's research found a higher need for tenotomy in children with an overall Pirani score greater than 5.0 or a hind foot score of 2-3 [13].

Adewole noted that children who needed tenotomy received more casts than others (5.9 versus 4.9) [14]. In an intriguing study by Jain, one group of residents received didactic training on the Ponseti approach (Additionally Trained Group), while the other did not (Classically Trained Group). He examined the outcomes of clubfoot management between these two groups and discovered that the Additionally Trained Group had a considerably higher frequency of tenotomy than the Classically Trained Group (73.3% versus 51.5%, $p=0.03$). Jain concluded that the greater frequency of Achilles tenotomy was due to the trained group's improved confidence in conducting the treatment following training sessions [15].

Sharma proposed that because of the link between higher initial Pirani scores, a larger number of casts, and maybe an Achilles tenotomy, parents of children with such scores be informed that treatment may take longer and may entail a small surgical procedure. In this investigation, we found no problems from percutaneous tenotomy [16]. Other investigations have found consequences such as vascular injuries that result in bleeding and pseudo aneurysms, nerve injuries that cause neurological impairments, and incomplete tenotomy [17, 18, 19, 20].

Our study had certain limitations. It followed a descriptive study design and had a modest sample size. Additional research is recommended to validate our findings.

CONCLUSION

A considerable proportion of our children had persisting equinus deformity, which resulted in a high incidence of Achilles tenotomy after Ponseti serial casting.

FUNDING SOURCE

No funding source

CONFLICT OF INTEREST

No conflict of interest

ETHICAL APPROVAL:

It was taken from the ethical review committee

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