# Percutaneous Tendo Achilles Tenotomy in the management of Equinus Deformity in conservatively treated CTEV

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## ABSTRACT

**Introduction:** Idiopathic clubfoot is the most common musculoskeletal birth defect affecting 1 per 1000 live births. The component deformities of clubfoot include equinus, cavus, heel varus and forefoot adductus. Ponseti method has become the popular method for the non-operative treatment of clubfoot all over the world, and percutaneous tendo Achilles tenotomy is a part of this method which is used to expedite the correction of equinus deformity. **Objectives:** The purpose of this study was to assess the merits of doing percutaneous tendo Achilles tenotomy by comparing tenotomy group with non tenotomy group. **Materials and Method:** Seventy-nine consecutive patients with 123 idiopathic clubfeet were treated at Hospital for Bone and Joint Surgery Srinagar. The patients were followed prospectively for 2 years and assessed for the results. All feet were initially graded for the severity of deformity by Dimeglio classification , and treated according to the Ponseti method. At the end of the treatment and during post treatment bracing, the tenotomy group was compared with non tenotomy group. **Results:** Fifty five (70%) children in the study were males and twenty four (30% ) were females. Forty four patients (55.7%) had bilateral involvement. Sixty four patients (81%) were classified as moderate and severe and 15 feet (19%) as very severe as per Dimeglio classification. Tenotomy of tendo Achilles was done in 84.5 % ( 67patients with104 feet) of the feet.Tenotomy group required an average number of 5.7 casts compared to the non-tenotomy group which required average number of 6.73 casts. **Conclusion:** In conclusion percutaneous tendo Achilles tenotomy is safe and inexpensive procedure with a very low complication rate.

**Keywords:** CTEV, Ponseti Method , Tendo Achilles tenotomy .

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## INTRODUCTION

Idiopathic clubfoot is the most common musculoskeletal birth defect affecting 1 per 1000 live births[1]. The component deformities of clubfoot include equinus, cavus, heel varus and forefoot adductus. Initial treatment of CTEV should be non-surgical and started soon after birth. In the past two decades, several reports have demonstrated successful correction in >95% of the clubfeet using the Ponseti method [2, 3, 4, 5]. This method has become the popular method for the non-operative treatment of clubfoot all over the world, and percutaneous tendo Achilles tenotomy is a part of this method which is used to expedite the correction of equinus deformity, although some mild cases of equinus can be corrected by casting also. In this method the clubfoot is corrected conservatively with serial manipulations followed by casts. Manipulation is done with the thumb of one hand placed over the talar head and the other hand holding the first metatarsal head with index finger and thumb[6]. Cavus is corrected by lifting the first metatarsal head, and the other manipulations done serially by abducting the forefoot in supination till the foot is maximally abducted. After achieving the abduction equinus is corrected by either a percutaneous tenotomy of tendo Achilles or its stretching with the palm of one hand placed under the entire foot, stretching being

done only in those feet where the foot can be brought to or within 5 to 10 degrees of neutral with gentle manipulation to achieve further dorsiflexion of at least 15 to 20 degrees. . The purpose of this study was to assess the merits of doing percutaneous tendo Achilles tenotomy by comparing tenotomy group with non tenotomy group of CTEV feet. Our study included seventy nine children with 123 idiopathic clubfeet, comparing the tenotomy group (104 feet) with non tenotomy group (19 feet).

## MATERIAL AND METHODS

Seventy-nine consecutive patients with 123 idiopathic clubfeet were treated at Government Hospital for Bone and Joint surgery Srinagar between June 2008 to July 2010. The patients were followed prospectively for 2 years and assessed for the results. Patients were excluded if they had syndromic or neurogenic clubfoot or if they were more than 6 months of age at presentation. All feet were initially graded for the severity of deformity by Dimeglio classification[7], and treated according to Ponseti method. At the end of the treatment and during post treatment bracing, the tenotomy group was compared with non tenotomy group with respect to total number of casts, complications, additional visits, recurrence of isolated equinus deformity during follow up and compliance with post correction bracing.

- **Technique of percutaneous tendo Achilles tenotomy[8]:**

The tenotomy is performed as a day care procedure under local anesthesia. 1 ml of 2% lignocaine was infiltrated around tendo Achilles about 1cm above its calcaneal insertion. After aseptic preparation of the posterior ankle and leg, the assistant holds the ankle in maximal dorsiflexion. A 15 no. beaver eye blade is introduced by the surgeon on to the medial edge of the tendo Achilles about 1 cm above its calcaneal insertion. The cutting surface of the tendon is pointing proximally at this stage. The tendon is felt with the tip of the knife and care is taken not to spear it. The knife is introduced in front of the tendon and the rotated 45 degrees which allows the tendon

to be severed from front to back. The ankle dorsiflexion will increase suddenly with an audible pop. After the tenotomy sterile gauze

is placed over the puncture wound and a well molded long leg cast applied over a soft roll with ankle in maximum dorsiflexion and foot in maximum abduction for 3 weeks. Figure 1Demonstrates the technique of percutaneous tenotomy

( a )

( b )

( c )

**Figure 1:** Percutaneous tendo Achilles tenotomy (a) local anaesthetic injection (b) performing tenotomy (c) chid in post tenotomy cast.

## OBSERVATION AND RESULTS

Seventy nine children (123 clubfeet) were treated. All children were six months or less of age. Fifty five (70%) children in the study were males and twenty four (30% ) were females Sixty five percent of the patients were first born. Family history was present in 4% of the patients. Forty four patients (55.7%) had bilateral involvement. Of unilateral cases twenty two patients (28%) had involvement of right side . 100% bilateral feet had similar grade of initial deformity. Sixty four patients (81%) were classified as moderate and severe and 15 feet (19%) as very severe as per Dimeglio classification. Tenotomy of tendo Achilles was done in 84.5 %( 67patients with104 feet) of the feet. Average no. of casts applied to correct all the deformities in the tenotomy and non tenotomy groups are given in Table 1. The tenotomy group had lesser number of hospital visits with secondarily a significant reduction in the cost of the treatment compared to the non tenotomy group. Recurrence of isolated equinus deformity was less common in the tenotomy group compared to the non tenotomy group.

**Table 1:** Average number of casts applied in the tenotomy and non-tenotomy groups

| Groups | No of feet | Average no. of casts |
|---|---|---|
| **Tenotomy** | 104 | 5.7 |
| **Non-tenotomy** | 19 | 6.73 |

We had no case of infection in our series. One case of excessive bleeding from the tenotomy site required suturing of the wound.

**DISCUSSION**

In 1823, Delpech performed subcutaneous tenotomy of Achilles tendon in two patients of acquired talipes equinovarus[9]. Sepsis occurred in both the patients and he did not repeat the operation. The high incidence of infection discouraged most surgeons from performing tenotomy. However, Stromeyer continued to practice the operation. In 1831, he subcutaneously divided the tendo Achilles in several patients with no fever or other signs of infection. Ponseti performed tendo Achilles tenotomy in 85% of his patients. Tendo Achilles tenotomy is performed as an office procedure under local anesthetics unless the child is older who may struggle under local anaesthetic[10].

Our study compared the children who underwent percutaneous Tendo Achilles tenotomy as part of the Ponseti correction of clubfeet versus the non tenotomy group. Although the number of patients in non tenotomy group are much less as compared to the tenotomy group but certain significant observations were made between the two groups. Significantly lesser number of casts were required in the tenotomy group to complete the initial phase of treatment as compared to the non tenotomy group although the patients with percutaneous Tendo Achilles tenotomy had much severe grades of deformity as compared to the patients in the non tenotomy group. However grouping was not done based on the initial grade of deformity. The tenotomy group had lesser number of hospital visits with secondarily a significant reduction in the cost of the treatment compared to the non tenotomy group. Recurrence of isolated equinus deformity was less common in the tenotomy group compared to the non tenotomy group. There was no significant difference of post treatment bracing compliance between the two groups.

**CONCLUSION**

In conclusion percutaneous tendo Achilles tenotomy is safe, inexpensive, effective, and an easy office procedure used to expedite the correction of equinus deformity in idiopathic clubfeet with a very low complication rate.

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