

# Mosquito Forceps Assisted Percutaneous Achilles Tenotomy for Clubfoot -Technical Note

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## Abstract

**Introduction** :- Ponseti method is currently the most accepted and popular mode of treatment in management of clubfoot deformity. Percutaneous Achilles tenotomy is an integral part of the Ponseti treatment and it is done as a final step to correct the residual equinus once other components of the deformity have been corrected. During Achilles tenotomy, excessive bleeding, pseudoaneurysm and injury to peroneal and posterior tibial vessels have been reported in the literature. To avoid these complications this technical note describes a simple method of doing percutaneous Achilles tenotomy using mosquito forceps assistance. The technique is simple and it minimizes the chance of possible neurovascular complications.

**Key words:** Clubfoot, CTEV, ponseti, percutaneous Achilles tenotomy, clubfeet, congenital talipes equinovarus.

## Introduction

Safety and efficacy of Ponseti technique has been established around the globe [1,2,3]. Percutaneous Achilles Tenotomy is required in more than 80% of feet to correct the residual equinus once other components have been corrected [4] and is considered to be a vital part of treatment of clubfoot by Ponseti's method. Traditionally, after serial castings percutaneous Achilles Tenotomy is done as an office procedure under local anaesthesia. With increased number of orthopaedic surgeons choosing Ponseti method, there is an increase in the number of percutaneous tendo Achillis tenotomies being performed across the world. In spite of proper training in Ponseti technique, some complications have been reported including excessive bleeding [5], pseudoaneurysm<sup>6</sup> and neurovascular [7] injuries. To avoid these rare but serious complications many modifications have been developed as per requirement of the surgeons and patients [8,9,10,11]. We describe a simple method of doing percutaneous tenotomy using mosquito forceps assistance. The technique is simple and it minimizes the chance of possible neurovascular complications.

## Technique

Under anaesthesia (local or caudal block), using a 15 number blade, skin is punctured 1cm proximal to the insertion of Achilles tendon on posteromedial aspect. A mosquito forceps is introduced anterior to the Achilles tendon with tip directed downward and posteriorly. The soft tissue, neurovascular bundle and musculo-tendinous units anterior to the Achilles tendon are separated bluntly.

Mosquito forceps is opened slightly and gently to prepare space for insertion of knife (Fig 1). With the mosquito forceps still protecting the structures anteriorly, a 15 number knife is introduced between Achilles tendon and mosquito forceps keeping it parallel to the tendon. The blade is turned 90° so that cutting edge faces the tendon (Fig 2). The foot is then dorsiflexed keeping the knife steady to cut the tendon. The sectioning of tendon (the snap) is felt. The tenotomy is completed (refer the video). Pressure gauze is applied for a minute. Passive manipulation is done to stretch the posterior structures and also to break any remaining fascial structures. A good dorsiflexion is achieved at the end of procedure. Wound is covered with sterile gauze after ensuring that there is no bleeding. Routine post tenotomy cast is given for 3 weeks with the foot in 15°-20° dorsiflexion and maximum external rotation achieved 50°-70°.

## Discussion

The presence of vascular abnormalities in the lower extremities of patients with congenital idiopathic clubfoot is well documented [12,13]. Absent or reduced anterior tibial artery or absent posterior tibial artery has been reported [13]. In these cases peroneal artery becomes the dominant artery to supply the feet. If both dorsalis pedis and posterior tibial are not palpable and if peroneal artery is found to be the only artery supplying the foot, then to avoid neurovascular injury few authors recommend open tendo Achillis lengthening instead of a percutaneous tenotomy<sup>9</sup>. Also To avoid neurovascular complications other modifications have been documented [8,9,10,11,14] including percutaneous tenotomy with a large gauge needle and a mini open Achilles tenotomy.

The described technique is a modification of percutaneous technique. In fact it is a middle path between the traditional percutaneous and the mini-open technique. It increases the safety margin in all cases including typical or atypical anatomy of neurovascular bundles. The new

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Figure 1



Figure 2

learners of Ponseti technique can be comfortable and can be sure of not damaging any vital structure during the sectioning of Tendo-achilles. The technique is very useful in syndromic feet like those of arthrogryposis and other associated anomalies. There is short learning curve. It is also useful for elderly presenting children [15]. In corresponding authors Institute more than 1700 cases has been treated with this technique in last 8 years with no complications.

**Video Technique:** This technical note is being supplemented with the video of the technique.

### Conclusion

In our experience this technique is easy, less invasive and safe. It increases the safety margin in all cases including syndromic feet and those feet where abnormal and compromised vasculature is documented preoperatively. It is very helpful for new learners of Ponseti technique. In fact it is the sure shot way of doing Achilles tenotomy without damaging neurovascular bundle.

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