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RESEARCH ARTICLE

A STUDY OF OUTCOME OF PERCUTANEOUS NEEDLE TENOTOMY FOR TENDOACHILLES RELEASE IN CONGENITAL TALIPES EQUINO VARUS

[1]Dr. Jawahar Mehmood Khan and [2,*]Dr. Jabreel Muzaffar

[1]JR Department of orthopaedics Goveranment Medical College Jammu
[2]SR Department of orthopaedics SGRR Medical College Dehradun

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ABSTRACT

Introduction: Congenital TalipesEquino Varus (CTEV) is a commonly seen complex congenital deformity of the foot, with an incidence of approximately 1 in 1000 live births. Over the past two decades, Ponseti management has become accepted throughout the world as the most effective and least expensive treatment of clubfoot. About 85% of the cases treated with the Ponseti technique require percutaneous sectioning of the tendoachilles for correction of residual equinus deformity. The sectioning of the tendoachilles is simple, effective and involves low risks. Originally, as described by Ponseti, tenotomy is performed using a tenotomy blade, such as a #11 or #15, or any other small blade, such as an ophthalmic knife. However, complications related to the procedure, such as excessive bleeding, formation of a pseudoaneurysm and neurovascular injuries, were described. To avoid these rare but serious complications, many modifications such as mini-open tenotomy and needle tenotomy, have been developed.

Materials and Methods: The study was performed in the Department of Orthopaedics, Govt Medical College Jammu from November 2015 to October 2016. All the children with CTEV presenting during this period were treated by the Ponseti casting technique. Only the cases with idiopathic CTEV were included in the present study.

Results: Between November 2015 and October 2016, twenty five patients with idiopathic clubfoot presented to department. Out of them, fourteen (56%) were male and eleven (44%) were females, sixteen (64%) have unilateral and nine(36%) had bilateral club foot. Out of these twenty five, twenty one (84%) were managed successfully. In case of two (8%) patients percutaneous needle tenotomy failed. Due to poor and faulty application of D-B splint and irregular follow up, (8%) patients developed relapse of the deformity. There were no cases of blister formation, excessive bleeding, psuedoaneurysm formation or neurovascular compromise.

Conclusion: In this study we performed the modified technique of tenotomy with a wide bore needle, as described by Minkowitz et al, as we consider this technique easy, simple, cost effective, and with fewer complication rates.

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INTRODUCTION

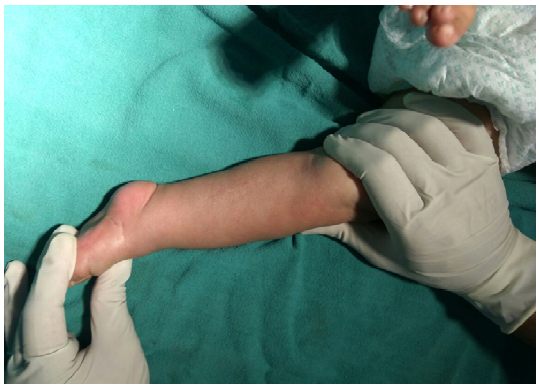
Congenital Talipes Equino Varus (CTEV) is a commonly seen complex congenital deformity of the foot, with an incidence of approximately 1 in 1000 live births. Over the past two decades, Ponseti management has become accepted throughout the world as the most effective and least expensive treatment of clubfoot. About 85% of the cases treated with the Ponseti technique require percutaneous sectioning of the tendoachilles for correction of residual equinus deformity. The sectioning of the tendoachilles is simple, effective and involves low risks. Originally, as described by Ponseti, tenotomy is performed using a tenotomy blade, such as a #11 or #15, or any other small blade, such as an ophthalmic knife. However, complications related to the procedure, such as excessive bleeding, formation of a pseudoaneurysm and neurovascular injuries, were described. To avoid these rare but serious complications, many modifications such as mini-open tenotomy and needle tenotomy, have been developed. Use of wide bore needle to perform percutaneous tenotomy of tendo-achilles was first described by Minkowitz et al and has been reported by few other authors .Minkowitz et al published a modification for the sectioning of tendo-achilles tendon, performing this procedure percutaneously with a large gauge hypodermic needle.

Corresponding author: **Dr. Jabreel Muzaffar,**
SR Department of orthopaedics SGRR Medical College Dehradun.

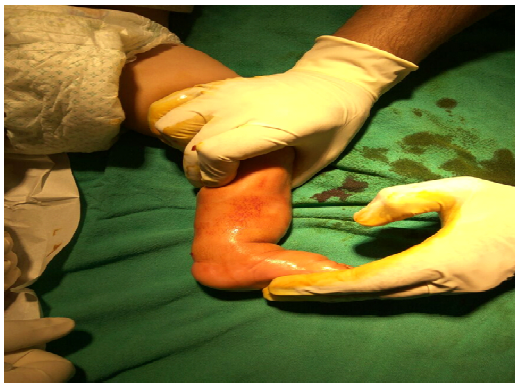
This technique with needle may possibly have advantages when compared to other tendon lengthening techniques, due to the minimally invasive approach, the simplicity and very low morbidity. Some surgeons perform these procedures in the operative room, thereby raising the cost and exposing the patients to the risk of anaesthesia, whereas the percutaneous needle tenotomy is performed in an outpatient setting, under local anaesthesia and without incising the skin, thereby minimizing complications. With the global ponseti initiative aiming to reach the rural population, this is a simple technique to be learned and used.

MATERIALS AND METHODS

The study was performed in the Department of Orthopaedics, Govt Medical College Jammu from November 2015 to October 2016. All the children with CTEV presenting during this period were treated by the Ponseti casting technique. Only the cases with idiopathic CTEV were included in the present study. In a child less than 6 months of age at the time of tenotomy, tenotomy was performed by using a 18 gauge needle, whereas in a child more than 6 months of age, a 16 gauge needle was used. The procedure was performed in an outpatient setting. The patient was placed in supine position, with the knee flexed to 90 degrees and the hip abducted to allow access to the posterior portion of the leg and ankle. An assistant maintained the position of the limb. The foot was forced in dorsiflexion causing the tendo-achilles to become tense and easily palpable. With all the aseptic precautions, an appropriate size (16 or 18 gauge) sterile needle was inserted from the medial border of the tendo-achilles about 1 to 2 cm proximal to the insertion of tendo-achilles. The beveled tip of the needle was used as a blade, for sectioning the tendon through lateralization and elevation movements of the cutting end. The completion of tenotomy was perceived with a grating sensation and sudden increase of dorsiflexion, with visible correction of dorsiflexion.



Preoperative picture



Post operative picture

Plaster cast immobilization was performed with the knee flexed 90degrees and the foot positioned in maximum dorsiflexion and abduction of 70 degrees. The same procedure was then performed on the opposite foot, in cases with bilateral involvement. The patient was kept under observation for about an hour, with attention paid to general condition, neuron-vascular status of the limb and signs of bleeding. This cast was left in place for 3 weeks to allow healing of the tendon. To prevent relapse of the deformity, a Denis-Browne bar with shoes (D-B splint) was applied after cast removal. D-B splint was used full time (day and night) during the first 3 months for at least 23 hours each day and then for 2 to 4 hours a day and for 12 hours at night, a total of 14 to 16 hours per 24 hour period.

RESULTS

Between November 2015 and October 2016, twenty five patients with idiopathic clubfoot presented to department. Out of them, fourteen (56%) were male and eleven(44%) were females, sixteen(64%) have unilateral and nine(36%) have bilateral club foot. Out of these twenty five, twenty one (84%) were managed successfully. In case of two (8%) patients percutaneous needle tenotomy failed. Due to poor and faulty application of D-B splint and irregular follow up,(8%) patients developed relapse of the deformity. There were no cases of blister formation, excessive bleeding, psuedoaneurysm formation or neurovascular compromise.

DISCUSSION

Residual ankle equinus deformity in CTEV treated with the Ponseti technique has been receiving special attention, as it is resistant to manipulations and plaster cast changes. According to Ippolito and Ponseti, the retraction of the posterior ligaments of the hindfoot, along with the associated shortening of the triceps surae produces the equinus deformity, which makes its correction by manipulation difficult. Hence, tenotomy of the tendo-achilles is necessary in approximately 85% of patients with CTEV treated with Ponseti technique, in order to achieve a plantigrade foot. The conventional technique of percutaneous tenotomy with a knife, as originally described by Ponseti, achieves good results, but is associated with complications, such as excessive bleeding, formation of a pseudoaneurysm and neurovascular injuries. In order to avoid such complications, Minkowitz et al first described the use of wide bore needle to perform percutaneous tenotomy of tendo-achilles. This modification has been adopted by few other authors12-15 with lesser complications and better results.

Conclusion

In our study, we followed the casting technique, as originally described by Ponseti. However, we performed the modified technique of tenotomy with a wide bore needle, as described by Minkowitz et al, as we consider this technique easy, simple, cost effective, and with fewer complication rates.

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