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PERCUTANEOUS NEEDLE TENOTOMY OF TENDO-ACHILLES;A MODIFIED APPROACH FOR PONSETTI METHOD

Orthopedics

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ABSTRACT

Background: Ponseti Method of treatment for clubfoot is the standard method. After correction of all other deformities by stretching and casting, equinus is the last deformity to be corrected and this requires a small incision using a beaver's blade and tenotomising the tendo-achilles. A 18 guage needle is less traumatic to tissues instead of the usual blade.
Aims and objectives: Present study was aimed at studying use of 18 guage needle for doing this procedure instead of the blade.
Results: There were 30 feet in our study with 10 bilateral and 10 unilateral clubfeet. All children were less than 4 months of age at the beginning of the treatment. The mean pre-op pirani score was 5.5 and the mean pirani score at finishing treatment was 0.5. There was no major complication during the surgical procedure like major bleeding or a neuro-vascular injury. The mean follow up was 6 months. There was 1 relapse which was successfully managed by PMSTR.
Conclusion: Percutaneous TA tenotomy for clubfoot is an extremely effective procedure to treat equinus. There are no major complications if proper technique is followed.

KEYWORDS:

Introduction: Clubfoot is the most common congenital anomaly of feet. Ponsetti method of treatment of clubfoot is now most widely used method. It involves stretching of the involved feet, followed by maintenance in plaster of paris cast which are given weekly. Equinus is the last deformity which is treated. This requires a tendo-achilles tenotomy, most of the times. The usual manner of doing this is using a no 15 blade or a beaver's blade under local anesthesia. We have been using a 18 guage needle instead for past few years. We postulated that this is less traumatic with fewer side effects and recurrences and so undertook this study to find it.

Material and methods: We included 20 children with 30 clubfeet (10 bilateral and 10 unilateral in our study). All children were less than 4 months of age at the time of the tenotomy. All of these children had been treated with conventional ponsetti method of casting and .At the time of tenotomy, full foot abduction (70°) was achieved in all the feet. All children required 4 casts to correct cavus, varus and adduction of the foot before final tenotomy was done. The procedure was approved by the institutional ethics committee of our institution and a written consent for same was obtained from the parents after explaining the procedure briefly.

Surgical Technique:
The procedure was performed under usual aseptic precautions. Child was placed in supine position. Skin was prepared as usual. We generally used short general anesthesia in day care setting for tenotomy. An 18 gauge was used for performing tenotomy. Needle was inserted into skin right behind the Achilles tendon while taking precaution not to pierce or go too way-wards medially or laterally. After getting in, the bevel of the needle was directed in such a way that it touched the dorsal aspect of the tendon. Using gentle sweeping movements at the wrist, the tendon was cut till you could not get the usual grating sensation. Once this was done, the ankle could now be dorsi-flexed to 20° as is desired. This means that the tendon is tenotomised. Pressure was applied at the site of need prick,till the ooze stopped. After the ooze stopped, we applied long leg cast with foot in 20° dorsi-flexion and maximum abduction with knee in 90° flexion.
The cast was kept for 2 weeks and thereafter splint was given to maintain the correction.

Results: There were 20 feet in total, with 6 bilateral and 8 unilateral feet. There were 8 males and 6 females. The mean age of children before starting treatment was 1.5 months (0- 4months). 6 out of 14 children had taken some form of treatment like casting from outside. The mean preoperative pirani score was 5.5(range 4-6). Mean number of cast required was 5.5(range 5-7). All patients included in study required a percutaneous tenotomy of tendo-achilles. The mean post-operative pirani score of all feet was <0.5.The mean follow up was 6 months.

Discussion:
Ponseti method for treatment of idiopathic clubfoot has become the new accepted standard world over[1]. Usually, equinus is the last deformity to be treated and around 90% of the patients will require it[1]. There are different techniques to perform tenotomy and although the technique using a beaver blade and under local anesthesia in sterile conditions is most popular but modifications are also becoming commoner in. As the Ponsetti method keeps on becoming popular and more and more children are being treated by this technique, the incidene of TA tenotomy will keep on increasing. Surgeons would keep on evolving newer modifications in order to decrease complications and increase the ease of doing so.

Per-cuatneous TA tenotomy has its limitations and they include injury to vital structure around the posterior aspect of ankle including peroneal arterty, lesser saphenous vein, sural nerve or even posterior tibial artery[2,3,4].

Sufficient correction i.e 70° abduction of forefoot should be obtained before doing a TA tenotomy. It is very important to do a complete TA tenotomy for correcting equinus. Incomplete tenotomy will lead to insufficient correction and maybe a cause of relapse

It has been demonstrated by ultrasound and MRI examination that whole of the tendon of TA re-grows by 6 weeks[5,6,7].

Furthermore we did not experience any significant bleeding complication in any of our cases. Though the follow is short of around 6 months only so far, still we did not find any such complications like recurrence so far.

Deformity did recur in 1 foott in follow up but that could be very well attributed to stiffer initial presentation of this foott and the poor compliance of the parents as the deformity was completely corrected initially in the patients including these 2. These cases were treated with Postero-medial soft tissue release and casting.

Conclusion : Percutaneous needle tenotomy procedure is minimally invasive technique with little chances of failure. Scar formation and chances of infection are less as compared to conventional tenotomy. It's a simple surgical technique and can obviate the need for use of blade in doing so.

Image1: the usual antiseptic preparation

Image 2: technique of doing TA tenotomy by 18g needle

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