

RESULTS OF CLUBFOOT TREATMENT WITH PONSETI METHOD

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AKTET V, 3: 370 - 374, 2012

SUMMARY

Background: Nonoperative treatment of clubfoot is accepted by most orthopaedic surgeons as the initial treatment. The Ponseti method has become popular worldwide. In our institution Kite method has been the standard initial treatment. Five years ago we introduced the Ponseti method in our institution so in this paper we are presenting the early results of idiopathic clubfoot treatment with Ponseti method.

Methods: We are presenting the first 50 (30 babies) clubfeet treated by Ponseti method during the period 2005-2008. We studied the rate of recurrence defined as the need to perform posteromedial release within the period of minimum follow up of 2 years. Pirani Score was measured before and after the treatment. Tibialis anterior tendon transfer or repeated Achilles tenotomy was not considered a recurrence but part of the protocol.

Results: In our series of 50 clubfeet only 1 (2%) had a recurrence that needed posteromedial release (PMR). This was a baby whose parents was not compliant with foot abduction brace and did not show up regularly on scheduled visits. Achilles tenotomy was needed in 47 feet (94%) and was performed at age 2 to 3 months. The average duration of cast was 10 weeks. Pretreatment Pirani score was 5.2. Three feet needed a second Achilles tenotomy and 2 feet needed tibialis anterior tendon transfer to third cuneiform.

Conclusions: Ponseti method is the method of choice in most protocols worldwide. The success rate of our series is 98%. We hope that this will become the standard protocol in our Institution where Kite method has been the standard treatment. Compliance with the post correction abduction bracing protocol is crucial to avoid recurrence of a clubfoot deformity.

Key words: Cast, Clubfoot, Ponseti.

INTRODUCTION

Nonoperative treatment of idiopathic talipes equinovarus is accepted worldwide by most orthopaedic surgeons to be the initial standard treatment^{1,2,3,4,5,6,7,8,9}. Different methods exist but Ponseti method has become popular over the past 2 decades. Ponseti claims to avoid surgery in 89% of cases by using his technique of manipulation, casting and limited surgery¹⁰. Cooper and Dietz¹¹ reviewed Ponseti's cases with an average of 30 years of follow up and found 78% of patients had achieved excellent or good functional and clinical results. Since than many studies have shown very good results with Ponseti Technique.

Talipes equinovarus is not uncommon in Albania with entire population of 3.5 million habitants and as white European (Caucasian) population the estimated incidence is 1 clubfoot per 1000 habitants.

In our Institution the standard protocol of nonoperative treatment of talipes equinovarus is Kite method. In 2005 we introduced the Ponseti technique in our Institution and started its application. In this study we present early results of the first 50 clubfeet treated with Ponseti technique. The parameter in question was the need to perform posteromedial release (PMR).

METHOD

All patients who were referred to our institution from July 2005 until September 2008 were eligible for the present study. Only patients with idiopathic clubfoot and a minimum of two years of follow-up after the initial casting were included. Clinical data were collected prospectively at each clinical visit with use of a template data sheet. At the time of presentation, the clubfoot deformities were graded with use of the validated 6-point scale of Pirani et al.¹² (Fig 1)

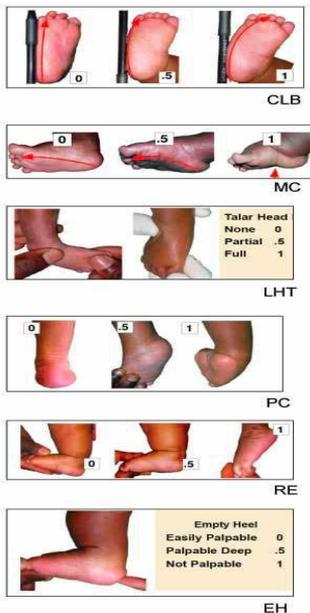


Fig 1. Pirani score used to evaluate gravity of clubfoot

50 clubfeet were treated at weekly intervals with above-the-knee casting as described by Ponseti^{13,14,15}, followed by a percutaneous Achilles tenotomy and then with a final cast for three weeks. At the completion of cast treatment, all patients were managed with an abduction orthosis. The open-toed, high-top shoes were fitted by the orthotist and were attached at shoulder width to a Denis Browne bar. Parents were emphatically instructed to ensure full-time brace wear for three months, followed by night and naptime wear until at least the age of two years. Any problem with casts, brace wear, and brace compliance was noted

We strove as much as possible to reproduce Ponseti's strict casting protocol faithfully. This calls for forefoot abduction with counter-pressure on the neck of talus (Fig 2 a and b), never pronating and never touching the calcaneus. If residual equinus was observed after 6 to 8 weeks of casting and the foot had been abducted 60°, a complete percutaneous Achilles tenotomy was performed and the foot was maximally dorsiflexed. After tenotomy, one more cast was applied and left in place for 3 weeks. When this cast was removed we allowed 2 days brake before application of foot abduction orthosis which was set at 70° external rotation for the clubfoot and 45° external rotation for the normal foot. For bilateral cases, both feet are set at 70° external rotation. The protocol for the foot abduction orthosis was 23 hours per day for the first 3 month and then nighttime and naptime for 2 to 4 years. This is important to avoid recurrence.



Fig 2.a and b

All available clinical records, including the prospective clubfoot worksheet, clinic charts, and operative records of all patients were reviewed.

Age at the time of initial casting, sex, family history, Pirani score, number of casts, and any clinical complications associated with casting or orthosis wear were noted. All surgical interventions and complications associated with these deformities were noted. The primary outcome measure was the recurrence of deformity requiring PMR.

RESULTS

30 Patients (with 50 affected clubfeet) treated with Ponseti Technique between 2005 and 2008

were followed up for at least 2 years (minimum 2 years and maximum 5 years). The mean age of children at time of presentation was 3 weeks. One patients (neglected by parents) started treatment at 2 years of age and finished the course of treatment without recurrence. The pretreatment Pirani score was 5.2. Forty seven out of fifty feet (94%) underwent percutaneous Achilles tenotomy. The average number of cast was 10. Results are shown on Table 3

Pirani score	Lateral border of foot	Medial crease	Posterior crease	Flexibility of ankle joint
Before treatment	0.92	0.75	0.75	0.8
After treatment	0.13	0.5	0.13	0.1

$P < 0.05$

Tab. 3

After a duration of average 2 years of follow up 49 feet (98%) were treated successfully with Ponseti technique and only 1 out of 50 had a recurrence that needed PMR. The parents of child that had recurrence were not compliant with foot abduction brace and did not show up in the scheduled visits

In functional evaluation Ponseti technique showed good subtalar motion, dorsiflexion or 30° (range $12^\circ - 42^\circ$) and plantar flexion of 45° (range $22^\circ - 65^\circ$)

DISCUSSION

Initial nonoperative management is the preferred method for the treatment of clubfoot in many institutions today¹⁶, largely because of the promising short and long-term results reported by Ponseti and others^{17,18,19}

Three are the main nonoperative methods used the Ponseti, Kite and French method. In Albania and in our Institution the standard treatment has been the Kite method. Kite²⁰ illustrated his method in 1964. He recommended abducting the forefoot against pressure at the calcaneocuboid joint. Ponseti called this maneuver "Kite's error" (Fig 4) because it blocks the correction of the hindfoot varus and internal rotation. Zimble²¹

showed 10% success rate for 75 patients (90 feet) who were treated with Kite method.



Fig 4. Kite's "error"

Shaw²² recommended correcting the deformity through dorsiflexing and everting the calcaneus with the index finger and thumb while using the thenar eminence to bring the forefoot into abduction, eversion and dorsiflexion. Vesely²³ tried to mold the forefoot into a valgus position and the hindfoot into valgus and pronation. Both recommendations are contrary with Ponseti's principles, because forefoot pronation creates an

increase of the cavus and locks the subtalar joint. Eversion of the calcaneus without first derotating it prevents its correct derotation. Another important factor in clubfoot casting is the need for long leg casts. Kite^{20,24} used below-the-knee casts in children younger than 12 months. A below-the-knee cast is not suitable for holding the foot in abduction and should therefore not be used at any age.

We have noticed retrospectively over the years that most clubfoot patients treated in our Institution with Kite method developed cavovarus foot which needed the Steindler procedure. This observation and the ripopularization of the Ponseti technique in the last two decades made us seek another method of nonoperative treatment for our clubfoot patients

Although this new series with Ponseti technique represents our learning curve with this technique, we are very satisfied with the initial results. Only one patient treated with the Ponseti technique required PMR as result of noncompliance with foot abduction orthosis. We believe that this was due to lack of compliance with brace wear. Lack of compliance with brace wears, as a contributory factor in the recurrence rate of clubfeet has been reported^{18,25,26,27}

Follow up our patients treated with Ponseti method was minimum of 24 months and thus far had one relapse. Good follow up with foot abduction orthoses is crucial in avoiding the relapse. A longer follow up study of our patients is needed to evaluate final outcomes.

Our team has started a comparison prospective study of clubfoot treatment with two different protocols(Ponseti and Kite) and will publish the results later.

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