

To study the effectiveness of Ponseti method of casting for idiopathic clubfoot—a five year experience from BPKIHS

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Abstract : To study the effectiveness of Ponseti method of casting for idiopathic clubfoot—a five year experience from BPKIHS.

[Purpose] We have conducted this study to find out the effectiveness of Ponseti method to our patient population.

[Study Design] We had conducted retrospective study of the clubfoot patients who had attended our orthopedic unit and had undergone Ponseti method of manipulation and casting for last five years. 168 patients attended our hospital at that period. Thirty four patients were excluded from the study. Data were analysed using demographic variables, initial and final Pirani scores, no. of cast, tenotomy, recast application, compliance with brace, parent satisfaction and final angle of dorsiflexion.

[Results] Among 134 patients, male were predominant over female. About 44.8% patients had bilateral involvement and among unilateral involvement right side was more in number. Initial mean Pirani score was $5.09 \pm .61$. Mean 5.88 ± 2.23 casts were used and 88.1% patient had undergone percutaneous tendoachilles tenotomy. 6.7% patient had recurrence of deformity, reapplication of cast and retentomy. 4.5% patient had posteromedial soft tissue release. Follow up was 2 months to 5 years duration and at last follow up final dorsiflexion was 9.04 degrees. 6% children were non compliant to braces and 96.3% parents were satisfied to treatment method.

[Conclusions] Ponseti method has avoided surgeries in more than 90% of our patients.

Key words : clubfoot, Ponseti, BPKIHS

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Fig. 1 Clubfeet patients with their parents at Clubfoot Clinic



Fig. 2 Bilateral clubfeet after manipulation and above knee Ponseti Casting

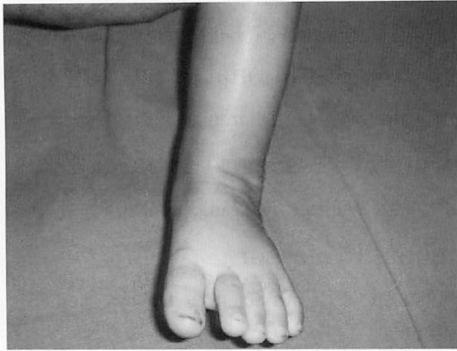


Fig. 3 Correction all deformities except equinus before percutaneous tendoachilles tenotomy



Fig. 4 Bilateral Clubfeet with foot abduction orthosis

Introduction

Ponseti method of manipulation and casting for clubfoot had been the gold standard method of treatment for the last decade. I G Ponseti had started the method in 1948 and first published his result in 1963¹⁾. Although his results were again published in 1980²⁾, his method was not popular till Cooper and Dietz published 30 year follow up study³⁾. Different uncontrolled clinical trials had shown Ponseti method the best method over Kite's and surgical method⁴⁾. Recent Randomized Controlled Clinical Trials had also shown that Ponseti method has better clinical outcome than Kite's method of non operative of treatment^{5)~7)}.

In underdeveloped countries long duration,

cost, lack of awareness, incomplete correction are the key factors for reluctant to treatment and lost to follow up with other treatment resulting in devastating deformities^{8)~10)}.

Different follow up studies had shown that Ponseti treated feet have painless, plantigrade and functional feet^{3)11)~13)}. Repeated soft tissue releases can result in a stiff, painful and arthritic foot and significantly impaired quality of life¹⁴⁾.

Results from various developed and developing countries had shown that incorporating Clubfoot programme in the National Clubfoot programme had better reduction in clubfoot deformities¹⁵⁾¹⁶⁾.

We had treated clubfoot by Traditional method and surgery in all those failures in the past. From 2004 we had started Ponseti method of manipula-

tion and casting for Clubfoot deformity in our hospital. We had conducted this study to find out effectiveness of our treatment method in our patient population.

Methods

We had conducted retrospective study of the clubfoot patients who had attended our orthopedic unit and had undergone Ponseti method of manipulation and casting from 2004 to 2009.

Institutional research forum and ethical clearance committee approval for the study was obtained. Hospital record sheet was the source of data obtained for the study. Ponseti method of manipulation and casting was done for all Clubfeet cases in our Clubfoot Clinic (Fig. 1). All the patients were examined thoroughly by the author and Pirani score was used to assess the deformity. Weekly manipulation and above knee casting (Fig. 2) was done and once the deformity was corrected except equines (Fig. 3) for which percutaneous tendoachilles tenotomy was done under local anaesthesia. Following which above knee cast was applied for three week and then foot abduction brace (Fig. 4) was applied for throughout 24 hours of the day for three month and then at night till maturity. Recurrences were managed by manipulation and reapplication of cast and those who were resistant to treatment were managed by surgical procedure.

Data were collected in standard Proforma. Descriptive statistics were applied to analyze data which included demographic variables, initial and final Pirani scores, no. of cast, tenotomy, recast application, compliance with brace, parent satisfaction and final angle of dorsiflexion.

Results : One hundred and sixty eight patients attended our hospital at that period. Thirty four patients were excluded from the study ; 16 were

non idiopathic clubfeet, 10 patients had previous manipulations and 8 patients were lost to follow up after start of treatment.

Among 134 patients, 61.9% patients were male and 38.1% were female i.e M : F = 1.6 : 1. Patients were from 2 days to 2 years of age ; mean age was 141.55 ± 121.42 days. Patients from hilly region were 57.5% and those from Terai region were 42.5%. 44.8% patients had bilateral involvement and 57.2% patients had unilateral involvement. Among unilateral involvement right side involvement was 33.6%. Pirani score was from 3.5 to 5.6 before application of cast in which initial mean Pirani score was $5.09 \pm .61$. Post manipulation and casting Pirani Score was 0.5 to 5 in which mean was 1.12 ± 0.65 . Mean 5.88 ± 2.23 (2-14) casts were used and 88.1% patient had undergone percutaneous tendoachilles tenotomy. No infection, skin necrosis, profuse bleeding and neurovascular compromise was noted post tenotomy. 6.7% patient had recurrence of deformity, reapplication of cast and retenotomy. Six feet were resistant to manipulation and casting technique and hence operative intervention was done. Posteromedial soft tissue release was done for those patients. Mean follow up was from 20.24 ± 11.83 month which was from 2 months to 5 years duration. At last follow up ankle dorsiflexion was from 0 degree to 16 degree in which mean was 9.04 ± 3.73 degrees. 6% children were non compliant to braces and 96.3% parents were satisfied to treatment method.

Discussion

Ponseti method of Clubfoot management has been the standard method for initial correction although various operative and non operative methods were used in the past^{17)~20)}. Literature

has conflicting results regarding age at start of treatment although most of the previous studies had done in patients under 3 months of age but few studies have shown good results with patients of older age group^{21)~23)}. We had followed Ponseti's protocol of treatment of clubfoot as early as possible¹⁾. We had treated patients from 2 days of age to 2 years. The mean age of patients was 141.55 ± 12.482 days (2-720 days).

Higher the initial Pirani score more the relapse and more number of manipulations and casting is needed, has been suggested by some literature²⁴⁾²⁵⁾. In our study mean Pirani score changed from 5.47 ± 4.44 to 1.12 ± 0.65 which showed correction of foot deformities.

In our study mean number of cast was 5.88 ± 2.23 (2-14) which was consistent with other studies^{5)6)10)~13)}. Male sex was more in number as described in other studies¹⁾. More number of patients had attended from Hilly eastern region of Nepal. It shows that parents from these area are now became aware of the clubfoot and its treatment despite problem in transportation, costly weekly visit to hospital and problems of accommodation for those poor people¹⁰⁾.

Due to these reasons it has shown that those developing countries which has incorporated clubfoot treatment in the National health programme has effective outcome and decreased rate of neglected clubfeet⁹⁾¹⁵⁾¹⁶⁾.

Percutaneous tendoachilles tenotomy has been the component of Ponseti method of treatment. Several studies has shown that regeneration of tendoachilles occurs in all those cases and it takes nearly 12 weeks to gain strength^{1)26)~29)}. In our study also nearly ninety percent patients undergone tenotomy under local anesthesia for equines deformity and 8.2% retenotomy.

Ninety four percent of the patients had

cooperated with foot abduction brace despite parents from under developed countries and shows that counseling regarding brace application was effective. Recurrence in the clubfoot deformity had been attributed to non compliance to brace protocol^{30)~32)}.

Those patients who are non adherence to brace protocol and follow up to clubfoot clinic had shown recurrence in the deformities and despite re manipulation and casting undergone postero-medial soft tissue release. Parent satisfaction was more than ninety percent in our study due to effective correction of deformity.

Hence Ponseti method has been the effective method of Clubfoot correction in underdeveloped countries like Nepal which has decreased costly and long duration treatment and has avoided surgeries. The method will be still useful to those people who live at remote areas of country if Clubfoot Programme is incorporated in the National health Programme.

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