

Changing Pattern of Management of Clubfoot in a Regional Orthopedic Hospital Club Foot Clinic in Nigeria

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Introduction

Clubfoot is a complex foot deformity which is commonly idiopathic in origin is also known as talipes equinovarus. The deformity has four components: equinus of the heel, hind-foot Varus, forefoot adduction and midfoot cavus. Early results of the surgical treatment of clubfoot were encouraging [1]. Long term results have been shown to be unsatisfactory [2]. Ponseti using his method of conservative treatment reported 74% good or excellent results after 30 years of follow up [3]. His method requires little technology and can be applied in poor resource environment [4]. This is a retrospective study to review the changing pattern of management of clubfoot in National Orthopedic Hospital over 10 years. National Orthopedic Hospital Enugu is a regional orthopedic center in South East Nigeria.

Methodology

This is a retrospective study of all patients who presented with clubfoot in National Orthopedic Hospital, Enugu, from 1st July 2004 to 31st June 2014, whose folders were available at our medical record department. Ethical clearance was obtained from the Hospital before commencement of the study. All the case notes of the patients with clubfoot that presented to National Orthopedic Hospital during the study period were retrieved and analyzed using frequency tables. This included the sex of the patient, age at presentation, pattern of deformity, the foot affected and the pirani score at presentation. Other information retrieved included previous management, number of casts applied, duration of treatment, type of brace used and other associated abnormality.

Results

A total of 218 patients presented with 324 clubfeet during the study period. Bilateral involvement of both feet was noted in 110(28%) of the limbs while the left foot was affected in 60 (27.5%) of the limbs (Table 1). The number of patients who were male was 121 with a male to female ratio of 1.2: 1. Presentation

before the age of 3 months was noted in 56 (25.7%) of the patients while 44.1% of the patients presented before 1 year of age (Table 2). Among all the patients with clubfoot, the first child of the family was the most affected. It was seen in 26.6% of the patients (Table 3). Using the Pirani score, the deformity was severe was in 30(13.8%) of the patients but the score was not documented in 110(54.5%) of the patients (Table 4). Seventy-four (33.9%) of the patients received orthodox treatment prior to presentation while 126(57.8%) of the patients had no treatment before presentation. Majority of the patients had surgical treatment between 1st July 2004 to 31st June 2012. One hundred and twenty-four patients had conservative treatment between 1st July 2012 to 31st June 2014 (Table 5). The number of casts applied before correction was achieved ranged from 1 to 16 casts (Table 6). One hundred and thirty-one (60.1%) had their deformity corrected within 6 months. Ankle foot orthosis was used in 53(24.3%) of the patients while 120(55.0%) of the patients had no brace (Table 7).

Foot affected	Frequency	Percentage
Right	48	22
Left	60	27.5
Both	110	50.5
Total	218	100

Table 1: Foot affected.

Age	Frequency	Percentage
<1 month	30	13.8
1-3months	26	11.9
3-6months	23	10.6
6-9months	13	5.9
9-12months	26	11.9
1-2 years	36	16.5
2-5years	23	10.6
5-10years	19	8.7
10 and above	22	10.1

Total	218	100%
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Table 2: Age at presentation.

Position	Frequency	Percentage
1 st child	58	26.6
2 nd child	43	19.7
3 rd child	41	18.8
4 th child	13	6.0
5 th child	14	6.4
6 th child	7	3.2
7 th child	3	1.4
8 th child	1	0.5
Not documented	38	17.4
Total	218	100

Table 3: Position of patient in the family.

Pirani score	Frequency	Percentage
0-1.5	21	9.6
2.0-3.0	25	11.5
3.5-4.5	23	10.6
5.0-6	30	13.8
Not documented	119	54.5
Total	218	100

Table 4: Pirani scores at presentation.

1 st July 2004-31 st June 2007	1 st July 2007-31 st June 2009	1 st July 2009-31 st June 2012	1 st July 2012-31 st June 2014
Surgical-28 Conser vative-0	Surgical-28 Conser vative-0	Surgical - 24 Conser vative-3	Surgical-12 Conser vative-124

Table 5: Management Method.

Number of casts applied	Frequency	Percentage
1-3	42	33.0
4-6	51	40.1
7-9	13	10.2
10-16	11	8.6
Defaulted before correction	10	7.8
Total	127	100

Table 6: Number of casts applied in conservative management.

Type of brace used	Frequency	Percentage
Reverse shoe	4	1.8
Foot abduction brace	38	17.4

Knee ankle foot orthosis	2	0.9
Ankle foot orthosis	53	24.3
Anti-foot-drop device	1	0.5
No brace	120	55.0
Total	218	100

Table 7: Type of brace used.

Discussion

In the recent time, a major change has been noted in the treatment of clubfoot globally. The method developed by Ignacio Ponseti has excellent functional outcome in more than 74% of clubfoot [3]. At our institution, the treatment commonly used before the Ponseti method was introduced was Elongation of Tendo-Achilles and postero-medial soft tissue release, usually after a period of failed 2 weekly casting. However, in 2009, Ponseti International Association had a workshop on Ponseti treatment method, attended by the corresponding author, after which the method was introduced in one of the five orthopedic units in the hospital, which gradually led to a change in management pattern of club foot in our hospital. This was due to a gradual shift of patients to our unit by choice, which led to the commencement of specialized club foot clinic on 1st of august, 2013, coordinated by the corresponding author. Subsequently, increased number of clubfoot patients presenting to the hospital was observed, with attendant better care because most patients preferred the conservative treatment method with reduced financial implication.

The study demonstrated increased affectation of male children which is in keeping with previous studies reported [5,6]. In a study by Byron-Scott et al. [7], 45% of cases had bilateral involvement which is similar to the reported value in this study. The left foot was more affected than the right foot in unilateral cases. This was in variance with the report of other investigators [7,8]. The reason for this variation could not be explained by this study. The finding in this study that the first-born child was the one most commonly affected is in keeping with other studies [8,9]. Pirani score was not documented in 54.5% of cases because this assessment method was introduced newly along with the Ponseti management protocol, with its attendant learning curve. However, more than half of those that had Pirani score done had scores of 3.5 or more, which indicate more severe deformity. The range of number of casts applied to achieve correction was slightly higher than that reported by other investigators [6,10].

The wide range of number of casts used to achieve correction, extending up to 16 weekly casts, can be attributed to the learning curve seen in the application of newer techniques. However, correction was achieved in most of the patients managed conservatively with 4 - 6 casts, which is in keeping with global trends [6,10]. Majority of the patients had surgical treatment between 1st July 2004 to 31st June 2012 after which the trend

was reversed in favor of conservative treatment between 1st July 2012 to 31st June 2014. Despite the fact that most of our patients presented late, with 45.9% presenting to us after 1 year, our study showed that they can still be treated with Ponseti technique. This is in keeping with reports where successes have been recorded in treating older patients with neglected clubfoot [6,11]. Majority of the patients did not use brace at all (55%) as there was initial resistance in accepting the foot abduction brace recommended by Ponseti, which resulted in adaptation of Ankle Foot Orthosis at the initial state of our usage of Ponseti method, thereby resulting in modification of the Ponseti management protocol.

Conclusion

Our initial experience with the application of the Ponseti technique in the treatment of clubfoot suggests that it is a simple and effective method and had accounted for the change in trends of management of clubfoot in our hospital. We hereby recommended it in a resource poor environment like ours.

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