

The Treatment Outcome Using Quantitative Assessment of Deformity

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Type of Publication: Original Research Article

Conflicts of Interest: Nil

Introduction

The disease “Club foot” is also called “Congenital Talipes Equino Varus (CTEV), or “Talipes Equino Varus (TEV).” It is the deformity of feet. It has an estimated prevalence rate of 0.1 percent of births and half of this consists of “bilateral clubfeet.”¹ The incomprehension of parents in Malaysia resulted in the large prevalence of this disease. The treatment of this deformity is hard due to its late extension.² In Malaysia, the frequency of “club foot” is 0.45 percent live births, as reported by Boo and Ong.³ The proportion of boys is 2.5 times greater than girls. However, the history of affected people shows that they had a family history of “CTEV.”⁴

The goal of all the treatments of CTEV is to have well-structured and functional feet.⁵ The problem arises in the treatment of club feet. The unstructured formation of muscles, joints, bones, leg, feet or ankles results in poor treatment of patient. The traditional treatment of this disease has a better rate of about 50 to 90% of all the patients.^{5, 6, 7} “Serial casting” is a technique in which the tightened forms are fastened before surgery.^{6, 7} The earlier the treatment, the better will be the result.⁸ It is recommended to manage the disease earlier because the bone’s mobility and structure can be maintained easily.⁹ “Dietz and Cooper” reports an evaluation of thirty years through “Ponseti procedure” that most of the patients had a pain free “supple feet.”¹⁰

The treatments of deformities can result in resistance to the traditional treatment. The foot is said to be resistant, if it does not show any progress in 3 months of the time period of treatment through traditional system of management.¹¹ For such resistant feet, the surgical treatment is recommended. The new and delicate soft tissues before 36 months help to achieve best remodeling via treatment.^{6, 12, 13} In reports, the “posteromedial release” prior half year of age has shown 71-90% better results and about half of the recurrence occurred after nine months of age.^{12, 14} The relapse rate was reported to about 24% within the range of 11-51%.^{15, 16}

The aim of this report is to revise the results CTEV management at “General Hospital from 2005 to 2009 by using “quantitative club foot assessment of the deformity (QCAD)”

Materials and Procedures

The sample of our report contained some patients from the General Hospital, who were treated for clubfoot. The sample was taken from 2005 to 2009. The outpatients and inpatients were noticed and tracked from their cards as well as “case notes.” The inclusion criteria in this case study is the timing of the sampling. The time selected was from January 2005 to December 2009. The exclusion criterion was the cases with multiple disorders like “associated meningomyelocele, spina bifida, arthrogryposis or other neurological or teratologic conditions.”

All the patients who were given casting treatment before the date of study assigned were continued to treat till their full recovery. All the patients who had resistance to “serial casting” were treated with another procedure known as “soft tissue release.” They did not get the bony process in between 6 to 9 months of their age. However, the patients who were handed over lately had to pass through that bony process. After the complete recovery of patients, they were assigned splint or “adduction shoe” for a minimum of 3 years of evaluation.

The patients who were included in the study were scrutinized keenly according to the “quantitative assessment of the deformity (QCAD).” The evaluation of the study is based on “anthropometric measurement” and “Pirani deformity severity score.” The former comprises of the lengths of the foot and leg along with the circumference of mid-leg or mid-feet. The point of “medial malleolus” is targeted from the “medial knee joint” to measure the length of the leg. However, the foot length is measured differently. It is calculated from within the two points which are the tip of heel to the tip of second toe. The middle point of the length of the foot is considered as the best area for measurement of the circumference. The “Pirani deformity score” is a convenient process of measuring the deformity. This Pirani scale is formed on 6 clinical indications of muscle tightening.¹⁷ the propositions for this scale are as under

- 0, for no abnormality
- 0.5, for moderate abnormality
- 1.0, for severe abnormality

These 6 signs are characterized into two further categories. The former three is associated with “hind foot,” however; the other three are interrelated with “midfoot.” For hind foot the deformity is associated with “severity of posterior crease, rigidity of equinus and

emptiness if heel.” For mid-foot the deformity comprises of “curvature of lateral border on foot, position of the lateral part of the head of the talus and severity of medial crease.” So a person can receive scores according to the type of deformity of the hind foot and mid foot at a range of 0-3 for each problem. Thus a complete number of 0-6 is set for a single person having such issues.

Microsoft excel was used as a storing application and “Statistical Package for the Social Sciences (SPSS)” for the analysis of data according to the statistics. “Mean and standard deviation” were used for the constant data.

The comparison of the treatment group with anthropometric and Pirani score was investigated by using a “paired t test.” A p value of less than 0.05 is seemed to me important for statistical examination.

Results

During the period of study, 65 percent patients with “Talipes foot” attained the standard. Just 32 patients were present for this survey. Half of which were males and half were females. The average age was about 4.5 years. The patient with smallest age was 12 months old and the patient with the largest age group was 8 years old. Malay race participated in this study in maximum proportion which was about 65%, after which Chinese come which were 25%, other population includes about 10%. From the given study, the results show that the patients who were affected bilaterally were 35% and the patients who were affected left side unilaterally were 39% and those with a right unilateral defect comprised of 26%.

Out of 30 patients, 13 patients were treated with “serial casting” and 17 were given surgical treatment. 2 out of 13 patients were passed through “defaulted treatment” due to economic issues. Both of these patients were followed for the whole study period and were resorted to General Hospital for further operative therapy.

When it was evaluated, no noteworthy variation was seen in “post-treatment Pirani deformity score.”

The table shows the treatment comparison between different groups.

Comparison of mean Pirani severity score between surgically treated and traditionally treated patients:

Sr. No	Surgery	Conservative	P value
Pirani score	0.42±0.56	0.6±1.28	P >0.05 (P=0.6)

The anthropometric results of this comparison between the two studies are given in the following table:

	Surgery	Conservative	P value
Difference in leg length	0.71±0.81	0.228±0.41	p>0.05
Difference of mid leg circumference	2.56±1.45	0.71±0.81	P<0.05
Difference of foot length	0.87±0.36	0.33±0.35	P<0.05
Difference of mid foot circumference	0.52±1.30	0.24±0.25	P>0.05

The average difference between mid-leg circumferences in both the groups was about 2.56 and 0.71 respectively. In the same way the difference between the lengths of the foot was 0.87 and 0.33 respectively. There was no remarkable difference noted in the length of the leg and the circumference of the foot.

Discussion

The number of males and females in this survey were equal and resembled to the study of Boo and Ong.³ The number of males is greater in the study of Lavy.¹⁸ The greatest proportion of males was seen in the study of Alexander which was about 3:1.¹⁹ Wallander²⁰ studies

have a ratio of 2.5:1 and Carey,²¹ has a proportion of about 2:1.

The most eminent race in our study was of Malay as reported by Boo and Ong.³ As Malaysia has Malay as a majority race proportion, this study also reflects the racial distribution in these cities.

Chung et al²² reports the variation of Talipes among the Hawaiians as a prominent feature than in Caucasians. In the study of Byron et al²³ the presence of CTEV was reported to be more prominent in “maternal aboriginal” in comparison to other South Australian races.

In this given study, the maximum cases reported were belonged to unilateral; this result resembled with the analysis of Byron²⁵ and Wallander²² which contained unilateral cases greater than half. The other studies show the more the proportion of bilateral cases as compared to unilateral cases.^{3, 20} Boo and Ong³ reported more left sided unilateral deformities while Byron²⁵ and Wallander²² reports more right sided unilateral deformities.

Until the age of 9 months, all the patients were firstly treated with serial casting. The patients, after that time period were treated with “open soft tissue release.” No noteworthy deviation is noticed in the whole case study. The major difference is seen in the degree of “calf atrophy” of operationally treated patients. This result can be due to the resistance to serial casting.

Conclusion

An evident difference is seen in the foot length and calf atrophy in operationally treated clubfoot patients and traditionally treated patients. For non-resistant patients, the traditional system is preferred while in resistant cases, the operation is a preferred treatment.

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Patients with Fibromyalgia”, *IJMACR-* September - October - 2020, Vol – 3, Issue -5, P. No. 120 – 124.

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How to citation this article: Dr. Ammad Javaid Chaudhary, Dr Beenish Javaid, “Association of Body Mass Index with Symptom Severity and Quality of Life in