



Soft Tissue Release for Neglected Clubfoot: One-year Clinical Outcome

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ABSTRACT

Background. Neglected clubfoot is the most common congenital problem leading to locomotor disability. Eighty percent children with clubfoot deformity are born in developing world and the majority do not have access to appropriate medical care. The severity of clubfoot may be assessed with a variety of methods; i.e Pirani scoring system. This study use Pirani scoring system to evaluate the clinical outcome of neglected clubfoot patients one year after soft tissue release. **Method.** A study of 17 patients who underwent soft tissue release in Harapan Hospital a year before. We compare Pirani score before and one year after soft tissue release. Other data submitted are age, reason of delayed treatment, term of prosthesis, and complication after surgery. **Result.** The 17 patients were 10 females and 7 males; the average age was 69.06 ± 49.15 months old. Deformity in left foot was in 13 feet (59.1%) and right foot was in 9 feet (40.9%). The average total Pirani Score before soft tissue release is 5.43 ± 1.03 and one year after soft tissue release is 0.30 ± 0.40 , $p < 0.0001$ ($p < 0.05$). This result shows significant improvement one year after soft tissue release. **Conclusion.** Soft tissue release for neglected clubfoot resulted in significant Pirani score improvement after one year.

Keywords: Neglected clubfoot, Pirani score, soft tissue release

ABSTRAK

Latar Belakang. *Neglected clubfoot* merupakan masalah kongenital yang paling sering menyebabkan disabilitas lokomotor. Tingkat keparahan *clubfoot* dapat ditentukan dengan beberapa metode, antara lain sistem skor Pirani. Salah satu tata laksana *neglected clubfoot* adalah *soft tissue release*. Studi ini mengevaluasi keluaran klinis pasien *neglected clubfoot* menggunakan sistem skor Pirani satu tahun setelah *soft tissue release*. **Metode.** Studi pada 17 pasien yang telah menjalani *soft tissue release* satu tahun yang lalu. Skor Pirani sebelum dan satu tahun setelah *soft tissue release* dibandingkan. Data lain meliputi usia, alasan terlambatnya tata laksana, *prosthesis* yang digunakan, serta komplikasi pasca-operasi. **Hasil.** Rata-rata pasien berusia $69,06 \pm 49,15$ bulan, 10 perempuan dan 7 laki-laki. Sejumlah 13 deformitas didapatkan pada kaki kiri (59,1%), 9 deformitas pada kaki kanan (40,9%). Rata-rata skor Pirani sebelum *soft tissue release* adalah $5,43 \pm 1,03$, sedangkan rata-rata skor Pirani satu tahun setelah *soft tissue release* adalah $0,30 \pm 0,40$. Hasil ini menggambarkan peningkatan signifikan skor Pirani ($p < 0,0001$). **Simpulan.** Keluaran klinis pasien *neglected clubfoot* dinilai menggunakan skor Pirani meningkat signifikan satu tahun setelah *soft tissue release*. **Husnul Fuad Albar. Keluaran Klinis Neglected Clubfoot Satu Tahun setelah Soft Tissue Release**

Kata kunci: *Neglected clubfoot*, *Pirani score*, *soft tissue release*



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INTRODUCTION

Clubfoot is the most common congenital deformity in children; many can not access medical treatment, leading to neglected cases since 80% of them born in low and middle income country.^{1,2} Poverty, lack of awareness, lack of appropriate medical resources in accessible locations resulted in treatment that is either not initiated or incompletely performed.¹⁻⁴ Neglected clubfoot is the most common congenital problem leading to locomotor disability. Soft tissue release is one of the techniques used for correcting clubfoot; it is preferred for cases that do not respond to conservative treatment or are neglected.¹⁻³ Pirani score has been developed and used to describe the deformity in clubfoot. It has been validated and has a good interobserver

reliability.^{3,5,6} The aim of this study is to evaluate the clinical outcome of neglected clubfoot patients using Pirani scoring system one year after soft tissue release.

METHOD

An observational study of the Pirani score assessment before and one year after soft tissue release on 17 patients (22 feet). The inclusion criteria were clubfoot patients older than 1.5 years of age and underwent soft tissue release a year before, has a complete Pirani Score pre-operative data and consented to this study. The other recorded data were age, the reason of delayed treatment, term of prosthesis and complication after surgery. Ethical clearance was given by The Health Research Ethical Committee, Medical Faculty,

Sumatera Utara University/ Haji Adam Malik General Hospital Medan, Indonesia.

Data were analyzed with paired t-test; predicting variables for the postoperative Pirani scores were assessed with linear regression model.

RESULT

Data in February 2018 recorded 17 patients (22 feet) with neglected clubfoot underwent soft tissue release one year before. Ten patients were female and seven were male; the youngest was 18 month-old and the oldest was 204 month-old, the average was 69.06 ± 49.15 month-old. The clubfoot is in the left foot in 13 patients (59.1%); in the right foot in 9 patients (40.9%). The reason of delayed

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treatment is due to lack of information in 10 patients (58.8%), financial reason in 6 patients (35.3%) and inadequate therapy in 1 patient (5.9%) (Table 1).

The most common soft tissue procedure was

posteromedial release in 18 feet (81.8%), other procedures were posteromedial release and tendon transfer in 3 feet (13.6%) and Achilles tendon lengthening in 1 foot (4.5%). Patients' compliance to orthosis was quite high; 11 patients (64.7%) followed the protocol, while

6 patients (35.3%) did not. Most patients (14 - 82.3%) did not have complication after the procedure; wound infection was found in 2 patients (11.8%) and pain in 1 patient (5.9%). (Table 2)

The mean total pre-operative Pirani score of 22 feet was 5.43 ± 1.03 , mean hindfoot contracture score was 2.73 ± 0.53 and mean midfoot contracture score was 2.71 ± 0.55 . One year after soft tissue release, the mean total post operative Pirani score was 0.30 ± 0.40 , mean hindfoot contracture score was 0.00 ± 0.00 and mean midfoot contracture score was 0.30 ± 0.40 (Table 3).

Statistically there is a significant difference in clinical outcome among patients with neglected clubfoot one year after soft tissue release ($p < 0.0001$).

The total pre-operative Pirani score was moderately correlated with age ($r = 0.180$; $p < 0.05$). One year post operative there is a correlation between age and total Pirani score. Using Pearson correlation test, the r value = 0.180 meant a positive correlation between variables.

DISCUSSION

The preoperative Pirani score in our study was comparable to other studies in neglected clubfeet; Laurenc⁷ found neglected clubfoot in 24 feet in 17 patients with a mean age of 3.9 (1.2-9.0) year-old, all have severe deformity with a Pirani score 4 and 5. Banskota, *et al*, also found 66 feet with neglected clubfoot in 42 patients with a mean of age 7.4 (5-10) years, had severe deformity with mean Pirani score 5.1 (3-6).⁸ Singh, *et al*, found 28 neglected clubfoot with Pirani scores ranging from 5 to 6 in a mean age of 4.2 years (3.4-5.2).⁹

More female (58.8%) and affected left feet (59.1%) was registered in this study. In Mejabi, *et al*, male patients is more common than female.¹⁰ While worldwide data showed that the prevalence of clubfoot in male children are twice as compared with in females.¹¹

The reason of delayed treatment is mostly due to lack of information (58.8%), while according to Penny the obstacles were poverty, lack of awareness, and lack of appropriate medical resources in accessible locations.¹²

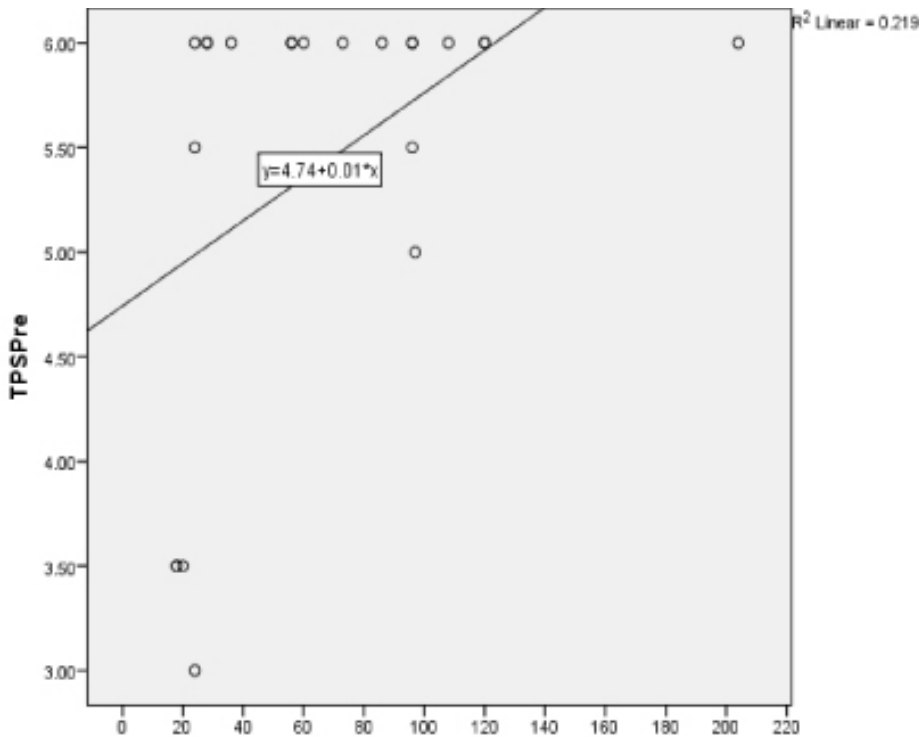


Figure 1a. Plot correlation between age and pre-operative Pirani score.

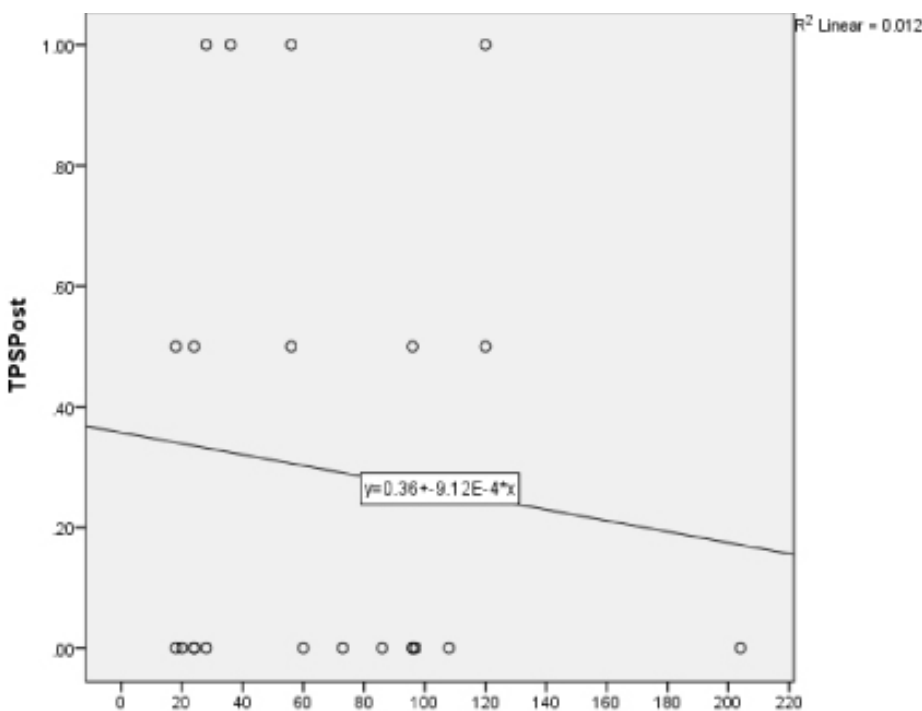


Figure 1b. Plot correlation between age and Pirani score one year post soft tissue release.



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Table 1. Characteristics of patients.

Variable	n	%
Sex		
Female	10	58.8%
Male	7	41.2%
Involved Limb		
Left	13	59.1%
Right	9	40.9%
Reason of Delayed Treatment		
Financial	6	35.3%
Lack of Information	10	58.8%
Inadequate Therapy	1	5.9%

Table 2. Type of procedure, term of orthosis conformity and complication of surgery

Variable	Cases (n)	Percentage (%)
Type of Procedure		
Posteromedial Release	18	81.8%
Posteromedial Release & Tendon Transfer	3	13.6%
Achilles Tendon Lengthening	1	4.5%
Orthosis Conformity		
Follow the protocol	11	64.7%
Did not follow the protocol	6	35.3%
Complication After Surgery		
No complication	14	82.3%
Pain	1	5.9%
Wound Infection	2	11.8%

Table 3. Pirani score

Variable	Mean Pirani Score	
	Preoperative	Postoperative
Hindfoot	2.73 ± 0.53	0.00 ± 0.00
Midfoot	2.71 ± 0.55	0.30 ± 0.40
Total	5.43 ± 1.03	0.30 ± 0.40

We found significant improvement in total Pirani score after soft tissue release done in the average age 69.06 ± 49.15 months old patient. Penny stated that soft tissue release is the most common surgical procedure in younger children up to approximately 4 years of age. In older children, osteotomies are often required as well.²

The majority of 17 neglected clubfoot patients who underwent soft tissue release do not have any complication; two patients had wound infection. Faldini et al found scar tissue is more common than wound infection.¹²

In this study, the compliance rate of wearing prosthesis is 64.7% with average of 9.59 ± 4.17 months. The compliance is a crucial factor for the development of the correction and to prevent the recurrence of the deformity.

CONCLUSION

Soft tissue release for neglected clubfoot resulted in clinical significant improvement as measured by Pirani score. Soft tissue release is effective treatment for neglected clubfoot.

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