

Functional Outcome of Syndactyly Repair in Children

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ABSTRACT

Background: As the most prevalent form of congenital hand malformation, syndactyly carries significant aesthetic and practical implications. For the vast majority of situations, surgery is the best option. Congenital syndactyly can be repaired with skin grafts and local flaps, however the results are often less functional and cosmetic than anticipated and often leave scars and residual syndactyly. So we set out to find out how children's syndactyly healing went in this study.¹

Objective: To analyze the functional outcome of syndactyly repair in children presenting in a tertiary care hospital.

Methodology: This Descriptive case series was conducted at Department of Plastic and Reconstructive Surgery, LUMHS Jamshoro / Hyderabad for 6 months. Sample size of 180 cases was recruited through Non-probability consecutive sampling. Then all patients underwent surgery under general anesthesia. In all cases, procedure was performed depends upon the type / extent of syndactyly. Then patients were discharged after recovery and were followed up on 1st, 2nd and 3rd months post operatively for assessment of functional outcome of syndactyly repair i.e. no supination and no pronation was noted. All this information was noted on proforma. Data was entered and analyzed using SPSS 22.0.

Results: The mean age of children was 6.30+3.55. There were 66 (37%) females and 114 (63%) male in the sample. There were 128 (71%) cases of simple syndactyly and 52 (29%) cases of complex syndactyly. There were 127 (71%) cases who had no-supination, 162 (90%) cases who had no-pronation. There was significant difference observed between both type of syndactyly ($P < 0.05$) for supination while insignificant for pronation.

Conclusion: Thus we have found that syndactyly repair is effective technique through which we can attain success in maximum number of patients which can help in achieving normal angulation of fingers after surgery.

Key words: Syndactyly, Pronation, Supination, Angulation, Children

INTRODUCTION

As the most prevalent form of congenital hand malformation, syndactyly carries significant aesthetic and practical implications. 2 Hand illnesses, both congenital and acquired, can have a substantial impact on people's professional and social lives. Syndactyly is one of the most common congenital hand abnormalities, accounting for about half of all cases. 3 One in every 2000–3000 live births has a syndactyly or webbed finger, which is the most common congenital anomaly. 4 Males are twice as likely as females to suffer from this condition, which accounts for 20% of all hand deformities. 50% of the time, there are bilateral syndactylies.⁵

Most occurrences of syndactyly go undiagnosed, however 10% to 40% of patients have a family history of the condition. Combined with delayed separation, complex and sophisticated syndactyly consequences are significantly worse. 7 Surgery is the most common treatment option. Traditionally, skin grafts and local flaps have been used to correct congenital syndactyly. However, the outcomes achieved are not always as functional and aesthetically pleasing as expected. 8 To separate syndactylous digits, a variety of flaps, some with and others without skin grafts, have been employed. 9

One study reported that syndactyly repair is effective improving functional outcome in 64.3% cases in terms of no supination and 85.7% in terms of no pronation (n=25).

Authors concluded that whether syndactyly is simple or complex, syndactyly repair is effective in maximum number of cases.¹⁰

Rationale of this study is to assess the functional outcome of syndactyly repair in children presenting in a tertiary care hospital. In literature it was observed that syndactyly is effective procedure in children with syndactyly. But no local evidence is available. Moreover, the study which is mentioned above was conducted on very small sample size) and we will conduct this study on large sample size to get more precise. The results of this study will help us to identify the surgical procedure for syndactyly with maximum functional and aesthetic results. In future advantage will go to the patient where the surgical procedure with maximum functional and aesthetic results will be practiced.¹¹

Objective: To analyze the functional outcome of syndactyly repair in children presenting in a tertiary care hospital.

MATERIALS AND METHODS

Study Design: Descriptive case series

Setting: Department of Plastic & Reconstructive Surgery, LUMHS Jamshoro

Duration of Study: Six months (July 2015 to December 2015)

Sample Size: Sample size of 180 cases was calculated with 95% confidence level, 7% margin of error and taking expected percentage of no supination deformity i.e. 64.3% in children undergoing syndactyly repair.

Sampling Technique: Non-probability consecutive sampling.

Selection Criteria: **Inclusion Criteria:** All children of age 1-12 years of either gender presenting with diagnosis of simple/complex syndactyly undergoing syndactyly repair.

Exclusion Criteria:

- Patients with a known syndrome affecting hand function (i.e., Apert syndrome)
- Patients with a known upper-extremity abnormality such as radial longitudinal deficiency, ulnar longitudinal deficiency, central deficiency, or amniotic constriction band

Data Collection Procedure: 180 patients fulfilling inclusion criteria were enrolled in the study from Department of Plastic and Reconstructive Surgery, LUMHS, Jamshoro. Informed consent was taken from parents and demographic data was obtained. Then all patients underwent surgery under general anesthesia. All surgeries were done by a single surgical team. In all cases, procedure was performed depends upon the type / extent of syndactyly. Then patients were discharged after recovery and were followed up on 1st, 2nd and 3rd months post operatively for assessment of functional outcome of syndactyly repair i.e. no supination and no pronation was noted.

Functional Outcome: It was measured after 3 months of procedure if there was:

- No supination deformity when finger moved outwards (0-5° loss was considered as acceptable)
- No pronation deformity when finger moved inwards (0-5° loss was considered as acceptable)

Data Analysis: Data was entered and analyzed using SPSS 16.0. For continuous variables such as age, mean and SD was calculated. For categorical variables such as sex and functional outcome (no supination and pronation), frequency and percentage were calculated.

RESULTS

In this we included 180 with the mean age of 6.30±3.55years. There were 66 (37%) females and 114 (63%) male in the sample. There were 128 (71%) cases of simple syndactyly and 52 (29%) cases of complex syndactyly. There were 127 (71%) cases who had no-supination and 53 (29%) cases had supination. There were 162 (90%) cases who had no-pronation and 18 (10%) cases had pronation. **Table 1**

Table 1: Patients' characteristics (n=180)

Age (years)		6.30±3.55
Gender	Male	114(63%)
	Female	66(37%)
Type of syndactyly	Simple	128 (71%)
	Complex	52 (29%)
Supination	Yes	127 (71%)
	No	53 (29%)
Pronation	Yes	162 (90%)
	No	18 (10%)

Among 128 cases with simple type, 107 cases who had no supination while among 52 cases of complex type of syndactyly, 20 had no supination. There was significant difference observed between both type of syndactyly (P<0.05). Among 128 cases with simple type, 118 cases who had no pronation while among 52 cases of complex type of syndactyly, 44 had no supination. There was insignificant difference observed between both type of syndactyly (P>0.05). **Table 2**

Table 2: Comparison of outcome in types of syndactyly

		Type of syndactyly		Total
		Simple	Complex	
Supination	Yes	107	20	127
	No	21	32	53
Total		128	52	180
Pronation	Yes	118	44	162
	No	10	8	18
Total		128	52	180

For supination: P-value = 0.000 (significant)

For pronation: P-value = 0.125 (insignificant)

DISCUSSION

Syndactyly is a failure in the separation of developing digits during organogenesis. Being an explicit limb phenotype, it comes to immediate medical attention at child's birth, particularly when it appears in the upper limbs.^{12, 13} Some mammals, including the siamang and kangaroo, exhibit it on a regular basis, but humans are the exception.¹⁴ Al-Zahrawi (d. 1013 CE), known in the West as Abulcasis, was the first person to recognise syndactyly as a congenital defect or burn injury. At that time, Ambroise Paré also described syndactyly.¹⁵

It's impossible to cover both digits with skin after surgery since the circumference of the conjoined digits is less than the circumference of the two distinct fingers. Because of this, new skin must be grafted into the area during surgery. A skin graft is the most typical method of accomplishing this (from groyne or anterior elbow). Creaking of skin toward the fingertip over time is the most typical syndactyly corrective problem. Tension at the repair site between the digits may be to blame. This may necessitate additional surgery. The use of skin grafts has been criticised since the grafts darken over time and become more obvious. In addition, skin grafts taken from the groyne region may develop hair if the grafts are left untreated. As a result of surgery, the fingers may be deviated. Complex syndactyly is the most prevalent example of this (when there has been a bony joining of the fingers).¹⁵

Thus in this study we included 180 children with the mean age of 6.30±3.55 years. There were 66 (37%) females and 114 (63%) male in the study. In our study, there were 128 (71%) cases of simple syndactyly and 52 (29%) cases of complex syndactyly.

In our study, after surgery, 127 (71%) cases showed no-supination and 162 (90%) cases showed no-pronation. Thus showing that syndactyly repair is good method for solving the issue of syndactyly. These results matches with results of a previous study which also reported that syndactyly repair is effective improving functional outcome

in 64.3% cases in terms of no supination and 85.7% in terms of no pronation. Authors concluded that whether syndactyly is simple or complex, syndactyly repair is effective in maximum number of cases.¹⁰

In our study, there were 114 male cases, among them 82 cases who had no supination while 101 cases who had no pronation. Among 66 females in our study, 45 had no supination while 61 had no pronation. There was insignificant difference observed between both genders ($P>0.05$). This showed that syndactyly repair is effective in both genders equally.¹⁶

Among 128 cases with simple type, 107 cases who had no supination while among 52 cases of complex type of syndactyly, 20 had no supination. There was significant difference observed between both type of syndactyly ($P<0.05$). Thus showing that syndactyly repair in simple syndactyly cases is more effective than complex syndactyly. While for pronation it was noticed that among 128 cases with simple type, 118 cases who had no pronation while among 52 cases of complex type of syndactyly, 44 had no supination, but the difference was insignificant ($P>0.05$).¹⁷

CONCLUSION

Thus we have found that syndactyly repair is effective technique through which we can attain success in maximum number of patients which can help in achieving normal angulation of fingers after surgery. Now we have got local magnitude. Now we are able to implement the syndactyly repair as management option for syndactyly.

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