

Early Correction of Incomplete Syndactyly by Simple Longitudinal Incision: A Prospective Study

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ABSTRACT: Forty-nine cases of incomplete distal simple syndactyly of the hands and feet in 14 patients, ages 1 day to 8 months were treated by simple longitudinal incision. The hand was involved in 84 per cent and the foot in 16 per cent. The long and ring fingers were the most commonly involved (34 per cent). The period of follow-up ranged from 3 months to 3 years. The parameters for evaluation included: (1) recurrence (2) cosmesis (3) deformity and (4) function. The results of the procedure were good to excellent. This technique may offer a great deal more than the traditional wait and graft approach. It is simple, uncomplicated and can be done at the nursery or on an outpatient basis without the risk of anesthesia.

INTRODUCTION

Syndactyly or fusion of two digits is the most common congenital anomaly of the hand, occurring once in every 2250 births¹. In a local study, Montalban, et al² cited a prevalence of 1 per thousand births. Involvement is bilateral and symmetrical in 50 per cent of cases. The most frequently involved digits are the long and ring fingers; followed by the little and ring fingers; the long and index fingers; and least frequently, the thumb and index fingers. Males are affected twice as often as females³. McCollum⁴ reported that 35 per cent of patients with webbed fingers also had affected toes.

Syndactyly is a result of failure of differentiation between adjacent digits during the 6th to 8th week of intrauterine life. Its occurrence is generally sporadic; but all known types of genetic transmission have been observed. It may be associated with other malformations and syndromes such as Apert's syndrome and Poland's syndrome. The incidence of syndactyly is very high in congenital constriction band syndrome¹.

The classification of syndactyly is based on the presence or absence of bony fusion and the degree of webbing^{1,3,5}. Present

methods of correction of syndactyly combine the order principles of Zeller (1810) who devised triangular dorsal flaps, Lenander (1891) who utilized free skin grafts and Pieri (1920) who recommended Z-shaped incisions. The techniques however, may vary from the straight incisions of Barsky⁶ to the zig-zag and wavy incisions of Bauer, et. al⁷ and Skoog. The flap formed by all of these zig-zag incisions are triangular^{8,9} or a single dorsal rectangular flap^{6,7,8}. These methods are designed to break up the straight line pull on the digits and subsequently reduce or eliminate scar contracture.

The objective of this paper is to present an operative technique that aims early uncomplicated correction of incomplete distal simple syndactyly of the fingers and toes.

MATERIALS AND METHODS

Forty- nine incomplete distal simple syndactyly of the hands and feet in 14 patients seen by the senior author at the Philippine General Hospital during an 11-year period between April 1979 to June 1990 were included in the study. Gestational, family and maternal obstetrical histories of each patient were reviewed and a preliminary x-ray of the hands and feet involved were taken. Only newborns (1 to 28 days) and infants (29 days to 1 year) were included in the study. Complex and simple complete type of syndactyly were excluded.

Operative Technique:

The operative sites were prepared with povidone iodine antiseptic solution. No anesthesia was used. The intervening band of skin was simply incised longitudinally, followed by application of direct pressure over the raw surfaces of the wound for hemostasis. Sterile dressing was applied to keep the digits separated until the wound healed by secondary intention. When three or more adjacent digits were involved, the operations were staged a week apart. The patients were followed up

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weekly until complete wound healing occurred and once two months thereafter.

RESULTS

Of the cases treated, there were three males and eleven females. Their ages ranged from 1 day to 8 months with a mean age of 1.6 months. The hands were involved in 41 cases (84 per cent) and the feet in 8 cases (16 per cent). In the hand, the long and ring fingers were the most commonly involved (34 per cent), followed by the index and long fingers (29 per cent). The thumb and index; and the ring and little fingers were the least involved, and about equal in frequency (Table 1).

Table 1.
Site of Involvement (41 cases)

Location	No.	Percentage
Long-ring fingers	14	34%
Index-long fingers	12	29%
Ring-little fingers	8	20%
Thumb-index fingers	7	17%
TOTAL	41	100%

Seventy-nine per cent presented with an abnormal gestational history. Eight had a history of maternal drug intake during the first trimester of pregnancy. Two patients had a history of maternal illness; and 1 patient gave a history of manipulation to effect an abortion. All patients had associated congenital anomalies in the form of equinovarus deformity (9), congenital amputation (4), Streeter's dysplasia (3) and complete syndactyly (2). All of these occurred singly or in combination; with clubfoot and congenital amputation as the two most frequently associated anomalies.

The period of follow up ranged from 3 months to 3 years. The patients were evaluated based on (1) recurrence, (2) cosmesis, (3) deformity, and (4) function. Wound healing occurred within 3 to 10 days depending on the length of the syndactyly. The average duration of healing, however, was one week. No case of infection was noted. There was a recurrence in one case wherein the dressing was removed before complete healing took place. Cosmesis was excellent. This was based on the quality of the scar and the distensibility of the skin. There were no deformities noted, either due to redundant tissue or contractures. Function was evaluated based on the passive range of motion of the joints. In all cases the range of motion was full.

DISCUSSION

For most congenital anomalies of the hand and foot, there seems to be no urgency to operate until growth is sufficient to allow exacting surgery.² In syndactyly however, the timing of surgery is important, and this depends largely on the fingers involved and the degree of completeness and complexity of the deformity. The objective of surgery in syndactyly is to separate the webbed fingers so that they can spread normally, and to improve function and appearance¹.

The technique presented in this study provides early uncomplicated separation of the digits to permit unimpeded growth. This is especially important for peripheral digits of unequal length in order to prevent lateral deviation and flexion contracture of the longer finger^{1,5}. Traditionally, these are separated between 6 months to 1 year of age. Syndactyly of the long and ring fingers pose no urgency since they are almost equal in length. One usually waits until the child is 2 or 3 years of age^{1,3,5} before doing surgery. The techniques of Lenander (1890), Bauer (1956), Cronin (1956) and Skoog (1966) give excellent results; but are difficult to perform in the newborn and infants.

Cohen¹⁰ (1987) reported the use of simple excision in newborns; however, closure was achieved with absorbable sutures under local or general anesthesia. Magnification of 3.5 x was utilized. In the present study the intervening soft tissue was simply incised without anesthesia and allowed to heal by secondary intention. We allow an interval of 1 week for multiple digit involvement because of the possibility of ischemia if both the radial and ulnar digital blood supply is disturbed. It is important that the raw surfaces of the wound be kept separate with a dressing material until complete healing has taken place to prevent reapproximation, as was noted in the single failure in our study.

In the same study by Cohen¹⁰, the good cosmetic and functional results are attributed to the biochemical nature of newborn skin which has a higher content of type III collagen than in infants. In our study however, the good results were comparable for the newborn and infant groups.

The main limitation of the study was the relatively small sample size and the lack of a more quantitative assessment of distensibility, contraction rate and scar quality. We therefore recommend that the procedure be tried in a bigger population of newborns and infants with more quantitative modes of assessment. Nevertheless, as shown by the study this technique may offer a great deal more than the traditional wait and graft approach. It is simple, uncomplicated and can be done at the nursery or on an outpatient basis without the risk of anesthesia.

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