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CONGENITAL SYNDACTYLY : AN ANALYSIS OF 20 CASES*

A. KRISHNAN

SUMMARY

20 cases of congenital syndactyly seen during the last 3½ years at the Command Hospital, Pune have been analysed, elucidating the types of the anomaly confronted, the sex incidence and the associated anomalies/syndromes. The reconstructive procedures performed on these patients are being presented whereby restoration of hand function was achieved in more than 90% of the cases.

The incidence of syndactyly is consistently high among congenital hand anomalies, vying for first place with polydactyly. Syndactyly, more than any other anomaly, is not restricted to its own category but is widespread throughout the entire spectrum of congenital limb anomalies as an associated problem (Dobyns et al., 1982). The associated anomalies constituting syndromes at times appear more significant than the syndactyly itself, but indication for surgical correction of syndactyly is often expedient (Gesell et al., 1940) in such cases to restore hand function, regardless of other treatment needs.

This analytical study of a series of congenital syndactylous malformations of the hand highlights the frequency of web involvement, incidence of different types of syndactyly, sex distribution and frequency of occurrence of associated anomalies (Swanson, 1976). The variety of reconstructive procedures required to achieve correction in these cases will be discussed.

Material and Methods

The 20 cases studied at the Plastic Surgery Centre, included children and dependents of Armed Forces Service personnel and ex-servicemen as well as civilians hospitalised through the authorised civil O. P. D. of Command Hospital. (S. C.), Pune during the 3½ year period from January 1984 to July 1987.

The diagnosis of different types of syndactyly found amongst the various patients in this series was established by careful clinical evaluation, with radiological confirmation wherever indicated.

Observations

The incidence of different types of syndactyly amongst the cases studied is shown in Table I. "Simple Incomplete" syndactyly was the most common condition found (Fig 1.)

Table I. Analysis—Classification

Type of syndactyly		Number of cases	Percentage
I	Simple		
	A. Incomplete	7	35%
	B. Complete	5	25%
II	Complex	5	25%
III	Complicated	3	15%
	Total	20	100%

The sex distribution and age of presentation for treatment are given in Table II. As the majority of cases hailed from rural areas of our country with conservative customs and superstitions maintained by their parents/guardians, a significant percentage of patients in this series sought treatment during late childhood/adolescence when their schooling or marital prospects were at stake. Male preponderance was obvious (70%) in the study.

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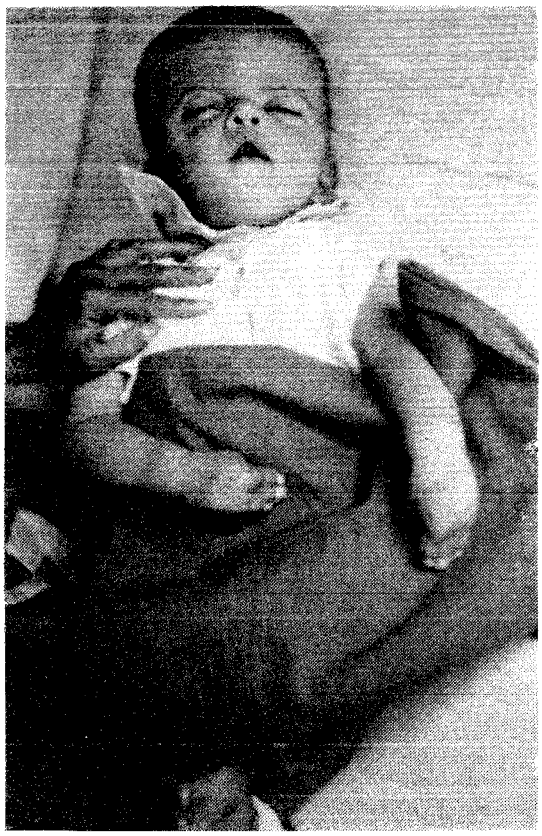
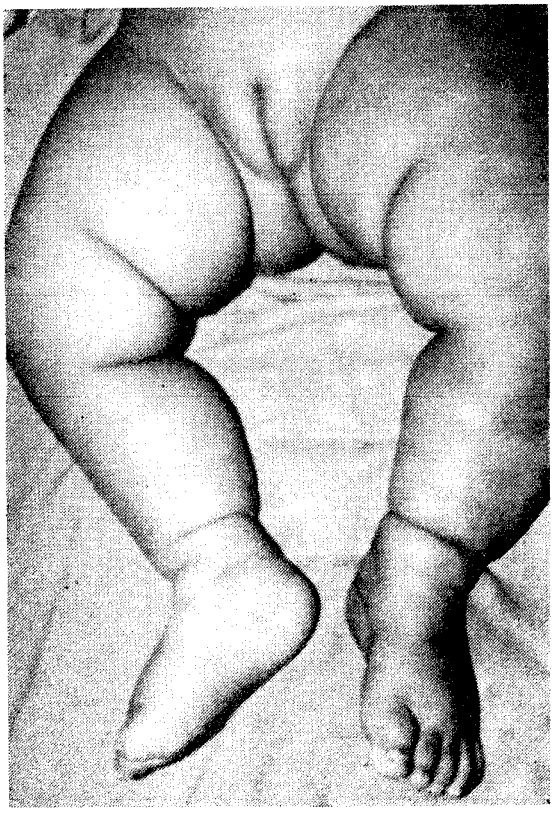


Fig. 2. Syndactyly as a component of Poland's Syndrome.

← Fig. 1. Syndactyly as a component of Apert's Syndrome.



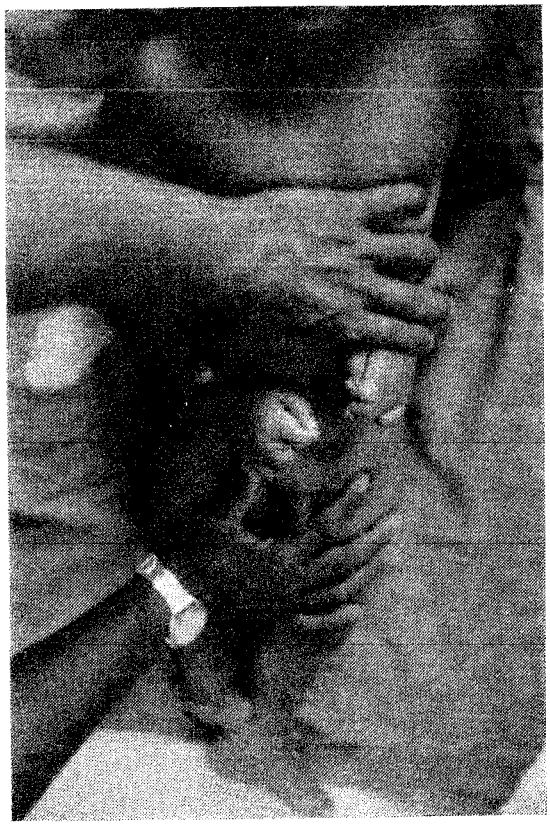


Fig. 4. Syndactyly associated with "Congenital Annular Constriction Band Syndrome".

← Fig. 3. "Congenital Annular Constriction Band Syndrome" ("Constriction Ring Syndrome").

Table II. Sex Incidence/Age of Presentation

Age at which patient presented for treatment	Males	Females
Less than 2 years	3 (15%)	1 (5%)
2 years to 5 years	6 (30%)	3 (15%)
More than 5 years to 10 years	2 (10%)	1 (5%)
More than 10 years to 15 years	2 (10%)	1 (5%)
More than 15 years	1 (5%)	Nil
Total	14 (70%)	6 (30%)

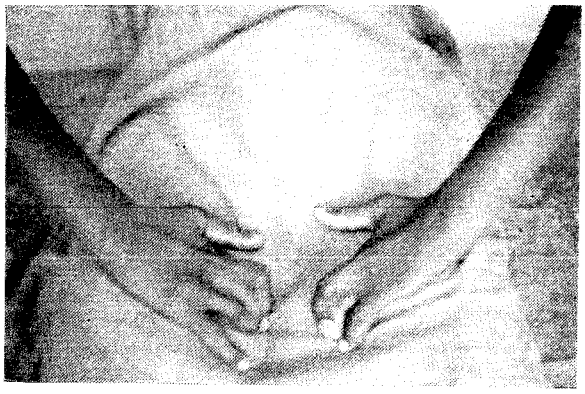


Fig. 5. Bilaterally symmetrical syndactyly.

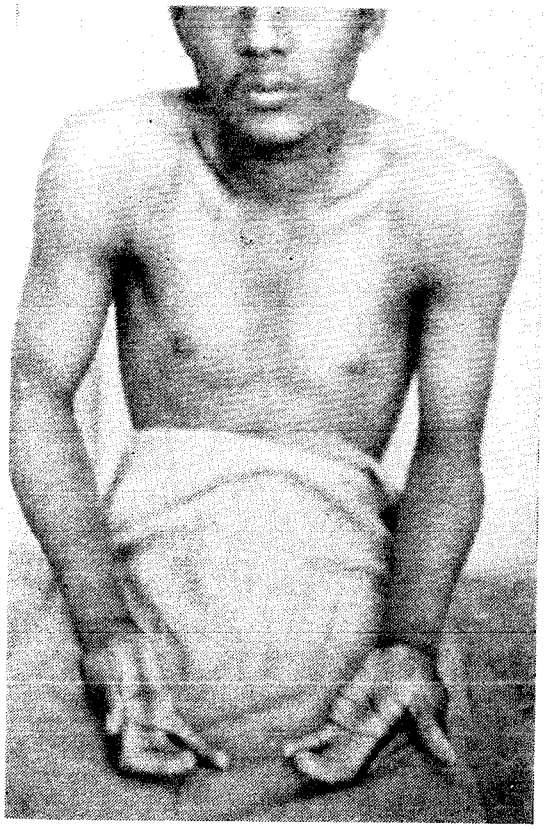


Fig. 6. Bilaterally symmetrical syndactyly.

Table III shows the web spacc/digits involved amongst the patients in this series. Syndactyly between the middle and ring fingers resulting in restriction/obliteration of the third space was the most common anomaly found in this series. Associated congenital anomalies (Table IV) were observed in 13 cases (65%). Fig. 1 shows a 2 yr. old male child suffering from Apert's syndrome. Fig. 2 depicts features of Poland's syndrome in an adolescent boy presenting relatively late for release of his congenital syndactylous digits. Fig. 3 demonstrates syndactyly with "Congenital Annular Constriction Band Syndrome" in a female infant. Fig. 4 shows the same associated anomaly in a $1\frac{1}{2}$ yr. old male. Bilaterally symmetrical syndactyly (Figs. 5 & 6) was evident in 9 patients (45%) of this study.

Table III. Web Space/Digits Involved

Web Space Involved		Number of cases	Percentage
	Between		
First Web	(Thumb & Index)	4	20%
Second Web	(Index & Middle)	4	20%
Third Web	(Middle & Ring)	7 (+2*)	35% (+10%*)
Fourth Web	(Ring & Little)	5 (+1*)	25% (+5%*)

*As associated web space involvement in case of Complicated/Complex Syndactyly.

Table IV. Associated Congenital Anomalies

	Associated Anomaly	Number of cases	Percentage
1.	Apert's Syndrome	2	10%
2.	Poland's Syndrome	2	10%
3.	Annular Constriction Band Syndrome (Congenital Constriction Ring Syndrome)	6	30%
4.	Other Congenital Skeletal & Visceral Anomalies	3	15%
5.	Not associated with any disorder	7	35%

Operative procedures

In the majority of cases, a broad proximally based triangular dorsal flap extending from the knuckle region to a level of two-thirds of the length of the proximal phalanges bordering the web distally (Bauer, 1956) was employed to pass between the separated fingers and form the reconstructed commissure by approximation with a transverse palmar incision flap. This procedure combined with limited marginal skin grafting was adequate for cases of simple incomplete syndactyly. However, complete syndactyly demanded interdigitating 'Z' flaps distally beyond the proximal reconstruction described above (Cronin, 1956). Resultant linear zig-zag striped areas of lateral digital skin deficiencies required skin grafting for resurfacing (Kelikian, 1974).

In 4 patients of complete syndactyly with limited and tight dorsal skin between the involved fingers, a dorsal and a palmar flaps were used to form the commissure.

Double opposing Z-plasty, called a "butterfly flap" (Flatt, 1977) was used for web reconstruction between fingers in 3 patients having tight and relatively short interdigital webbing.

Conclusion

The frequency of web involvement was highest in the third web, followed by the fourth web, second web and lastly the first web. Bilaterally symmetrical syndactyly was observed in almost half the number of cases. The majority of the cases in this series had associated anomalies. Pre-operatively, whatever be the type of syndactyly, insufficient skin was the common problem.

Where secondary deformity existed from disproportionate length in fingers tethered together too long, the fascial tissues including retinaculum, tendon sheaths and joint ligaments were the tightest and most deforming static structures. The most common problem seen in complex syndactyly was anomalous interconnection of tendons, both flexor and extensor, with the interconnections extending distally throughout the length of the digit along with abnormalities of the neurovascular bundles. Bone anomalies ranged from completely normal bones in size, position, configuration and number to helter-skelter skeletal assemblages.

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The Author

LT. COL. A. KRISHNAN, A.M.C., M.S., M.N.A.M.S., F.I.C.S., M.Ch. (Plastic), *Reader & Senior Specialist*, Reconstructive Plastic Surgery Centre, Command Hospital, Armed Forces Medical College Complex, Pune-411040.

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LT. COL. A. KRISHNAN, A.M.C., No. 77, Krishna-Kunj Kanaiya Society, 2393, General Thimayya Road, Pool Gate, Pune-411001.