

**DORSOLATERAL FLAP FOR VOLAR CONTRACTURES**

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**SUMMARY**

*The dorsolateral flap from the same finger was used in 30 cases for resurfacing of the volar surface after release of contracture. It was observed that it is a versatile local flap for resurfacing of finger defects.*

**Key Word :** Flaps, Contractures.

The skin and soft tissue obtained from the hand itself is superior to the skin from elsewhere in the body for resurfacing hand defects. Based on this principle various types of local rotational & transpositional flaps have been described by different authors, which includes, V-Y advancement flap by Kutler (1947), cross finger flap Gurdian et al (1950) which was later modified by Cronin (1951) & Curtis (1957); flag flap of Vilain & Dupuis (1951); volar advancement flap by Snow (1967) & Kein (1969); rotation flap of Lenden's (1971); dorsolateral finger flap of Joshi (1972); transposition flap by Mac Dougal (1976); Gibrael flap (1977) for resurfacing flexion contracture; traspositional flap for release of volar contracture by Green & Dominguez (1979).

All these local flaps give good results but they have their own limitations as well. Sometimes the scar contracture on the volar aspect of the finger produce special problems like exposure of long lengths of the tendon after release of contracture, and use of flaps become mandatory in such situations.

The skin from the dorsolateral surface of the finger can be used as a flap because of the presence of dorsal branches of the digital vessels and nerve which can easily be included in the pedicle of the flap (Johnston & Whilis, 1954).

This paper describes the use of dorsolateral skin flap as described by Joshi (1972) & Green et al (1979) in a more wider way.

**Material & Method**

This study was undertaken in the Department of Plastic Surgery S.S.K.M. Hospital, Calcutta, from January, 1986 to January, 1990. A total of 20

patients ranging in age from 3 years to 60 years, of either sex presenting with finger contracture following burn (thermal or electrical) or injury, were included in this study. Dorsolateral finger flaps were used only in fingers where tendon got exposed and bared of paratenon after release of contracture. The fingers which were resurfaced by other methods, i.e. Z-plasty, skin grafting, or distant flaps were excluded from this study.

Out of 20 cases, 8 were children & rest were adults. Right hand was involved in 10 cases, left hand in 6 cases & both hands, in 4 cases. Duration of involvement was from 6 months to 15 years. The extent of involvement of different joints are shown in (Tab. I) Eight cases had ring and little finger involvement. Middle finger was involved in two cases. The whole length of finger was involved in 21 cases where extent of involvement was from M.P. to D.I.P. joint.

If the joints were stiff, preoperative X-Ray of the hand, and physiotherapy was advised. After admission for operation routine investigations were carried out which were within normal limit in all the cases. Then the cases were prepared & put up for surgery.

Brachial block anaesthesia was used for surgery. Mobility of the joints and extent of contracture were reassessed under anaesthesia. Tourniquet was used in all the cases. Silk loop stitches were applied at the distal end of fingers for maintaining traction while doing surgery. The flap is first drawn on the ulnar side of the finger extending from the M.P. joint level or more proximal MP crease to PIP or DIP joint or distal to it as per requirement of the length of the flap. In case of the little finger the flap is always taken

from the radial side as ulnar side is the pressure bearing area.

The length of the flap available is 2-2.5 cm for M.P. involvement, 4-5 cm for PIP & 6-7.5 cm for DIP involvement in an average adult hand. The width of the flap is more proximally and gradually tapers distally.

From the volar margin of the flap relaxing incisions are made perpendicularly on the crease line of MP, PIP or DIP (Fig-I A & B) which are made across the full width of the finger to allow division of scar tissue & straightening after release. After release of scar, the finger is made straight and lengthening of the tendon is assessed at this stage, and measurement of the defect both in longitudinal and transverse axis is made.

As per transverse axis of the defect the dorso-lateral incision is now completed. The flap is now raised along a plane between superficial & deep fascia. The base of the flap is mobilised sufficiently to allow it to be rotated on to the volar surface.

The donor site defect is covered by free skin graft. The flap is now rotated and placed on the volar raw area and sutured along the margin of the defect by 4/0 interrupted silk stitches (Fig II C & D).

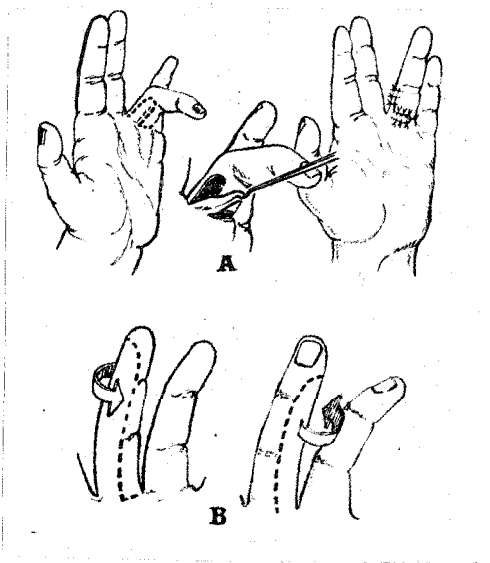


Fig. 1. Schematic Diagram Showing—(A) D.L. flap for M.P. cover, (B) Area of skin for transposition of D.L. flap.

This flap can also be used if based distally. Out of 30 fingers, in two fingers, the flaps were elevated on distal base due to scarring near the proximal base. In rest of the 28 cases proximally based flaps were used. After completing the operation dressing and POP cast were applied on the dorsal surface of the hand. Details of types of cover and results are shown in (Tab. II.)

The only disadvantage of the flap is that, when whole of the volar surface of the finger requires resurfacing after release of contracture, this flap does not reach the tip of the finger, which requires resurfacing by free skin graft along with dorso-lateral flap.

The post operative periods were uneventful in all the cases. Stitches were removed within 10-14 days. The cases were discharged with advice of active finger exercises. Use of splintage was advised in late cases where tendon shortening was present.

Out of the 30 flaps, tip necrosis occurred in 4 cases. 3 of these required secondary skin grafting and one case healed following repeated dressings.

In 17 cases (Tab-II) skin grafting was necessary along with dorsolateral flap for two raw areas, near the base and lateral side of the tip of the flap. Result was good in 26 cases.

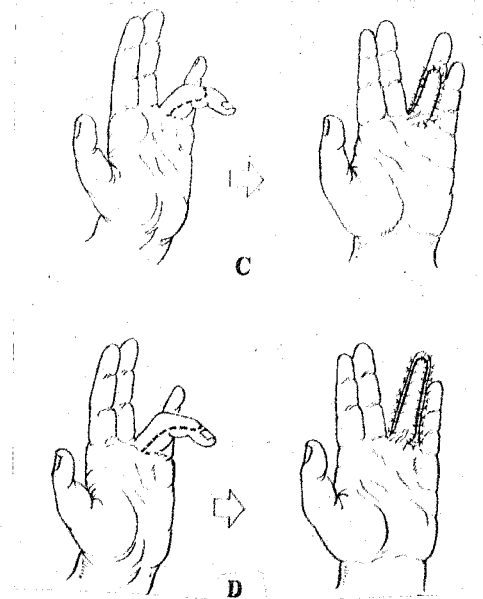


Fig. 2. Schematic Diagram Showing—(C) D.L. flap for P.I.P. cover (D) D.L. flap for D.I.P. cover



Fig. 3. Pre-operative photograph showing contracture of fingers.

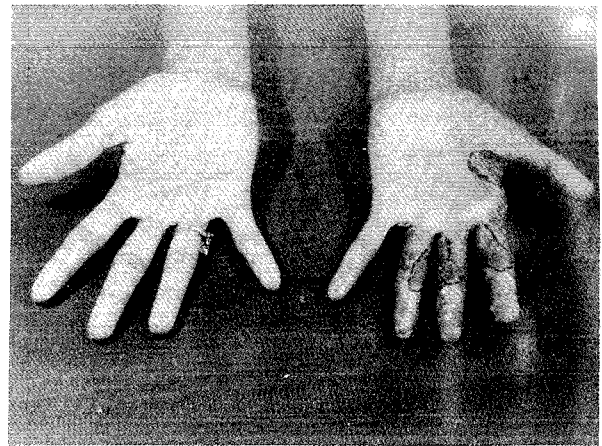


Fig. 4. Post-operative photograph after flap cover.

Table I. Number & Extent of Involvement of Different Fingers

	FINGER INVOLVED	No	EXTENT OF INVOLVEMENT		
			M P	MP-PIP	MP-DIP
One	Index	4	1		3
	Middle	2			2
	Ring	3	1	1	1
	Little	6		1	5
Two	Ring + Little	8		3	5
Three	Middle + Ring + Little	3	2		1
Four	Index + Middle + Ring + Little	4			4
Total		30	2	7	21

These cases were followed up from 6 months to 5 years. There was no functional disability and no recurrence of contracture (Fig. 3 & 4).

#### Discussion

Dorsolateral finger flap is a multipurpose flap for resurfacing the finger defect. This procedure has been performed in 30 finger (20 patients) with good result in 26 fingers. The amount of correction of the deformity obtained was better than with other methods (free graft & distant flap). Recurrence of contracture was nil. This technique can be used in multiple finger contracture at a

time. It is a one stage procedure. Prolonged immobilisation is avoided, keeping the joints free and mobile.

Dorsolateral flap is a neurosensory flap and provides satisfactory perceptive ability. It provides good padding over the palmar surface of the hand.

This type of flap can be based either proximally or distally and may be used to resurface volar or dorsal surface of PIP jt. or commissure (Mac Dougal 1976). It can be elevated safely on distal base as random pattern flap. Only difference is that the mobility of the distally based flap

Table II. Type of Cover &amp; Results in 30 Cases

	Finger Involved	D.L. FLAP		D.L. FLAP + Skin Grafting	RESULT	
		Proximal Base	Distal base		Good	Tip Necrosis
One	Index	2		2	4	
	Middle			2	1	1
	Ring	2		1	3	
	Little	3	1	2	5	1
Two	Ring + Little	1	1	6	7	1
	Three					
Three	Middle + Ring + Little	3			3	
	Four					
Four	Index					
	Middle + Ring + Little			4	3	1
	Total	11	2	17	26	4

is less than the proximally based flap as more redundant skin is available near the base of the finger. The proximally based flap can also be used as island flap based on digital neurovascular bundle (Mac Dougal, 1976).

### Conclusion

The technique of using dorsolateral flap from the same finger to resurface the defect in finger contracture has been described. It is a good flap and is superior to other usual methods. No recurrence of the contracture has been observed during the long follow up.

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