

## THE RANDOM PATTERN DE-EPITHELIALIZED TURN OVER FLAP

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### SUMMARY

*Random pattern de-epithelialized flap has been used in 23 cases as resurfacing procedure and its scope has been evaluated in elective as well as in emergency situations.*

### Introduction

In clinical situations where there is exposed bone, bare tendon, bare cartilage, and exposed neurovascular bundles, split thickness skin grafting is not indicated. Such raw areas require flap cover. The random pattern de-epithelialized turn-over flap is a safe, simple, one stage procedure and appears to be, a better alternative to local rotation or transposition flaps particularly in technically difficult situations like lower 1/3 of leg. In the present paper we have tried to evaluate its scope in situations where other local flaps can not possibly be used.

### Review of Literature

Hynes (1954) showed that a piece of whole thickness skin, from which epithelial surface has been removed, will take readily as a free graft if turned upside down before being placed on the recipient bed. The under surface of such a dermis will often accept a split skin graft. Hynes attributed its survival on relatively avascular defects to the fact that comparatively large vessels in the deepest part of dermis become smaller towards the surface and thus increase the chance of link up. Clodius and Smahel (1973) reported a transfer of de-epithelialized island of skin and fat from the calf of one leg to the sole of other foot. Maurice and Sharma (1975) have used a partly de-epithelialized turn over cervical flap to repair pharyngocutaneous fistula. Leonard (1980) has used axial pattern (Deltopectoral

flap) de-epithelialized turn over flap for chest wall reconstruction. Random pattern de-epithelialized turn over flap from adjacent area has been used by various workers (Thatte, R. L. 1981, 1982, 1983, Mahler, D. & Yanai, E., 1981) to resurface the defects that need flap cover.

### Material and Methods

Twenty three patients from different age groups have been included in the study (Table I). Prior to operation thorough clinical evaluation and relevant—haematological, radiological and bacteriological examinations were done. The length of follow up extended from 3 months to two years.

### *Design and Technique of elevation of the flap*

The markings of the flap are shown in Fig. 1. Suppose the raw area of width X, for its resurfacing requires a reverse dermal flap of size 'Z'. 'Z' will be equal to 'X' + Y<sub>1</sub> + Y<sub>2</sub>. 'Y' is the width of the pedicle. It is half or one-third in width of the area 'X' depending on the vascularity of the area from where the flap is being planned. The marked flap is de-epithelialized by Silverman's skin grafting knife (Fig. 2, 3, 4). The skip areas are dermabraded. The flap X + Y<sub>1</sub> is raised taking care not to raise Y<sub>2</sub> through which the blood supply of the flap is maintained (Fig. 5). The flap is then turned over to cover the raw area and fixed in place by 3/0 catgut sutures with a drain

underneath the flap. The resultant raw area (reversed side of the flap and donor area) is covered by split skin graft (Fig. 6, 7). If the wound is large or the shape of wound is Triangular/L-shaped, multiple flaps can be used to resurface the defect (Fig. 8).

### Observations

Patients of either sex between age group of 20-50 yrs. were selected for the study. For smaller defects single flap has been used but for larger defects and L-shaped or Triangular defects, multiple flaps were required. The

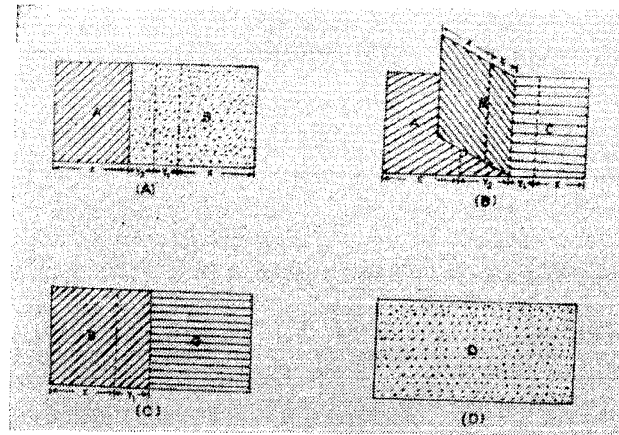


Fig. 1. Design of the random pattern de-epithelialized turn over flap.

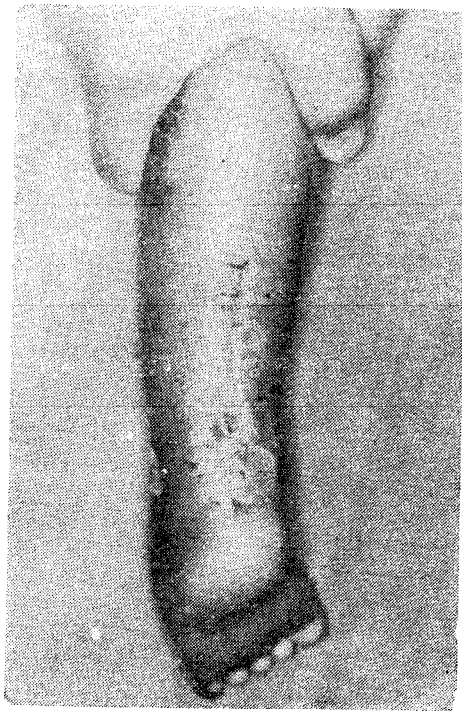


Fig. 2. Photograph showing exposed tendoachilles after surgical correction of CTEV.

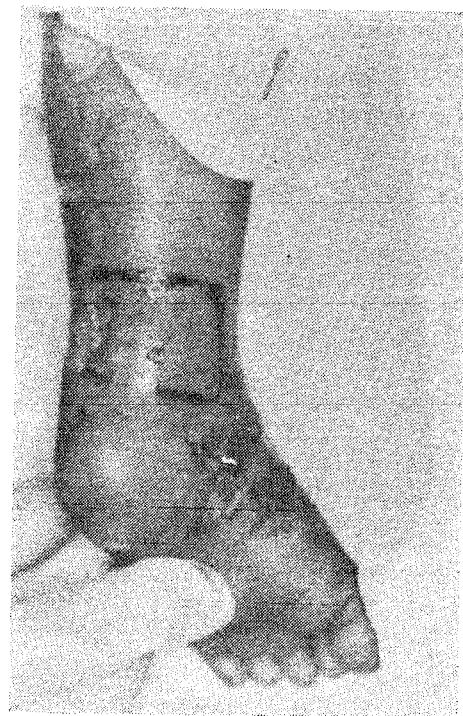


Fig. 3. Depiction of the flap markings.

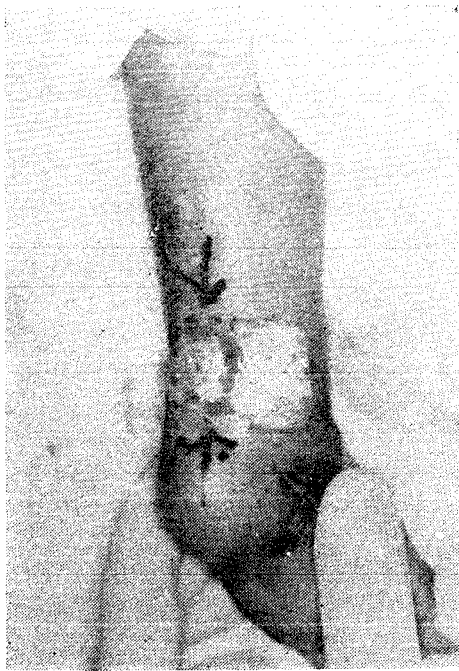


Fig. 4. The flap after de-epithelialization.

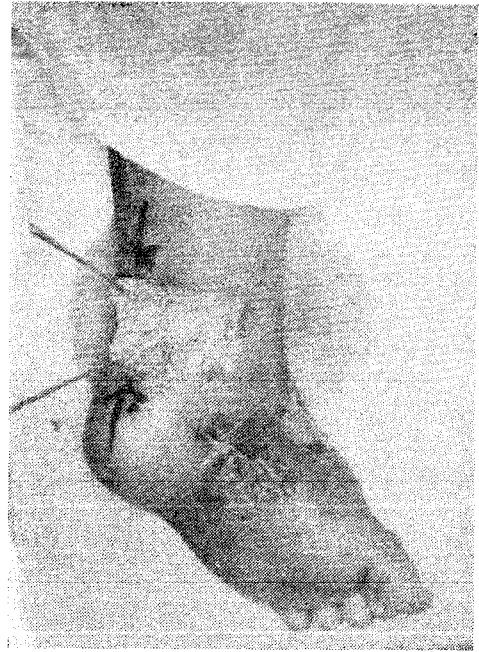


Fig. 5. The flap has been raised and turned over the exposed tendoachilles.

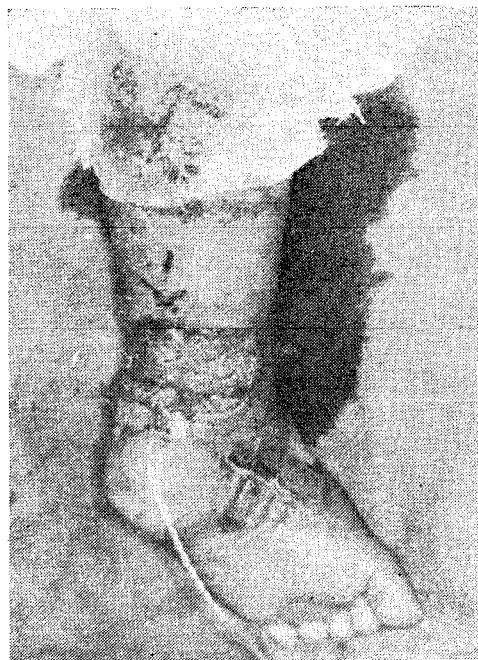


Fig. 6. Immediate post-operative photograph of the same patient shown in Fig. 2.



Fig. 7. Post-operative photograph after 3 weeks.

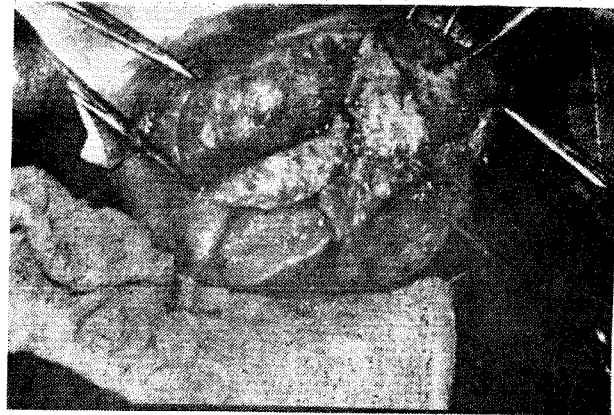


Fig. 8. Photograph showing three de-epithelialized turn over flaps, used to cover a sacral sore.

length breadth ratio was 1:1 or less in all the cases. The minimum size of the pedicle was not less than one third of the wound. The largest wound which we have resurfaced by single flap was  $9 \times 5$  cms. in dimensions. This wound required  $9 \times 9$  cms. flap on 2 cm. wide pedicle. We have used this flap to resurface three smaller sized sacral sores and a case of trochanteric sore. All cases were of traumatic

paraplegia and hence did not require anaesthesia. The maximum size of the sore (sacral) which was operated was of size  $8 \times 6\frac{1}{2}$  cms. Six wounds of various size and shapes required two flaps and one L-shaped wound required three flaps to cover it. The successful take of the graft over the donor site and turn over flap was excellent in twenty cases but in three instances only 10-20% of graft survived. Three

Table I

S. N.	Indications	No. of Cases	Anaesthesia	Elective/ Emergency Procedure
1.	Exposed bone after compound fracture of tibia & fibula	9	G.A.	Elective
2.	Pressure sores	4	NIL	Elective
3.	Post surgical raw area	3	G.A.	Elective
4.	Secondary gap produced as a result of contracture release	2	G.A.	Elective
5.	Traumatic soft tissue loss (Over dorsum of hand)	2	L.A.	Emergency
6.	Miscellaneous			
	(i) Salvage operation (Exposed tendoachilles)	2	G.A.	Elective
	(ii) Exposed bone due to Chr. osteomyelitis of upper end of tibia	1	G.A.	Elective
TOTAL		23		

patients had post-operative haematoma which was managed by mechanical evacuation and low pressure suction. Marginal necrosis of the flap and infection was noticed in two cases.

### Discussion

The pattern of blood supply to skin and various skin flaps has been discussed by Daniel and Williams (1973). Random pattern flaps derive their blood supply mainly from the perforating musculocutaneous vessels. In random pattern de-epithelialized turn over flap, even after the flap is turned over these vessels do not twist or kink. In places where local flaps have their own limitations, a random pattern de-epithelialized turn over skin flap fashioned from the surrounding area (Thatte, 1981, Mahler and Yanai, 1981, Thatte, 1982; Thatte, 1983) provides a safe, single staged and simple solution. Thatte (1981, 1982, 1983) and various other workers have used this technique to resurface exposed bones, raw areas after contracture release, traumatic soft tissue loss and as a salvage procedure with minimal complications (Table II). Similar to Thatte, in our study also this technique has proved to be an excellent procedure. Sometimes because of large size or peculiar shape (Triangular or L-shaped) of the wound, resur-

facing by a single turn over flap is not possible. In these cases we have successfully used more than one de-epithelialized turn over flaps from surrounding areas. For the first time, we have used this flap to resurface small size pressure sores in cases of traumatic paraplegia. The results are quite encouraging. They have stood the pressure effects well and have provided sufficient amount of cushion on the decubitus ulcer. We have not used this flap in head and neck area because of poor cosmetic results.

The success of de-epithelialized turn over flap has become a major break through in the field of flaps. It avoids staged procedures, long surgical session for microvascular skin flap transfer and use of rotation or transposition flaps in situations where its planning is technically not possible (Thatte, 1983).

### Conclusions

Random pattern de-epithelialized turn over flap is a safe, simple, one stage, versatile flap which can be used in any area of the body. It can be done as an emergency procedure under local anaesthesia. For larger defects more than one flap can be used to resurface the defect. It has been used to resurface pressure sores with good results.

Table II

Extended	Indications	Morris (1981)	Leonard (1980)	Thatte (1981)	Bhatnagar (1987)
1.	Comp. FR. B.B. Leg	—	—	✓	✓
2.	Hand Injury	—	—	✓	✓
3.	Salvage Operations	—	—	✓	✓
4.	Surgical Raw Area	—	✓	—	✓
5.	Secondary Gaps and Contracture Release	—	—	✓	✓
6.	Tr. Ac. Soft Tissue Loss	✓	—	✓	✓
7.	Osteomyelitis	—	—	—	✓
8.	Decubitus Ulcer	—	—	—	✓

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