

## Two-stage Random-Pattern De-epithelialised Turn-over Flap to Manage the Chronic Cavity of the Dorsum of the Foot

— Two Cases Reports —

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### = Abstract =

Chronic cavities of the dorsum of the foot often have bare bone and are unsuitable for free skin grafting. Local Flaps are often impossible because of surrounding scar tissue and dead space.

A simple method is presented; it consists of the excision of the lesion, filling the cavity by a two staged random - pattern de-epithelialised turn over flap, and skin graft.

**Key Words** : Flap, Random-pattern, De-epithelialized Turn-over.

### INTRODUCTION

Foot fractures with considerable overlying skin loss will usually need a skin flap cover to allow healing. The skin cover may be provided by local transposition flaps, distant flaps or by a free flap transfer. But local flaps are often impossible because of surrounding scar tissue and distant pedicle flaps are feasible, but carry well-known disadvantages.

Hynes<sup>1)</sup> showed that a piece of whole-thickness

skin, from which the epithelial surface had been removed, was taken readily as a free graft when it was turned upside down before being placed on the recipient bed.

This paper describes the use of two staged random-pattern deepithelialised turn over flap to cover and fill the cavity of the dorsum of the foot.

Two examples of this type of flap used on the foot are presented in this paper.

### CASE REPORTS

#### Case 1.

A 47-year-old man was admitted to hospital following an accident in a factory where a large beam

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fell on his right foot. In spite of 1 operation an ulcer developed and persisted for 2 months.

The partially healed ulcer was located distal and dorsal to the base of the fourth metatarsal bone. There was much surrounding scar tissue except for the lateral side of the cavity, which was fixed to the underlying bone. The ulcer was approximately 3 cm in transverse diameter and 2 cm in depth over the dorsum of the foot.

The ulcer had failed to heal following one attempt of a split-skin grafting and the cavity was considered suitable for two-stage random pattern de-epithelialised turn-over flap.

An area approximately  $5 \times 3$  cm was marked out on the lateral side of the ulcer and made a bipedicle delayed flap (Fig. 1).

**Fig. 1.** Dense scar over the dorsum of the foot with a cavity. An area of skin  $5 \times 3$  cm over the lateral aspect of the foot is marked out as a flap and de-epithelialised.

One week later the flap was then raised and de-epithelialised and turned over  $180^\circ$ , rolled and placed in the cavity, where it was secured by interrupted chromic catgut sutures (Fig. 2).

The turn-over flap and the adjacent secondary donor site were covered with a split-skin graft. Healing of the soft tissue wound was uneventful and the results after 14 days and six months later are shown (Fig. 3).

#### Case 2.

A man aged 27 was admitted with a post-trau-

**Fig. 2.** The de-epithelialised flap is raised, turned over and filled into the cavity. A split - skin graft is placed over the this flap and the adjacent donor site.

**Fig. 3.** One month after application of skin graft, showing satisfactory healing.

matic ulcer measuring approximately 2 cm in transverse diameter and 2.5 cm in depth over the dorsum of the foot.

A two staged de-epithelialised turn-over flap,  $2.5 \times 6$  cm in size was raised on the medial side of the foot to fill the defect using the identical technique.

The wound healed without any complication.

## DISCUSSION

Skin defects below the knee present difficult problems particularly when it occurs on the dorsum of the foot with cavity.

The dorsum of the foot is almost devoid of muscle, apart from the extensor digitorum brevis and the dorsal interosseous muscles, none of which

can be mobilized to any significant degree, although the former muscle has been used on occasion<sup>4)</sup>. The abductor digiti minimi and abductor hallucis muscles are well suited for coverage. However sometimes it is not possible to mobilize the abductor digiti minimi muscle to the cavity. The cross-leg flap and flaps from a distance may give good results in experienced hands but the disadvantages of these methods are well known..

A flap of acceptable proportions that easily survived elsewhere on the body soon became necrotic on the lower leg. For several decades, most textbooks have advised against the use of local flaps below the knee.

Although this is open to debate, if a pedicle flap is raised in two stages separated by a period of about 1 week, then a greater length will survive than if the flap had been completely elevated at the first operation<sup>2)</sup>.

In our cases, in order to get long local flaps, pedicle flaps were raised separately in two stages by a period of 1 week.

The studies of Thatte<sup>5)</sup> showed that de-epithelialised turn over flaps were able to offer a useful solution to the cover of complicated defects using local tissue in a one-stage operation. The flap was particularly useful in the upper third of the leg and its main attraction was its safety and simplicity.

In 1982 Thatte<sup>6)</sup> also showed that one-staged random-pattern deepithelialised "turn-over" flaps in the lower third of the leg appeared to be as useful and successful as in the upper third of the leg.

When de-epithelialised random pattern flap in turned over on itself to cover the skin defect, the paucity of subcutaneous blood vessels supplying the skin is striking. But the perforating and musculocutaneous vessels at the base of the flap are not kinked or twisted and the blood supply to the skin of the farthest

point of flap is assured by the intradermal anastomoses that remain unaffected by deepithelialisation.

The turn-over flaps described in this paper can be based adjacent to the pathological area as long as the base is placed over intact muscle even if the skin over this muscle is partly scarred.

The fate of the epithelial elements in the dermis gives cause for little concern. Peer and Paddock<sup>3)</sup> found that buried dermis in man did produce epithelial cysts but there were of microscopic size and the epithelium lining in them disappeared after a few weeks. No epithelial cysts developed in our cases up to 1 year after operation.

In conclusion, we consider the main advantages of this technique are its simplicity in concept and performance.

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= 국문 초록 =

## 190° 회전한 탈상피 국소피판을 이용한 만성 피부 결손의 치료 -2예 치험-

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족부에 만성 동공성 피부결손이 있을 경우 단순한 피부이식술로는 치료하기가 어렵다. 국소 피부판 이식술로도 주위의 반흔조직으로 인하여 좋은 결과를 얻지 못하는 경우가 많다.

저자들은 병변 부위를 제거 한후, 탈상피화한 국소 피판을 만든 후, 180도 회전 하여 결손 부위를 덮고, 피부판을 이식하는 간단하면서도 손쉬운 방법으로 좋은 결과를 얻어 이 방법을 문헌 고찰과 함께 보고하는 바이다.