

## USE OF STORED SRIN GRAFTS IN RESURFACING OF WOUNDS

(An experience of 100 cases)

*\*Lt Col J. C. Sharma*

Excision of extensive burns or granulating wounds cause extensive capillary haemorrhage. Considerable time is consumed to achieve haemostasis. Even with attention to meticulous details, results are often not very satisfying. The use of diathermy causes tissue necrosis and the recurrence of capillary haemorrhage under the graft during the time patient is coming out of anaesthetic hypotensive effect is not totally preventable. Further it is difficult to avoid shearing movement of the grafts on recipient bed while moving the patient.

A technique was looked for by which the above mentioned difficulties could be obviated. The key solution to the problem was successful storage of split skin graft in the era of power shortage with frequent breakdowns in power supply.

### Material and Method

Patients having thermal burns, electric burns, avulsion injuries and with other causes of skin loss admitted to plastic surgery unit of Command Hospital, Lucknow were studied. Under general anaesthesia excision of the slough or unhealthy granulations was done and saline dressing were applied. Split skin grafts were taken from thighs, legs, arms, abdomen or back of the patients. The grafts

were wrapped in vaseline gauze taking care to avoid contact between the raw surface of the graft and vaseline. This in turn was wrapped in moist saline gauze and put in side the wide mouthed sterile tubes. These tubes were corked and stored in the blood bank refrigerators at the temperature of 4°C. This refrigerator was chosen because of its automatic connexion with the power generator. Only in 10 cases the tubes were placed in side the wide mouthed thermos flask filled with ice, which also gives temperature of 4°C.

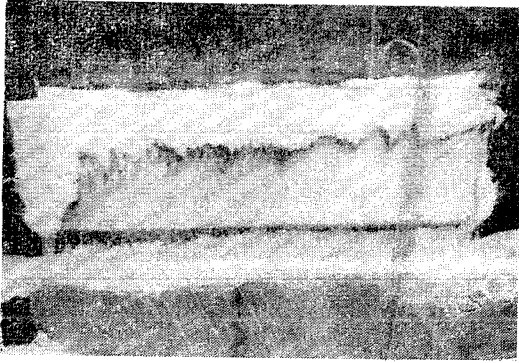
After 24 to 48 hours the dressing was opened and checked for any capillary oozing from the wounds. If the wound was dry, the skin grafts were spread over the recipient site. The graft was left exposed. Any collection under the graft was promptly removed by aspiration with needle and syringe. Antibiotics were used where necessary and the donor site was managed by leaving the dressing on till it separated by itself.

This technique has been used in 100 patients between Oct. 1977 and June 1980. Fig. 4 to Fig. 8 show some of the representative cases.

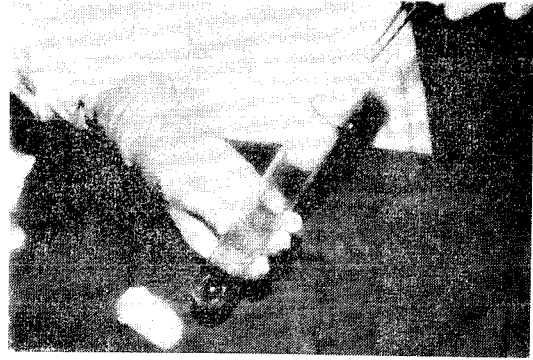
### Observations

One hundred patients were treated by this method between Oct 1977 and June 1980.

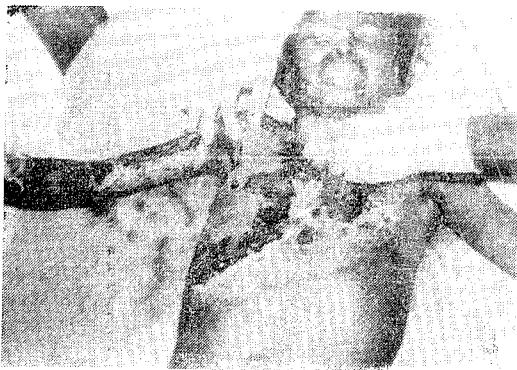
\* Classified Specialist (Surgery & Reconstructive Surgery)  
Department of Plastic Surgery & Burn Centre,  
Command Hospital (CC) Lucknow—226002.  
Paper read at Annual Conference Calcutta—December 1980



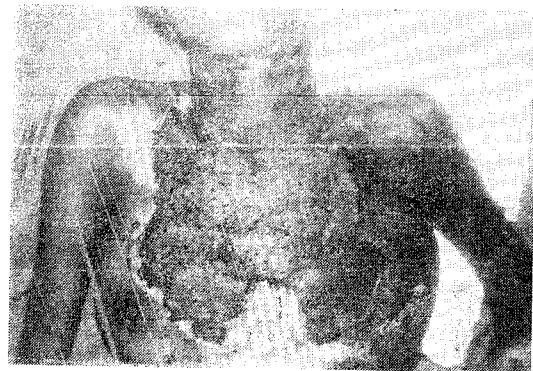
1. Split skin graft being covered with saline gauze



2. Split skin graft rolled in gauze being put in test tube.



3. Split skin graft being placed on recipient area by ward staff.



4. Grafts placed on anterior chest wall of a young female.

Our youngest patient was 3 years old and oldest 65 years. However the largest group was between 20–35 years, being a service hospital. There were 53 females to 47 males in this study and females mostly had thermal burns.

Etiological classification of skin loss in these patients is given in table No. 1. Thermal burns constitute the major group with 68 patients.

During the initial part of the study endotracheal general anaesthesia with gas and oxygen was administered. Later on "Ketamine" anaesthesia was used, since the whole procedure was very short.

**Table 1**

*Showing etiological classifications of skin loss in 100 patients.*

| Etiology of skin loss | No of cases | %    |
|-----------------------|-------------|------|
| Thermal burns         | 48          | 68%  |
| Electric burns        | 20          | 10%  |
| Avulsion injury       | 4           | 4%   |
| Other                 | 18          | 18%  |
|                       | 100         | 100% |

The procedure took 5 minutes to 30 minutes in these 100 cases for an average of 15 minutes. The cases where recipient site was healthy the time taken for operation was

understandably short because only skin grafts were taken. The desloughing of burns was done in parts and the areas desloughed had saline compress immediately, thereby reducing blood loss. No attempt was made to catch blood vessels unless some spurter was seen. This factor and also the non-application of graft at this operation considerably reduced the time of operations.

The blood loss was obviously less because compression dressings were applied immediately after desloughing.

The oozing of plasma should be cleaned at the edges of the graft, since this is a very potent media for bacterial growth. In some cases of complete graft loss the graft just floated on the recipient bed. In such eventuality we removed the graft, stored it and reapplied after 72 hours with reasonable success. The ward staff who laid on the graft took special interest in removing any collection from under the graft, since they were fully involved in these cases.

Incidence of graft take by this method is shown in table II. Of the four cases who had complete loss of graft 2 had streptococcus 'B' haemolyticus infection. In the other two cases the patients were unco-operative and could not stay in one position resulting in shearing between the graft and the recipient bed. The cases where graft take was less than 50% were, those having severe burns and grafting was done in presence of infection to provide biological dressing. The graft take between 50-79% was found in cases of long standing wounds, which had fibrotic beds and infection. Eighty to 100% graft take was recorded in those cases who had recipient sites over the trunk in majority of the cases. Possibly the stable recipient bed is responsible for such good results.

**Table 2**

*Shows the incidence of graft taken after this method*

| Percentage of graft take | No of cases |
|--------------------------|-------------|
| a. 80—100                | 68 (68%)    |
| b. 50--79                | 18 (18%)    |
| c. Less than 50          | 10 (10%)    |
| d. 0                     | 4 (4%)      |

### Discussion

Delayed skin grafting with stored split skin grafts has proved useful for resurfacing wounds (Gibraiel 1973); Rees and Hughes, 1975); Lehman and Saddawi 1975). It was found to be more practicable in the areas of body where application of dressing was difficult or the movements could not be controlled (Calnan Innes 1957). Better success rate for the wounds over the trunk, thigh, leg and foot was reported by Shukla, et al 1980. Our experience has been similar. Delayed split skin grafting has been found useful particularly for wounds face, trunk, axillae, neck shoulder, perineum and buttocks. Dressings over these areas are difficult to retain and there is inevitable graft movement under the dressings resulting in graft loss (Muir and Barclay 1962; converse and Brauer, 1964). It is the continuous contact between the graft and the recipient bed which is important for vascularisation and not the pressure (Laplace 1908). Rapid vascularisation of the graft occurs in 2 days old wound because capillary sprouts have already formed (Smahel 1971).

We have stored grafts at 4°C in the refrigerator of the blood bank, where continuous power supply was ensured. However for trial we had used the storage in wide mouthed thermos flask filled with ice. The results are similar but these thermos flasks do not take

more than 1 or 2 wide mouthed tubes containing skin, therefore, storage space is very limited.

Shearing between the graft and bed is unavoidable if the dressings are done in the operation theatre with patient anaesthetised. This is obviated by placing skin grafts on the wound with patient fully conscious and cooperative in the ward. During the operation the blood loss is reduced since the pressure dressings are applied immediately over the desloughed areas. This also saves operating time. No suturing is required for delayed grafting and no dressing are required. Thus, it is economical both on operation time and dressing material.

Involvement of the ward staff in the procedure itself ensure a bit of extra care about these patients.

### Conclusions & Summary

Stored split thickness skin grafts were for resurfacing wounds of various types in 100 cases. The grafts were applied in the ward after 24-58 hours delay and were treated by exposure method. The advantages claimed are a better take of the graft, reduced blood loss, and less operation time, economy in dressing and participation of ward staff in the management of these cases.

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