

Early Tangential Excision & Skin Grafting in Burn Patients

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The paper presents a study conducted in sixty patients divided in two equal groups of 30 patients each, in which a comparison between early tangential excision followed by skin grafting (Group I) and a conservative approach (Group II) was carried out and it was seen that in Group I patients, that the mean hospital stay reduced, the graft uptake rate was about 78%, the mortality rate was less and the chances of complications were comparatively less.

Key Words Early excision in burns,, skin grafting in burns, mesh grafting in burns.

This study was conducted in, to improve the treatment of burn victims of our society deviating from the traditional conservative policy. The idea behind this study was to reduce the misery of the patients and family in terms of physical injury, psychological trauma, economic loss, time lost from work, life time earnings cut short by deaths, and permanent loss of millions of productive years. Janzekavic's presentation in 1970 of large series of surgically treated patients set new stage for a new phase of interest in aggressive wound management¹. Partial thickness burns which by clinical judgement will not heal within two weeks are candidates for early excision and grafting². Full thickness burns particularly of large surface areas are treated safely and effectively by early excision and grafting. Early tangential excision and grafting of deep dermal and full thickness burns reduces the morbidity and mortality rates³. Superficial burns can be treated conservatively. The early removal of non-viable tissue reduces the risk of both infection and hypertrophic scarring⁴. However, it is expensive, in terms of resources and operating time and may involve major financial loss. Special funds were created to conduct this study.

Study Design

This study was prospective and was conducted in the West Surgical ward, Mayo Hospital, Lahore. Duration of study was from 8th July 1996 to 25th September 1997.

Material & Method

All the male and female patients with less than 50% of burns were selected. This study was conducted on sixty patients, divided into two groups.

Group I

The patients in this group underwent aggressive excision policy which is defined as excision between 1-5 days after injury⁵.

Group II

The patients in this group underwent excision at 14 days or after separation of eschar. This is conservative policy⁵.

The study contained questions regarding biodata, mode of injury, nature of injury, duration of injury, respiratory difficulty, cough or stridor etc. Clinical examination included recording of burn sheet which includes age of patient, extent of burns, degree of burns, location of burns, any inhalation injury and co-morbid factors. Detailed systemic examination was carried out investigations included haemoglobin levels, TLC, DLC, S/electrolytes, urine, x-ray chest, ECG. Surface swab

cultures and biopsy specimens were taken according to their indications.

Burns to vital areas ie. Hands, face and feet were given priority and early surgical excision and grafting was done to minimize scarring. Electrical and chemical contact burns were also immediately excised to avoid toxic systemic effects.

Stabilization during the initial 48 hours - the "burn shock" phase was achieved with attentive monitoring and volume resuscitation. Inhalation injury and respiratory insufficiency required mechanical ventilatory support. Burns wounds were cleaned regularly and anti-bacterial dressings applied to retard bacterial colonization and invasion of burn eschar. Banked blood components were arranged in a sufficient quantity to replace potential intra-operative losses. 25-50ml of whole blood was arranged for each percentage of body surface area to be excised.

General anaesthesia with inhalation agents, intravenous narcotics and a dissociative drugs were chosen according to the clinical status of patient. To avoid hyperkalaemia and sudden arrest, depolarizing muscle relaxants were avoided.

Specialized instruments were used for tangential excision and grafting. These included

- a) The Humby Knife
- b) Air driven dermatome
- c) The tonner mesher

Thin layers of eschar were removed to evaluate each serially exposed tissue plane for viability. Haemostasis was achieved by application of laparotomy sponges soaked in adrenaline solution (1:50,000). Large calibre vessels were suture ligated and small vessel bleeding was controlled by electrocautery. Mechanical mesh allowed expansion of the graft upto the required expansion. An expanded 3:1 and 6:1 grafts were chosen to cover recipient areas. To secure the grafts for optimum 'take' care was taken in application of multilayer bandage.

Post operatively bandages were removed on the 3rd day. Light dressings subsequently applied. Newly healed epithelial surfaces are kept moist and pliable by massage with mineral oil. Elastic garments applied to all the healed grafted areas to prevent contracture formation. These were renewed every 6-8 weeks and worn until wound maturation is complete.

Results

Results of the study were assessed in terms of

- a) Period of hospitalization
- b) Wound infection
- c) Mortality and morbidity

Period of Hospitalization
Group I. Aggressive Policy

n=	%age	Mean hospital stay (days)
5	(13.33%)	12 days
10	(33.3%)	15 days
15	(50%)	16 days

Group II Conservative Policy

n=	%age	Mean Hospital stay(Days)
15	(50%)	25
15	(50%)	30

Wound Infection

Group I

n=	Infecting organism	Graft Uptake
Initial 10 patients(33.33%)	Pseudomonas & Strept pyogenes	Graft uptake 60%
Subsequent 20 patients(66.6%)	Wound infected to milder extent	Graft uptake upto 85%

Group II

n=	%age	Graft uptake
20 patients	66.6%	Wounds healing contaminated & graft uptake of 30% Mean: 45%
10 patients	33.3%	Graft uptake upto 60%

Mortality and Morbidity

Group I

n=	Mortality	Morbidity
Initial 5 patients 13.33%	50%	All the surviving patients return to their work within 8 weeks time
Next 10 patients 33.33%	30%	Mean 33.3%
Subsequent 15 patients 50%	20%	

Group II

n=	Mortality	Morbidity
Initial 15 patients i.e 50%	60%	All the surviving patients return to their work within 20 weeks time
Subsequent 15 patients 50%	80%	Mean 70%

To sum up the results, mean hospital stay is reduced to half in Group I patients. However, risk of wound infection and mortality/morbidity is double in Group II patients, undergoing conservative policy.

Discussion

Early tangential excision and immediate mesh grafting therefore plays an important role in

- i) Converting the injury to a closed one
- ii) Decrease in hospital time

- iii) Healing is completed in less than three week and lessen by half the time the patient is incapacitated
- iv) Removal of non-viable tissue reduces a source of potential systemic sepsis especially in patients of more than 30% of burns.
- v) Excision and immediate grafting provides a better definitive covering for the healed wound
- vi) Early excision and grafting allow more rapid restoration of function and less long term functional loss.

It has been now a usual practise in U.K. over the past 5 years to proceed to early excision of the burn wound with immediate wound closure and skin grafting⁶. The rationale behind this approach is longer there is a significant unhealed area of burn, there is a chance of life threatening infection and continuing demands on metabolism⁷. Also quicker the wound is closed the shorter is the period of pain and distress for the patient⁸. Surprisingly, there is little published evidence that early excision decreases mortality, though most authorities would accept that morbidity is lowered. Early wound closure permits early rehabilitation with improved functional and come, it also reduces scarring. People having been using human allografts obtained from stain bank as a temporary skin cover, occasionally in case of a child parental skin can be used. A skin replacement substitute material composed of an inner layer of collagen which becomes incorporated into host tissue and an outer sialastic layer which is removed after 2-3 weeks and replaced by an ultrathin layer of autograft. However, the final long term results of this bilaminar material are still awaited. To sum up we emphasize that early tangential excision followed by skin grafting has brought us more than satisfying results and we advocate the use of this technique for all patients who have been burnt extensively.

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