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THIERISCH SKIN GRAFTING OF WOUNDS IN A GENERAL SURGICAL WARD

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ABSTRACT

OBJECTIVE: *The goal of this study was to evaluate the results of skin grafting in a general surgical ward.*
STUDY DESIGN: *A prospective observational study.*
PLACE AND DURATION OF STUDY: *This study was carried out in Surgical Unit of Ghulam Mohammad Maher Medical College Hospital Sukkur, from August 2006 to July 2009.*
PATIENTS AND METHODS: *All patients admitted to our unit who required split thickness skin graft were included in the study. A total of 75 patients, 57 males and 18 females were studied. Complete history, local, systemic and thorough general physical examination with relevant investigations carried out and recorded in a comprehensive Performa. Contaminated wounds were cultured and treated with dressings and wound cleaning under cover of appropriate antibiotic according to sensitivity reports.*
Grafts were taken from the thigh and arms wherever applicable, with Hamby's knife and even with shaving blade under general, spinal and local anesthesia depending upon requirement of each case. Most of the grafts were applied in small stamp shapes but some required sheets stitched with healthy skin to avoid slipping. Antibiotic cover practiced in therapeutic doses. The grafts at joints required POP splints and slabs. Dressings were routinely examined on 5th postoperative day.
RESULTS: *A total of 75 patients, 57 males and 18 females were studied. Most of the patients were between the ages 25 to 50 years of age. Degloving injuries and burns were the commonest cause of extensive wounds (64%), followed by various causes like fungating skin lesions and breast tumors. In 10 patients there was graft rejection due to infection. Patients with wounds in lower leg and especially around ankle (5%) were the most resistant. There was no mortality and the commonest complication was wound infection in 21 patients, Staphylococcus Aureus being the main organism. The mean hospital stay was 22.5 days.*
CONCLUSION: *To relieve the work load of plastic surgeon, the skin grafting can be performed by general surgeons. The spilt-thickness skin grafting is very useful method to cover the large wounds unable to close otherwise. The infection can controlled with vigilant approach and other modern methods should also be tried.*

KEYWORD: Skin grafting, Thierisch split skin graft, Surgical wounds, Burns.

INTRODUCTION

The surface of the skin is important as a biological layer for homeostasis. Restoring the skin surface is therefore critical even if underlying structures can wait later reconstruction. Epidermis regenerates from deeper follicular elements, with the most superficial layer losing vascularity and acting as a barrier to fluid loss and providing important protection against invasion by micro-organism. Skin loss may occur in full thickness burns, degloving and other injuries, necrotizing fasciitis, chronic ulcer, and after some surgery for tumors. Without skin, wound heals by secondary intention with fibrosis and contracture and underlying structure are vulnerable to necrosis, chronic infection and dysfunction. [(1)]. Early closure of the defect is the best if it can be achieved. Smaller sized wounds are dealt by suturing primarily or delayed primary and secondary suturing. Larger defect are best treated with autologous split thickness skin grafts. A number of surgical techniques are available for closing the soft tissue defects, ranging from skin graft to flaps [(2, 3)], skin substitute, tissue expansion, vacuum-assisted closure and implants and prosthetics.[(1,4,5,6)] The technique adapted depends upon the nature of the wound and the patient's general

condition [7,8].

Various methods of skin grafting have been in practice since the 19th century ranging from full thickness graft to split thickness grafts. In 1822 Bunger, again in 1830, Warren first successfully grafted autologous skin to a nasal defect [9]. Thierisch in 1886 devised a method of harvesting split thickness skin graft [8.10]. Thinner skin grafts take more reliably but tend to contract more.[9] The advantage of split thickness graft includes availability of large areas of donor site, convenient of harvesting, decreased chance of contractures and coverage of large defects. The disadvantages are: cosmetic inferiority, decreased durability and hyper-pigmentation [11, 12].

Civil Hospital Sukkur has been recently upgraded and attached to Ghulam Mohammad Maher Medical College and recognized by PM&DC as teaching hospital. Becoming a tertiary referral centre from upper Sindh population and adjacent areas of Punjab and Balouchistan, faces a big burden of patients with burn and large wounds who are unable to go to specialized units at Hyderabad and Karachi. This hospital does not enjoy the facilities of plastic surgery department so the general surgeons have been offering the services to patients requiring skin grafting. We, therefore, decided to evaluate our results of split-thickness skin grafting (Thierisch graft) to different wounds in a general surgical ward.

PATIENTS AND METHODS

All patients admitted to our unit from August 2006 to July 2009 who required split thickness skin graft were included in the study. A total of 75 patients, 57 males and 18 females were studied. Complete history, local, systemic and thorough general physical examination with relevant investigations carried out and recorded in comprehensive Performa. Contaminated wounds were cultured and treated with dressings and wound cleaning under cover of appropriate antibiotic according to sensitivity reports.

Grafts were taken from the thigh and arms wherever applicable, with Hamby's knife and even with shaving blade under general, spinal and local anesthesia depending upon requirement of each case. Most of the grafts were applied in small stamp shapes but some required sheets stitched with healthy skin to avoid slipping. Antibiotic cover practiced in therapeutic doses. The grafts at joints required POP splints and slabs. Dressings were routinely examined on 5th postoperative day.

Table # 1

AGE DISTRIBUTION

Age Group	Number of patients	%
10-20 years	09	12%
21-30 years	21	28%
31-40 years	27	36%
41-50 years	15	20%
51-60 years	03	4%
Total	**75**	100%

Table # 2

GRAFT FAILURE ACCORDING TO ETIOLOGY

Etiology	No of patients	Failure Cases	% age of failure
Trauma	12	01	8.33%
Burn	21	06	28.57%
De-gloving injuries	21	03	14.28%
Skin tumor excision	09	-	-
Fungating Breast tumor excision	03	-	-
Leg ulcer	06	02	33.33%
Necrotizing infection	03	-	-

Table # 3

COMPLICATIONS

Complication	Number of Patients
Wound infection	15
Seroma formation	02
Haematoma formation	-
Graft slippage	05
Graft failure	12

Table # 4

ORGANISM ISOLATED IN WOUND INFECTION CASES

Micro-organism	Number of Patients	%
Staphylococcus Aureus	07	9.33%
Pseudomonas Aeruginosa	01	1.33%
Klebsiella	01	1.33%
Streptococcus pyogenes	03	04%
E.Coli	03	04%

RESULTS

A total of 75 patients, 57 males and 18 females were studied. Majority of the patients belonged to the 21 to 40 years age group (64%). (Table I)

Looking at the causes of the wounds included for spilt-skin graft were caused by post-traumatic 12 cases, degloving injuries due to some machines 21 cases whereas burn cases also of same numbers i.e.21 while the other cases were due to wide excision of extremity tumors, fungating breast tumors, necrotizing fasciitis and leg ulcers. (Table II). 33 patients had complication, infection being the commonest (20%) and graft failure seen in (14.6%) (Table III).

Staphylococcal infection remained the most frequent micro-organism in the infected wounds of grafts on culture and sensitivity. (Table IV).

DISCUSSION

Skin performs many important functions apart from a barrier and one of these is to produce the greatest amount of vitamin D in the epidermal layer of the skin. [13] so it is essential to cover the wound with skin borrowing from other parts of the body, if unable to close by conventional methods. Spilt- thickness skin grafts survive initially by imbibition of plasma from the wound bed, after 48 hours fine anastomotic connections are made, which lead to Inosculation of blood. Negative pressure dressings facilitate plasmatic imbibition and revascularization, leading to significant improvement in overall spilt-thickness graft survival. [14].

Optimal skin graft success is influenced by several factors. Skin grafts rarely take when placed on bone, cartilage or tendon without the presence of periosteum, perichondrium and paratenon respectively. The use of dermal substitute such as alloderm or integra has been described as a method to address such circumstances, as it provides an adequate vascular supply for subsequent spilt-thickness skin graft placement. [15, 16] In our study, we used stamp shaped and sheets of spilt-thickness skin grafts meshed by making small stab incisions in graft as it is suggested that a skin graft may be meshed to provide coverage of a greater surface area at the recipient site. Modern skin graft meshers were introduced in 1964. [17].

In this study we included the cases with wounds larger then to be closed by suturing primarily or secondarily. The age of the most of the patients belonged to third and fourth decades of life (64%) which is quite comparable to national study [18] and other study [19]. The male and female patients are 76% and 24% respectively coinciding with national study (18) but not with Ferraro et al. [20]. The grafts are carried out in most of the cases of trauma, degloving injuries and burns in 54 patients (72%) where as one study showed necrotizing fasciitis with degloving injuries were more common and burns not included. [18].

The overall uptake of the grafts in all our case is 84% and failure is seen in 16% of patients, somewhat inferior to a study showing success rate 98%. [21]. Skin tumor excision and breast fungating mass are 12 cases and none showed failure similar to the study of Zaki [22]. Leg ulcers are always difficult to treat with spilt-thickness skin graft. In our study out of 6 cases two (33.3%) faced graft failure and sent to plastic surgery department Karachi for further management. This failure is also seen in other studies. [23, 24] but one study showed healing more than 95% in extremity sarcoma in conjunction with vacuum assisted closure therapy. [25] As wound infection is the most frequent complication of any surgery, seen in this study also in 20% of cases and the commonest organism isolated was Staph: Aureus as found in other studies [18, 26].

CONCLUSION

To relieve the work load of plastic surgeon, the skin grafting can be performed by general surgeons. The spilt-thickness skin grafting is very useful method to cover the large wounds unable to close otherwise. The infection can controlled with vigilant approach and other modern methods should also be tried.

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