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Case Report

Pixel Grafting In a case of Gluteal Burn Injury

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Abstract

Skin grafting is the transplantation of skin, a routinely performed procedure to cover the loss of skin. Skin is the largest organ of the body, which falls short of availability in extensive injuries, especially burns. In such a situation, pixel grafting, a novel expansion technique helps to cover a large area with less skin harvest. In this research, pixel grafting was done for a patient with burn injury.

Keywords: *Pixel grafting; Thermal burns; Regrafting; Gluteal burns.*

Introduction

Burns injuries constitute a major cause of skin injury, and the loss of which is reconstructed with a split-skin graft. Various techniques are available to increase the area of coverage with limited split-skin graft harvest, namely graft meshing, micrograft, Meek graft, punch graft, and pixel graft.[2]

The concept of pixel graft came into being with the hypothesis that smaller grafts increase the regenerative potential of the graft by creating many more pieces of the same original skin graft. The concept of small graft is old, used by Reverdinin1869, in the form of pinch graft, and later, Meek described a technique for mincing a split- thickness skin graft into small pieces, allowing tenfold expansion. Meek's method never gained widespread clinical application as the skin graft pieces needed to be placed with the dermal side down to ensure survival, the device for mincing the skin grafts was expensive, and the method was labor-intensive.[3]

In this study we have taken a case of 37-year-old male presented with 10 % thermal burn injury case for which prior pixel grafting was done was improved and again we have done pixel grafting in the remaining raw areas.

Materials and Methods

Informed written consent was obtained from the patient and permission obtained from departmental ethical committee for performing this study. A 37-year-old male presented with 10% third degree burns over the bilateral gluteal region following a/h/o loss of consciousness and fall on pyre while burning the garbage. He is a known case of seizure disorder under evaluation and alcohol dependence syndrome. He was admitted and daily dressing was done. Initially hydro-dissection was done with normal saline. Then application of silver stream was done. Then hydrocyn aqua gel was applied. Collagen sheets were applied over the wound, followed by which urgotol sheets were applied. Then packing done with gauzes and pads, and opsite. Negative pressure wound therapy was applied with continuous regulated oxygen therapy. Mutiple times split thickness skin grafting done due to graft loss.

For some raw areas present over the previous graft loss site area we have calculated the thin split thickness graft amounting to 1 % of body surface area and was harvested, the graft was minced with the help of fine scissors in multiple directions in a stainless-steel bowl till the graft appears like paste.

The size of the shredded graft was found to be of various sizes with an average size of 0.3×0.3mm when examined under a microscope. The minced graft was sprayed over a wet collagen sheet of 10 × 10 cm [Figure 2] and platelet rich plasma was sprayed over the minced graft with collagen sheet and the sheets were cut into the appropriate sizes and the same was placed over the raw area after wound bed preparation with graft sprayed side facing the wound [Figure3]. Then the non-adhesive dressing was done. The orientation of minced graft was not necessary owing to the small size of the graft. The first dressing was changed after 3days; collagen was left undisturbed unless soaked, and subsequent dressings were done on alternate days until the seventh day. The graft take was assessed on the seventh day. Parameters that were assessed were the rate of epithelialization of post-burns raw area, area of the donor site, and number of settings of pixel grafting. Wound reepithelialisation was recorded on 7th day. Photo planimetry of wound photograph was done at every dressing [Figure 4].

Figure 1: Raw area of the wound prior to application on pixel graft

Figure 2: Minced graft spread over the collagen sheet

Figure 3: Application of the minced graft over the raw areas

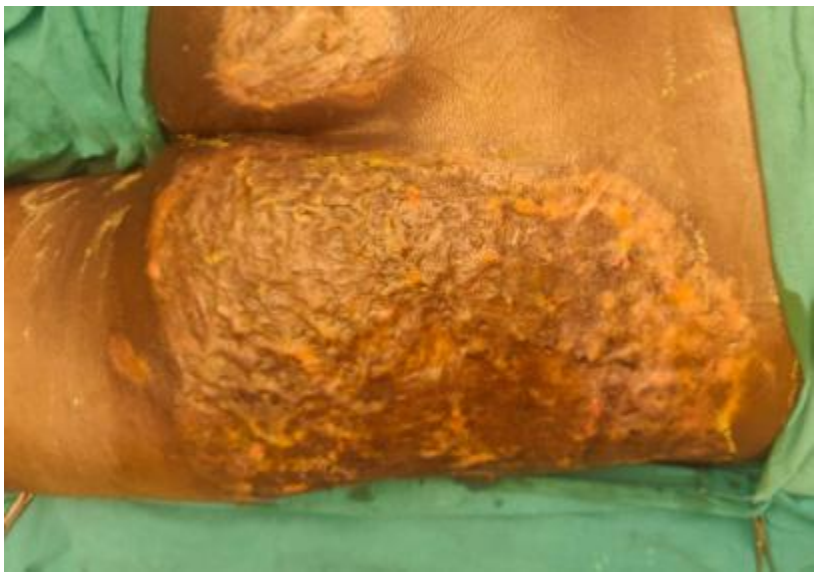

Figure 4: Post operative day 1 week

Results

The split skin graft was helpful in grafting over the small areas of the large burn wound in a healing phase of previously treated with multiple methods. Here, the graft take was good and there was minimal soakage at the graft take site and no infections were recorded and graft take can be noticed on the 7th post operative day also.

Discussion

Traditionally meshed skin graft has been the treatment of the post-burn raw area. However, lack of auto graft skin is always a problem after the initial surgery, which limits the excision of remaining eschar, thus inviting wound infection and septicemia, which may prove to be fatal. The pixel grafting technique allows a greater expansion ratio as compared to the mesh graft, as has been reported by other researchers. The small autografts are well supported by the wet collagen sheet and can be easily applied in contrast to the difficult handling of higher expansion (1:6 or1:9) mesh graft. The chances of the lifting of the small autograft are land at the time of dressing are negligible as the wet collagen sheet sticks in place, and on the seventh day, collagen sheets will be lysed, and autograft is land shave sufficiently grown into the tissues. [4-6]

Advantages of pixel graft are as follows:

- The increased number of grafts with pixel grafting technique results in an increased number of islands of regeneration, which facilitates faster reepithelialization.
- Pixel grafts survive by diffusion rather than by neovascularization, hence the survivalof pixel grafts is higher than micrografts because of decreased diffusion distance for nutrients.
- Even if the wound gets infected, the chance of loss of graft is usually localized only to that particular area.
- Overlay allograft is not necessary as the epithelialization progresses rapidly from the edges of the autograft islands. This has earlier been verified even in the technique of intermingled auto- and homograft transplantation by other workers. [7,8]
- The wound contraction and scar strength are comparable to micrograft.[9]

The disadvantages of pixel grafting that have been described in literature are poor cosmesis, lack of stability of graft and contracture. [8,9] The device used for pixel grafting is expensive and is labor-intensive. In our method, we have used only fine scissors to mince the graft.

In this study, one wound of the patient with burn injury over the gluteal region was managed with the pixel grafting and patient wound was found to be healing with the pixel grafting with epithelialisation of the raw areas.

Conclusion

Pixel grafting technique is a promising advancement in the field of wound healing, especially in burns. This would address the limitation of the availability of split-thickness skin graft with the possibility of a very large expansion ratio. The technique elaborated gives minced graft, which can be easily used in smaller health-care centers. Our study establishes the premise of pixel grafting technique and shows its efficacy in the application to large raw areas.

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