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Scar Management of Skin Graft Donor Site

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Abstract

Skin Grafting is a surgical procedure in which a skin or skin substitute is placed over a non-healing wound. Scar management of Donor site post Skin Grafting is one of the most important considerable factors which is always expected from patients in order to be scar free which is cosmetically acceptable. Scar from surgical wounds can range from asymptomatic to cosmetically unattractive.[1] The aim of this study is to highlight different methods to reduce Scar formation of Skin Graft Donor Site.

Keywords: Scar Management; Donor Site; Skin Grafting.

INTRODUCTION

An imbalance of collagen synthesis and degradation is the most common cause of scar formation. Wound healing includes three phases inflammation, tissue formation, tissue remodelling which is a complicated and dynamic interaction process. The complex wound pattern has initiated efforts to create new and innovative techniques in tissue regeneration which creates a scar.[1] When the patient is being discharged post Skin Grafting surgery, the healing donor site must be adequately managed, taking into account the pain, extended hospital stays, lost work days, and financial load and most importantly it also needs to look cosmetically better. Patients acting as donor for skin grafting require specialised care in scar management and to prevent surgical/wound site infection. Intralesional steroid injection, surgical excision, cryotherapy, irradiation, dermabrasion, pulse and carbon dioxide laser therapy were few of the well proven scar treatment available. Scar treatment requires a multimodality approach for outcomes that are satisfactory from an aesthetic stand point. The importance of management of scar formation post Skin Grafting is analysed here in this study.

MATERIALS AND METHODS

This study was conducted in the Department of Plastic Surgery in a tertiary care institute. The patient under study was a 31-years-old male, with no other known comorbidities underwent skin grafting to the right lower limb raw area. The skin graft was taken fromthe left thigh region. 14 days post-skin grafting and wound healing, the scar management was initiated. Multimodal approach for scar reduction was applied which included Low Level Laser therapy (Fig. 1), Scar Massage, Topical onion extract gel (Fig. 2), Pressure garment

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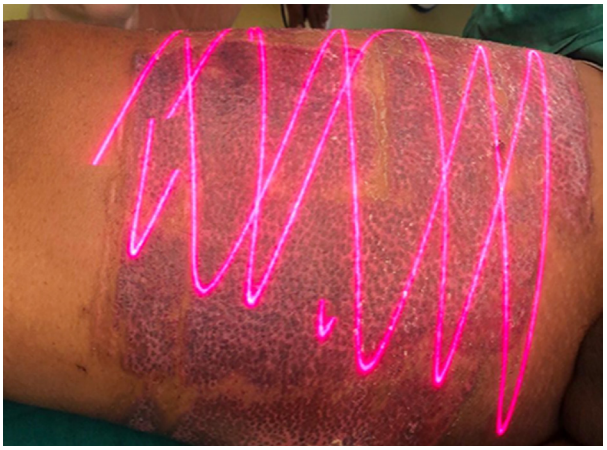

Fig. 1: Low level laser therapy

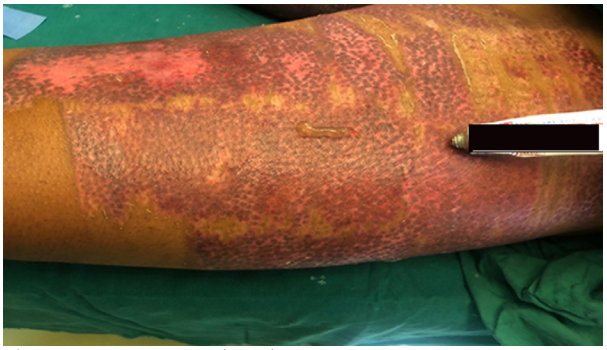

Fig. 2: Onion extract gel application

therapy (Fig. 3) as modalities for scar management. The Vancouver scar scale was used the grade the scar before treatment and after treatment. The scar scale before treatment was 7/13. After utilisation

Fig. 3: Pressure therapy by compression bandage

of this multimodal approach Vancouver scar scale scoring was calculated to look after the efficiency of this approach. Low level laser therapy was given for 10 mins once in 2 weeks for 4 weeks for 10 minutes. The patient was advised to do scar massage for 10 minutes twice a day with oil for 3 months. In our case, commercially available onion extract gel (Mederma) is used (Fig. 2). The cost of 20 g tube is around 480 rupees in Indian market. The patient was advised to apply the onion extract gel twice a day for 6 weeks, to assess the response to the treatment. The patient was advised to wear compression bandage over the scar site at most of the possible times.

RESULTS

The skin graft donor site healed well which was cosmetically good without formation of abnormal scar. (Fig. 4) The Vancouver scar scale after treatment for 3 months was found to be 4/13. Patient was compliance with all treatment strategies.

Fig. 4: Healed Scar at 3 months

DISCUSSION

Skin graft donor site healing continues to be an important health issue that requires to be cosmetically addressed for patient satisfaction. To address the healing of the wound without scar formation, the mechanism of wound healing should be addressed from the very beginning post-surgery. During the wound healing process, the production of matrix metalloproteinase (MMP) 1 causes the breakdown of extracellular matrix (ECM) components, including type I collagen. To encourage re-epithelialization, MMPs can break components of cell-cell junctions and cell matrix interactions inside the epithelium. MMP-1 is present in human cutaneous wounds during the re-epithelialization process, but it disappears once the lesion is closed. The ECM must be altered in order for wound healing to be resolved and scar formation to be reduced.[1] MMPs are thus important regulators of a variety of tissue repair processes.[10,11] In our case by usage of Topical onion extract Gel, Low Level Laser, Scar Massage and Pressure therapy we are addressing the basic mechanism involved in scar formation. Low Level Laser Therapy (LLLT) is one of the proposed modalities to improve scar quality. LLLT is claimed to increase collagen synthesis, decrease inflammation and has positive impact on scar remodeling.[2,3] Low level laser used was

Gallium Arsenide (GaAs) diode red laser of wave length 650 nm, output power 100 mW, frequency 10 kHz, continuous beam, scanning mode, non-contact delivery (60cm distance between laser source and scar) with area of delivery adjustable according to the size of scar.[4] Onion extract inhibits fibroblast activity, which helps to reduce scar formation.[5,6] Prophylactic pressure therapy is generally recommended in burn patients requiring burn wound excision and grafting or in wounds taking longer than 10-14 days for spontaneous closure. It is recommended that pressure should be maintained between 20 and 30 mm Hg, which is above capillary pressure but less than what would diminish peripheral blood circulation. To be effective, PGT should be maintained for at least 6 to 12 months.[7] Patients are instructed to wear pressure garments 23 hours each day, and better results are observed if PGT is initiated prophylactically as early as 2 weeks following wound closure.[7] As far as patient preferences, most feelthat pressure garments contributed positively to mobilityas well as to the look and feel of scars even though theydo not feel comfortable wearing the pressure garments andface masks outside of their home. After 3 months of treatment with the above said techniques, wound healing was better and no abnormal scar formation was noticed. Vancouver scar scale improved significantly.

CONCLUSION

The above multimodal approach significantly reduces the scarring in patients who are Skin Graft Donors and proves to be cosmetically well acceptable.

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