

Effective management of problematic complicated non healing ulcer by split thickness skin grafting : A case report.

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Abstract : Now a days skin grafting has utmost importance in plastic surgery & dermatological conditions. Skin grafts are used for variety of conditions but generally avoided in the management of more complex wounds. Conditions with deep spaces and exposed bones normally require the use of skin flaps or muscle flaps. In the present case report, we want to stress the importance of skin grafting in the management of complicated ulcer in chronic debilitated patient.

Key words : Non healing wound, Split thickness skin graft (STSG), Full thickness skin graft (FTSG).

Introduction : Skin graft is one of the most indispensable techniques in plastic surgery and dermatology. Since Reverdin first performed skin autotransplantation in 1869^[1] many pioneers have tried to improve the results of grafting^[2-4] in 1929, Brown et al. established their technique of split-thickness skin grafting, and they differentiated between full-thickness, intermediate-thickness, and epidermal (Thiersch) grafts, pointing out the advantages and disadvantages of each. These fundamental principles of skin grafting still hold true today.^[5,6]

Skin grafts are used in a variety of clinical situations, such as traumatic wounds, defects after oncologic resection, burn reconstruction, scar contracture release, congenital skin deficiencies, hair restoration, vitiligo, and nipple-areola reconstruction.^[7,8,9] Split skin grafts are generally avoided in the management of more complex wounds. Conditions with deep spaces and exposed bones normally require the use of skin flaps or muscle flaps.

In the present case report, we highlight how to get successful outcome of SSG in a case of complicated wound.

Case Report : A 60 years old male admitted with a large non healing ulcer over left leg over shin of tibia since 3 months with foul smelling discharge from the wound. Patient was having bad prognostic factors such

as: 1) Large non healing wound (20*6 cms), 2) Hypoproteinemia & Anemia, 3) Diabetes, 4) Infection. He was treated conservatively in following manner: 1) Daily local dressing of wound, 2) High protein diet, 3) Good glycemic control, 4) Appropriate antibiotic coverage. After two weeks ulcer showed healthy granulation tissue with fresh bleeding on touch. (Figure-1) We performed STSG. Skin graft was taken from right thigh, prepared on wooden plate by creating multiple cuts over inner surface of skin by 11 number bard parker knife. Then we applied the prepared graft after removing a thin layer of granulation tissue with a saline wash from the wound. Wound was closed with bactiguaze dressing. On the 5th post operative day exposure of wound revealed no signs of graft rejection. (Figure-2) Donor site was healed on 15th postoperative day. Regular dressing care was given and patient was discharged on 18th post operative day. (Figure-3)

Discussion : Skin grafts are generally classified as split-thickness or full-thickness grafts. When a graft includes only a portion of the dermis, it is called a split-thickness skin graft. When a graft contains the entire dermis, it is called a full-thickness skin graft. Split-thickness skin grafts are further classified into mesh skin grafts, stamp skin grafts, and chip skin grafts, based on their shape^[10,11] In our case we performed STSG.

Common sites for donor graft include the upper anterior and lateral thighs.^[12] We also took graft from right thigh.

The wound bed must be optimally prepared to ensure skin graft survival. Improper wound preparation is the source of most skin graft failures.^[13,14,15] Underlying conditions that compromise wound healing, venous stasis, and arterial insufficiency should be optimized prior to grafting to increase the likelihood of graft survival. The wound must be free of necrotic tissue and relatively uncontaminated by bacteria.^[13,15] Skin grafts will not survive on tissue with limited blood supply (cartilage, tendon, nerve). Skin grafts will survive on periosteum, perichondrium, peritenon, perineurium, dermis, fascia, muscle, and granulation tissue. Wounds that develop secondary to radiation are also less likely to support split-thickness skin grafts (STSGs) and often require adjunctive measures to optimize survival.^[16] In our case wound was infected & patient was having chronic debilitated conditions like anemia & diabetes. In spite of all antagonistic factors as mentioned we got successful outcome due to proper

preoperative measures, good operative technique & thorough post operative care.

The donor site must also be dressed appropriately at the conclusion of the operation.^[17]

The amount of dermis included with the graft determines both the likelihood of survival and the level of contracture. That is to say, split-thickness grafts can survive in conditions with less vascularity, but they have a greater likelihood of contracture. In contrast, full-thickness grafts require a better vascular bed for survival but undergo less contracture.^[18] We intelligently took a proper level of graft thickness for better outcome of a surgery without contracture.

When the defect to be grafted is extensive or has convoluted surfaces, split-thickness skin grafts can be meshed to expand. This meshing process not only increases the surface area that can be covered by the harvested graft but also allows the graft to adhere better to a convoluted wound.^[19] In this case we manually performed meshing of skin on the wooden plate with bard parker knife & prepared a graft suitable to the recipient site.

Before the dressing is applied, the graft should be inspected for hematoma formation. Flushing beneath the graft with saline removes blood clots and provides for better adherence of the graft. In graft fixation, the first step is to apply a nonadherent dressing. Then, a dressing should be applied to the graft with gentle pressure (10–20 mmHg) to promote graft adherence without causing pressure necrosis.^[20] We did not find any hematoma formation, we properly flushed the area beneath the graft with saline & we apply non-adherent bactiguaze dressing over grafted area.

“Tie-over dressing” is useful, because it minimizes the risk of hematoma or seroma formation and also prevents shearing forces from outside. If a mesh skin graft is going to be applied, or if a secondary operation is planned over the good granulation tissue on the surface of the wound bed, it may be sufficient to place cotton balls or press fluffed gauze onto the wound after suturing the graft. When the tie-over dressing is needed at an infectious site, it is better to remove the fixing suture earlier on 2-3 days after operation and observe the grafted skin. Many fixation techniques have been reported, such as reverse tie-over fixation, use of a wire frame or stoppers in tie-over fixation or quilting sutures, use of fibrin glue and dermabond, and negative pressure dressing without tie-over dressing.^[21-24] We tied a crepe bandage over the dressing & immobilized

the limb with elevation for 5 days.

Wound contraction may present serious functional and cosmetic concerns, depending on the location and severity. Contraction probably begins shortly after initial wounding,^[25] progressing slowly over 6-18 months following grafting. Myofibroblasts are believed to cause contraction.^[26] The spectrum of wound contraction from least to most is as follows:

- Full-thickness skin grafts (FTSG) – Least contraction
- Thick STSG
- Thin STSG
- Open wounds – Most contraction

The ability of a skin graft to resist contraction is related to the thickness of the deep dermal component included in the graft,^[25] not just the absolute thickness of the graft. This deep dermal component is able to suppress myofibroblast function by an unknown mechanism.^[26] In our case we performed STSG with some thick & some thin grafts which were taken successfully without contracture. (Figure-3)

Images:



Figure -1



Figure - 2



Figure -3

Conclusion : Thorough knowledge in the materials and methods used in skin grafting, as well as a complete understanding of wound healing, is essential so that cosmetic and functionally acceptable outcomes can be reliably achieved. We are very fortunate to achieve a good result in a complicated case of STSG.

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