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Objective

The objective of this presentation is to demonstrate a new procedure for the immobilization and isolation of a meshed skin graft without dressing changes, bolstering or negative pressure wound therapy.

Introduction

Split thickness skin grafts (STSGs) are a common and very effective surgical technique to quickly provide reepithelialization for well prepared wound beds. The survival or "take" of a graft is dependent on numerous factors, however, the most frequent causes of STSG failure are dislodging or shear, and accumulation of wound fluid between the graft and wound bed. The two primary methods of providing immobilization of grafts during the take period are the use of a tieover bolster or application of negative pressure wound therapy. Both of which are successful treatments but present some complications with either difficulty in observing the underlying graft or in terms of equipment and personnel resources.

Methods

We present a treatment modality suitable for immobilizing, isolating and providing a moist wound healing environment for a meshed STSG. This treatment employs a novel powder dressing. When this powder dressing is applied to a mesh graft site, it transforms into a hydrating layer that adheres to the interstitial spaces between the graft. The material appears to fill in these spaces and behaves as a protective support bolster between the mesh graft and serves to anchor the mesh to the underlying wound bed. As new tissue begins to fill in the mesh spaces through contracture, the powder dressing sloughs off.

A Procedure Using a Single Dressing Application for the Bolstering and Protection of a Meshed Skin Graft

Patient History

81 year old female with history of diabetes, CHF, PAD, PVD

Wound History

Arterial ulcer on dorsal plantar of right foot. Wound was treated for several months prior to evaluation at Rush Hospital with little success. After evaluation of Vascular Status, she was found to have severe peripheral arterial disease and required vascular intervention.

Wound Treatment

Vascular flow was established with angioplasty and stenting per vascular interventionist. This was performed with excellent results, then the patient was taken to the OR for sharp debridement and STSG. The STSG was harvested from the right thigh donor site, meshed 1:3 and then applied to the wound bed and anchored with staples.

Powder Dressing Application and Follow-up

- The powder dressing was applied immediately post-op to a thickness of 1-2 mm
- A fenestrated wound contact layer** was applied over the graft site and covered with gauze
- The contact layer was changed at day 5 and 10.
- The powder dressing was removed at day 12 with greater than 90 % reepithelialization.

Results and Observations

The novel powder dressing described in this technique was initially evaluated as a covering for skin graft donor sites. Following evaluation in donor sites, the product was applied to a STSG with the hope that it could provide a convenient and comfortable treatment to protect a mesh graft during the period of "take" while the graft adheres to underlying tissue and reepithelializes across interstices.

The powder is applied with a procedure that is dramatically different from most films or pads using sprinkling rather than laying or stapling a pad in place. This application lends itself to covering the uneven surfaces of a mesh STSG. Additionally, the powder can be pressed into the spaces as it is applied over the surface. The resulting transformation from powder initially yields a white covering that gradually darkens in appearance with blood and wound fluid. The material does not resorb but does flatten somewhat over the graft surface and does not appear to allow shear forces to pull or dislodge the graft tissue as the mesh knits to the underlying wound. The chosen silicone mesh contact layer is easily removed from the powder dressing surface. Removal of the powder dressing if necessary can be accomplished by soaking the dressing in saline for several minutes after which pieces remaining on the wound can be peeled away without strong adhesion to the underlying tissue.

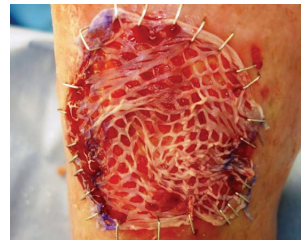
Conclusions

Results from this treatment were better than expected. The dressing provided a flexible, immobile surface that penetrated the gaps in the mesh graft and had strong adhesion to the underlying wound bed. The wound surface remained hydrated and the dressing did not dry or flake away from the moist tissue during the 12 day treatment. This technique appears to be a viable method of easily securing a STSG with a single dressing. The technique should be explored further to determine the best clinical practice and full benefits of this application.

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Ulcer Post Sharp Debridement



Mesh STSG in Place on Wound



Novel Powder Dressing on Wound



Day 5-No Dressing Changes



Day 10-No Dressing Changes



Day 12-Powder Dressing Removed

* Altrazeal Transforming Powder Dressing
** Mepitel fenestrated silicone