Treatment of skin graft donor sites using 3M™ Tegaderm™ Absorbent Clear Acrylic Dressings

Authors:
Marcia Spear, APRN-BC, CPSN, CWS
Amanda E. Bailey, ACNP-BC, CWS, CRRN

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Introduction

Split-thickness skin grafting (STSG) is a frequently used reconstructive technique but is associated with variations in practice. Rakel et al (1998) in the review of the literature found a transparent film to be the best dressing for the care of STSG donor sites[1]. This review of 33 studies found that transparent film was associated with one of the fastest healing rates, a smooth epithelialized surface, a low infection rate, the least amount of pain and minimal cost.

Numerous controlled studies in the last 50 years have established that moist wound healing is the best evidence-based practice. Dried wound tissue is more prone to complications such as infection, scarring, pain and prolonged healing.

The goal of treating skin graft donor sites is to promote healing while minimizing the risk of introducing new complications and pain to an already traumatized patient. An old and still practiced strategy is to cover the wound with petrolatum (paraffin) gauze and allow it to dry out. Drying was often accomplished with the use of hair dryers, heating blankets (bear huggers), or air drying. The procedure often resulted in pain and discomfort for the patient, and vigilance was needed to regularly trim the edges of the dressing as it peeled away from the healing wound. If not done, the dressing could catch on clothing or linen, causing pain to the patient, trauma to the wound, and necessitating a repeat of the drying process.

Essentially, the wound was left open to scab, which is contradictory to the best evidence-based practice of today, that of moist wound healing. In recent years, much has been published highlighting the benefits of moisture-retentive dressings in treating donor sites. Moisture-retentive dressings that have been used include hydrocolloids, foams, and transparent thin film dressings, alone or in combination with absorbent materials such as alginates, hydrofibers or gauze. While hydrocolloids and foams provide the needed absorbency, they must be removed whenever wound inspection is required, increasing treatment cost and the risk of traumatizing the wound. Thin film dressings allow for wound visualization, but usually fail to contain the drainage for more than 24 hours, even when used secondary to other absorbent dressings (which also negates the benefit of transparency).

3M™ Tegaderm™ Absorbent Clear Acrylic Dressing is a moisture-retentive, absorbent dressing which combines the benefits of highly absorbent dressings such as hydrocolloids, foams, alginates and hydrofibers with the transparency of thin film dressings. Recent published work indicates that this dressing provides excellent results with skin donor sites[2,3].

Following IRB approval, patients were screened for approval. Patients who were older than 17 years of age undergoing a split thickness skin graft were approached to participate in the study. These patients presented to the Plastic Surgery Service both inpatient and outpatient. Patients were excluded if they have an allergy to one of the components of the dressing (acrylic or adhesive), were unable to continue contact with the investigator, or were unwilling or unable to follow study protocol.

Twelve patients with skin donor wounds were recruited and enrolled in this case study series. An alginate dressing with or without a silver layer was applied in the operating room and sealed with Tegaderm™ transparent film. That initial dressing applied in the operating room inevitably was leaking on post operative day one, therefore it was removed, the donor site cleansed, and the study dressing was applied. Tegaderm™ absorbent dressing was applied to donor sites post-operatively on day one (POD-1) and subsequently followed for up to 21 days or until dressing leakage, whichever came first. Wounds were evaluated for healing, leakage, and pain. Healing was noted when 90% of the surface had epithelialized, leakage was determined visually as drainage outside of the dressing enclosure, and pain was evaluated using a 10-point Likert scale. Case studies are presented for three of the enrolled patients and summary results are presented for all of the patients enrolled into the study.

Case Study 1

A 49-year old male presented with an open wound of the right popliteal space following excision of a cystic lesion. Subsequently, the wound was debrided in preparation for gastrocnemius muscle flap coverage with a split thickness skin graft.

The donor site on the right lateral thigh measured 10.5 x 4.5 cm with a depth of 0.010 inches. A transparent film dressing was used as the initial post surgical dressing. Wound drainage leaked from under the transparent film dressing on POD-1. The film was removed and wound was cleansed. (Figure 1)

The patient reported his pain to be 7/10 at the donor site during the first 24 hour post operative period. During removal of the transparent film dressing and cleansing of the donor site, the patient reported his wound pain to be 2/10.

Following cleansing of wound, two 20.0 X 20.3 cm Tegaderm™ absorbent dressings (pad size 14.9 x 15.2 cm, #90805) were applied. The patient reported his pain level to be 0/10 immediately following dressing application. (Figure 2)

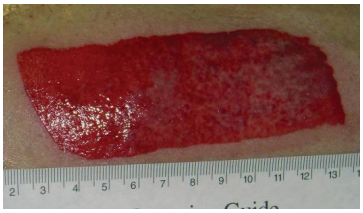

Figure 1: POD 1, Right lateral thigh donor site after removal of initial post operative dressing and cleansed with normal saline.

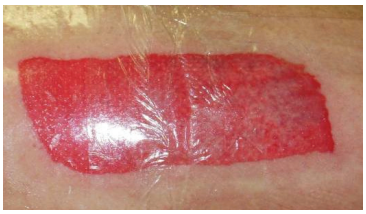

Figure 2: POD 1, donor site wound with Tegaderm™ absorbent dressing applied.

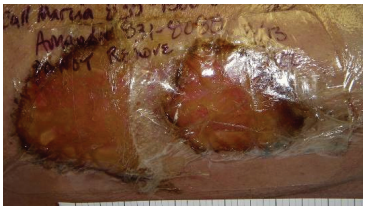

Figure 3: POD 5, Tegaderm™ absorbent dressing intact.

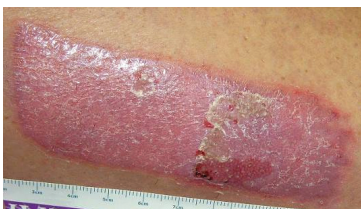

Figure 4: Dressing remained intact for 16 days without leakage. At a follow-up appointment on POD 16, the dressing was removed, and the donor site was healed.

Case Study 2

A 53-year-old female presented with dog bite injuries including bilateral ulna and radius fractures, massive soft tissue injuries and complete devascularization of her hands. Although the bones were stabilized and tissue was revascularized, she had ongoing, large open wounds with necrosis requiring subsequent debridement and intensive wound care. Eventually, a bilayer skin substitute was placed over the wound. After total wound bed granulation was complete, the patient had a split thickness skin graft to her right arm.

The donor site on the left lateral thigh measured 12.5 x 2 cm with a depth of 0.010 inches. The initial post operative dressing consisted of a silver layer, a hydrofiber, and a transparent film dressing. Wound drainage leaked from under the transparent film dressing on POD-1.

The patient reported her pain to be 6/10 at the donor site during that first 24 hour post operative period. During removal of the initial dressing and cleansing of the donor site, the patient reported her wound pain to be 4/10 (Figure 1). Following cleansing of the donor site two 20.0 x 20.3 cm Tegaderm™ absorbent dressings (pad size 14.9 x 15.2 cm, #90805) were applied. The patient reported her pain level to be 4/10 immediately following dressing application. (Figure 2)

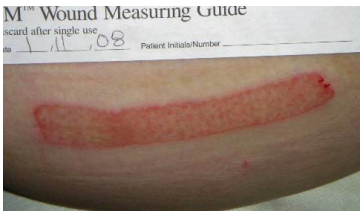

Figure 1: POD 1, Left lateral thigh donor site. Initial post operative dressing removed, site cleansed with normal saline.

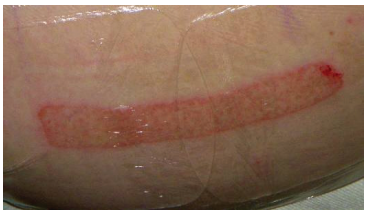

Figure 2: POD 1, donor site wound dressed with Tegaderm™ absorbent dressing.

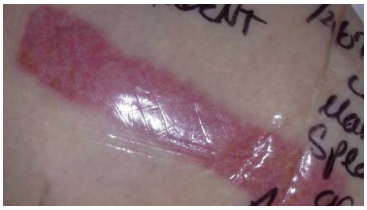

Figure 3: POD 15, Tegaderm™ absorbent dressing in place over donor site wound.

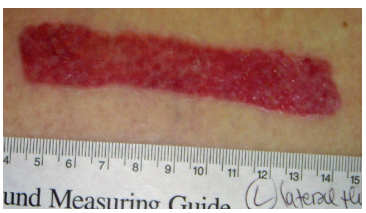

Figure 4: The dressings remained intact for 19 days without leakage. POD 19, Follow-up appointment, dressing removed. Donor site wound healed.

Case Study 3

An 86-year-old female presented with a malignant melanoma of the scalp. She underwent resection and closure of the defect with local advancement flaps and application of a split thickness skin graft over the resulting defect.

The donor site on the left anterior thigh measured 14 x 14 cm with a depth of 0.010 inches. A hydrofiber and a transparent film dressing were used as the initial post operative dressing. Wound drainage leaked from under the transparent film dressing on POD-1.

The patient reported her pain to be 2/10 at the donor site during the first 24 hour post operative period. During removal of the hydrofiber and transparent film dressing and cleansing of the donor site, the patient reported her pain to be 4/10 (Figure 1). Following cleansing of the donor site, four 20.0 X 20.3 cm absorbent clear acrylic dressings (pad size 14.9 x 15.2 cm, #90805) were applied. The patient reported her pain level to be 0/10 immediately following dressing application. (Figure 2)

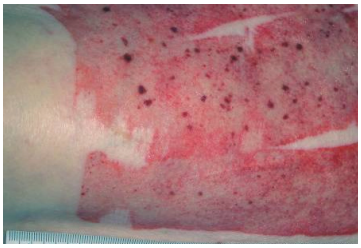

Figure 1: POD 1, Initial post operative dressing removed and wound cleansed.

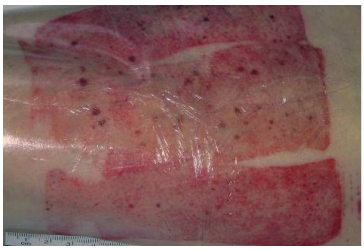

Figure 2: POD 1, Tegaderm™ absorbent dressing applied to donor site wound.

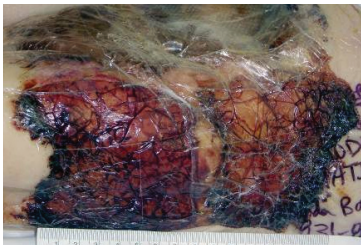

Figure 3: POD 15, Tegaderm™ absorbent dressings intact for 15 days without leakage.

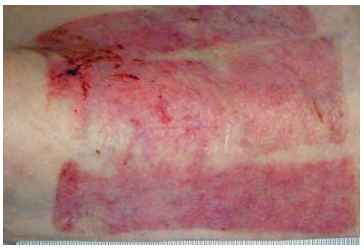

Figure 4: POD-15, Tegaderm™ absorbent dressing removed, donor site healed.

Findings and Conclusions

Twelve patients with 13 donor site wounds were enrolled into the study. Six patients were male and six were female. The average (SD) age was 50 (21) years. One patient was still ongoing at the time of this report and three were discontinued for reasons unrelated to the study dressing.

Wound healing occurred in seven of the remaining nine wounds within the 21-day follow up period. One of the two open wounds was 50% healed when dressing leakage occurred on POD-10. The other open wound was later determined to be a full thickness wound after the dressing was removed on POD-21 which fell out of the parameters for partial thickness wounding of a donor site. In most cases (10/13 wounds), the dressings remained in place and functional until the wound healed or the patient was discontinued.

The average (SD) time to healing for the seven wounds that healed was 14.3 (2.9) days. Average (SD) dressing wear time for the nine wounds that completed the study was 14.6 (3.7) days. Median (range) pain score before and after application of the dressing was three (0-7) and zero (0-5), respectively.

Tegaderm™ absorbent dressing evaluated in this study is a significant advancement in donor site care. The dressing allowed for monitoring of the donor site without unnecessary dressing change or disruption of the wound bed. Wear time for Tegaderm™ absorbent dressing exceeded our expectations, remaining functional until the wound was healed or the patient was discontinued from the study.

The majority of patients reported a decrease in pain with use of this dressing on the donor site. No additional adhesive products were required to maintain dressing integrity.

In our experience with these highly draining wounds, Tegaderm™ absorbent dressing should be applied such that the absorbent pad overlaps onto healthy skin approximately 2-4 inches. Based on our outcomes, we recommend that the dressing be applied on POD-1 and stay in place until at least POD-14 and no later than POD-21. This is the general healing time for most partial thickness donor sites. If patient's age is over 65 years, longer wear time (up to POD-21) is recommended, as these patients generally require more time to heal.

Tegaderm™ absorbent dressing was effective in meeting our goals for treatment of skin graft donor sites, and provided a significant advancement in donor site care. The dressing provided all the essential components of wound care including moist healing, patient comfort, protection of the wound, decreased manipulation of fragile epithelial cells, and easy wound monitoring by direct visualization through the dressing during the healing process.

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Medical Division
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70-2010-7060-7