

Moisture Controlling Wound Dressing to Optimize Wound Healing

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OBJECTIVE

To evaluate if a new generation of wound dressings, which utilizes active regulation of moisture in a wound bed, has the ability to impact the time to wound closure. This new technology allows the dressing to moisturize or dry the wound as needed, even in adjacent areas, simultaneously.

HYPOTHESIS

We hypothesized that precise control of moisture within a wound bed would result in faster wound closure, and a higher percentage of closure, as compared to historic results achieved with traditional dressings.

METHODS

A moisture regulating dressing (TheraGauze* is made by Soluble Systems, Newport News, VA) was applied to a variety of wounds following debridement of the wound bed and placement of skin substitutes or xenografts. A secondary dressing was then applied in order to secure the entire combination of materials.

TheraGauze is a new "smart" dressing which controls the release and absorption of fluid to the wound bed. The 4x4 dressing will release or absorb approximately 5 cc of fluid to or from the wound surface. It consists of a non-woven poly/rayon substrate that supports a proprietary polymer which regulates wound bed moisture at the cellular level.



Fig. 1: Moisture within the wound was controlled by TheraGauze which releases or absorbs a specific amount of fluid across the wound surface, depending on local conditions.

CASE STUDY 1



28yo female w/ inflammatory bowel disease and ulcer 2° to pyoderma gangrenosum. With each GI flare, the lesions reopened and were painful. Wound was infected with MRSA. Antibiotics and local care, along w/ application of human dermal replacement tissue and TheraGauze, were applied to the wound and covered with a compression dressing. Dressings were changed weekly. Wound went from 49cm² => 3cm² in 21 days, and closed shortly thereafter.

CASE STUDY 2

88yo female with chronic venous stasis and multiple wounds encompassing calf. Wound was treated with xenograft matrix and TheraGauze dressing under compression wrap. Wound went from 38cm² => 0.5 cm² in 28 days.



CASE STUDY 3



44yo male w/ sickle cell and 6.8cm² ulcer & MRSA on medial malleolus. Initial dermal replacement failed to take. Next, dermal regeneration template was placed with TheraGauze dressing on wound, and held in place with compression wrap. Wound was assessed on a weekly basis. Wound closed completely 30 days after treatment began with TheraGauze.

CONCLUSIONS

After use of TheraGauze SMRT dressing, 3 patients closed their chronic wounds in 30 days or less. Pain was also greatly reduced due to the non-stick nature of the dressing, as well as the retention of moisture without maceration.

In this pilot study, we examined the use of a new wound dressing material, TheraGauze, which has the unique ability to control the moisture content of a wound bed at the cellular level.

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CONCLUSIONS

A critical examination of the TheraGauze polymer material under scanning electron microscopy gives some insight as to how the fluid content is controlled within the wound. Close examination reveals a series of small vertical tubular structures which resemble straws. We hypothesize that these structures allow the dressing to selectively draw fluid away from the tissue surface. Interspersed between these tubular structures is a series of interconnecting canals resembling capillaries, that allow for overflow and coordinated movement of fluid to and from the tissue bed. As a result, the surface of the wound is kept moist but not macerated. This, in turn, reduces the risk of infections and separation of the tissue planes.

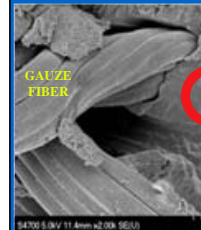


Fig. 2a: SEM of moisture control dressing, (2000X) shows polymer held in place by gauze fibers.

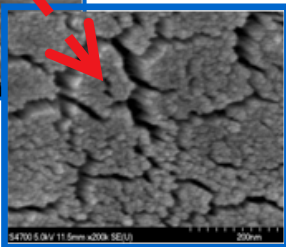


Fig. 2b: At 200,000X the polymer contains a series of "straws" & canals which act like capillaries at the cellular level to regulate fluid content across the wound surface.

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* TheraGauze is a registered Trademark of Soluble Systems, LLC