

STUDY USING A 21-DAY WOUND CARE SYSTEM WITH MARINE EXTRACTS



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INTRODUCTION

Superficial Mohs and shave excisions can result in saucer-shaped wounds that can be slow to heal in the elderly. These patients have difficulty in cleaning and changing wound dressings. In this paper, we review our experience with traditional wound bandages changed every one to two days as compared to a new 21-day stay-in-place breathable, water permeable dressing system. This system contains time release marine extract crystals (including extracts from sea cucumber and abalone).

Improving the speed and quality of healing wounds is the primary function of any wound dressing. Other important functions include reducing pain and suffering, and decreasing anxiety of both the patient and the caregiver while maintaining or improving the quality of peripheral skin. In our experience with this new product, it meets each of these objectives and advances the field of wound care.

METHODOLOGY

This is a retrospective review of healing times in our patients following superficial Mohs or shave excisions using two different types of wound care. All patients received an excisional procedure with electrodesiccation and aluminum chloride. Wounds were cleaned with water, and a small amount of antibiotic ointment was applied. For the control group (n= 24), a BAND-AID® brand bandage was placed on the wound and patients were instructed to remove the bandage, clean the wound, apply a small amount of antibiotic ointment, and reapply a new bandage every one to two days, being careful to keep the wound and bandage dry during the entire healing process. In the test group (n=70), this 21-day micro and macro-channeled rayon dressing was applied and patients were instructed not to change the dressing. They were to clean the area with water-soaked gauze daily while applying a small amount of antibiotic ointment every other day directly through the dressing. Quantified endpoints were healing time (in days) speed of healing (mm²/d) and percent healing at 21 days. The two groups were compared by 1-tailed Student's t- test assuming equal variances. All procedures and follow-up were conducted in Dr. Lewis' practice in Beverly Hills, CA (dba Beverly Hills Dermatology and Wound Care Research Center).

Although completion of total wound healing takes 6 to 12 months, we use the completion of epithelialization as our end point to healing.

Miracle Dressing™ Wound Care System ("MDS") is a patent-pending new product developed and sold by MBET Health in Tarzana, CA.; R&D was started in 2014 and the product was launched in 2020.

The dressing component of MDS is a tough, durable, non-woven, regenerated cellulose fiber bandage containing a pressure sensitive adhesive. It has high moisture vapor permeability and 1 mm channels spaced on 3 mm centers. There are non-perforated lanes along the longitudinal edge (and along the center of wider dressings). It is available in widths up to 4" and various lengths up to 15 feet. Photo 1 shows the dressing in place on a subject. Photo 2 and Photo 3 are micrographs showing the 1 mm channels and the micropores formed by the cellulose fibers.

MDS also contains time release marine extract crystals in agglutinant. The agglutinant is a topical skin adhesive comprising isopropyl alcohol and partially hydrogenated rosin.

These marine extracts (Natural Marine Extract™) are in the form of lyophilized crystals from various marine animals and botanicals including sea cucumber and sea abalone. Such marine ingredients are well known to contain compounds of documented healing benefits. (1,2) We observed that the time-released crystals dissolve in 14-21 days with daily water application.



Photo 1

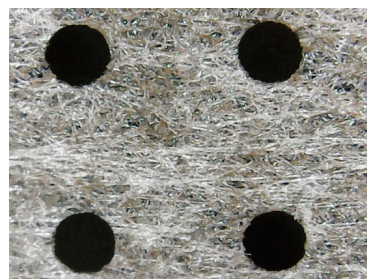


Photo 2

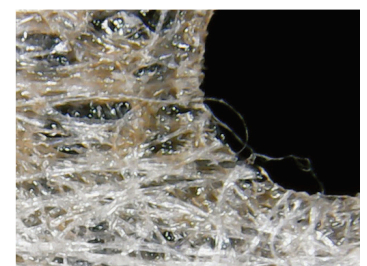


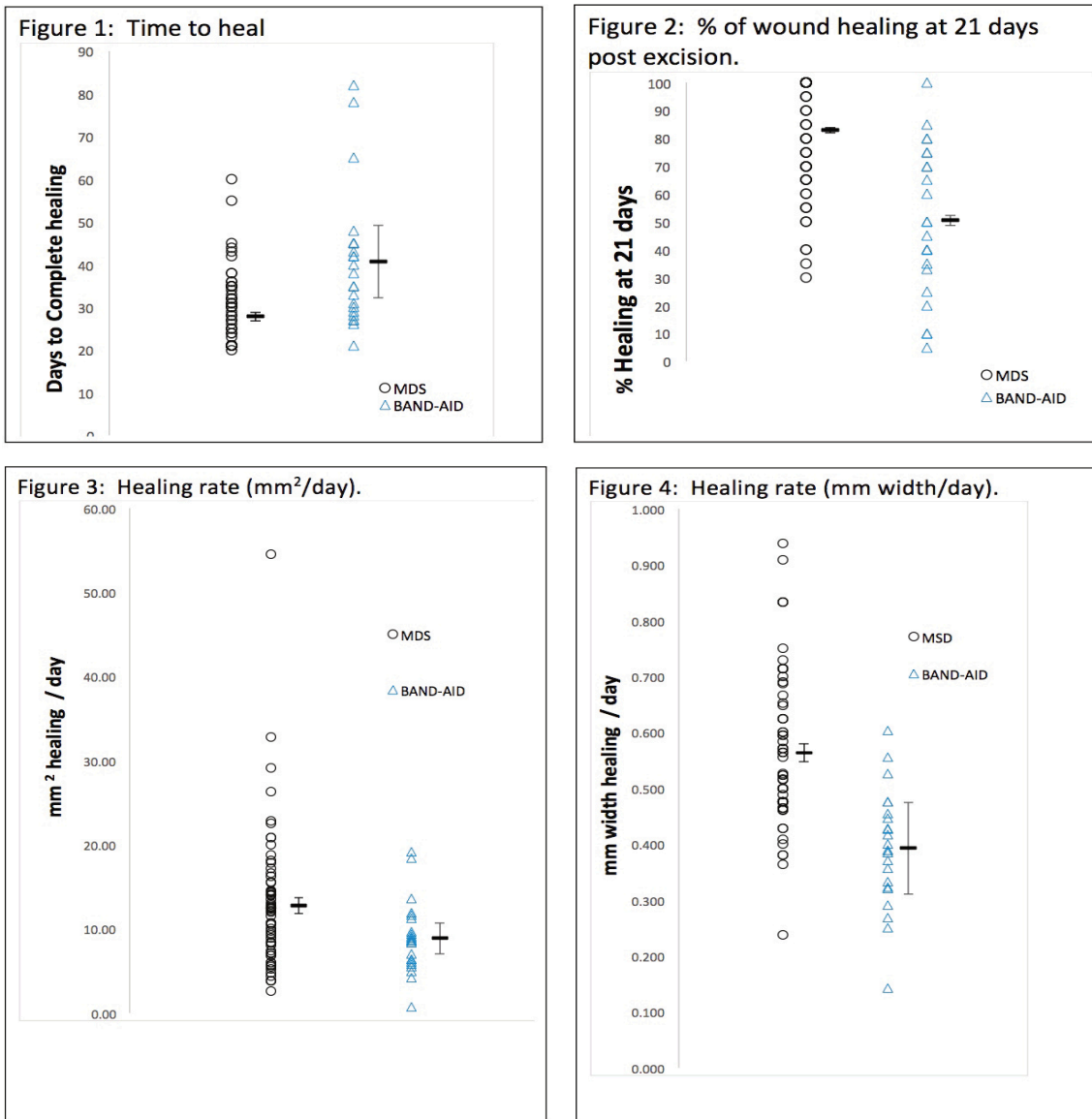
Photo 3

RESULTS

Time to healing (or wound re-epithelialization) was significantly shorter in the 21-day dressing test group than the control group, with a mean of 27.8 days compared to 40.65 days in controls ($p < 0.001$). Healing expressed as mm² per day was significantly greater in the 21-day dressing group than controls with a mean of 12.75 mm²/day compared to 8.89 mm²/day ($p = 0.013$). The percentage of the wound that was healed by 21 days was significantly greater in the test group than in controls, with a mean of 82.9% compared to 50.6% in controls ($p < 0.001$). For each of the parameters examined, healing was remarkably accelerated in the 21-day dressing group. Furthermore, patients in the 21-day dressing group reported a higher satisfaction with post-surgical care at home compared to controls. We observed that the quality of healing of not only the wound but the peripheral skin was also improved.

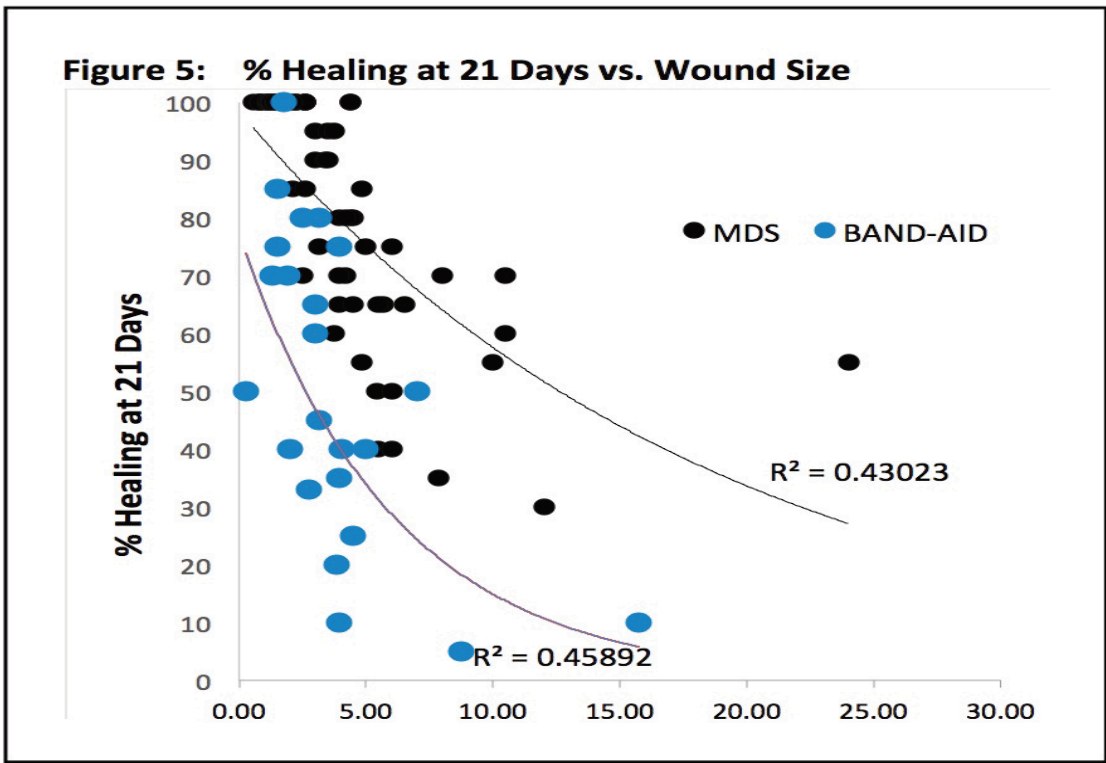
The data were also analyzed by percent healing at 21 days versus the size of the initial wound (in cm²). These results are shown in Figure 5.

Here, as expected, the larger wounds were less healed by 21 days than the smaller wounds. Indeed, there was a significant correlation between size and healing. However, there was a significant difference between the MDS and the control group, where MDS healed more quickly for all wound sizes. Indeed, whereas only one patient in the control group was 100% healed by 21 days, many patients with wounds as large as 5 cm² were 100% healed by 21 days.



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DISCUSSION

In the United States, the average life span was 50 years in 1920, while 100 years later it is about 80. In our elderly, the skin's thickness, strength and elasticity, as well as the fibrocytes and capillaries nourishing the skin, have decreased proportionately. Thus, not only the propensity to injury has increased but the ability to heal the injuries has decreased as well. Wound dressings have not evolved to meet this growing need. Wound care in the elderly present the dermatologist with special challenges. Besides protracted healing time, the elderly are especially susceptible to skin tears and ecchymosis from simply changing a wound dressing. Thus, using a breathable, 21-day stay-in-place dressing which stabilizes not only the wound but the surrounding skin may set a new standard of care.

If a wound has tremendous amounts of exudate, all existing dressings, including even the absorbent ones (other than MDS), must be changed frequently. The common practice of applying and frequently replacing traditional adhesive dressings typically cause disruption of the wound with inflammation, bleeding, irritation and skin breakdown of the surrounding skin. Many of these elderly patients require caretakers, usually family members, to help change dressings. The trauma of dressing changes is not only painful but it is also the source of anxiety for the patient and caregiver.

We have found that, instead of "keeping the wound dry and changing the bandage every day," as typically directed, maceration can be avoided with MDS water immersion (e.g. sponge rinsing, shower) which cleans the wound and dissolves the marine extract crystals in a time release manner. In our experience, MDS generally stays adhered to the skin for three to four weeks and then falls off on its own when the wound is healed or close to it. Because of the dressing's relative transparency, the wound and surrounding skin can be monitored during this time.

In health care facilities, COVID-19 exacerbated the vulnerability of elderly skin to pressure injuries and the lack of medical technology to deal with it. The continued unfortunate paucity of nursing staff in long term care and skilled nursing facilities has caused the Wound Healing Society and Wound Source Fact Sheet to change the standard of care for pressure injuries - increasing the time intervals between in-person visits by nurses and decreasing dressing changes.

Unfortunately, the present wound dressing technology has a maximum period between changes of two to seven days. Obviously, the 21-day dressing of MDS changes this paradigm, not only protecting and helping to heal Stage 1 and Stage 2 pressure injuries but protecting the surrounding precarious skin.

CONCLUSIONS

Our results showed superior healing using the 21-day breathable, stay-in-place dressing with marine extracts. It also showed reduced signs of surrounding skin disruption and pain as compared to traditional bandages. These results may be due to wound stripping that occurs with bandage changes in the control group, as well as the air breathability and liquid permeability of 21-day dressing. Moreover, the marine extracts may have contributed to the decreased skin xerosis and micro-fissures in surrounding areas which can cause inflammation, bacterial colonization and slow wound healing. We have also used 21-day dressing for skin tears, second and early third-degree burns, ecchymoses, pressure injuries and their prevention with remarkable success. This dressing has no wound size limitations and can be used on entire limbs for such problems as burns and bullous disease. We predict that the MDS product will have a substantial impact on wound care and its associated financial burden.

Notice of conflict of interest: Dr. Lewis has a financial interest in MBET Health but received no financial support for this study other than a gratis supply of MDS.

CASE STUDIES

Second and Superficial Third Degree Burns

A nine year old patient sustained 2nd and superficial 3rd degree burns on his buttocks and a 2nd degree burn on his back. The superficial 3rd degree burn covered 10% of his buttocks.

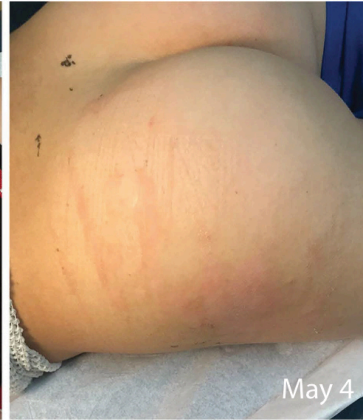
He was treated at a major burn center using standard burn care and was sent home to have his parents change his dressing on a daily basis. Four days of these daily wound changes severely traumatized the patient and the wound. The boy refused to allow another wound change and was referred for MDS placement.



Total disruption of 2nd and superficial 3rd degree burn wounds by standard wound care.



Miracle Dressing Wound Care System in place on April 12th. The boy no longer experienced pain.



Miracle Dressing Wound Care System was removed after 21 days, at which time the wound was healed, no scars.

Pressure Injury Wound Care

A retired 87 year old man's health had declined and he became more wheel chair dependent and bed bound, eventually developing Stage 1 and Stage 2 sacral and buttocks pressure wounds, secondary to atrophic skin. Standard wound dressing changes disrupted the surrounding skin and enlarged the wound.



Miracle Dressing Wound Care System was applied across the entire affected area on October 3.



Miracle Dressing Wound Care System was removed after 21 days. With typical wound care treatments, these wounds may never have healed to this extent.

Scalp Radiation and Skin Cancer Surgery Wound Care

Three and a half months before this 72 year old man came into the office, the patient had had a significant skin cancer removed from his scalp. As a result of this surgery, and a history of radiation therapy, he was left with a large wound and no healing had taken place because of the lack of collateral circulation around the wound. Typically, such a wound would require approximately 150 stitches to bring the sides together to close the wound.



Miracle Dressing Wound Care System was applied on March 24.



Miracle Dressing Wound Care System was removed after 21 days. This wound typically would have taken many months to heal to this extent.