

Effectiveness of a Self-Adaptive Advanced Wound Care Dressing in Multiple Wound Types

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ABSTRACT:

The purpose of this study was to determine the effectiveness of a novel *humifiber* advanced wound dressing* for achieving optimal moisture balance in multiple wound types. The subject dressing had the unique property of being able to sequester large amounts of exudate or conversely prevent desiccation of a dry wound. This allowed the dressing to be used throughout the healing of a wound. A total of 17 patients with 22 wounds from a variety of settings (clinic and nursing homes) were selected. The types of wounds in the study included venous, diabetic, and decubitus ulcers as well as chronic radiation and surgical wounds. The dressing was applied one to three times per week either in clinic or in home settings, based on wound conditions and in conjunction with local best practices throughout the entire study. Our overall approach was to use this dressing on any wound regardless of etiology or amount of exudate, and to decrease dressing changes to a minimum (once a week) until the wound was completely re-epithelialized. Our conclusion was that this dressing was effective on all types of wounds with minimal to heavy exudate and with no need for dressing customization. We observed notable improvements of wound edge conditions. The dressing demonstrated excellent properties with regard to preservation of peri-wound skin. Dressing removal was painless and non-traumatic. It also seemed that this dressing minimized formation of biofilm, therefore reducing the need for debridement. We had promising results with extended use in patients with once per week dressing changes with moderate drainage. Utilization of a one-fit-all dressing for multiple wound types, regardless of exudate levels, simplified wound care. This dressing improved the quality consistency of practical moist wound healing and facilitated care continuity in the clinic, home and facility settings.

OBJECTIVE:

To evaluate the effectiveness of a new self-adaptive advanced wound dressing* in achieving optimal moisture balance in multiple wound types.

PROBLEM:

- The growing number of available dressings makes choosing the correct dressing for each wound an increasingly challenging and time-consuming task.
- The various dressing properties needed to treat different wound types and conditions generally prompts a regular exchange of dressings for each wound, based on qualitative evaluation.
- The selection process among hundreds of dressings can lead to confusion, and sometimes, an unsuitable type of dressing for a particular wound.

BACKGROUND:

- Use of one single dressing type capable of maintaining optimal moisture balance in all wound types and conditions would ideally allow any healthcare setting to simplify wound care product selection and reduce facility inventory costs.
- We evaluated the use of a new synthetic polymer *humifiber* dressing, that was designed to be self-adaptive to any wound condition (exuding or non-exuding) to facilitate proper moisture balance in all wound types.

Case 1: Chronic lower extremity venous stasis ulcer

53-year-old male with a draining lateral lower leg venous stasis ulcer that had been present for several months



A. Chronic venous leg ulcer with edematous raised bed after 4 months of advanced wound care and prior to humifiber application. After debridement, ulcer measured 4.0 x 4.0 x 0.5 cm.



B. Two weeks following initial use of humifiber dressing, drainage is considerably decreased and peri-wound erythema is completely resolved. Signs of inflammation are no longer present and the wound is nearly level with the peri-wound skin.



C. After 1 month of humifiber dressings, wound size was reduced to 0.5 x 0.25 x 0.25 cm with no edema or drainage. The wound appeared optimally moist and mostly re-epithelialized.



D. Venous stasis ulcer is completely closed with excellent aesthetic result after 2 months of humifiber dressings.

Case 2: Diabetic foot ulcer secondary to gout

60-year-old diabetic female with a draining foot ulcer secondary to gout and neuropathy on her right foot great toe



A. Wound secondary to gout at initial presentation, following debridement. Edges were undermined, edematous, and erythematous.



B. One week after initial use of humifiber dressing, wound margins and peri-wound erythema are considerably decreased; bone is exposed.



C. After 2 weeks of humifiber dressings, the wound is 100% granulated, including over tendon, with no edema or drainage. Wound and peri-wound area remain optimally moist.



D. One month after initial presentation, wound edges are approximating and peri-wound is healthy with no edema.



E. After 2 months of humifiber dressings, the wound is fully re-epithelialized and the dressings are discontinued.

Case 3: First metatarsal head following amputation

75-year-old diabetic male presented with a diabetic wound of the left foot first metatarsal head following toe amputation 7 months prior



A. Diabetic foot ulcer with severe peri-wound maceration after 7 months of advanced wound care and prior to humifiber dressing application



B. Three weeks following initial use of humifiber dressings, maceration is considerably decreased; wound odor and signs of biofilm are no longer present.



C. After 6 weeks of humifiber dressings, ulcer area is reduced > 60% with minimal drainage.



D. After 8 weeks of humifiber dressings and two tissue-engineered skin grafts, skin islands are visible within the wound bed. Wound edges appear moist, even over calloused skin.



E. At the 2-month follow-up post study period, the wound bed and peri-wound area remain optimally moist and 100% granulated.

METHODS:

- We prospectively evaluated effectiveness of a novel humifiber advanced wound dressing in patients with chronic, subacute and acute wounds.
- With patient consent, consecutive wounds, regardless of etiology or amount of exudate, were included in the evaluation.
- Wound was debrided of all necrotic tissue, and culture-specific topical antibiotics were applied when appropriate.
- A humifiber dressing (sized 10.2 x 10.2 or 12.7 x 15.2 cm) was placed over the wound, overlapping 2 to 3 cm onto intact skin. When more than one dressing was required, dressings were placed side by side and taped with cotton tape. Dressings were secured with a kerlix wrap or tape.
- Initially, dressings were changed daily in wounds with moderate to heavy drainage, and changed every other day in wounds with minimal drainage.
- Goal was to gradually reduce dressing change frequency to once per week when appropriate.
- Patients were evaluated by clinic once per week or every other week.
- Dressing leakage, dressing strike-through, change in wound size, wound closure rate, drainage control, peri-wound maceration, dressing change frequency and debridement frequency were noted.
- Length of evaluation was 12 weeks or until wound was completely re-epithelialized, whichever occurred first.

RESULTS:

- 17 patients with 22 wounds were evaluated
- 10 patients were male and 7 were female; average age was 63 years old (range: 39 to 84 years)
- Wound types consisted of pressure ulcers (n=6), diabetic foot wounds (n=4), chronic radiation wound (n=1), venous leg ulcers (n=7), and dehisced surgical incisions post amputation (n=4).
- 19 of 22 wounds (86.4%) showed consistent progression towards closure and 4/22 (18.1%) were completely closed during the study period
- Dressing change frequency was reduced in 18/22 (81.8%) wounds and debridement frequency was reduced in 16/22 (72.7%) wounds after 2 weeks of humifiber dressings, compared to initial 2 weeks of application.
- Wounds remained free of wound surface desiccation and peri-wound maceration during use of humifiber dressings.

CONCLUSIONS:

- Dressing self-adapted to multiple wound conditions—from minimally to severely exuding wounds—and was effective in all wound types with no need for dressing customization.
- Notable improvements of wound edge conditions were observed during use of humifiber dressing.
- Healthy peri-wound skin was preserved in all cases with humifiber dressings.
- In the majority of cases, formation of biofilm was reduced with the humifiber dressing, therefore reducing the need for debridement over time.
- The humifiber dressing appeared to prevent accumulation of fluid and desiccation in all chronic, subacute and acute wounds in this series.
- Study patients reported high satisfaction based on painless and non-traumatic dressing removal, the ability to shower with the dressing in place, and reduction in dressing change and debridement frequency.
- Extended time between dressing changes lowered dressing cost for the patient and helped maximize Medicare/Medicaid benefits by reducing number of home health visits.
- A switch to this one-fit-all dressing simplified wound care, helped ensure standardization of care, reduced inventory costs, and diminished guesswork and potential human error that can be associated with traditional dressing selection.
- In our opinion, the new humifiber self-adaptive dressing satisfies the vast majority of patient and wound requirements and can be used in lieu of a wide array of wound care products to simplify wound care in any healthcare setting.