OBJECTIVE

To evaluate the effectiveness of a new non-drug, self-adaptive wound dressing technology with respect to slough removal, pain control, granulation tissue formation, re-epithelialization rates, and simplicity in acute and chronic wounds.

BACKGROUND

• Although uncontrolled pain is known to negatively affect wound healing and impact quality of life, pain remains a common experience among people with wounds [1].
• Wound pain is complex, often interconnected, causes may relate to the wound itself, surroundings, and systemic pathology [2].
• Although wound pain is multi-dimensional, it is a cornerstone of indicators and stalled wound healing [3].
• Dressings that actively reduce inflammation and edema, control blackheads, and relieve non-traumatic contact may be instrumental in reducing pain and accelerating wound healing [1].
• Selection of appropriate dressings that minimize wound-related pain should be based on comfort, moisture balance, healing potential and maintenance of healthy periwound edges [3].
• A synthetic polymer self-adaptive dressing is recently available and designed to facilitate proper moisture balance in all wound types through the simultaneous absorption of fluid and release of water vapor [4,5].
• The self-adaptive dressing protects healthy, non-macerated skin. When more than one dressing was required, dressings were placed side by side and sealed with adhesive tape. Dressings were secured with a Velcro® snap or adhesive tape. Dressings were changed over a 2-3 day period or until the wound was fully epithelialized, whichever occurred first.

We evaluated the ability of the new self-adaptive advanced wound dressing to affect wound-related pain, comfort, moisture balance, granulation tissue and epithelialization rates, and maintenance of healthy periwound edges of acute and chronic wounds.

METHODS

• With patient consent, consecutive acute and chronic wounds, regardless of etiology or amount of exudate, were prospectively evaluated.
• Wounds were sharply debrided prior to initial dressing application, except in patients who were receiving pre-congstenction therapy, and debrided at dressing changes as necessary.
• Topical granulation tissue was applied to the wound prior to the self-adaptive wound dressing in cases of unexpected wound colonization.
• The self-adaptive wound dressing (20 x 10 x 15 x 15 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 sealed with adhesive tape. Dressings were secured with a Velcro® snap or adhesive tape.
• Dressings were changed over a 2-3 day period, and weekly thereafter for 3 weeks or until the wound was fully epithelialized, whichever occurred first.

RESULTS

• The self-adaptive wound dressing was evaluated in eight patients; four females with 8 wounds. Average age was 64 years old (range: 34 to 92 years).
• Four wounds were acute and four were chronic. Chronic wound etiology included trauma (n=1), venous (n=1), and multilevel skin secondary to trauma (n=2). Average duration of chronic wounds prior to dressing initiation was 148.1 days (range: 30 to 912.5 days).
• Wound reported average beaded pain at 1.0 (range: 0 to 9) on a 0 to 10 scale prior to first dressing application. Following dressing initiation, all patients reported pain of 0 within an average of 4.6 days.
• Average granulation tissue coverage was 49.0% at dressing initiation. In one wound, 100% granulation tissue coverage was not achieved. Mean time to 100% granulation tissue coverage in the remaining seven wounds was 11.6 days.
• Four of the 8 wounds healed, mean time to full epithelialization was 15.8 days. One wound required a dressing, to seal the lesion, without dressing changes on 2 weeks and was healed two-week later. Two wounds were 100% granulated and decreased in diameter by 75% to 80% of the wound. The remaining wound did not progress due to issues of patient non-compliance.
• Right inactivation was observed in one wound, which healed after one week. In a second wound with heavy wound drainage, the alternate absorbent version of the self-adaptive dressing was used to alleviate wound edge maceration. Wound edge maceration was not noted in the 6 remaining cases.

CONCLUSIONS

• All wound pain, both during treatment and dressing changes, was diminished with the use of the self-adaptive wound dressing, including chronic pain that had been present for months.
• The self-adaptive dressing assisted in antibiotic administration and bedSIDE nutrition, as demonstrated in the 100% granulation tissue coverage of 6 of 8 wounds, including wounds initially covered with 80 to 100% slough.
• The self-adaptive dressing provided healthy, non-macerated peri-wound skin and reduced cell-associated pain.
• Patients were very satisfied with the dressing due to comfort, pain elimination during treatment, and non-traumatic dressing removal.
• Preparation of the wound for homogenous skin application was made easier with the use of the self-adaptive dressing, compared to previous dressings.
• Application of the self-adaptive dressing helped to maintain granulation tissue formation in all previously nonhealing wounds.
• The dressing was compatible with many topical therapies, including antibiotics.
• In the investigator’s opinion, the new self-adaptive wound dressing is extremely rewarding, and can be used to bridge a wide array of wound care products to simplify wound care in any healthcare setting.

CASE 1

Traumatic, painful extremity wound with slough. Complete closure achieved using only 3 dressings.

72-year-old female with a trauma wound sustained on her left forearm during a fall two weeks prior. Patient is oxygen dependent with a history of congestive heart failure, coronary artery disease and hypertension.

A Day 0

Traumatic wound with slough at presentation measured 4.0 x 3.0 x 0.2 cm. Patient presented pain score 9/10.

B Day 3

After 3 days with self-adaptive wound dressing, the wound was 100% granulated and dressing was removed. Pain was reduced to 6/10.

C Day 10

Post-initiation of self-adaptive dressings, wound was considerably contracted and measured 3.0 x 1.5 x 0.1 cm.

D Day 17

At the third dressing change, wound was closed and self-adaptive dressings were discontinued.

E Day 24

Wound closure at one-week follow-up; post-removal of self-adaptive dressings.

CASE 2

Non-healing foot ulcer with chronic osteomyelitis secondary to crush injury

44-year-old male with foot ulcer complicated by chronic osteomyelitis secondary to crush injury sustained four months prior.

A Day 0

Crush wound with 80% slough after four months of previous treatment measured 2.5 x 2.0 x 0.1 cm with wound edge epithelial and slight undermining.

B Day 16

After two weeks of self-adaptive advanced wound dressings, the wound was 90% granulated and measured 2.0 x 2.0 x 0.3 cm with moist, flatter, non-macerated wound edges.

C Day 37

After five weeks of self-adaptive dressings and four week post-layered skin substitutions, wound is nearly epithelialized. No inactivation or pain is reported.

D Day 52

Wound is fully epithelialized.

CASE 3

Non-healing extremity wound in anticoagulated patient with multiple concomitant medical morbidities

72-year-old female with a wound induced by subcutaneous tissue hematomata sustained on her right lower leg one month prior. Patient is oxygen dependent with history of herpetic chronic obstructive pulmonary disease and chronic antiallergy medication requiring anticoagulation medicine.

A Day 0

Non-healing traumawound, measured 2.9 x 1.5 x 0.1 cm. Patient reported wound pain of 5/10.

B Day 15

Exudate is contained within the dressing and there is no pain wound maceration with use of self-adaptive advanced wound dressings. Wound is epithelialized and wound pain is 0, requiring no topical pain medication.

C Day 21

At the fourth dressing change, wound is fully re-epithelialized, and all wound dressings were discontinued.