

# Bioelectric vs. Standard Wound Care: A Randomized Comparative Study

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## Background

Curettage and electrodesiccation (C&E) is a localized procedure to treat small squamous cell and basal cell carcinomas. The procedure is localized and results in a full-thickness wound from the scraping and burn effect to the skin. An IRB-approved pilot clinical study was conducted to compare healing rates, assess pain levels, and assess the incidence of wound complications including infection.

## Methods

Non-pregnant participants between the ages of 18-80 scheduled to undergo curettage and electrodesiccation for removal of their skin lesion(s) were included in the study. A total of twenty-six wounds were randomized into three groups and treated with either a self-adhesive soft silicone foam island dressing\*, a standard adhesive bandage\*\*, or a novel bioelectric dressing\*\*\* covered with the foam island dressing. In the presence of a conductive fluid, the wireless, self-contained bioelectric dressing generates a sustained electrical microcurrent within a therapeutic range of 2-10 microamperes on the surface of the device. Wounds were photographed and signs of erythema and edema were evaluated visually by the investigators. Subjective pain levels were documented by the patients utilizing a numeric pain intensity scale. The sites were cultured and correlated with clinical incidence of infection.

## Results

At three weeks, the bioelectric dressing-treated group experienced an 88% reduction in wound size, as compared to the foam island dressing (74% reduction in wound size) and the adhesive bandage (77% reduction in wound size) treated patients. No pain was reported across all groups. It was noted during this study that there was a presence of non-pathogenic light to moderate bacterial flora. All wounds healed to closure with no complications or adverse reactions. Clinically, the bioelectric treated wounds had less erythema, appeared healthier compared to the other wound sites, and were shown to heal significantly faster than wounds treated with adhesive bandages (p<0.02). Additionally, patients treated with the bioelectric dressing reported ease of use and increased comfort.

Table 1. Gender distribution, average age, wound area, follow-up days

	Bioelectric Dressing	Foam Dressing	Adhesive Bandage
Male Sex (n (%))	9 (69.2)	6 (75.0)	3 (60.0)
Age (mean±SD)	75.2±16.9	74.8±9.9	76.6±8.4
Wound Area (mean±SD)	1.18±0.94	0.91±0.50	1.1±0.72
Follow-up days (mean±SD)	22.4±4.3	23.6±7.7	28.0±8.8

Table 2. Effect size

Week	Bioelectric vs. Foam Dressing (Positive favors Bioelectric)	Bioelectric vs. Adhesive Bandage (Positive favors Bioelectric)	Foam Dressing vs. Adhesive Bandage (Positive favors Bandage)
1	-0.06	1.21	1.05
2	0.89	0.66	-0.35
3	0.56	0.51	-0.09



Foam Island Dressing



Bioelectric Wound Dressing



Adhesive Bandage

### KEY:

- Group 1: Bioelectric Dressing
- Group 2: Foam Island Dressing
- Group 3: Adhesive Bandage

## Conclusion

This study supports the use of bioelectric wound dressings as an emerging option for wound care resulting in accelerated wound healing, antibacterial protection and increased patient comfort and satisfaction. Traditionally, wound care dressings create the "optimal" environment for wound healing. The concept of bioelectric wound care is unique in that it enhances and stimulates the wound healing environment, and may be used in both acute and chronic wound settings with impressive clinical results (1-3). Compared to traditional dressings, bioelectric wound care offers significant advantages and offers the clinician a superior treatment option for wounds.

## Bibliography

1. Sheftel SN. The role of a bio-electric, antimicrobial dressing in the healing of acute and chronic wounds [abstract]. Clinical Symposium on Advances in Skin and Wound Care, Las Vegas, NV, October 2008; (suppl): 217.
2. Davis SC, Gil J, Valdes J, Perez R, Rivas Y. Assessment of the effects on wound healing and gene expression of a bioelectric dressing using a porcine wound model and real time reverse transcriptase-polymerase chain reaction. J Am Acad Dermatol. 2009;60:AB200.
3. Parker, J, Ho, A. The Treatment of Partial Thickness Burns with a Bioelectric Dressing Following Cosmetic Laser Facial Resurfacing. [abstract] J Burn Care Res 2009;30;2:AB171.

\*Mepilex® Border Lite, Mölnlycke Health Care, Gothenburg, Sweden  
 \*\*Band-Aid®, Johnson & Johnson, Langhorne, PA  
 \*\*\*Procelera™, Vornaris innovations, Inc., Chandler, AZ

Figure 1. Percent Change in Wound Area from Baseline by Group (All Subjects).

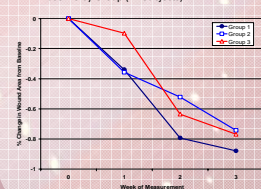


Figure 2. Percent of Subjects with 50% Wound Healing by Week.

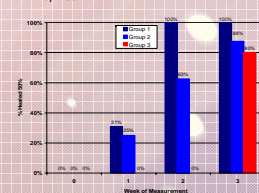


Figure 3. Mean of Erythema by Group and Week

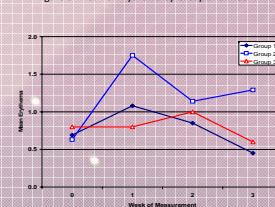


Figure 4. Mean of Edema by Group and Week

