The Treatment of Partial Thickness Burns with a Bioelectric Dressing Following Cosmetic Laser Facial Resurfacing

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BACKGROUND

Laser resurfacing procedures produce a partial thickness burn, resulting in unfavorable side effects including significant pain, erythema, swelling, exudate, eschar formation, peeling, and skin discoloration. Less common, but more severe side effects include blistering, persistent thermal damage, scarring, altered skin pigmentation, and infections. Wound aftercare is essential to improve re-epithelialization and reduce the severity of side effects and persistent complications. A growing body of research documents the efficacy of electrical stimulation in the management of partial and full-thickness wounds. A novel bioelectric, antimicrobial dressing that generates a sustained electrical microcurrent on the surface of the device has been observed to accelerate healing and decrease pain.

METHODS

A controlled, randomized pilot study was conducted to determine the safety and efficacy of a bioelectrical wound dressing in the treatment of partial thickness burns after cosmetic laser facial resurfacing. The study was IRB approved. All participants were >18 years of age, non-pregnant, and scheduled to undergo laser facial resurfacing. Informed consent was obtained from all participants. An Erbium: Yag Laser was set at an energy level of 2940 NM to burn to a depth of 40 microns. The output was 45 W and pulse duration was 0.1 up to 50 ms. Thirty patients were randomized into two groups; the control group was treated with a topical petrolatum based skin ointment* and dressings, and the study group was treated with a moistened bioelectrical total contact face mask, covered with a neoprene mask. The dressings were changed every three days. Subjective pain levels (Visual Analog Scale), wound assessments, and use of pain medications were documented. Photos were taken to monitor and compare wound healing.

RESULTS

The control group (n=9) healed in 9 days, whereas the study group (n=18) healed in 4 days, representing an accelerated healing of 55%. At 2 days post-procedure, patients treated with bioelectrical wound care experienced decreased erythema and edema levels as compared to controls. Patients treated with a bioelectric dressing experienced a 74.1% reduction in pain levels as compared to the control group (8.2% reduction), and required no narcotics as compared to the control group (100% narcotic analgesic use). 22.2% of the study group utilized over the counter analgesics such as acetaminophen and ibuprofen for mild discomfort. No complications (including herpetic outbreaks) were noted with the use of the bioelectric dressing.

CONCLUSIONS

It appears that the application of an antimicrobial, close-proximity electrically active wound dressing may be effective in accelerating healing of partial thickness burns, reducing burn-related pain, and reducing the need for narcotics.

REFERENCES