

Treatment of Chronic, Infected Pressure Ulcers with Noncontact, Low-Frequency Ultrasound Therapy*

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Background

Chronic pressure ulcers, particularly those that become infected, are a persistent challenge in the long-term care setting. It is well-established that high levels of bacteria in a wound disrupt the wound healing process. A potential bactericidal effect of noncontact, low-frequency ultrasound therapy* was observed in an *in vitro* experiment.¹ Additionally, clinical studies have demonstrated the efficacy of noncontact, low-frequency ultrasound in improving healing rates and time to healing in a variety of chronic wounds.²

Case Series

This case series reports the use of noncontact, low-frequency ultrasound to treat chronic, infected pressure ulcers in 3 Native American patients with substantial medical comorbidity.

Outcomes

In this case series, stalled, infected wounds closed completely or made substantial progress toward healing with noncontact ultrasound therapy, despite extensive medical comorbidity.

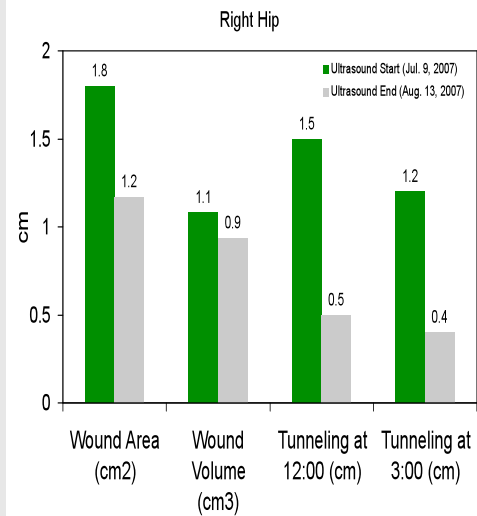
¹ Kavros SJ, Schenck EC. Use of noncontact low-frequency ultrasound in the treatment of chronic foot and leg ulcerations: a 51-patient analysis. *J Am Podiatr Med Assoc.* 2007;97(2):95-101.

² Unger P. Low-frequency, noncontact, nonthermal ultrasound therapy: a review of the literature. *OstomyWound Manage.* 2008;54(1):57-60.

* MIST® Therapy, Celleration, Eden Prairie, MN

Patient #1 Pressure Ulcer (Right Hip)

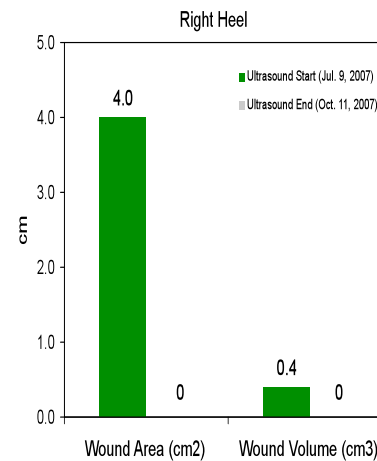
81-year-old woman whose comorbidities include Parkinson's disease, anemia, hypertension, immobility, malnourishment, and urosepsis. An MRSA-positive pressure ulcer on her right hip was present on admit Dec 27, 2006. Healing had stalled and tunneling of 1.5 cm at 12:00 and 1.2 cm at 3:00 persisted after 6 months of negative pressure wound therapy (NPWT). After 5 weeks of noncontact ultrasound (3 times/week) and calcium alginate/silver dressing, tunneling and wound area were reduced substantially despite patient's worsening medical condition and admission to the hospital.



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Patient #2 Graft Site (Right Heel)

77-year-old woman with a previously grafted pressure ulcer on the right heel. A corner of the graft did not take resulting in a smaller ulcer. Her comorbidities include coronary artery disease, diabetes, neuropathy, Parkinson's disease, and edema (right lower extremity). After 6 months of diathermy and foam dressings, the wound measured 4 cm². After 3 months of noncontact ultrasound 3 times/week, the wound closed with a small tan scab slowly flaking off with intact skin beneath.



Patient #3 Multiple Pressure Ulcers

66-year-old woman with osteoporosis, cachexia, anemia, chronic pain, and 4 pressure ulcers. Healing had stalled and 2 ulcers were MRSA-positive after 6 months of NPWT and calcium alginate/silver. As shown in the graphs below, after 6 weeks of noncontact ultrasound (2-3 times/week), ulcers on the left spine and right heel closed completely. After 4 months, the sacrum ulcer was near complete closure and the right back ulcer had decreased in area by 60% with a concomitant 60% decrease in undermining.

