

Effectiveness of Low-Frequency, Noncontact Ultrasound* for Closure of a Chronic Wound

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Background

Chronic sacral pressure ulcers compromise mobility, quality of life, participation in activities, and life expectancy of elderly patients in long-term care facilities. Low-frequency, noncontact, nonthermal ultrasound* (aka noncontact ultrasound) is a relatively novel wound healing modality reported to hasten healing of stalled, nonhealing wounds. In randomized clinical studies, this therapy has been shown to be effective at improving time to healing and proportion of wounds healed in diabetic foot ulcers¹ and ischemic wounds.²

Objective

Noncontact ultrasound was administered to facilitate wound closure and maintain intact epithelium in a chronic sacral pressure ulcer of several years duration with brief, transient episodes of closure.

* MIST® Therapy, Celleration Inc., Eden Prairie, Minnesota

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Case Report: Chronic Sacral Pressure Ulcer

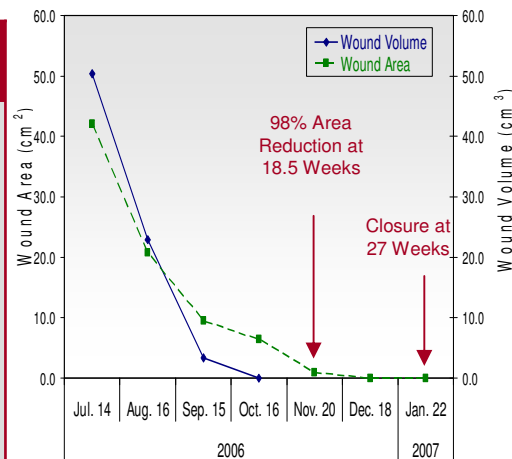
History

This 79-year-old woman, who uses a wheelchair, presented with a chronic sacral pressure ulcer of several years duration, albeit with brief periods of closure. Her medical history includes hypertension, anemia, dementia, chronic urinary tract infections, mild obesity, osteoarthritis (spine), and former alcohol and tobacco abuse. On admission, the wound was completely covered with yellow slough. Swab culture was positive for MRSA infection and osteomyelitis was present in the sacrum. Papain urea ointment was applied the first week until enough slough cleared to use negative pressure wound therapy (NPWT).

Clinical Course

Noncontact ultrasound 3 times weekly for 6 min per treatment was initiated on Jul. 14, 2006. Treatment time decreased to 3 min as the wound approached closure. Concomitant therapies were NPWT and weekly sharp debridement through August and nonadherent dressings and alginates throughout. Weekly evaluations included wound dimensions, tissue content, periwound integrity, and exudates. After 9 weeks of noncontact ultrasound, 90% granulation was achieved and undermining was resolved (see table). At 13 weeks, granulation was complete. The wound was near closure at 18.5 weeks and closed completely at 27 weeks (see graph). Closure has been maintained for > 10 months.

Date	Tissue Content		Periwound Skin	Undermining	Drainage
	Granular	Slough			
Jul. 14	0%	100% 15% fibrin	Irritation, local erythema 1 cm	2.0 cm at 12:00	Moderate serous
Aug. 16	70%	30%	Intact, local erythema, edema +1	0.4 cm each at 12:00, 3:00, 6:00, and 9:00	Moderate serous
Sep. 15	90%	10%	Intact, irritation	None	Moderate serosanguineous
Oct. 16	100%	—	Intact, irritation	None	Moderate serosanguineous
Nov. 20	100%	—	Intact, irritation	None	Minimal serosanguineous
Dec. 18	100%	—	Intact, irritation	None	Minimal serous



Discussion

In this case report, the use of noncontact ultrasound therapy along with nonadherent alginate dressing and limited use of NPWT and sharp debridement resulted in complete and sustained closure of an MRSA-infected chronic sacral pressure ulcer of multiple years duration in a wheelchair-bound resident of a long-term care facility. Previous treatments over several years had achieved transient periods of closure but sustained closure had been elusive.

This resident is now able to spend more time in a chair and come out of her room to participate in activities. It is unfortunate that photo documentation of this healing success is unavailable due to a restriction against photographing patients at this facility.

References

- Ennis WJ, Foremann P, Mozen N, Massey J, Conner-Kerr T, Meneses P. Ultrasound therapy for recalcitrant diabetic foot ulcers: results of a randomized, double-blind, controlled, multicenter study. *Ostomy Wound Manage.* 2005;51(8):24–39.
- Kavros SJ, Miller JL, Hanna SW. Treatment of ischemic wounds with noncontact, low-frequency ultrasound: the Mayo Clinic experience, 2004–2006. *Adv Skin Wound Care.* 2007;20(4):221–226.