Noncontact, Low-Frequency Ultrasound Therapy* for Infected Pressure Ulcers in a Patient with Multiple Comorbidities

Ann Bingham, RN, BSN, CWOCN, Oak Tree Hospital at Baptist Regional Medical Center, Corbin, Kentucky

Purpose

Infection and comorbidity contribute to wound chronicity. This case report describes the course and outcomes of noncontact, low-frequency ultrasound therapy* (i.e. noncontact ultrasound) to assist with healing of chronic, infected pressure ulcers in an elderly patient with multiple comorbidities.

Background

Noncontact ultrasound delivers acoustic pressure to wound tissues via a fine mist of sterile saline. Randomized and nonrandomized studies, primarily involving lower-extremity ulcers, have demonstrated faster healing and greater proportion of wounds healed when APWT is added to conventional wound care.[1-3] An in-vitro experiment also identified a potential bactericidal effect of this novel ultrasound therapy.[3]

Case History

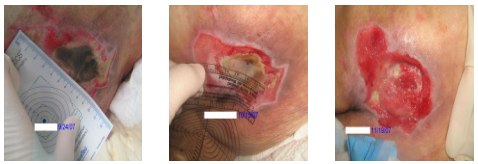
This 76-year-old Caucasian woman presented with two pressure ulcers of 2 to 3 months duration: a partial- and full-thickness ulcer of the sacrum and a full-thickness ulcer of the occipital area of the head. Her medical history includes obesity (BMI: 31), ovarian cancer, myocardial infarction, coronary artery disease, left ventricular thrombus, chronic obstructive pulmonary disease, respiratory failure, sputum infection, apical aneurysm, cataract surgery, cholecystectomy, colostomy, and bowel perforation leading to ileostomy. Her medications include a nutritional supplement and megestrol acetate.

Treatment and Outcomes

Sacral Wound

On admission, the sacral wound was entirely covered with slough and eschar. It was infected with *Enterobacter aerogenous* and *Proteus mirabilis*. Periwound tissue was fragile and friable. Drainage was moderate serosanguineous. Initial treatment was enzymatic debridement and wet-to-dry dressings. From Sept. 26 to Nov. 19, noncontact ultrasound was administered 3 times/week for 10 min/treatment with silver gel and dry dressings. After 8 weeks of noncontact ultrasound (with negative pressure wound therapy for the last 2 weeks), 100% slough and eschar was replaced with 97% granulation tissue and wound area was reduced by 74%. See table and photos below. Silver gel and dry dressing once a day were continued.

Sept. 24 | Oct. 15 | Nov. 19



	Area	Undermining	Tissue	Dressing
Sept. 18	121 cm^2		Slough 40%, Eschar 60%	Papain-urea ointment, zinc, and gauze
Oct. 15	45 cm^2		Granular 75%, Eschar 25%	
Nov. 19	28 cm^2	*Nov 12:* 2 cm @ 9:00, 11:00 0.5 cm @ 12:00 1 cm @ 3:00 *Nov. 19:* 1 cm @ 12:00-6:00	Granular 95%, Slough 5%	NPWT, Silvasorb, foam, films, hydropolymers
Nov. 27	32 cm^2	1 cm @ 7:00-4:00	Granular 97%, Slough 3%	

Occipital Wound

On admission, the head wound was covered with eschar and being treated with dry dressing and pressure relief. Periwound tissue was fragile and friable. Drainage was none to minimal sanguineous. On Sept. 19, we initiated noncontact ultrasound (3 times/week for 5 min/treatment) with hydrogel and dry dressing. After 7 weeks of noncontact ultrasound therapy (discontinued Nov. 7) and an additional 3 weeks of hydrogel or silver gel and gauze, 90% granulation was achieved. Wound area had decreased by 75%. See table and photos below. Hydrogel and dry dressing once a day were continued.

Sept. 18 | Oct. 15 | Nov. 27

	Area	Tissue	Dressing
Sept. 18	24 cm^2	Eschar 100%	Gauze stockinette
Oct. 15	16 cm^2	Eschar 100%	Hydrogel, gauze stockinette, waffle pillow
Nov. 27	6 cm^2	Granular 90%, slough 10%	Silvasorb, gauze stockinette, waffle pillow

Summary

Healing of these chronic pressure ulcers was complicated by extensive slough and eschar, infection, and medical fragility. Substantial improvements in wound size and tissue quality were observed with 7 to 8 weeks of noncontact ultrasound therapy added to moist wound-healing dressings.

On Nov. 29, the patient was transferred to a nursing home because she no longer required an acute care setting. Unfortunately, she died at the nursing home and no further information about her wounds is available.

References

[1] 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.

[2] 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.

[3] 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.*

* MIST® Therapy, Celleration, Eden Prairie, Minnesota

Disclosures: The author received no financial support for this case study. Funding for poster production was provided by Celleration.
ML-66160