

***ABSTRACT: The Symposium on Advanced Wound Care (SAWC),
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Hypochlorous Acid Irrigation During Acoustic Powered Debridement Enhances

Healing: HOCl irrigation is synergistic with acoustic powered debridement to decrease wound bioburden.

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Background:

Wound debridement with the 22.5kHz acoustic powered hand piece* has advantages of curette and scalpel: patient comfort, decreased bleeding, ease of removing bioburden from large chronic wounds, direct disruption of bacteria cell walls, and ultrasonic stimulation of the wound surface cells has a trophic effect on healing. Acoustic debridement speeds healing by controlling wound bioburden.(1)

Hypochlorous acid (HOCl) is a small, naturally occurring moiety that diffuses quickly into wound surface bioburden to kill bacteria while sparing eukaryotic cells. In myelocytic white blood cells, hypochlorous acid is synthesized by the iron containing enzyme myeloperoxidase. HOCl kills bacteria engulfed by myelocytes via five known mechanisms.(2)

This study asks two questions about HOCl solution irrigation** for acoustic powered debridement. Is HOCl irrigation comfortable for the patient? Is HOCl irrigation superior to saline for bioburden control and improved wound healing?

Methods:

Hypochlorous acid (HOCl) replaced saline, off label, as irrigation solution for 22.5kHz powered debridement of complex of stalled chronic wounds in a community wound clinic. Irrigation bottles were “spiked” with irrigation tubing after puncturing the plastic bottle wall with one blade of a dressing scissors.

Results:

Photographs document healing in five patients with multiple wound comorbidities. Three patients with wounds, present at least five months, underwent successful bilayer human cell skin substitute grafting after one to three weekly 22.5 kHz debridements with HOCl irrigation.

Conclusions:

Acoustic powered debridement with HOCl irrigation is well tolerated in difficult wounds. Exudative chronic wounds “dried up” rapidly following HOCl irrigation. This anecdotal trial suggests that hypochlorous acid irrigation during 22.5 kHz powered debridement appears superior to saline irrigation. Improved bioburden control by HOCl is the probable mechanism.

References:

1. Tan, J et al. A Painless Method of Ultrasonically Assisted Debridement of Chronic Leg Ulcers: A Pilot Study. *European Journal of Vascular and Endovascular Surgery*, Volume 33, Issue 2, Pages 234-238 (February 2007).
2. Hurst, J. L., W. C. Barrette, Jr., B. R. Michel, and H. Rosen. 1991. Hypochlorous acid and myeloperoxidase-catalyzed oxidation of iron-sulfur clusters in bacterial respiratory dehydrogenases. *Eur. J. Biochem.* 202:1275-1282.

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