

Sonic Frequency Vibratory Debridement Tool Disrupts Biofilm and Stimulates Petechial Microbleeding Through Controlled and Safer Microlayer Debridement

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Introduction

A novel Vibratory Debridement Technology (VDT)* has been recently developed and documented to reduce the pain and anxiety of debridement, speed wound healing, improve patient satisfaction, and save procedural time, with overall cost savings (1-4). Debridement converts a chronic wound from an inflammatory to an acute phase to promote wound progression. It also addresses bacterial biofilm reduction (5, 6).

VDT uses sonic frequency in the range of >500 vibrations per second. Multiple wound heads are available and quickly interchangeable with the system. The Scrubbing Head can be used for maintenance wound hygiene, as well as for periwound skin, which has been demonstrated by imaging to contain high bioburden resistant to wiping (7). Planar control of debridement depth is controlled by using index finger pressure to the top front end of the handpiece during use. Debridement Heads have plastic teeth aligned on the outside edges, which can be angled to carve and refashion wound edges.

Methods

14 patients (7 male and 7 female, 43-84 years old) with chronic wounds were treated at an outpatient wound care center with VDT. Wounds represented a random sampling of chronic venous, arterial, pressure, and diabetic ulcers. Wound age, and wound bed status varied from clean to heavily contaminated. Wounds were assessed and cleaned/debrided according to standard clinic protocol. Use of VDT replaced standard surgical debridement. Weekly clinic visits included pictures before and after debridement, wound measurements, pain scale, and physician assessment.

Conclusions

All 14 patients were successfully debrided with VDT. Among sensitive patients, all preferred VDT. Two patients with necrotic tendon required scalpel use in addition to VDT. Biofilm is documented to regularly reach 50-70 microns deep in the wound bed (8). Control of debridement depth can therefore remove thin layers from the wound bed in a relatively safe and controlled manner. After VDT, the additional benefit of healthier petechial microbleeding was noted – more than commonly seen with sharp debridement. These diffuse areas of petechial microbleeding will recruit platelets and initiate the first stage of wound healing with reintroduction of PDGF and transforming growth factors.

More studies are needed, but VDT wound debridement appears to show promise at disrupting the tenacious EPS / biofilm and stimulating petechial microbleeding through controlled, relatively safe and effective microlayer debridement.

Vibratory Debridement Technology

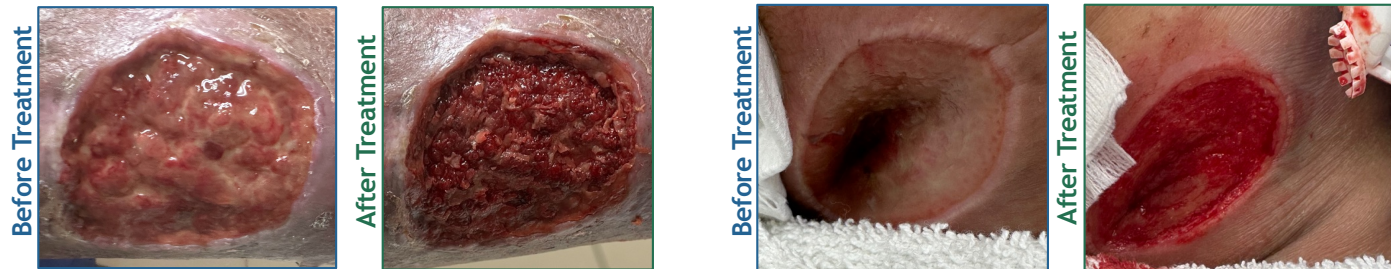
Handpiece is reusable with Caviwipe. Uses sleeve over handpiece. Scrubbing, Debridement and Small Debridement Heads are available.



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Outcomes



This case series illustrates that sonic frequency Vibratory Debridement Technology (VDT) can be used in a relatively safe and controlled manner to scrub wounds and periwound skin, as well as to debride by removing microlayers of wound bed. Resultant microbleeding helps convert chronic inflammatory state back to an acute phase of wound healing. Patients report overall less pain and anxiety using VDT compared to standard debridement.

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