

# Utilizing Pure Hypochlorous Acid (pHA)-Preserved Wound Cleanser and Bioresorbable Synthetic Antimicrobial Matrix to Preserve Orthopedic Hardware in Patients with a Non-Infected Surgical Wound Dehiscence

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## INTRODUCTION

- Dehiscence and the development of a slow healing wound, is not uncommon following orthopedic surgeries involving the insertion of hardware.
- Due to many reasons, clinicians may opt to treat these usually infected wounds with the goal of salvaging the hardware via the steps of wound cleansing and antimicrobial barrier therapy, with a final goal of closure via secondary intention, or if appropriate primary closure.
- Along with systemic Abx therapy, local wound treatment in such cases is important to progress the wound.
- Local wound management can be performed by using a silver antimicrobial bioresorbable matrix. A product of interest is a resorbable matrix that contains nanoparticles (NP)\* of silver and a fully synthetic polymer scaffold to foster healthy cell growth. This product contains 1ppm of nanoparticle (7-10nm) ionic and metallic silver at nontoxic levels in the wound environment.
- An additional and very critical step that is recommended by several guidelines include the use of pure Hypochlorous Acid (pHA)\*\* preserved wound cleanser\*\* on a regular basis.
- Such cleansers are to be used as frequently as possible, due to the proven noncytotoxic nature of the pHA cleanser, that also has a slightly acidic pH associated with wound healing.

## TREATMENT METHOD

### Case 1

- Cleanser: pHA\*\* Wound Solution used at every cleansing.
- Sustained Release Antimicrobial Synthetic Matrix (MM\*) placed in wound bed and directly over hardware. Wound cultures negative-only normal skin flora is noted.
- Secondary Dressing: NPWT at 125 mm Hg
- Compression: 2 layer

### Case 2

- Cleanser: pHA\*\* Wound Solution
- Sustained Release Antimicrobial Synthetic Matrix (MM\*) placed in wound bed and directly over hardware. Wound cultures negative-only normal skin flora is noted.
- Secondary Dressing: NPWT at 125 mmHg
- Compression: 2 layer

## CONCLUSION & DISCUSSION

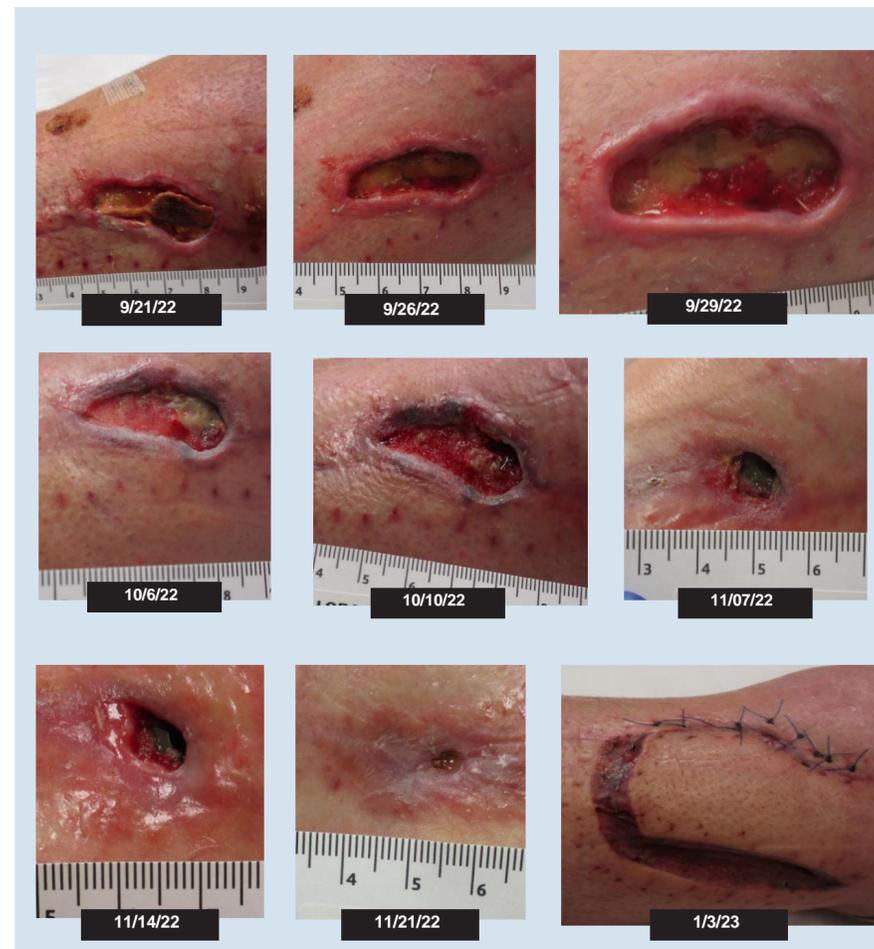
- Outpatient specialists in wound centers often treat wounds involving contaminated hardware.
- Local wound management is important.
- The use of both a sustained release nanoparticle silver matrix (MM\*) and a cleansing solution containing pure Hypochlorous Acid antimicrobial preservative, pHA\*\*, is an effective way to manage contaminated hardware
- Of the two cases presented, the wounds healed in one via secondary intention without further surgery. Figure 1 shows the way the wounds healed over time.
- In the other, the surgeon opted to remove the hardware though the wound specialist advised otherwise given the healthy state of the wound and its steadily decreasing size.
- The principle that contaminated hardware-related wounds can be well treated by MM\* synthetic antimicrobial matrix and pHA antimicrobial preserved dressing is proven in these two cases. The two products appear to be quite compatible based on empirical observations.

MM = \*Microlyte® Matrix, Imbed Biosciences

pHA\*\* = Vashe® Wound Solution, Urgo Medical North America

## CASE 1 – 29-YEAR-OLD FEMALE

- 29 y.o. female with a history of a tibial plateau fracture, non-smoker, non-diabetic. Patient compliant with protein and vitamin recommendations to support wound healing. Injury 7/23- initial surgery 8/3 (fx repair with ex fix), 8/3 2nd surgery (soft tissue repair and ORIF)
- Sutures and external fixation was removed 9/7, the patient suffered wound dehiscence of the surgical wounds complicated by periwound fracture blisters. Wounds were of the left knee (medial and lateral)
- Wounds were cared for by the orthopedic team for 4.5 weeks prior to being referred to wound care for further assessment and treatment of the open surgical wounds. In addition to the open wounds the patient c/o lack of knee ROM and pain related to PT work.
- Left lateral knee was of the most concern as it had unstable necrotic tissue overlying the orthopedic hardware. Once necrotic tissue was debrided a screw head was visible in the proximal portion of the wound.
- The wound was flushed with a pHA\*\* preserved wound cleanser followed by a pHA\*\* soak x 10 min. MM\* matrix was placed over the wound bed and screw head prior to placing a NPWT device to run at 125 mmHg and 2 layers of Tubigrip F to aid in compression therapy. Patient was seen 2 x week.
- Hardware remains stable on CT, blood work is stable and WBC, ESR, CRP are WNL throughout wound care duration. Wound culture only reveals "normal skin flora"
- 11/21/22 Patient understands she has 2 options: retain original hardware or removal; but decides on hardware removal r/t reduced ROM and deep knee pain.

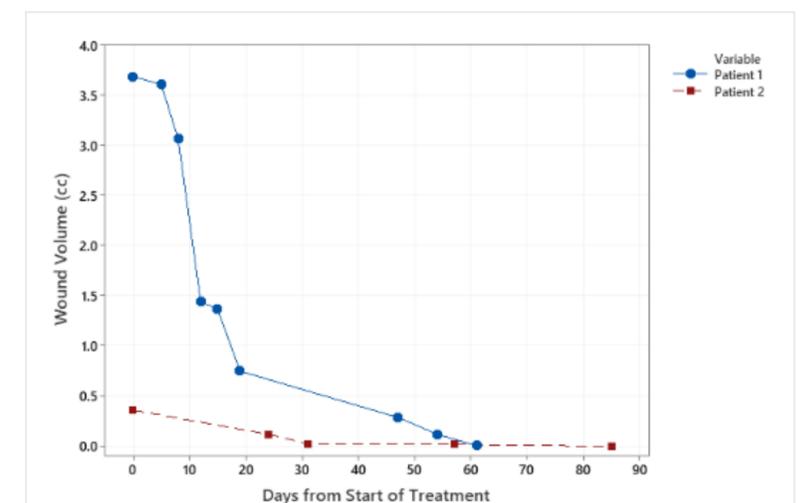


## CASE 2 – 70-YEAR-OLD FEMALE

- 70 y.o. female with a history of a bunionectomy 9/23/2022
- Sutures removed 2 weeks post-op and patient suffers wound dehiscence with orthodeic plate exposed in the base of the wound (right dorsal foot). The bone is not healed and it is optimal to keep the hardware intact until the bone is healed.
- Wound was cared for by podiatrist for approximately 6 weeks prior to referring to wound care for follow up assessment and treatment. Patient has a wound culture taken 12/8 and started on oral antibiotics
- The wound was flushed with a pHA\*\* preserved cleanser followed by a pHA\*\* soak x 10 min. MM\* matrix was placed over the wound bed and plate prior to placing a wound vac to run at 125 mmHg and 2 layers compression wrap to aid in compression therapy. Patient was seen 2 x week.
- Hardware remains stable on CT, blood work is stable and WBC, ESR, CRP are WNL throughout wound care duration. Wound culture only reveals "normal skin flora" on wound culture that was collected 1/17/2023. Patient was not on oral antibiotics at the time both wound cultures were collected and began a 10-day course of oral antibiotics on 1/31/2023.
- A wound culture was collected 12/8 and reveals coag negative staphylococcus and another culture was obtained 1/17/2023 which revealed normal skin flora.
- Patient kept on doxycycline to prevent infection, wound primarily closed 2/7, 3/7 patient remains healed with no s/s of infection or pain, patient returns to a normal walking shoe. Will continue oral antibiotics for 6 weeks.



FIGURE 1 – WOUND HEALING OVER TIME WITH MM\* AND PHA\*\*



Produced with support from Urgo Medical North America and Imbed Biosciences