Reducing Bioburden and Disrupting Hard to Remove Microbial Colonies with Pure Hypochlorous Acid (pHA)* in a Necrotic Wound On the Surface of an Implanted Device

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INTRODUCTION

- Presence of bacterial colonies that are adherent to the tissue surface are recognized as deterrents to wound healing.
- If an implant is involved in the wound area, and bacteria enter and proliferate/colonize the implant, the risk to the patient is highly magnified.
- Wound cleansers that efficiently remove germ and germ secreted matter such as polysaccharides and proteins (in common parlance, bacterial slime), may lead to notable outcomes against all expectations.
- A pure Hypochlorous Acid (HOCl)-based cleanser*, evidence shows, is able to remove bacteria, associated slime like materials, and necrotic tissue that are all usually associated with problem wounds.
- It may also be able to modify the wound pH to a range that is amenable to healing with the de-selection of pathogens in the microbiome.

METHODS

- 79 yo female s/p percutaneous aortic valve repair complicated by bleed and hematoma in right groin at the valve insertion site, resulting in full thickness necrosis.
- Medical history: Aortic valve stenosis, CHF, HTN, Obesity
- Treatment:
  - Patient not deemed a primary closure surgical candidate upon presentation.
  - NPWT instillation with dwell time** dressing with pHA cleanser, at the bedside, to soften and degrade necrotic tissue.
  - Taken to OR for staged debridements.
  - pHA (HOCl) cleanser used always for irrigation during every opportunity in this treatment phase, applied via soaked gauze.
  - Definitive closure performed with reticular dermal matrix*** placed as tissue scaffolding for soft tissue replacement.
  - Placental allograft**** placed to optimize healing, followed by incisional primary closure of defect
  - Incisional NPWT Therapy initiated following closure
  - Incisional wound dehisced during stay at stepdown facility
  - The dehisced wound was cleansed regularly with HOCl cleanser, via soaked gauze, then closed primaily via sutures when the wound bed was deemed ready

RESULTS

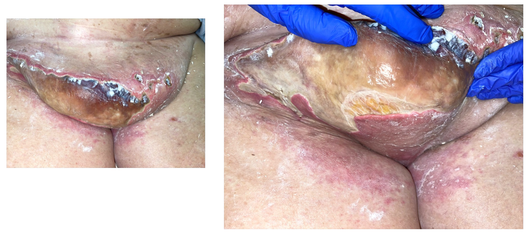
- Figures 1-12 pictorially describe the resolution of the problem via the use of HOCl cleanser with other important techniques.
- As there was an episode of dehiscence, after the first closure, there were two primary closures on the way to healing for this patient.
- Following both closures, and up to complete resolution there was no evidence of residual or recurrent infection at the wound site. More importantly, following a delay in healing there was no evidence of bacterial seeding of her recently implanted aortic heart valve.

CONCLUSION

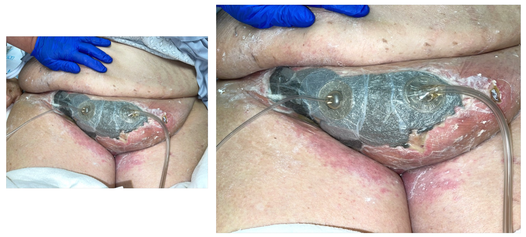
- HOCl use seems to be quite compatible with the use of biological matrices used to promote wound healing such as human dermal matrix and amniotic materials.
- We believe there may be a role for HOCl to remove biorburden, necrotic tissue, and associated debris to lead to infection free wound healing in highly complex wounds/ patients.
- Implanted devices are highly prone to bacterial seeding and the development of life-threatening internal infections. The use of pHA/HOCl based cleanser seem to have significantly mitigated this risk for this patient.

CASE STUDY – FULL THICKNESS NECROSIS GROIN

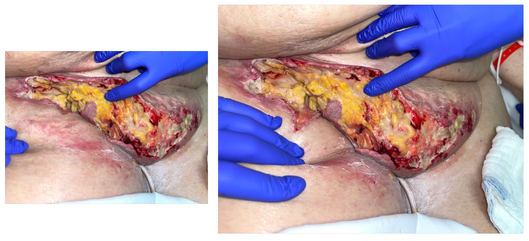
Right groin wound with necrotic debris



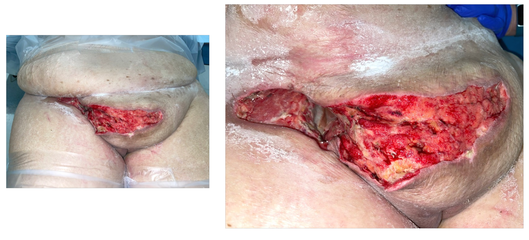
Day 1 – Right Groin wound with necrotic debris



Day 1 – NPWTi-d initiated to loosen eschar and necrotic tissue

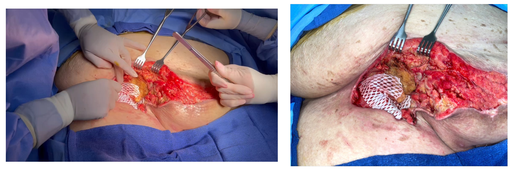


Day 3 – NPWTi-d initiated to loosen eschar and necrotic tissue

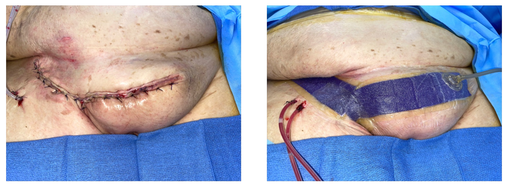


Day 14 – Wound appears adequate for soft tissue reconstruction

Day 14 – Flap mobilized for coverage of vessels, Placental allograft utilized to optimize wound bed



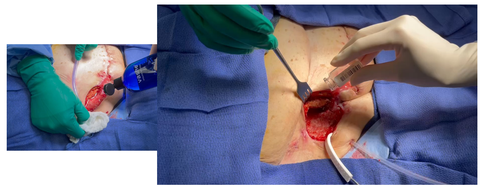
Day 14 – Layered support with SomaGen reticular dermal matrix and native flap tissue



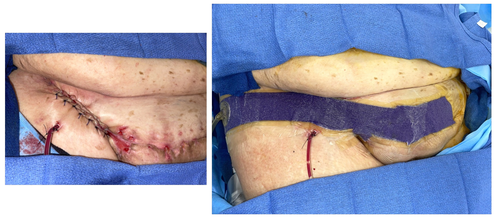
Day 14 – Closure performed and NPT placed

Day 24 – NPT dressing and drains removed. Pt returned to care facility and started on physical therapy

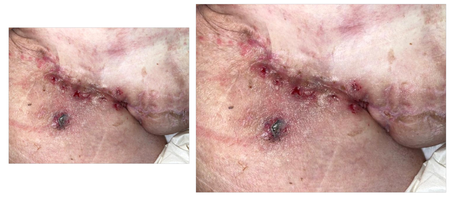
8 Weeks – SomaGen matrix completely incorporated with no vessel exposure



8 Weeks – Wound irrigated . Placental allograft placed in preparation for surgical closure.



8 Weeks – Closure performed and NPT placed



3 Months – Healed. No further surgical intervention needed

Vashe Wound Solution, Urgo Medical North America,
**3M™ Veraflo™ Cleanse Choice™, *3M™ Medical*
*** *Somagen™ MTF Biologics*
**** *Salera® MTF Biologics*
*****V.A.C. VERAFLO™, 3M™ Medical*

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