



Expediting Acute Wound Healing by Integrating Multiple Therapeutic Strategies

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INTRODUCTION

Traumatic injuries can lead to massive, complex wounds with an increased propensity for infection. Historically, rudimentary and single-product dressings have been applied to treat even complicated acute wounds with varying efficacy. Alternatively, an acute surgical wound service (ASWS) often incorporates an integrated, advanced wound therapy approach. The objective of our case review series was to assess if healing rates correlated with utilization of unique combination therapies.

METHODOLOGY

An ongoing observational, prospective analysis was performed, reviewing patients with complex acute surgical or traumatic wounds from their inpatient admission through their outpatient course until wounds were healed.

- Systematic assessments were standardized, employing a variation of T.I.M.E. (tissue, infection /inflammation, moisture balance, edge/ periwound) with an "S" for wound size and social considerations.
- Treatments were tracked and reevaluated at every patient encounter with adjustments based on healing progression, treatment options/ availability, and updated individual needs.
- Key outcome events included:
 - wound progression determinations,
 - measurements,
 - individualized treatment regimens,
 - time to healing,
 - and healthcare utilization metrics.

TRADEMARKED ITEMS

- *Vashe® Wound Solution, Urgo Medical North America, Fort Worth, TX, USA
- °Aquacel® Ag Extra™, °DuoDerm®, ConvaTec, Inc., Bridgewater, NJ, USA
- ^Allevyn® Life, Smith & Nephew, Inc., Fort Worth, TX, USA
- ^Adaptic™, ^Promogran Prisma™, ^Tegaderm™, 3M Health Care, St. Paul, MN, USA
- ^MediHoney®, ^Acell®, Integra LifeSciences, Princeton, NJ, USA
- ^Mepilex®, ^Mepitel® One, Mölnlycke Health Care, Gothenburg, Sweden

DISCLOSURES

This work was produced with support from Urgo Medical North America.

CASE STUDY #1

Patient: 38-year-old female with a PMH of anxiety and depression
Mechanism of injury: Found down after polypharmacy overdose
Sustained: Compartment syndrome of LUE requiring fasciotomy
Initial size: 22.1x11x0.3cm
Time to healing: 42 days
Combination of therapies used: pure hypochlorous acid based wound cleanser (pHA)*, sharp debridement, non-adherent cellulose acetate petroleum, negative pressure wound therapy (NPWT), porcine urinary bladder matrix, split-thickness skin graft. (10/21- continued drainage so followed until complete resolution day #42.)



10/4 10/12 10/21

CASE STUDY #3

Patient: 37-year-old female with PMH tobacco use
Mechanism of injury: Dog bites
Sustained: Multiple full-thickness wounds to the LUE, RUE, and RLE
Initial size: LUE: 2x3.5cm, 1.5x2.5cm, & 1.5x3cm with depth appearing to be ~0.3-0.5cm; RUE: 8x4.5cm, 1x3.5cm, & 3x8cm with depth appearing to be ~0.5-1cm; RLE: 1x3cm & 1x4cm with depth appearing to be ~0.2-0.4cm
Time to healing: 6 wounds healed in 10 days, the remaining 2 in 24 days
Combination of therapies used: pHA*, primary closure, hydrofiber impregnated with silver, non-adherent foam, bacitracin, non-adherent cellulose acetate petroleum, ABD pads, rolled gauze



LUE LUE RUE RUE RLE

Dog bite photos are 9/6, day of injury, to show severity. Healed photos N/A.

CASE STUDY #2

Patient: 44-year-old male with PMH of HTN and OSA
Mechanism of Injury: Crushed by heavy machinery
Sustained: Multiple abdominal injuries including hemoperitoneum with feculent spillage resulting in fascial closure with skin and subcutaneous tissue left open
Initial size: 23.1x8.7x2.7cm
Time to healing: 132 days
Combination of therapies used: pHA* via NPWT instillation, pHA* gauze soak, delayed primary closure, hydrofiber impregnated with silver, non-adherent foam, silver nitrate



6/6 6/14 6/24 9/22

CASE STUDY #4

Patient: 52-year-old female with PMH DVT/PE on warfarin
Mechanism of Injury: Several hundred-pound windowpane fell on shin
Sustained: Large RLE traumatic hematoma with complications including periwound eschar and fat necrosis
Initial size: 1.7x4.3x3cm with undermining of 4.5cm from 10-2 o'clock and undermining of 5.5cm from 5-7 o'clock
Time to healing: 03/09, day 127, wound is almost completely healed
Combination of therapies used: surgical debridement, pHA* gauze soak, NPWT, hydrocolloid, non-adherent cellulose acetate petroleum, ABD pads, transparent silicone dressing, hydrofiber impregnated with silver, non-adherent foam, silver nitrate



As patient has not completely healed, data is not included in current calculations. However, pictures are included as we felt her progression was impressive.

11/3 11/7 11/18 12/15 1/12 3/9

FINDINGS / RESULTS

Since inception, 124 patients met the inclusion criteria, remained within the service, were stable for wound healing, and survived until wounds were healed. In these patients, single or multiple complex acute wounds of various etiologies, and dimensions up to 1120cm³, were healed. The median time for ASWS consultation was 2 days from injury. It was determined that all patients had been treated with a pure hypochlorous acid based wound cleanser* (pHA) in combination with one or more of the following: negative pressure wound therapy, collagen, silver, manuka honey, and foam dressings. The median healing time was 19 days for all 366 wounds, compared to 35 days in the literature². Wound healing delays were associated with tobacco use, immunocompromise, and inability to obtain recommended wound care supplies. No adverse events were noted with any of the therapies utilized.

Discussion

Early wound specialist consultations assure integration of optimal advanced therapeutic combinations, especially for complex wounds. While simple acute wounds may require 4 weeks to heal, innovative dressings, including pHA and other beneficial components, have shown reduced healthcare utilization, in part by shortening time to healing. The resulting decrease in dressing change frequency, follow-up outpatient appointments, and home care could increase patient satisfaction and optimize wound healing outcomes.

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