1 Year Retrospective Case Series: Wound Outcomes Utilizing Novel Highly Charged Fiber Wound Dressing*

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Background

- Debridement - a technique to remove dead or infected tissue from the wound bed. Types include - autolytic, enzymatic, mechanical & surgical
- Autolytic – utilizes the body's endogenous enzymes & moisture to liquify and remove non-viable tissue
- Highly charged fiber (HCF) dressings are a form of autolytic debridement, in which charged fibers bond to positively charged regions of slough, enhancing the breakdown of necrotic tissue

Objectives

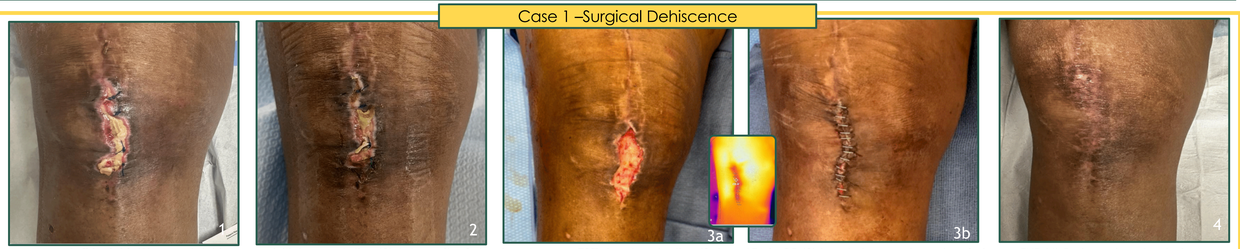
- **Evaluate** the efficacy of HCF dressings, in promoting wound healing and reducing infection in patients with various wound types
- **Compare** the different mechanisms of debridement and **analyze** their respective roles in optimizing wound healing based on wound type and environment
- **Describe** the principles of autolytic debridement and the role of HCF dressings in facilitating tissue regeneration by utilizing endogenous enzymes and moisture, with an emphasis on their antimicrobial properties

Methods

- Retrospective review from April to Oct. 2024 of patients with various wound types treated with HCF dressings as primary and/or preoperative treatment
- Operative techniques and perioperative protocols were examined
- Patient demographics, comorbidities, and operative cultures were reviewed
- Outcomes were assessed in the outpatient wound center, focusing on postoperative complications and/or wound healing process

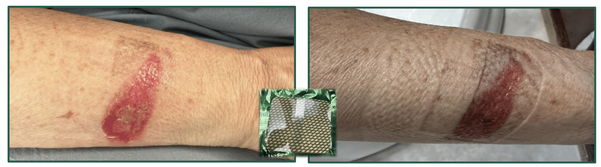
Results

Case 1 –Surgical Dehiscence



Left to right: (1) wound dehiscence - initial presentation (2) 6 days after 3 dressing changes, 70% slough reduction (3a) pre LTA in OR (3b) post closure w/ good perfusion on FLIR (4) 5 wks post op, healed

Case 3 - Superficial Partial Thickness Burn



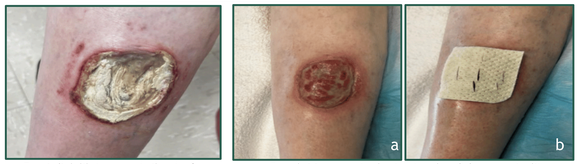
Top left: Prior to initial dressing placement

Top right: 2 days after initial dressing

Bottom left: Healed in 1 wk (3 dressing changes)

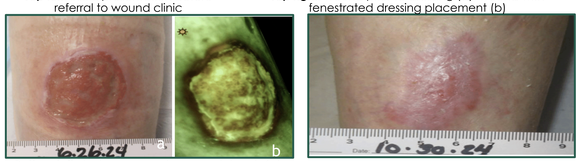
Bottom right: 8 months, minimal scar

Case 4 –Pyoderma Gangrenosum



Top left: initial presentation before referral to wound clinic

Top right: wound prior to dressing (a), wound with fenestrated dressing placement (b)



Bottom left: 6 wk progress, decreased slough (a). Moleculight study showing decreased colonization (b)

Bottom right: Healed at 5 months

Case	Age, Sex	Wound Type	Wound Location	Wound Assessment (Initial)		Wound Management	Outcome
1	70 F	surgical dehiscence	Right TKA	Etiology: surgical Slough: 76- 100% Granular tissue: none	Thickness: full Exudate: moderate sero/sang Epithelization: none	6 days of dressing changes Q3 w/ 70% slough reduction, taken to OR for I&D w/ pHA, excision & LTA, iNPWT, discharged w/ q2 dressing changes	Fully healed in 2 wks
2	F	surgical dehiscence	RLE	Etiology: surgical Slough: 1-25% Granular tissue: 1-25%	Thickness: full Exudate: moderate sero/sang Epithelization: 26-50%	CLWC of an existing STSG, dressing placement w/ NPWT	Healing well by 2 months, continuing to follow w/wound care
3	48 F	Superficial Partial thickness burn	distal forearm	Etiology: trauma (burn) Slough: 50% Granular tissue: n/a	Thickness: superficial partial Exudate: mild serous Epithelization: n/a	2 dressing changes in clinic (burn day 1,3)	Fully healed in 1 wk. Minimal scar at 5 months
4	73 F	Pyoderma gangrenosum	LLE	Etiology: other Slough: 26-50% Granular tissue: 26-50% Epithelization: none	Thickness: full Exudate: moderate sero/sang Additional: M. necrosis	Weekly dressing changes w/ manual fenestration to allow for secondary drainage	Fully healed by 5 months
5	75 M	squamous cell carcinoma excision w/ osteomyelitis	LLE (Pretibial)	Etiology: surgical Slough: 26-50% Granular tissue: 26-50%	Thickness: full Exudate: moderate sero/sang Epithelization: 1-25%	6 dressing (qod) prior to OR. 1st Operation- burring of tibia, irrigation w/ pHA, myriad graft, NPWT. 2nd Operation - I&D, STSG w/ NPWT	Fully healed by 4 months
6	70 F	Pyoderma gangrenosum w/ diminished dorsalis pedis pulses	RLE	Etiology: trauma Slough: 76-100%, dry Granular tissue: none Epithelization: none	Thickness: full Exudate: moderate sero/sang Additional: M., B., T. necrosis	pHA soak prior to dressing placement, Triamcinolone periwound	Minimal healing w/ HCF dressing, healed w/ honey based dressing

Table 1: Patient demographics, wound characteristics, management and healing outcome. TKA: total knee arthroplasty, I&D: incision and drainage, LTA: local tissue arrangement, iNPWT: incisional negative pressure wound therapy, STSG: split thickness skin graft, CLWC: complex layered wound closure

Key Pearls

- **HCF dressings works best with high slough, high moisture wounds**
- **HCF dressings can be beneficial for various wound types and used preoperatively for wound bed preparation or as primary treatment**

Results

- 6 cases were reviewed with various wounds (table 1)
- 5 of which healed well
  - 2 surgical wound dehiscences (case 1,2)
  - 1 Partial-thickness burn (case 3)
  - 1 skin cancer-related wound (case 5)
  - 1 pyoderma patient (case 4)
- 1 pyoderma patient did not have successful healing with HCF dressings (case 6)
  - Dressing showed to be too drying for the wound environment & location

Conclusion

- HCF dressings effectively debrides slough, reduces bacterial colonization, and accelerates wound healing in complex clinical scenarios
- Preoperatively, it improves wound preparation for surgery, reducing complications and enhancing surgical outcomes
- Tailoring dressing selection to wound characteristics, such as moisture and slough, is essential for optimizing healing and patient outcomes, as seen in case 6

References

1. Lazareth I, et al. The role of a silver releasing lipido-colloid contact layer invenous leg ulcers presenting inflammatory signs suggesting heavy bacterial colonization: Results of a randomized controlled study. Wounds. 2008;20(6):158–66.
2. Desroche N.et al., Characterization of the antimicrobial spectrum and anti-biofilm activity of a new silver-containing dressing with poly-absorbent fibres and antimicrobial silver matrix. Poster EWMA May 2016.

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