

Rise of the Contact Layer Clones: Novel Therapeutic Contact Dressings Appear to Improve Elastic Compression Therapy Results

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Problem:

- Ischemic ulcers, nonreconstructable aortic occlusion
- Comorbidities:
 - End stage COPD
 - Paraplegia
 - Cardiomyopathy with 22% Ejection Fraction
- Exquisite pain

Treatment:

- Ultrasound powered debridement
- Fuzzy wale elastic compression**
- HEMA nano powder dressing***



Rx day #0. Three wounds with painful macerated peri wound skin in 55 y/o F vasculopath with aortic occlusion, COPD, cardiomyopathy (ejection fraction of 22%) and depression.

Rx Day #40. Fuzzy wale stockinet™ is stretched with one hand to open up space between fuzzy wales while hydroxy ethyl methyl methacrylate (HEMA) nanoparticle powder™ is sifted onto the wound surface. HEMA polymer is strongly hydrophobic, and as such, is a novel antimicrobial.



Photos document interval healing with HEMA nanoparticle™ powder wound contact dressing and fuzzy wale compression stockinet.™



Outcome:

- Healing without scar in profoundly ischemic R foot



Rx Day #240. Observe that healing fuzzy wale stockinet compression has occurred in spite of no audible doppler signals in the foot, that healing without scar has occurred, which is one of the bedside signs of regenerative healing (stem cells involved), and that the regenerated skin over the full thickness pressure wound lacks old age spots. Patient attributed her miraculous result to crucifix seen in photo.

Problem:

- Refractory recurrent VLU
- Chronic vena cava occlusion syndrome
- Tracheostomy for pulmonary hypertension
- Morbid obesity

Treatment:

- Debridement
- Activated carbon cloth as a therapeutic contact layer#
- Fuzzy wale elastic compression stockinet**



Initial presentation of L ankle VLU 18 months before the distal VLU recurrence seen in next photo. Vena caval occlusion occurred after placement of percutaneous venous filter following pulmonary emboli.

Rx Day #24. Observe advancing flat wound edge with robust epithelial cells (thin blue arrow). Note corrow furrows in the wound granulation tissue and skin, result of fuzzy wale elastic compression stockinet.™ Note the recently healed ulcers with light colored scar (wide blue arrow).



Rx Day #45. Recurrent VLU has healed. In our experience, we consistently observe rapid wound bed preparation with long fiber activated carbon cloth as a contact layer during elastic compression therapy.



Outcome:

- Complete healing day #45
- Activated long fiber carbon cloth as a contact layer# appears to enhance wound bed preparation in concert with fuzzy wale elastic compression stockinet**

Problem:

- Recent onset of multiple VLUs
- Painful bilateral stasis dermatitis, onset in late spring, hot weather
- Lymphorrhea
- Comorbidities:
 - Obesity
 - Diabetes

Treatment:

- Hydrophobic/hydrophilic polymer micro knit bilayer cloth### to control weeping lymphorrhea
- Fuzzy wale elastic compression stockinet **



Rx Day #0. Fifty-five y/o warehouseman treated at home by RN, his daughter. Comorbidities include obesity, edema, hypertension, diabetes and sleep apnea.

Rx Day #0. R posterior calf observe: dried serum eschar on 4 cm and 9 mm ulcerations, betraying recent weeping lymph fluid, red painful peri wound skin, abnormal exfoliation due to stasis dermatitis, and pitting edema.



Rx Day #3. Observe clearing of stasis dermatitis under the bilayer moisture wrap between the blue arrows.

Outcome:

- VLU healed in 2 weeks
- Stasis dermatitis in remission over summer

Problem:

- R leg painful weeping venous stasis dermatitis
- Multiple small VLUs
- Comorbidity: Recently diagnosed with Diabetes presenting with hyperosmolar coma, COPD

Treatment:

- Viscose rayon leva fiber wrap####
- Fuzzy wale elastic compression stockinet**



Rx Day #0. Fifty y/o auto parts manager. What is not seen in this photo of painful stasis dermatitis is weeping clear lymphorrhea, present for 6 weeks, a time during which he was hospitalized for diabetic hyperosmolar coma.

Rx Day #0. Extensive dry exfoliation betrays recent massive edema, treated with diuretics during hospitalization for new onset hyperosmolar diabetes. Red, painful, fissured skin weeps clear lymphorrhea. Pain, with exuberant exudate typically complicate effective application of elastic compression dressings to deliver physiologic compression therapy.



RX Day #0. Dressing layer #1, viscose rayon leva fiber wrap,### layer #2, fuzzy wale elastic compression stockinet™, held in place with layer #3, leva fiber### and fuzzy wale elastic stockinet compression therapy™, reversing the venous stasis inflammatory processes that created the painful dermatitis and ulceration. This fantastic response to one week of compression therapy motivated Omaha Mercy Wound to use leva fiber, not just as a wound contact layer, but as the first layer of a 3-layer compression dressing when wound pain and wound/peri wound lymphorrhea is high. We observed that water in wound exudate evaporates from a relatively thin 3-layer dressing to allow for long wear times (in this case dressing changed at one week). Observe dried exudate on dressing in background.

Outcome:

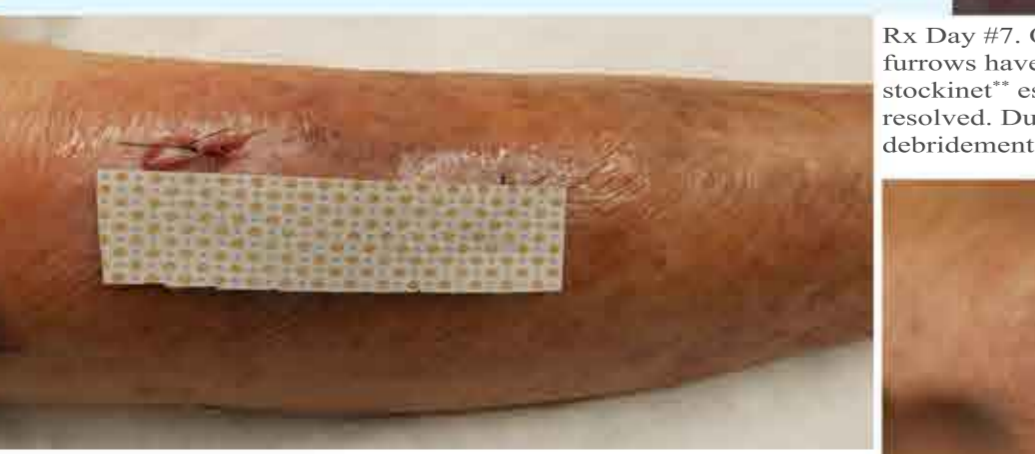
- Pt discharged at his request, officially "healed," after 3 weeks of leva fiber#### and fuzzy wale elastic compression** to followed by his primary physician. Fuzzy wale stockinet prescribed to prevent VLU recurrence.
- Leva fiber wrap, as a skin contact layer, rather than cast padding, appears to be highly effective in concert with elastic compression to heal venous stasis.

Problem:

- R calf pretibial car door laceration, non-healing skin flap sutured in ER
- Comorbidities:
 - Peri-wound cellulitis
 - Arterial and venous insufficiency
 - Congestive heart failure with edema
 - Fragile senile skin

Treatment:

- Voltaic rayon wound contact layer#####
- Fuzzy wale compression stockinet**



Rx Day #0. Non-healing laceration, ten days after suturing in the emergency department. Observe thin senile skin refracting light betraying edema due to heart failure and venous insufficiency. Not seen is exudate and periwound cellulitis. The skin flap was covered by a polyester contact layer with silver (brown) and zinc (blue) polka dots that create a simple electrochemical 1.2-volt current over skin surface.

Rx Day #7. Observe that redness, cellulitis, and edema has decreased. Corrow furrows have formed in the skin, the result of fuzzy wale elastic compression stockinet™ eschar is separating from granulating wound, and peri wound exudate has resolved. Due to exquisite pain and anxiety, patient adamantly refused mechanical debridement.



Rx Day #28. Observe sutures removed, eschar separating from wound edges, and less edema in peri wound skin.

Outcome:

- Wound with multiple comorbid conditions healed in 35 days with voltaic zinc/silver rayon contact dressing##### in concert with fuzzy wale elastic compression**

Problem

Christine Moffatt RN, Charing Cross Hospital, 2003, established the considerable effectiveness of a 4 layered compression dressing for venous leg ulcers (VLUs).¹ From that time until present, generic nylon or rayon wound contact dressings were included in layered dressing kits, but often caregivers substituted more expensive contact layers.² Recently, rayon treated with DACC, a hydrophobic polymer antimicrobial³ has been included in a widely marketed VLU dressing kit. This anecdotal study asks, can modern therapeutic contact dressings improve results of elastic compression therapy?

Methods

Five novel contact layers are used on refractory VLUs treated with elastic compression.^{**} Therapeutic mechanisms include: 1) HEMA^{***} hydrophobic polymers which inhibit microbe growth, 2) activated carbon cloth[#] which absorbs nutritional substrates and inflammatory mediators, and also is powerfully hydrophobic³ 3) hydrophobic and hydrophilic fibers, joined by a micro-knit process^{###}, and a scrim backed viscose rayon felt^{####} (both technologies conduct exudate/transudate away from the wound and skin),^{4,5} and polyester cloth printed with silver and zinc dots to form a simple cell battery producing a current of 1.2 volts across wound surface.^{#####} Clear photos document wound presentation, treatment details and healing.

Results

Photos document wound bed preparation and healing of difficult chronic refractory VLUs using six novel therapeutic contact dressings and elastic compression.

Conclusion

Treatment of refractory VLUs with novel wound contact dressings under fuzzy wale elastic compression suggest that five new to market therapeutic contact layers appear effective. Although anecdotal, there results with therapeutic contact dressings may presage a standard of care change.

References

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 3. Stadler et al, Survey of 12,444 patients with chronic wounds treated with active carbon cloth. Akt Dermatol 2002; 28: 351-354 3
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 5. Suzie Ehmann, DPT CWS CLT, Bridging the Gap Between Compression and Exudate Management in Lower Extremity Wounds, Science poster, Symposium of Advanced Wound Care October 20, 2017, Las Vegas, NV
- * Sorbact® Cutimed® DACC coated rayon dressing, BSN Medical International Guillaume Kroll L-1882 Luxembourg
 ** EdemaWear® Fuzzy Wale Elastic Compression Stockinet, Compression Dynamics LLC, Omaha NE 68102
 *** Altrazeal® Nano Crystalline HEMA Wound Dressing, Uluru Inc, Addison, TX 75001
 # Zorflex® Activated Long Fiber Carbon Cloth, Calgon Carbon, Chemviron Division, Tyne on Wear, New Castle UK, available in USA from NovaGran Wound Care Products, a division of PBE, Bowling Green, Ohio 43402
 ### Tritec® Milliken Healthcare Products LLC, Spartanburg, SC 29303
 #### Drawtex® Leva Fiber Hydro Conductive Dressing, SteadMed Medical Inc., Fort Worth, TX 76107
 ##### Procellera®, Integra Life Sciences, Drive Plainsboro, NJ 08536