Five Bedside Signs Suggesting Textile Compression Delivers Effective Wound Tissue Micro Deformation, Enhancing Local Protein Synthesis and Increasing Perfusion **During Venous Leg Ulcer Therapy**

Martin J Winkler Sr MD FACS Mercy Wound Clinic Omaha Nebraska

Mechano Transduction Heals Pretibial Crush Injury



Rx day #0.

Post trauma day #10. Riding mower, shin bone vs. corrugated sheet metal laceration/crush injury: observe periwound skin edema, wound edge epiboly, weeping transudate, and cellulitis.

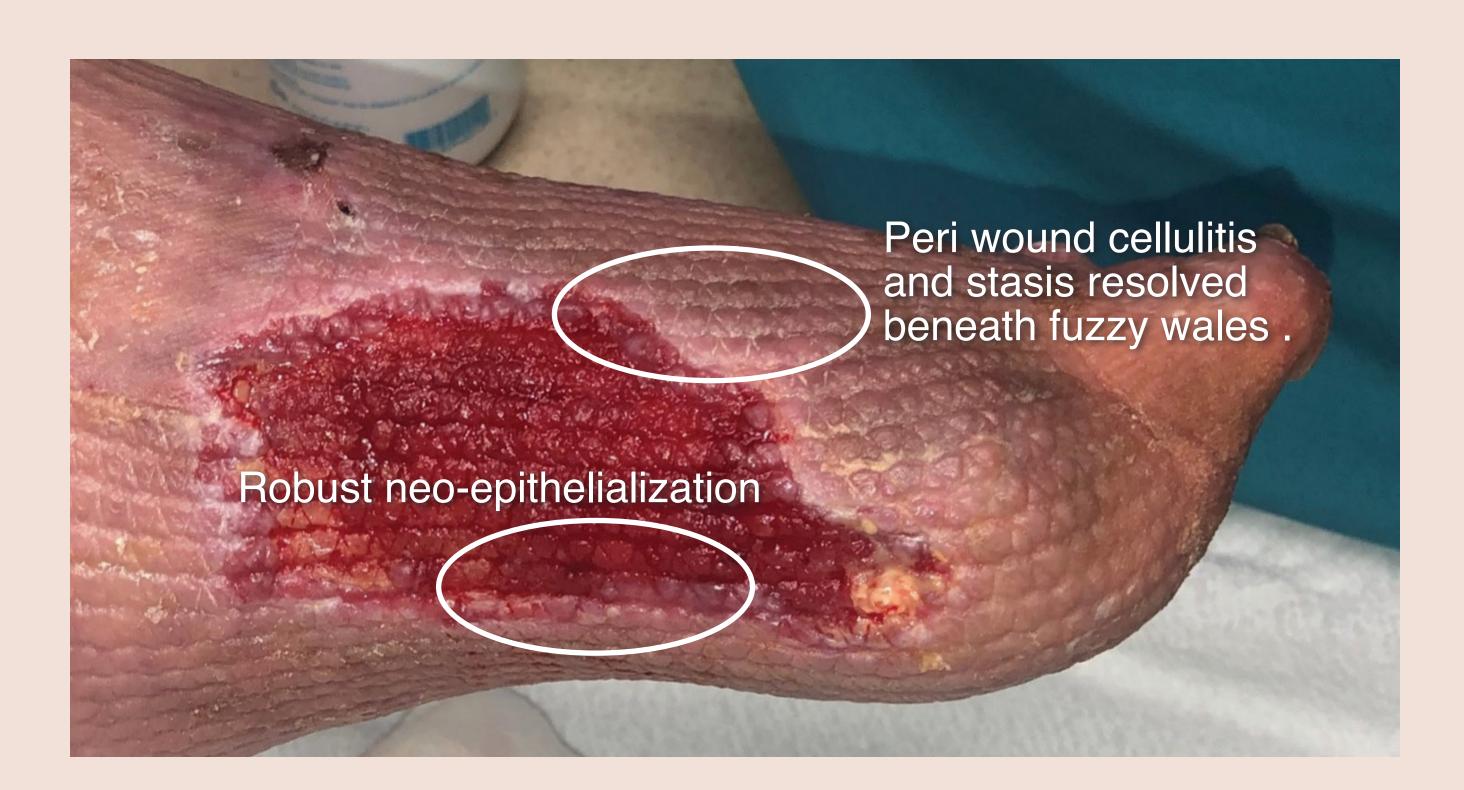


Rx day #17.

We believe the dramatic wound bed preparation seen in this case is in large part the result of mechano transduction, from physiologically effective textile compression force on the wound surface, in a manner similar to negative pressure wound therapy (NPWT). (Schultz G, Sibbald G) Tissue beneath fuzzy wales experiences physiologic micro deformation. Effective cell membrane mechano transduction upregulates gene expression and protein synthesis.



Rx Day #0. (Photo © Suzie Ehmann).



Tissue Micro Deformation Via Fuzzy Wale Compression

Photo-refractory mixed etiology ulcer initially treated with flat super absorptive wrap as contact layer.***



Day #14.

Fuzzy wale compression stockinette* as the wound contact layer with highly absorbent flat second layer*** to prevent moisture damage. (Photo © Suzie Ehmann)

Rx Day #14.

Observe: Upper oval shows complete resolution of peri wound cellulitis/dermatitis peri wound dermatitis /cellulitis. Lower oval shows robust neo-epithelialization between furrows created in granulation tissue that is similar to what is seen with Negative Pressure Wound Therapy (NPWT). Ehmann coined the term Positive Pressure Wound Therapy (PPWT) to explain the results of fuzzy wale elastic compression stockinet therapy seen above. (Ehmann 2023) We posit that granulation tissue in furrows beneath fuzzy wales experiences micro deformation, which upregulates gene expression and cell protein synthesis, via a process termed mechano transduction as also seen in NPWT. (Photo © Suzie Ehmann)

Skin Furrows Beneath Fuzzy Wales Support Tissue Micro Deformation



Trauma Day 0. High speed MVA passenger ejected (Cellphone photo by patient's family)



Post Trauma Day #8.



PTD #10, RX #3. Family obtained fuzzy wale elastic compression stockinet.*





Necrotic tissue, staples and road rash detritus remain -slow wound bed progression - pain, epiboly, peri wound dermatitis and cellulitis persists. Patient wearing fuzzy wale elastic stockinet* and initiated twice daily 10 minute wound shower sprays.

PTD #16, Rx Day #9.

Healing results from fuzzy wale stockinet* are dramatic – an inexpensive, nonprescription stockinet is a good value, patient launders stockinet as needed. Robust wound bed progress and exuberant neo-epithelization suggests that Positive Pressure Wound Therapy is upregulating gene expression and protein production. (Ehmann 2023)

Introduction

We've reported dramatic outcomes using an inexpensive warp knitted compression stockinet* to control edema since 2009 (Sibbald 2020) (Ehmann 2020). Anecdotal bedside diagnostic findings suggest that fuzzy wale stockinet compression also effectively 1.) increases arterial perfusion of skin and subcutaneous fat, and 2.) delivers physiologically effective micro deformation to wound granulation tissue.

Mechano transduction signals arising in tissue experiencing micro deformation upregulate local gene expression, increasing local cell protein synthesis required to heal (Orgill) (Saxena). Healing outcomes with fuzzy wale stockinet appear similar to what is seen with the open cell foam used in Negative Pressure Wound Therapy (NPWT). Ehmann has coined the term Positive Pressure Wound Therapy (PPWT)** when fuzzy wale stockinet is intimate with wound surface tissue. (Ehmann 2020 & 2023)

Methods

Photos document anecdotal findings at bedside that suggest enhanced perfusion and dramatic wound bed progress. (Schultz 2003) (Ostler 2019)

Results

Wound photos document anecdotal rapid:

- 1) Resolution of epiboly
- 2) Clearing peri-wound stasis dermatitis in refractory VLUs (Ostler 2019)
- 3) Neo epithelialization
- 4) Healing without scar

5) Healing full thickness ankle wounds with no pedal Doppler signals. (Winkler 2023)

Discussion

Fuzzy wale compression stockinet creates furrows in granulation tissue and appears to be considerably more effective than flat compression textiles to speed wound bed preparation. Temple of Asclepius priest healers, c. 350 BCE no doubt swaddled limbs with rough-spun linen.

Fuzzy wale textile of wound granulation tissue compression appears to create effective tissue micro deformation such as we are reporting and holds promise for mixed leg ulcer treatment.*

References

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*EdemaWear® fuzzy wale elastic compression stockinet, Compression Dynamics LLC, Omaha Nebraska 68102

**Positive Pressure Wound Therapy© (PPWT), Suzanne Ehmann, North Myrtle Beach, North Carolina (2020)

*** Tritec Active Fluid Management® Technology, Milliken & Co. OVIK Health, Spartanburg, North Carolina

PTD #12, Rx Day #5.