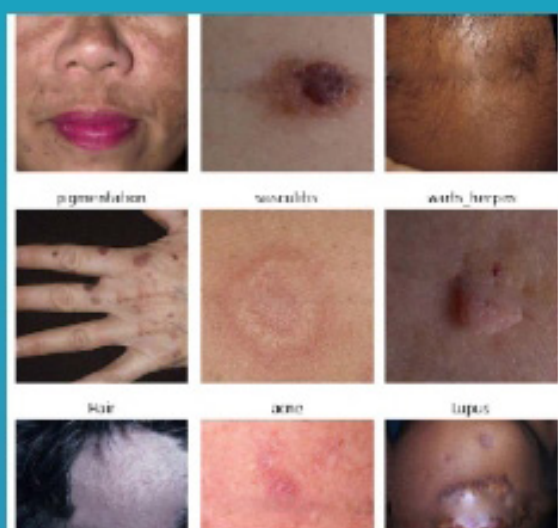


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CASE STUDY

Trauma Induced Venous Leg Ulcers: A Case Study in the Frail Elderly

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ABSTRACT

Age-related changes in skin structure, including loss of collagen and elastin, make the skin more susceptible to tearing with minimal trauma and are commonly found on the extremities, particularly the lower limbs of compromised patients. Normally, skin injuries such as traumatic skin tears heal within weeks; however, when among patients with other comorbid conditions or the elderly, they can become chronic. Contributing cofactors generally include mobility issues, poor skin hydration, use of medications affecting skin integrity (Like Corticosteroids), and improper handling during transfers.

One major concern when treating patients who have a non-healing skin trauma injury is the development of a high bacterial load and the susceptibility to biofilm formation. Despite use of common over the counter and prescription treatments, biofilm forms within hours of injury and allows bacteria to reside in a protected and nurtured environment, resistant to the typical wound treatments. The aim of this case is to demonstrate that biofilm/bioburden focused care can enhance the patient's ability to heal hard-to-heal wounds. Biofilm in wounds is a significant barrier to healing and as this case presents can be the confounding factor preventing wound progression toward proliferation. By using a biofilm-focused approach to wound care, the provider was able to destabilize the biofilm with full wound closure in four weeks of beginning therapy with BLASTX and collagen.

KEYWORDS:

Traumatic Skin Injury, Frail, Biofilm, Bioburden

INTRODUCTION

According to the National Institute of Health (NIH), skin tears are among the most common lower limb traumatic skin injuries in the elderly. Simple traumatic wounds, such as skin tears, are a frequent event that can usually be managed without sequelae, unless the wound is at high risk [1]. Even superficial wounds in the elderly can present a high-risk potential for patients with other comorbid conditions in addition to age related changes in the skin. Skin tears occur when the top layer of the skin separates from the underlying layer due to minor trauma like falls, bumping into objects, or removing adhesive dressings. Skin tears can occur in any location of the body but are especially found over bony prominences [2]. Factors like poor nutrition, dehydration, and certain medications can further increase the risk of skin tears.

Age-related changes in skin structure, including loss of collagen and elastin, make the skin more susceptible to tearing with minimal trauma and are commonly found on the extremities, particularly the lower limbs, due to increased friction and shearing forces during movement. Contributing cofactors generally include mobility issues, poor skin hydration, use of medications affecting skin integrity (Like Corticosteroids), and improper handling during transfers.

Skin tears can be hard to heal and as one author stated, "Clinical management of skin tears can be difficult, and

these wounds may also be associated with prolonged hospitalization stays, increased health care costs and adverse impacts on patients' quality of life [3,4].

One major concern when treating patients who have a skin tear injury that has failed to heal, is the development of a high bacterial load and biofilm development in the wound. Despite use of common over the counter and prescription topical treatments, biofilm forms in a matter of minutes of injury and allows bacteria to reside in a protected and nurtured environment, resistant to most known topical wound treatments. High risk wounds have a greater tendency to carry a higher bioburden and become infected. Wounds characterized by specific attributes such as jagged edges (Traumatic Wounds), wound location (Lower Leg), underlying medical conditions like diabetes, poor immune and nutritional status, and progressive diseases such as Minimal Change Disease (MCD) contribute to the ability of a patient to heal and the often dictates the aggressiveness of providers treatment choices.

Even without overt infection, according to a 2018 study by Kim *et al.*, "Clinical Assessment of a Biofilm-disrupting Agent for the Management of Chronic Wounds Compared With Standard of Care: A Therapeutic Approach" found in a 43 patient study where 22 patients were enrolled in the experimental arm using a biofilm-disrupting wound gel and 21 patients enrolled in as a control using the most commonly prescribed over-the-counter topical wound treatment (Neosporin), wound size was reduced by 71% in the experimental group as compared to the control group by [5]. Findings of this study supported a combination of the experimental product with wound debridement significantly improved healing rates by disrupting the biofilm structure within a chronic wound.

Collectively, authors agree that certain wound and patient types require much more aggressive and effective treatment for established chronic wounds, especially in debilitated patients [6,7]. The authors point out that "the most important and preventable challenge in wound healing is preventing infection and infection progression" [8].

This case of an 80-year-old female with a traumatic skin tear (Dishwasher Injury), demonstrates the effectiveness of aggressive treatment using a targeted biofilm-disrupting wound get combined with Standard of Care (Inclusive of Debridement) promote better outcomes for patients with conditions that undermine standard wound care practices.

Highlights:

1. Skin of compromised patients is less likely to heal without intervention for increased bioburden and biofilm.
2. Biofilm-focused care, which includes a biofilm-disrupting agent and collagen, enables the bodies major patient biological resources to contribute toward healing instead of becoming sacrificed to the elevated inflammatory processes of a chronic wound.

Case Presentation

- 80-year-old female.
- Anterior lower left leg non-pressure venous ulceration caused by trauma to the area against a dishwasher.
- Comorbidities are hypertension, high cholesterol, history of bladder cancer, lymphedema, drug- induced lupus, and MCD. Patient developed MCD following a UTI in 2023 that went unresolved and led to lymphedema symptoms.
- Ulceration opened 8 weeks prior to first office visit DOS 12/03/2024. Wound was being dressed for 5 weeks with topical antibiotic ointment such as Neosporin. Increased edema, erythema, and temperature were noted during an office visit with patient's Nephrologist DOS 12/02/2024 in which Doxycycline antibiotics were prescribed.
- During the initial office visit, a culture was taken from the wound site with results showing no bacteria present. Following initial office visit, subcutaneous debridement was performed in the office with application of collagen sheets and Blastx with a compression dressing. Local wound care and dressing changes continued twice weekly from 12/03/2024 to 12/30/2024.

Condition: Frail elderly patient experiencing compromised healing related to skin trauma.

Intervention:

1. Initial 8 weeks of at home treatment with Neosporin.
2. BLASTX w/collagen started 12/3/2024.

Outcome: Healed 4 weeks

Clinical Images

All attached visuals are post-debridement visuals of the lower leg wound.



Figure 1 Venous Leg Ulceration, 12/03/24.



Figure 2 Venous Leg Ulceration, 12/09/24.



Figure 3 Venous Leg Ulceration, 12/16/24.



Figure 4 Venous Leg Ulceration, 12/23/24.



Figure 5 Venous Leg Ulceration, 12/30/24.

Conclusion/Results:

- Anterior left lower leg ulceration measured 5.12 sq cm during initial visit post-debridement on 12/03/2024.
- Ulceration demonstrated a near 50% reduction in ulceration area with one week of treatment with measurements at 2.6 sq cm on 12/09/2024.
- A 56% reduction was noted with the second week of local wound care treatment using Blastx and collagen sheets with weekly debridement measuring at 1.12 sq cm on 12/16/2024.
- 75% reduction was noted in ulceration size with the third week of treatment measuring at 0.28 sq cm on 12/23/2024.
- Ulceration demonstrated full closure noted in the fourth week of treatment on 12/30/2024.

Conflict of interest: None

Acknowledgements: None

Ethical considerations: None

References

1. Serra, R., Ielapi, N., Barbetta, A., & de Franciscis, S. (2018). Skin tears and risk factors assessment: a systematic review on evidence-based medicine. *International wound journal*, 15(1), 38–42. <https://doi.org/10.1111/iwj.12815>
2. Koyano Y, Nakagami G, Iizaka S, Minematsu T, Noguchi H, Tamai N, Mugita Y, Kitamura A, Tabata K, Abe M, Murayama R, Sugama J, Sanada H. Exploring the prevalence of skin tears and skin properties related to skin tears in elderly patients at a long-term medical facility in Japan. *Int Wound J* 2016;13:189–97.
3. LeBlanc, K., & Ousey, K. (2024). Assessment, prevention and management of skin tears in older people. *Nursing older people*, 36(5), 22–28. <https://doi.org/10.7748/nop.2024.e1462>
4. Chang YY, Carville K, Tay CA. The prevalence of skin tears in the acute care setting in Singapore. *Int Wound J* 2016;13:977–83. [DOI] [PMC free article] [PubMed] [Google Scholar]
5. Kim, D., Namen Ii, W., Moore, J., Buchanan, M., Hayes, V., Myntti, M. F., & Hakaim, A. (2018). Clinical Assessment of a Biofilm-disrupting Agent for the Management of Chronic Wounds Compared With Standard of Care: A Therapeutic Approach. *Wounds : a compendium of clinical research and practice*, 30(5), 120–130.
6. Han, G., & Ceilley, R. (2017). Chronic Wound Healing: A Review of Current Management and Treatments. *Advances in therapy*, 34(3), 599–610. <https://doi.org/10.1007/s12325-017-0478-y>

7. Sharma, S., Mohler, J., Mahajan, S. D., Schwartz, S. A., Bruggemann, L., & Aalinkeel, R. (2023). Microbial Biofilm: A Review on Formation, Infection, Antibiotic Resistance, Control Measures, and Innovative Treatment. *Microorganisms*, 11(6), 1614. <https://doi.org/10.3390/microorganisms11061614>
8. Trengove NJ, Stacey MC, McGeachie DF, Mata S. Qualitative bacteriology and leg ulcer healing. *J Wound Care*. 1996;5(6):277–280. doi: 10.12968/jowc.1996.5.6.277.



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