

Clinical Application of Electro Activated Super Oxidized Water(EASW) and Hydrogel in Wound Healing

Ramasamy K.B, Fadhilah J.J, Ladna S, Vilvkumaran, Avthar Singh
Wound Management Team, Hospital Tengku Ampuan Rahimah, Klang, 41200, Malaysia.



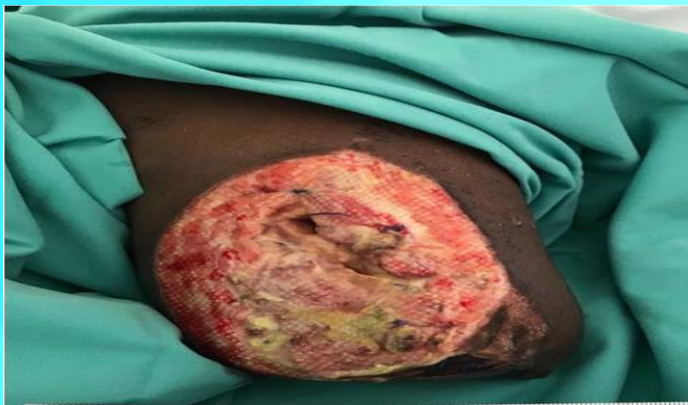
Introduction

Wound healing is a dynamic process consisting of four continuous, overlapping, and precisely programmed phases. The events of each phase must happen in a precise and regulated manner. Interruptions, aberrancies, or prolongation in the process can lead to delayed wound healing or a non-healing chronic wound¹. This case series demonstrates the effective combination therapy of hydrogel (Hydrocyn gel) and EASW (Hydrocyn aqua) in treating chronic and infected wounds for preparing the wound bed for secondary closure.

Case Series

Case 1-Infected left above elbow amputation stump

17 years old boy with no known comorbid sustained a open fracture (gustillo 3) of his left humerus which resulted in above elbow amputation due to the severity of the injury. One week post operatively noted pus discharge and slough over his left above elbow amputation stump. After usage of daily hydrogel and EASW dressing for 25 days, the wound was healthy and clear of infections and patient was subsequently planned for split skin graft.



Wound 13cm x 8cm x 5cm over left elbow amputation site with pus and slough



Well healed wound and fit for SSG after 25 days

Case 2 - Finger abscess

52 years old lady with underlying diabetes mellitus presented with right little finger abscess since 1 week after pricked by a durian. Subsequently patient had to undergo wound debridement twice in quick successions due to the extensive infection. Tissue cultures taken noted MRSA infection. Patient was started on appropriate antibiotics (vancomycin) as well as daily hydrogel and EASW dressing. The wound was healed completely after 5 weeks of treatment.



Wound 11.5cm x 6.5cm over dorsum of right hand with exposed tendon



Wound fully healed after 5 weeks

Case 3 - Wound Breakdown post Lower segment Caesarean section(LSCS)

31 years old lady with no known comorbid presented with wound breakdown post day 15 of LSCS. Patient had to undergo wound debridement x 1 and tissue cultures showed staph aerius infection. Patient was started on appropriate antibiotics (rocephine) and daily hydrogel and EASW dressing was done. After 30 days of dressing, wound was clean and healthy and patient was subsequently planned for secondary suturing.



Wound 21cm x 2.1cm x 6cm with extensive slough



Wound clean after 30 days and planned for secondary suturing

Case 4-Diabetic Foot Ulcer secondary to Peripheral Vascular Disease(PVD)

62 years old gentleman with underlying DM and PVD presented with wet gangrene of left 3rd and 4th toe and subsequently underwent ray amputation of the affected toes. Patient was referred 4 months later as wound was not healing using conventional dressing. Patient was then started on daily hydrogel and EASW dressing for 22 days and wound was almost healing during his last review.



Initial wound of 5cm x 3cm x 2cm over previous ray amputation site



Wound 2.5cm x 0.5cm and almost healing after 3 weeks

Discussion

Hydrogel provides moisture as well as promotes autolytic debridement². EASW has bactericidal, fungicidal and sporicidal properties that helps to reduce the infection load in the wound³. It is also important to take regular tissue cultures and treat with the appropriate systemic antibiotics which are essential for the treatment of deteriorating and clinically infected wounds⁴.

Conclusion

This combined dressing helps to deslough and reduce the bacterial load in the wound thus helping to prepare a healthy wound bed for secondary closure. This study has shown to reduce amount of wound debridements needed in the operation theater and also reduce hospital stay of patients.

References

1. Guo S, Di Pietro LA. Factors affecting wound healing. J Dent Res. 2010;89(3):219-229. doi:10.1177/0022034509359125
2. Patrick S. Murphy and Gregory R. D. Evans, "Advances in Wound Healing: A Review of Current Wound Healing Products," Plastic Surgery International, vol. 2012, Article ID 190436, 8 pages, 2012
3. Heggers, J. P., Sazy, J. A., Stenberg, B. D., Strock, L. L., McCauley, R. L., Herndon, D., & Robson, M. C. (1991). Bactericidal and wound-healing properties of sodium super oxidising solutions: The 1991 Lindberg Award. Journal of Burn Care and Rehabilitation, 12(5), 420-424.
4. Bowler PG, Duerden BI, Armstrong DG. Wound Microbiology and Associated Approaches to Wound Management. Clinical Microbiology Reviews. 2001;14(2):244-269. doi:10.1128/CMR.14.2.244-269.2001.