Aggregate Wound Dressing in the Management of Soft Tissue Wounds

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Abstract

This investigation presents the clinical outcome following the utilization of aggregate wound dressing following radical debridement in a 43-year-old Native American female who presented with a case of necrotizing fasciitis and a history of diabetes mellitus.

Clinical Course

Following serial debridement, the patient was left with a large dorsal foot wound and a partial second-ray amputation. A foot-narrowing reconstructive procedure was then performed, and the patient was transitioned through a multitude of advanced wound healing modalities to stimulate wound healing to the large dorsal wound. NPWT was initially utilized in the post-operative setting to control drainage and to promote granulation tissue, however the patient was transitioned to a aggregate wound dressing on post-op day 4. Approximately two and a half weeks following initial presentation, the patient was observed to have developed a healthy granular base, a STSG was harvested and applied to the dorsal wound.

Clinical Images

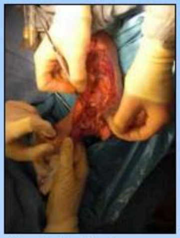

Fig. 1: Radical debridement following presentation with necrotizing fasciitis.

Fig. 2: Partial second ray amputation with large plantar deficit.

Fig. 3: Extensive dorsal soft tissue loss.

Fig. 4: Foot-narrowing procedure to reduce defect following partial 2nd ray amputation.

Fig. 5: NPWT was initially utilized to promote formation of granulation tissue.

Fig. 6: 1-week post-op following initial radical debridement.

Fig. 7: Aggregate powder applied to the dorsal soft tissue wound.

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Results

Following radical debridement for necrotizing fasciitis and subsequent reconstructive efforts and progression through several wound healing modalities, the patient went on to complete healing in 9 weeks.

The patient reported a decrease in pain associated with dressing changes transitioning between the NPWT and the use of aggregate wound dressing. We hypothesize that this pain reduction is due to a light cooling effect of the moisture controlling dressing and subsequent reduction in inflammation as well as the total contact nature of the dressing.

Fig. 8: Aggregate powder in deaggregated state.

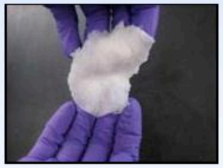

Fig. 9: Exposure to ionized fluid media initiates aggregation.

Fig. 10: STSG was applied to the dorsal foot wound at 2 1/2 weeks following initial presentation.

Fig. 11: 7-weeks following initial presentation, the patient demonstrates 80% healing. The patient was 100% healed at 9 weeks.

Conclusion

Wound dressing was utilized to provide moisture control and to promote wound healing following radical debridement of the left lower extremity. This technology is a recently developed advanced wound healing modality that demonstrates promise in the management of acute and chronic exudating wounds. Upon activation with serum or exudate, the subsequent powder dressing provides moisture control for actively exudating wounds, in addition to reducing the risk of bacterial contamination. While this technology is in it is early stages, there is significant potential for usage of the powder dressing in the management of complex soft tissue wounds to serve as primary wound dressing as well as providing a delivery platform for analgesics, antimicrobials, and proangiogenic compounds, and as such further research is necessary.

References

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