

CASE SERIES

Infected Lower Extremity Wounds with Extensive Tendon and Bone Involvement Remained Moist and Closed Quickly Using Various Polymeric Membrane Dressing* Configurations

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BACKGROUND

An elderly woman with undiagnosed diabetes had extensive foot abscesses for three months with destroyed joints and exudate deep in her sole. A middle-aged man with Hansen's disease had multiple dorsal foot ulcers, including a heavily exudating 10.5 cm x 4 cm x 2 cm wound with fully exposed tendons. A 67-year-old woman with poor venous return from a knee deformity developed painful 9.0 cm x 4.5 cm and 7.5 cm x 4.5 cm foul-smelling abscesses with extensive tunneling beginning along her Achilles tendon, which was deteriorating with dried brown areas. The only prior treatment for all these patients was cloth wraps to keep out flies.

RATIONALE

The ingredients in polymeric membrane dressings work synergistically to draw and concentrate the body's natural healing substances into the wound bed to promote rapid healing. These ingredients also facilitate autolytic debridement by loosening bonds between slough and the wound bed. The liquified slough is lifted out of the wound bed and pulled into the dressing to be discarded at dressing changes. Often no manual wound cleansing, which disrupts new tissue growth, or even rinsing, which cools the wound, is needed at dressing changes.

Polymeric membrane cavity filler is absorbent on all surfaces, while standard polymeric membrane dressings have an outer semipermeable membrane which facilitates wound moisture optimization. The dressings donate moisture to dry areas of wounds such as exposed tendons while absorbing excess exudate, locking it inside the dressings as a gel. In addition to being non-adherent, these unique dressings inhibit the nociceptor response, so using polymeric membrane dressings often yields significant relief of wound pain as well as decreased inflammation and edema.

An elderly woman with undiagnosed diabetes had extensive foot abscesses for three months with destroyed joints and exudate deep in her sole. Pain in the deeper tissues of her foot prevented weight-bearing, but the patient was unaware of the extent of her infection. She adamantly refused injections, including antibiotics, insulin and lidocaine.



All cavities were cleared out and flushed; loose bones were removed. Only semi-sterile conditions were possible.



Two days post-debridement. Polymeric membrane cavity filler or dressings contacted all wound surfaces.



Removing the non-adherent dressings consistently revealed clean wound beds - no manual cleansing was needed.



6 1/2 weeks: The deep wounds in plantar surface of foot closed; others almost closed. The patient was fully ambulatory throughout the treatment; she walked with a stick to partially offload. All wounds were completely closed at 8 weeks.

METHODS

Treatment included oral antimicrobials and acetaminophen, prayer and nutritional counseling, as well as direct wound care. Initially all wounds were cleansed using sharp debridement and salt water or EUSOL. Polymeric membrane cavity filler was inserted into wound cavities and tunnels so all wounded surfaces were in contact with active dressing. Exposed cavity filler was covered with standard polymeric membrane dressings. For all of the patients, dressing change frequency began at daily or every-other-day and decreased as wound healing progressed.

PURPOSE (OBJECTIVES)

1. Review the evidence for the use of both pink and silver polymeric membrane cavity filler and polymeric membrane dressings and to maintain appropriate wound moisture balance and promote rapid healing.
2. Recognize the many advantages of polymeric membrane dressings' ability to continuously cleanse wounds, which often eliminates the need for direct wound cleansing at dressing changes.

RESULTS

No additional sharp debridement was performed on any of the patients. Pink or silver polymeric membrane cavity filler and standard or extra-thick polymeric membrane dressings continuously loosened and absorbed the fibrin/slough, keeping all of the wounds clean without the need for additional wound cleansing at dressing changes.

The wounds filled in quickly in all three patients. Tendons and bones were kept moist enough to remain viable so that the patients retained full foot mobility. All three patients remained ambulatory during treatment.

Middle-aged man with Hansen's disease and heavily exudating wounds: the largest is 10.5 cm x 4 cm x 2 cm with fully exposed tendons.



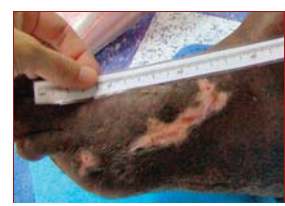
7 July - The periwound area is macerated from the previous treatment. Polymeric membrane cavity filler and dressings arrived on site; began treatment with these products.



7 July - Polymeric membrane cavity filler lightly fills the cavity inferior to the tendon. Polymeric membrane dressings will be used to cover the entire wound site. (Gauze secures dressings temporarily for the photo).



23 July - After only 16 days of treatment with polymeric membrane cavity filler and dressings, the wound has filled in with new tissue. Only a small area of tendon on the dorsum of the foot remains visible.



14 August - Despite the harsh environment, the wound never became re-infected, and it closed after only 38 days of polymeric membrane cavity filler and dressing treatment.

CONCLUSION

Polymeric membrane dressings kept these extensive lower extremity wounds with exposed tendons and bone clean and infection-free and appropriately moist under very adverse conditions, supporting quick healing in these three patients despite their compromised health.

BIBLIOGRAPHY

1. Kahn AR. A Superficial Cutaneous Dressing Inhibits Pain, Inflammation and Swelling In Deep Tissues. Presented at the World Pain Conference, July 15-21, 2000. Pain Medicine 2000 June;1(2):187.
2. Togo T, Alderton JM, Bi GQ and Steinhardt RA. The mechanism of facilitated cell membrane resealing. Journal of Cell Science 1999;112(5):719-731.
3. Middleton C. Understanding the physiological effects of unrelieved pain. Nursing Times. September 16, 2003; 99(37):28-31.
4. Markel H. Should Physicians Be Prescribing Prayer? Medscape Pediatrics 2004;6(2).
5. Beitz AJ, Newman A, Kahn AR, Ruggles T, Eikmeier L. A polymeric membrane dressing with antinociceptive properties: analysis with a rodent model of stab wound secondary hyperalgesia. J Pain. 2004 Feb;5(1):38-47.
6. Hess CT. Clinical Guide: Skin and Wound Care. Lippincott Williams & Wilkins. Ambler, PA. 2007;228-231,234-5, 343-350.
7. Kim Y, Lee S, Hong S, Lee H, Kim E. The effects of polymem on the wound healing. J Korean Soc Plast Reconstr Surg 1999;109:1165-1172.
8. Burd A, Kwok CH, Hung SC, Chan HS, Gu H, Lam WK, Huang L. A comparative study of the cytotoxicity of silver-based dressings in monolayer cell, tissue explant, and animal models. Wound Repair and Regeneration 2007;15:94-104.

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*PolyMem®, PolyMem Wic®, PolyMem Wic Silver® and PolyMem Max® dressings are made by Ferris Mfg. Corp., Burr Ridge, IL 60527 USA · www.polymem.com

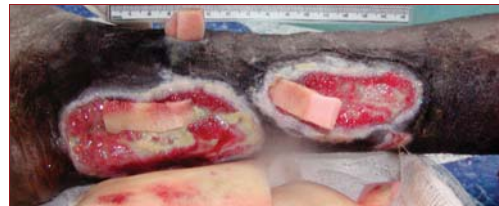
A 67-year-old woman with poor venous return from a knee deformity developed painful 9.0 cm x 4.5 cm and 7.5 cm x 4.5 cm foul-smelling abscesses with extensive tunneling beginning along her Achilles tendon, which was deteriorating.



18 August 2004: Two days of treatment with extra-thick polymeric membrane dressing have already softened the fibrin/slough significantly. Further sharp debridement would be risky now: the formerly brown tendons are becoming yellow as they take in moisture and are difficult to distinguish from slough.



27 August 2004: The tendons are fully hydrated and are becoming more prominent as the slough/fibrin disappears. The silver polymeric membrane cavity filler shows the location of the the longest fistula.



8 September 2004: The difference in the wound bed appearance in only ten days is dramatic. As soon as it was clean it began filling in. The tendons are mostly covered. Polymeric membrane cavity filler fills the tunnels and depressions.



15 Oct 2004: The author traveled, so no further wound photos were taken. However, the chart states the wounds were completely closed at 4 months.