



Polymeric membrane dressings* for skin graft donor sites: 4 years experience on 800 cases

Jeremy Tamir, MD, and Josef Haik, MD, Plastic Surgery, Sheba Medical Center, Israel (Dr. Jeremy Tamir is currently at Halstead Wound Care Center, Halstead, Kansas, USA)

PROBLEM

Skin grafting to cover open acute and chronic wounds is one of the most common surgical procedures performed. Techniques for caring for the skin graft site to assure an adequate graft and prompt wound healing are well established and are widely accepted and applied by workers in the field. Unfortunately, that is not always the case for skin graft donor sites. Traditionally, donor sites are dressed with paraffin-soaked gauze or scarlet red covered by a secondary gauze dressing. However, paraffin gauze and scarlet red frequently dry out and stick to the wound surface, causing significant discomfort and pain to the patient. Due to the open weave structure of gauze, wound infections are common, leading to more pain and unacceptable cosmetic results.

Studies show the advantages of moisture-retentive dressings over traditional dressings. We wanted an absorbent dressing that could provide a moist, non-adherent environment over the graft donor site, permitting rapid, pain free re-epithelialization. What started out as a small scale dressing trial at our clinic ended with a total conversion to polymeric membrane dressings* on donor sites.

RATIONALE

Polymeric membrane dressings contain components that work together to help create an ideal moist wound healing environment. The polymeric membrane dressings are covered with a semipermeable thin film backing that is optimized for oxygen and moisture vapor transmission. The dressings contain a nonionic, nontoxic, tissue-friendly wound cleanser, glycerol moisturizer and a superabsorbent. The absorbent draws wound fluid, which is known to contain natural growth factors and nutrients, to the wound site. The wound cleanser and moisturizer are released by both wound fluid and skin moisture. The combined actions of the components usually eliminate the need for wound bed cleansing during dressing changes, allowing for less disruption and cooling of the new growth in the wound bed. The dressings also allow virtually pain free dressing changes because the dressings do not adhere to the healing tissues.

Polymeric membrane dressings help protect periwound skin from maceration because when the wound fluid is absorbed a gel is formed in the dressing, helping to lock fluid in the dressing, away from the wound.

Polymeric membrane dressings have also demonstrated the ability to help reduce wound pain by inhibiting nociceptor activity at the wound site and inhibit infection, important properties when dealing with graft donor sites.

METHODOLOGY

Paraffin gauze is usually left on the wound until epithelialization is complete, which generally takes 10 – 14 days. The secondary absorbent dressings often need to be changed on a daily basis.

In contrast, a polymeric membrane dressing was applied directly after the surgery and was changed whenever it was saturated, generally every 2 – 3 days depending on the amount of bleeding and which thickness of polymeric membrane dressing was used. We prefer the extra-thick version that can absorb 60% more than the standard version of the polymeric membrane dressing. The dressings were affixed with an adhesive film or cloth dressing.

Polymeric membrane dressings have been the dressings of choice for all the donor site cases in our department since 2004. We compared the ease of application, pain reduction and donor site epithelialization between this new choice, polymeric membrane dressings, and data from many years of using paraffin-soaked gauze.

AIM / OBJECTIVES

1. Learn that polymeric membrane dressings dramatically decreased pain in our patients, which significantly decreased the use of pain medications and increased the patients' mobility.
2. Recognize that dressing changes are very fast and easy to perform with polymeric membrane dressings because the dressings are non-adherent and additional wound bed cleansing is not needed.
3. Discuss the reasons for the decreased infection rates the patients enjoyed when polymeric membrane dressings were used on their graft donor sites.

RESULTS

We used polymeric membrane dressings to cover skin graft donor sites on more than 800 patients. 656 (84%) of the patients were adults and 144 (16%) were children. The primary wounds were burns, penetrating trauma and chronic wounds. Our experience showed that paraffin-soaked gauze dressings were extremely painful for the patient during both wear time and at dressing changes. Compared to traditional paraffin-soaked gauze, we observed a dramatic reduction in pain on donor sites covered with polymeric membrane dressings. Dressing changes performed on the children became far less traumatic. The nurses reported that the use of pain medication in the ward was significantly reduced after polymeric membrane dressings were introduced. An additional benefit was faster mobilization of our patients.

The epithelialization time was reduced also. Donor sites often closed within a week, rather than the 10 – 14 days with the paraffin gauze dressings. So, the donor sites usually closed after only 2 – 3 dressing changes, rather than the 10 – 14 dressing changes required with the paraffin gauze.

We also observed a reduction in the infection rate of the donor sites, which was evidenced by a reduction of antibiotics used on the ward.

CONCLUSION

Our clinical experience after 800 cases of using the polymeric membrane dressing proved to us that polymeric membrane dressings have many advantages over paraffin-soaked gauze on donor sites. The dramatic reduction in pain impressed us the most. The dressing changes were fast and easy to perform as the dressing did not adhere to the wound surface and no additional wound bed cleansing was needed.

Based on our own experience, together with our nurses' and patients' perceptions, we feel it would be valuable if further prospective and comparative studies are performed. In the meantime, we will continue using polymeric membrane dressings as our first choice for covering skin graft donor sites.

BIBLIOGRAPHY

1. Terrill PJ, Goh RC, Bailey MJ. Split-thickness skin graft donor sites: a comparative study of two absorbent dressings. *J Wound Care*. 2007 Nov;16(10):433-8.
2. Rennekampff HO, Rabbels J, Reinhard V, Becker ST, Schaller HE. Comparing the Vancouver Scar Scale with the cutometer in the assessment of donor site wounds treated with various dressings in a randomized trial. *J Burn Care Res*. 2006 May-Jun;27(3):345-51.
3. 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.
4. 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.
5. Cutting KF, White RJ. Criteria for identifying wound infection: Revisited. *Ostomy/Wound Management*, 2005;51(1): 28-34.
6. Worley CA. So, what do I put on this wound? Making sense of the wound dressing puzzle: Part II. *Dermatol Nurs*. 2005;17(3):203-205.
7. Hess CT. *Clinical Guide: Skin and Wound Care 6th Ed.* Lippincott Williams & Wilkins. Ambler, PA. 2008;228-231,234-5,343-350.
8. Fluhr JW, Gloor M, Lehmann L, Lazzarini S, Distanti F, Berardesca E. Glycerol accelerates recovery of barrier function in vivo. *Acta Derm Venereol*. 1999;79:418-421.
9. 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.
10. European Wound Management Association (EWMA). Position Document: Pain at wound dressing changes. London:MEP Ltd, 2002.

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



Our Procedure:

The non-adherent nature of the polymeric membrane dressings makes removal gentle. Due to the built-in wound cleanser in the dressings, no additional wound cleansing is needed at dressing changes, making them very fast and easy to perform. If the donor site is large, as in this case, several dressings can be used with a slight overlap.

Typical Skin Graft Donor Site Case: Closed in one week with only two dressings



Appearance of the donor site immediately after harvesting the split skin graft. The amount of bleeding varies between patients. Local anesthesia containing adrenalin has been used to minimize the bleeding.



The wound is immediately covered with an extra-thick polymeric membrane dressing, secured with adhesive film. Later dressings were sometimes affixed with cloth tape. Polymeric membrane dressings without borders should ideally be affixed with a "window-pane" technique to allow the patient to benefit fully from the dressing's ability to create the ideal moisture balance in the wound bed.



The first dressing change. The polymeric membrane dressing comes off easily without causing any pain to the patient. No wound cleansing is needed – the dressing has continuously removed contaminants. The time to change the dressing is determined by the amount of exudate; saturation level is visible through the dressing backing. In skin graft donor sites, the first change is generally after 2 – 3 days; the second change after 3 – 5 days.



Epithelialized skin graft donor site.
The wound required only two dressing changes and one week to close.
The patient was pain free the whole time.

This case series was unsponsored.
Ferris Mfg. Corp. contributed to this poster presentation.