

# Efficiency of Local Wound Treatment by Combining Polymeric Membrane Dressings\* and Negative Pressure Wound Therapy

Edda Skrinjar<sup>1</sup>, Nikolaus Duschek<sup>1</sup>, Gottfried Sebastian Bayer<sup>2</sup>, Hans Kern<sup>1</sup>, Afshin Assadian<sup>1</sup>.

1. Wilhelminenspital / Department of Vascular Surgery (Wilhelminenspital, Vienna, AUSTRIA)

2. Plastic surgeon at the Department of Vascular Surgery (Wilhelminenspital, Vienna, AUSTRIA)

## INTRODUCTION

At our department of vascular surgery we often use negative pressure wound therapy (NPWT) before, and after certain procedures to facilitate healing. The recommended change frequency is every 2-3 days, but, due to our high workload, combined with frequent unscheduled acute operations, we sometimes do not have the possibility to change the NPWT at the operating theatre. Delayed dressing changes often cause problems with in-growth of granulation tissue into the foam, leading to traumatized bleeding of the granulation tissue and painful removal. Due to the dressing-change related pain it's difficult to take care of these patients in the ambulatory clinics so we need to remove the dressings in the operating theatre, and therefor blocking time from other surgical procedures. Initially we tried to combine NPWT with a soft silicone wound contact layer, however the application was tricky and very time consuming. Most of the time the silicone layer slipped out of place so this was not an option for us.

## Aim

A pilot evaluation of polymeric membrane\* cavity dressings (with and without silver) as a primary wound contact layer in combination with the regular foam used in NPWT. Aim was to evaluate the impact of less frequent dressing changes in regards to;

- In growth of tissue into the dressing
- Pain
- Healing

We also looked at the difference in workload and cost associated with the use of an extra interface dressing.

## METHOD

We chose to use polymeric membrane cavity dressings as direct wound contact layers since they are frequently used at our clinic instead of, and after NPWT, to facilitate wound healing. Polymeric membrane cavity dressings are fit for purpose as they don't have a film backing layer and wound fluid can pass through the dressing.

On the few occasions we used the silver version we always included a piece of the standard pink polymeric membrane dressing as a colour indicator.

The dressing change frequency was every 5-7 days depending on macroscopic colour change of the dressing (photo examples to the right) or amount of fluid in the vacuum-pump collector.

Initially we planned to trial this method on 5 patients, however, the results were so promising we expanded the trial to include 15 patients.

## RESULTS

The combination of polymeric membrane cavity dressings and NPWT made handling of the procedure very easy.

The patients reported no or reduced pain during wear time and at dressing change. There were no observations of in-growth of tissue in the polymeric membrane dressings, not even when the dressing had been in place for over 7 days.

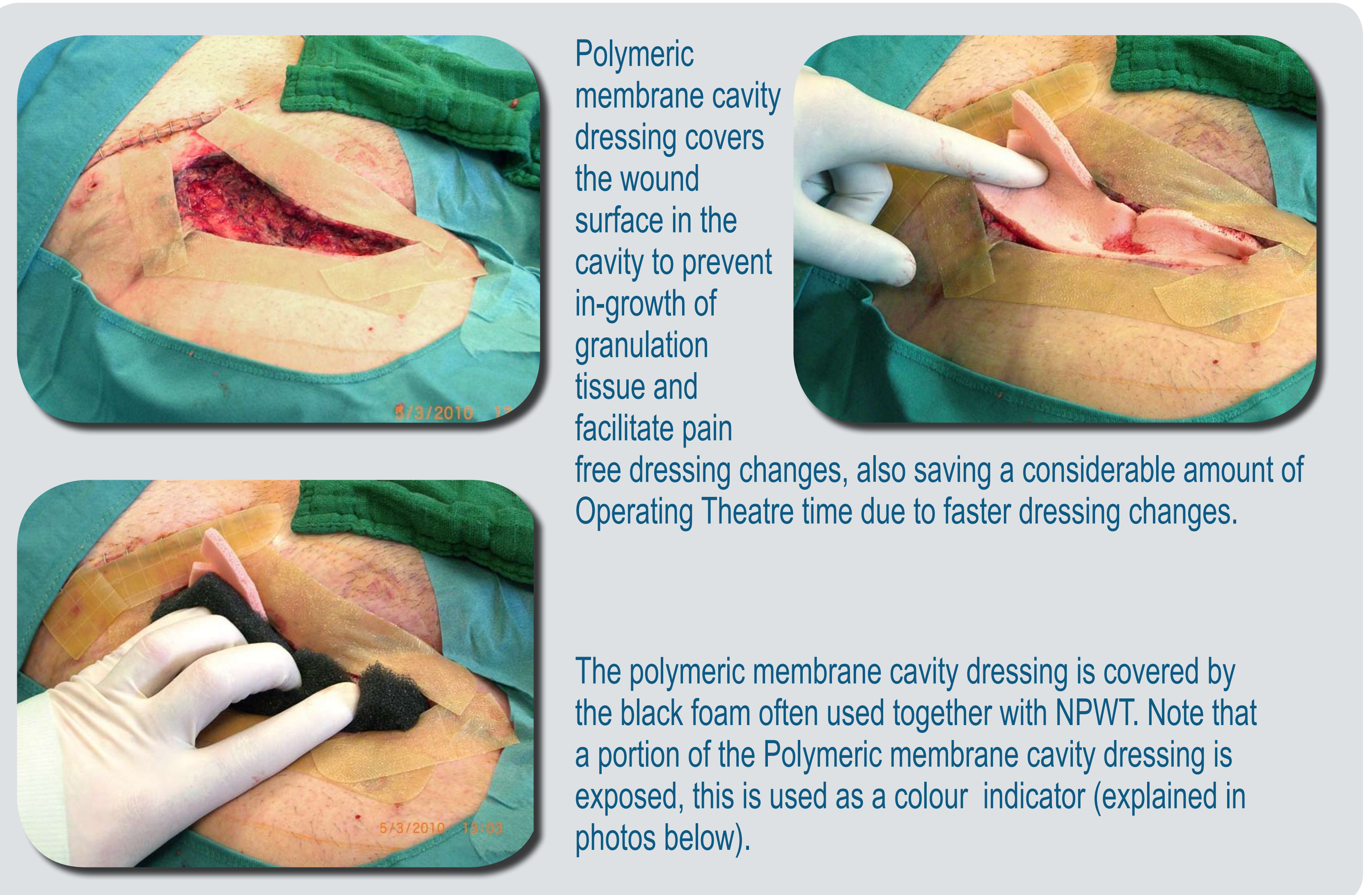
On several patients it has been sufficient with one dressing change to prepare the wound surface for a split skin graft or local flap. In three patients we only needed 3 dressing changes to achieve wound closure with skin grafts and/or local flaps.

Due to the absence of tissue in-growth as well as reduction of pain we could follow up most of the patients in the ambulatory clinics instead of occupying a surgical theatre room.

## Bibliography

Beitz AJ et al. 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.

\*PolyMem® WIC Wound Cavity Dressings with and without Silver. Manufactured by Ferris Mfg Corp, Burr Ridge, IL 60527 USA. This study was unsponsored.



## DISCUSSION

Our subjective feeling is that we achieved faster healing, less infection/pain and increased patient comfort with this combination. We noted that fewer dressing changes were need to achieve wound closure with skin grafts or flaps. Extended wear time did not have a negative impact on the wound healing nor cause sticking to the wound surface.

When comparing NPWT versus polymeric membrane cavity dressins + NPWT we found that;

- We could extend the wear time from 2-4 days to 5-7 days (extended to 9 days in one patient)
- Pain scores were reduced from 3-5 to 0-2,5
- Sedation was needed for most dressing changes with only NPWT, but, when combined with polymeric membrane cavity dressings, none of the patients needed to be sedated prior to dressing change.

The combination polymeric membrane cavity dressings + NPWT allowed for about a 33% cost reduction in comparison to a patient with only NPWT (The cost calculations were only based on the material used and operating theater time). However, these are preliminary findings with a small sample-size. We plan to perform studies with a higher number of patients in order to achieve more robust data.