ASSESSMENT OF THE COMPATIBILITY OF A NON-ADHERING DRESSING AND CNP FOAM DURING NPWT *IN VITRO*

C. Wiegand[1], M. Abel[2], S. deLange[2], P. Ruth[2], U.-C. Hipler[1]

[1]Department of Dermatology, University Medical Center Jena, Germany [2]Lohmann & Rauscher GmbH & Co. KG, Rengsdorf, Germany

Introduction

NPWT has been shown to be clinically effective in the treatment of chronic-stagnating wounds. In vitro studies suggest that positive effects of NPWT result from the recruitment of cells to the wound site. It could be shown that the dressings used for NPWT exhibit different effects, cells especially show a significant tendency to grow into large-pored foams [1-3]. We have used a previously established in-vitro-model for NPWT [3] to investigate the effects of the combination of non-adhering dressing and large-pored PU foam dressing on fibroblasts.

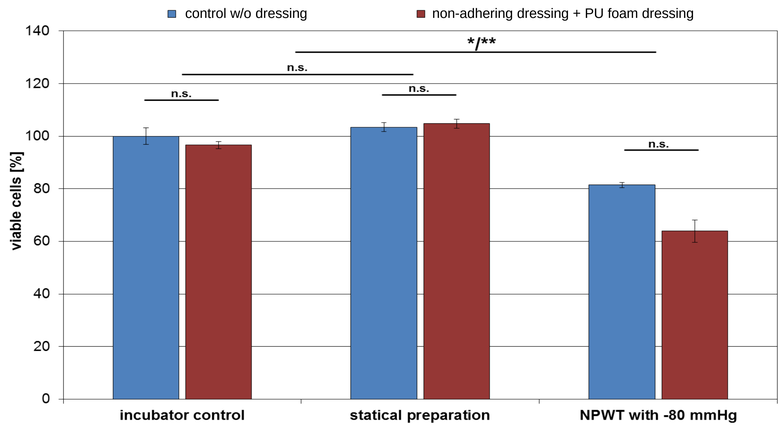

Figure 1: The combination of the non-adhering dressing and the large-pored PU foam dressing did not affect cell viability negatively. Slightly lower numbers ov cells were observed after treatment with NPWT (-80mmHg) due to the loss of fibroblasts after migration to the collagen pellicle edge.

Material & Methods

Non-adhering dressing samples* and large-pored PU foam dressing** were placed on fibroblast 3D-cultures [3]. The assembly was positioned in a 6-well-plate and sealed with a vacuum-applicator-lid (VAL). VALs were connected to medium supply and vacuum pump. Experiments were carried out at -80mmHg for 48h. Histology specimens were stained with haematoxylin/eosin and fibroblasts were detected using anti-vimentin-antibodies. Cell viability and ingrowths of cells into samples was determined.

*Lomatuell® Pro (Lohmann & Rauscher); **Suprasorb CNP® foam (Lohmann & Rauscher)

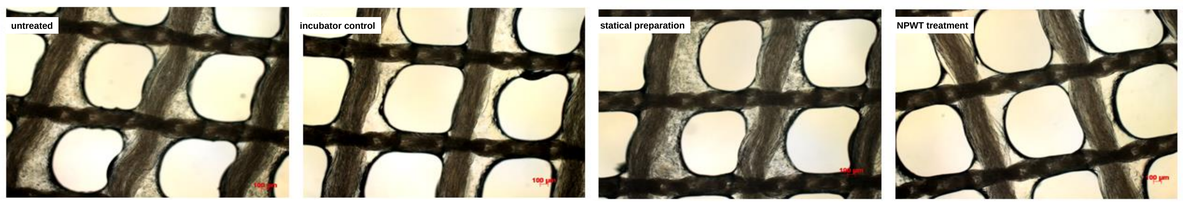

Figure 2: Microscopic evaluation of the non-adhering dressing samples: untreated compared to incubator control, statical preparation and after NPWT treatment for 48h with -80 mmHg. Pictures were taken at 40x magnification (scale bar = 100 µm).

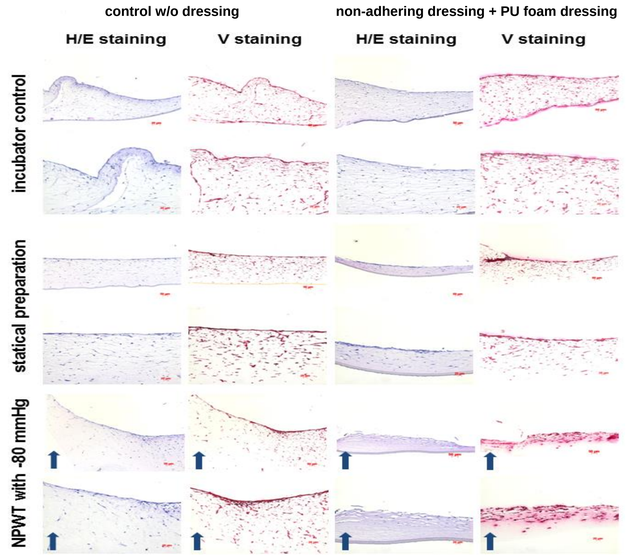

Figure 2: Fibroblasts are evenly distributed in the 3D-cultures a nd they responded to NPWT by migrating in the direction of the applied vacuum.

Results

It could be shown that the combination of the large-pored PU foam dressing and the non-adhering dressing is highly cell compatible and does not affect cell viability negatively (figure 1). Moreover, using the large-pored PU foam dressing and the non-adhering dressing samples in combination with NPWT at -80 mmHg induced fibroblast migration in direction of the applied vacuum (figure 2). However, ingrowth of cells into the large-pored PU foam dressing and the non-adhering dressing during NPWT was noted *in vitro* (figure 3).

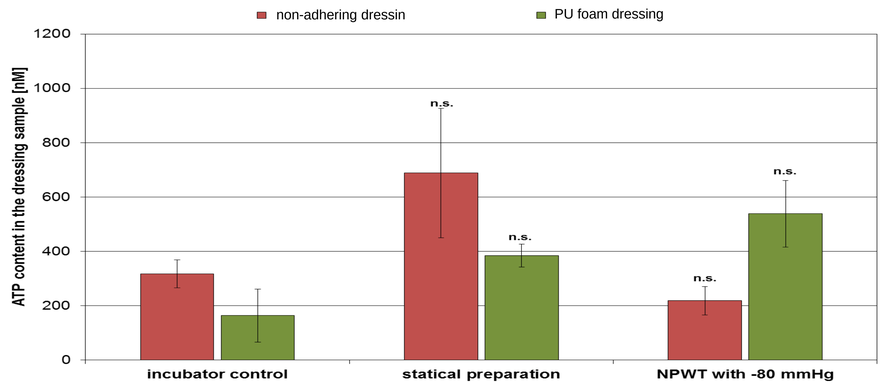

Figure 3: Measurement of ingrowth of cells into the wound dressing samples by determination of the ATP content (mean ± SE).

Conclusions

It could be shown that the combination of the non-adhering dressing and the large-pored PU foam dressing demonstrates good cell compatibility and does not negatively affect cell viability. Moreover, the combination of non-adhering dressing and PU foam dressing samples did not interfere with the induction of fibroblast migration in direction of the applied vacuum during NPWT at -80 mmHg.

References

[1] Campbell PE, Smith GS, Smith JM. Int Wound J, 2008; 5:280-6; [2] Malmsjö M, Ingemansson R, Martin R, Huddleston E. Wound Rep Reg, 2009; 17:200-5; [3] Wiegand C, Springer S, Abel M, Wesarg F, Ruth P, Hipler UC. Wound Rep Reg 2013; 21:697-703

EWMA 2016 ● 11-13 May 2016 ● Bremen ● Germany

Scientific grant of Lohmann & Rauscher GmbH & Co KG, Rengsdorf/Germany