Measurement of the adhesion disposition of silicone-coated PU foam dressings *in vitro*

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Introduction

Wound dressings that adhere to the wound surface can disrupt the wound bed and destroy newly formed, healthy tissue on removal, resulting in a disturbed, rough surface. This often happens with simple gauze pad. A silicone coating of wound dressings can prevent their adherence to the wound surface which otherwise would disrupt the wound bed and destroy newly formed, healthy tissue on removal. This happens for example often with simple gauze pad but may also appear with foams. Hence, we have evaluated the adhesion disposition of modern silicone-coated PU foam dressings *in vitro*.

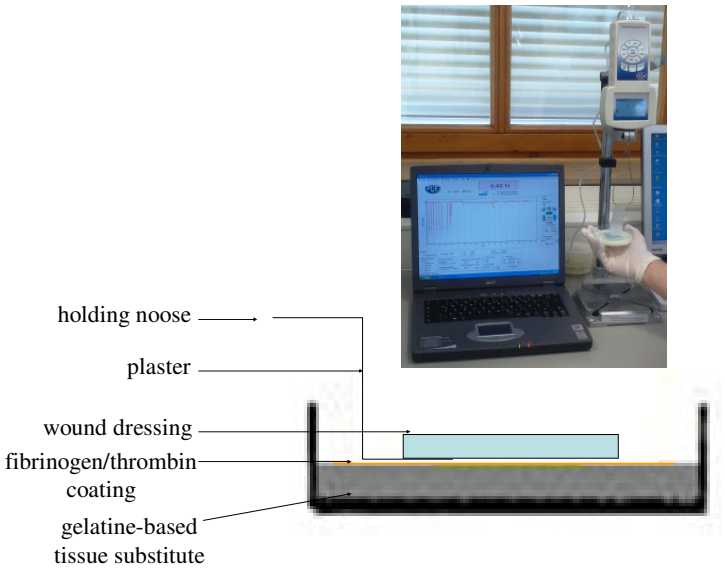

Figure 1: Schematic representation of the experimental set-up to determine the adhesion disposition of wound dressings *in vitro*.

Material & Methods

For the conglutination tests, simple cotton gauze (Fuhrmann) was chosen as positive control (A). Three silicone-coated PU foams (B: Suprasorb® P silicone, Lohmann & Rauscher; C: Mepilex® border, Mölnlycke Health Care; D: Biatain® Silicone, Coloplast) were picked for analysis. For measurement of the adhesion disposition, a tissue substitute (10% (w/v) gelatine, 10% (w/v) milk powder) with a fibrinogen/thrombin layer was prepared. Wound dressing samples were cut corresponding to 3cm x 4cm and fixed to a plaster with a holding noose for the force gauge. In each case, only the dressing area posing the padding zone was employed for testing. Cotton gauze (A) was treated in the same manner. Evaluation of the adhesion disposition was carried out by measurement of the force necessary to remove the dressing from the tissue substitute.

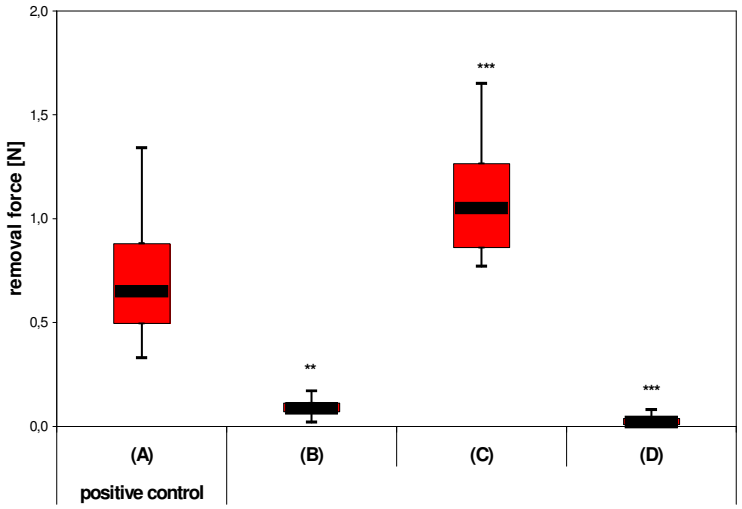

Figure 2: Determination of the force necessary to remove the dressings from the tissue substitute. Results shown as mean ± SE (n = 12).

Results

The dressings B and D exhibited *in vitro* a similarly low adhesion disposition compared to the positive control. Only for dressing C a significantly higher force was needed to remove the adhesive wound pad from the tissue substitute which accounts for the stronger adhesion observed.

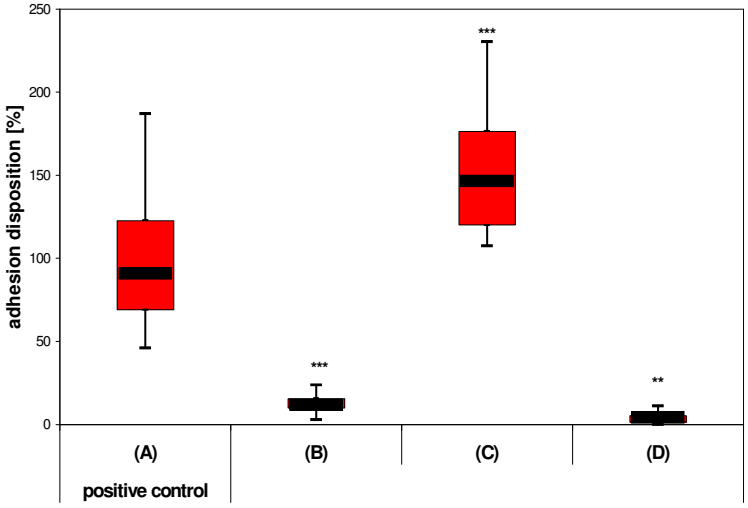

Figure 3: Evaluation of the adhesion disposition of the wound dressings tested compared to conventional cotton gauze. Results shown as mean ± SE (n = 12).

Conclusion

The adhesion disposition of PU foam dressings with a silicone coating could be quantified and evaluated *in vitro* using a special tissue substitute. It could be shown that the dressings B and D demonstrated a significantly lower adhesion than simple cotton gauze pads.

24th Conference of the European Wound Management Association (EWMA), 14.-16. May 2014, Madrid/Spain