

Comparison of the adhesion disposition of conventional and modern wound 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. To avoid conglutination with the wound, e.g. combined fleece compresses possess a micro-porous polyester foil or impregnated gauze is used. So far, it hasn't been studied whether the conglutination proclivity of conventional dressings is different from modern wound dressings, e.g. foams featuring a WCL (wound contact layer). Hence, we have evaluated the adhesion disposition of conventional and modern wound dressings *in vitro*.

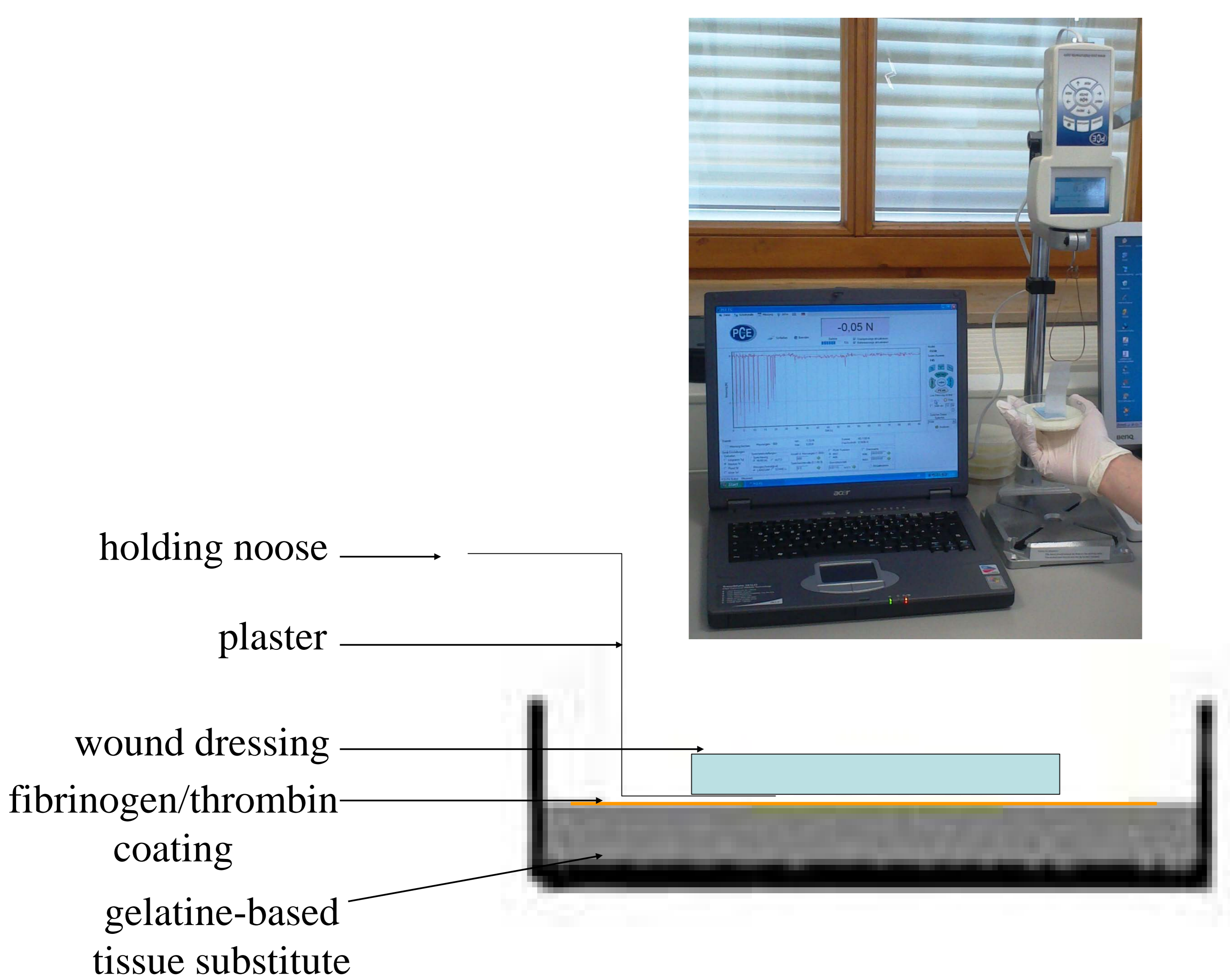


Figure 1: Schematic representation of the experimental set-up to determine the adhesion disposition of wound dressings *in vitro*.

Material & Methods

For the conglutination tests, simple cotton gauze (Fuhrmann) was chosen as positive control. Four combined fleece compresses (Solvaline[®] N, Solvaline[®] N *new*, Lohmann & Rauscher; Melolin[®], Smith & Nephew; Askina[®] Pad, B.Braun) and three impregnated gauzes (Lomatuell[®] H, Lomatuell[®] Pro, Clauden[®], Lohmann & Rauscher) as well as four modern foam dressings with WCL (Suprasorb[®] P, Lohmann & Rauscher; Allevyn gentle, Smith & Nephew; Mepilex[®] border, Mölnlycke Health Care; Biatain[®] non-adhesive, Coloplast) were picked for analysis. A fibrinogen/thrombin layer was applied onto the tissue substitute (10% (w/v) gelatine, 10% (w/v) milk powder) on which the dressing samples (3cm x 4cm) were put. Evaluation of the adhesion disposition was carried out by measurement of the force necessary to remove the dressing from the tissue substitute (figure 1).

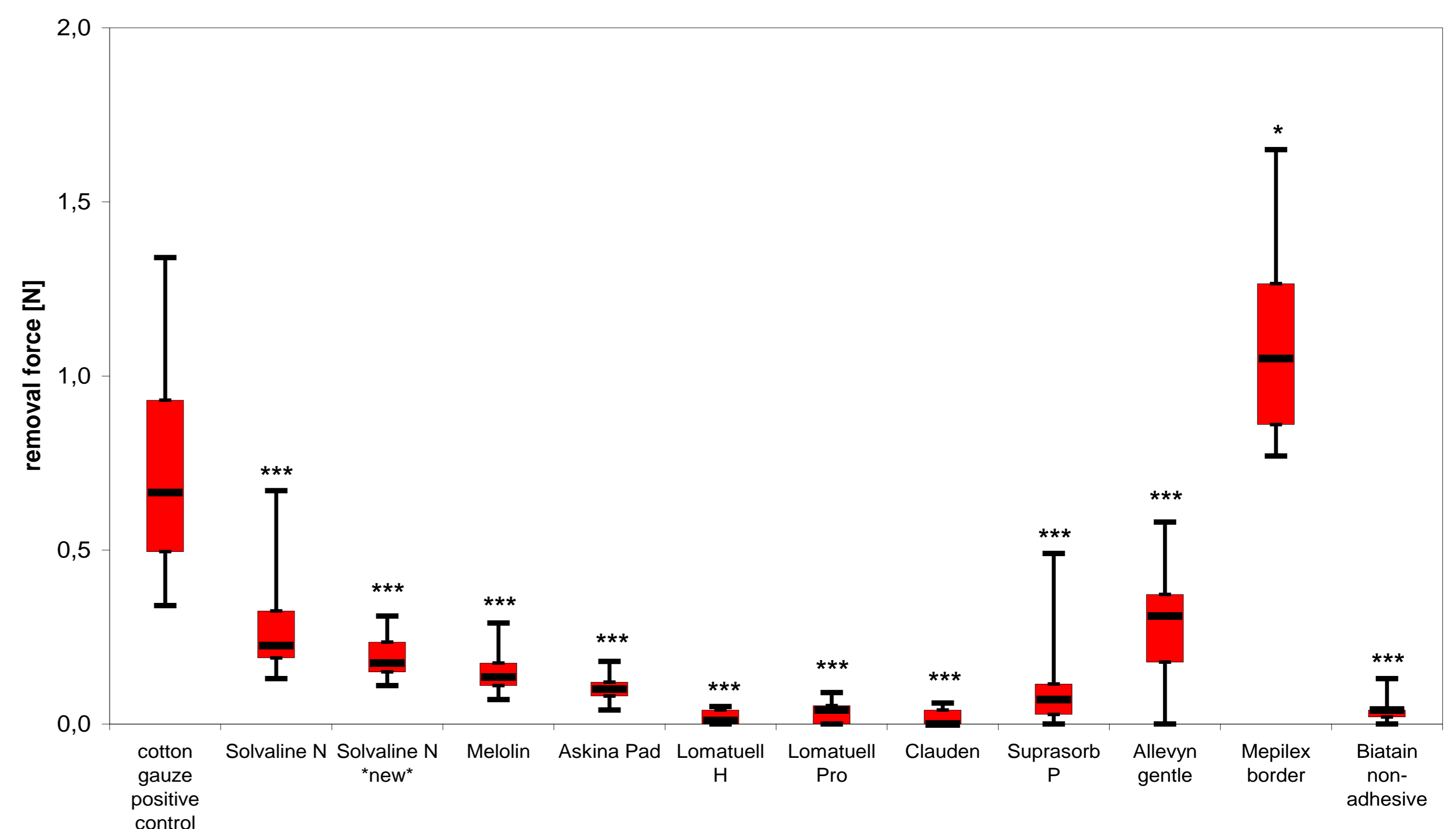


Figure 2: Determination of the force necessary to remove the dressings from the tissue substitute. Results shown as mean \pm SE (n = 12).

Results

It could be shown that by combination of a fleece compress with a micro-porous polyester foil the adhesion disposition can be significantly reduced compared to a simple cotton gauze ($p < 0.001$). Distinctly less force was needed to remove the dressings Solvaline[®] N, Solvaline[®] N *new*, Melolin[®] and Askina[®] Pad from the tissue substitute. The impregnated gauzes Lomatuell[®] H, Lomatuell[®] Pro, and Clauden[®] did not exhibit any conglutination in the test. All modern wound dressings demonstrated a significantly reduced adhesion *in vitro* compared to cotton gauze, except dressing Mepilex[®] border (features an adhesive dressing pad). The dressing pad of Mepilex[®] border possesses an adhesive bond line that exhibits higher conglutination which results in a distinctly stronger force needed to remove the samples from the tissue substitute.

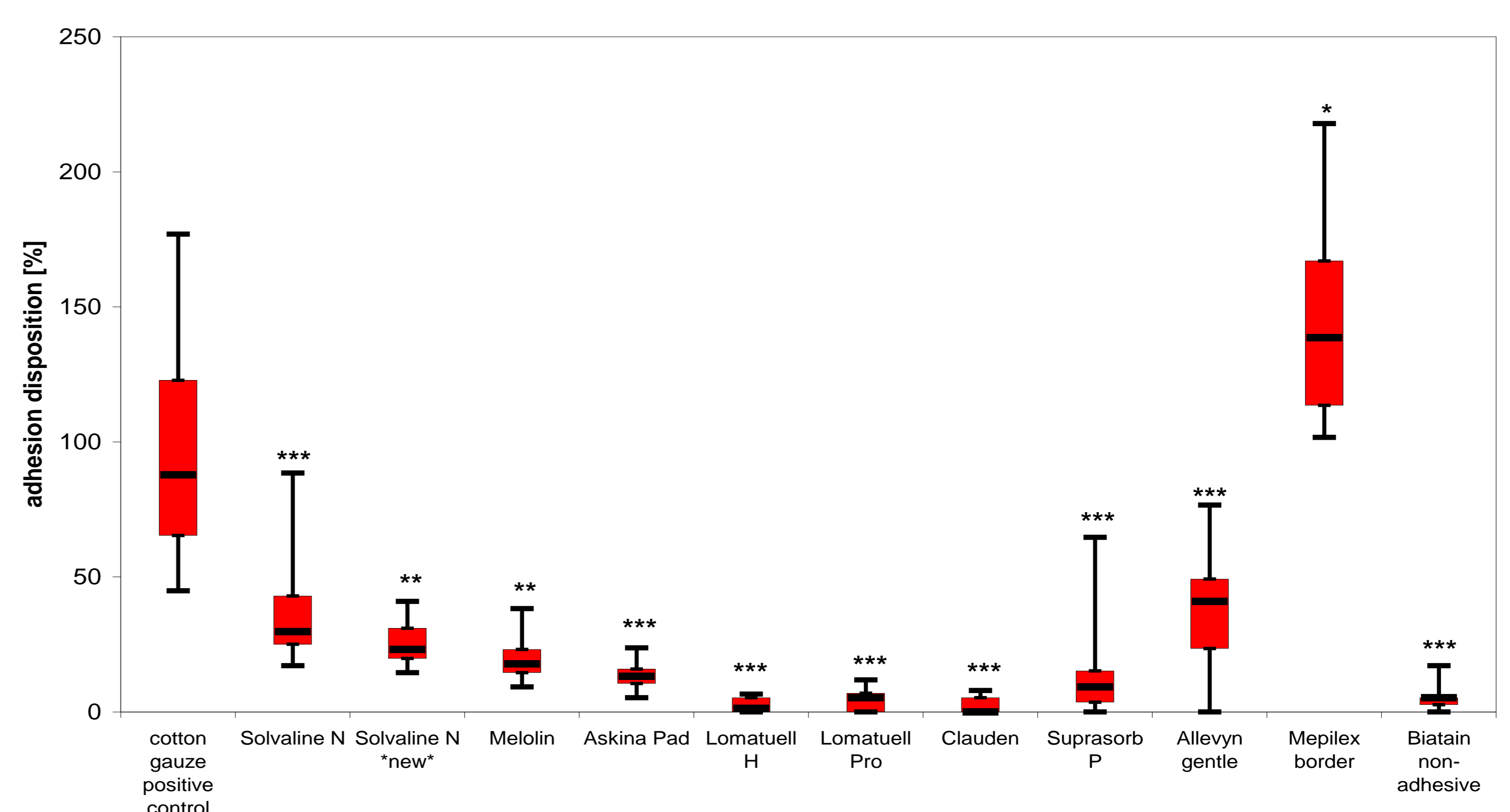


Figure 3: Evaluation of the adhesion disposition of the wound dressings tested compared to conventional cotton gauze. Results shown as mean \pm SE (n = 12).

Conclusion

With the help of an *in vitro* tissue model, the adhesion disposition of wound dressings could be quantified and evaluated. It could be shown that conventional dressings are capable to exhibit a comparable low conglutination with the wound as modern wound dressings.