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.

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 und 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.

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 two impregnated gauzes (Lomatuell® H, Clauden®, Lohmann & Rauscher) as well as four modern foam dressings with WCL (Suprasorb® P + WCL, 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).

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.