DETERMINATION OF THE FLUID HODLING CAPACITY (FHC) AND PROTEIN RETENTION OF THE NEW MONOFILAMENT DEBRIDER DEVICE*

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Introduction

Chronic wounds contain devitalized, necrotic or sloughy tissue that impedes healing as it acts as proinflammatory stimulus or serves as media for microorganisms [1]. For mechanical debridement mainly wet-to-dry gauze is used, which nondiscriminatorily removes devitalized tissue from the wound, resulting in pain and damaged healthy tissue [2]. The new debrider device* consists of polyester monofilament fibres presenting a novel, fast and almost painless option for debridement. Evidence further suggests that greater dressing moisture retention is associated with fewer clinical infections, greater patient comfort and reduced scarring. Keeping this in view, prevention of desiccation of a wound and achieving moisture balance should also be a focus during debridement. Hence, a high fluid holding capacity, beneficial for taking up excess amounts of wound exudates, is not only advantageous for dressings but also for debridement devices* such as the pad (figure 1A) or the lolly (figure 1B).

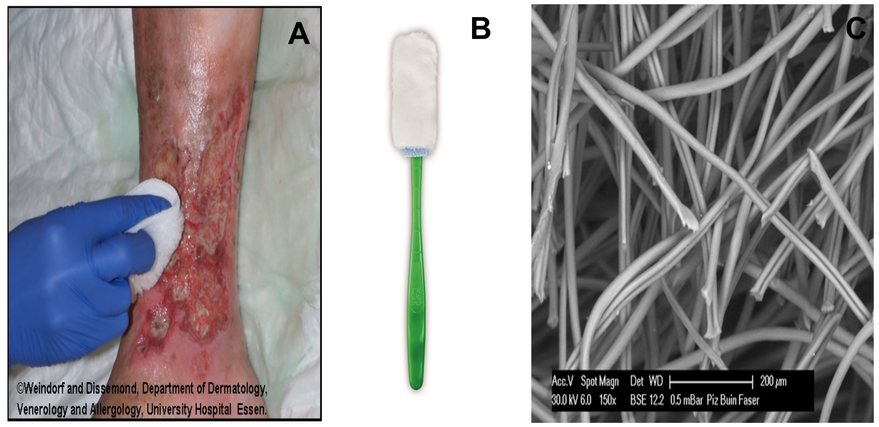

Figure 1: Mechanical debridement with the monofilament debrider (A) and the newly developed debridement device* (B) for cleansing of deep wounds. Both consist of polyester monofilament fibers (C).

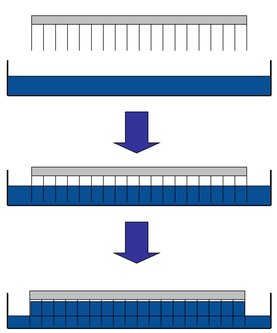

Figure 2: Schematic representation of soaking the samples in the respective solutions.

Material & Methods

The fluid holding capacity of the debrider device* and monofilament pads** was investigated *in vitro*. Therefore, samples were soaked in (a) distilled water and (b) 10%BSA solution. Sample weight was immediately determined. Samples were then dried at 80°C for 4h.

*Debrisoft® Lolly (Lohmann & Rauscher)

** Debrisoft® (Lohmann & Rauscher)

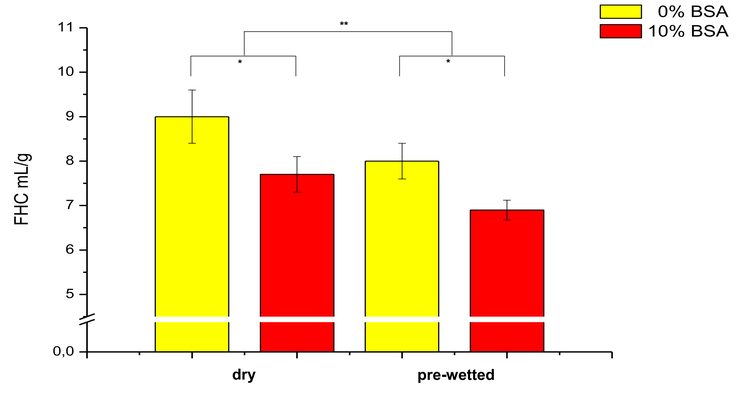

Figure 3: Measurement of the fluid holding capacity (FHC) of dry and pre-wetted debrider devices*.

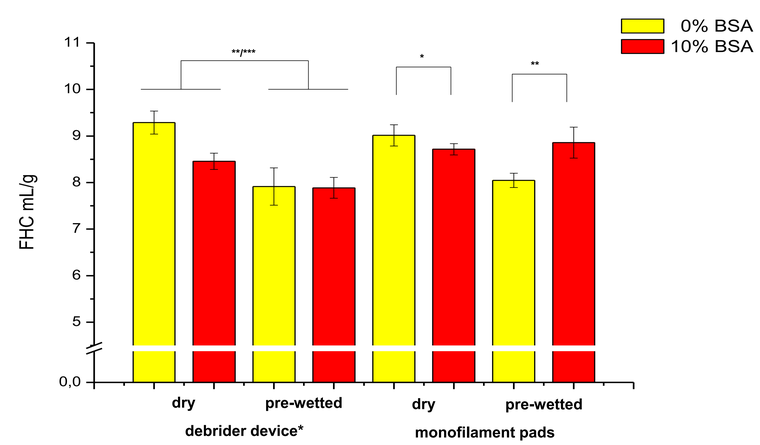

Figure 4: Measurement of the fluid holding capacity (FHC) of dry and pre-wetted debrider devices* and monofilament pads.

Results

The debrider device* absorbs and binds water and protein solutions. The water handling of debrider device* (figure 3) was similar to that of the monofilament pads (figure 4). Although a higher resilience to fluid drainage in the vertical position could be observed for the product debrider device*. The effect of the protein content on the absorption behavior was determined by analyzing the fluid holding capacity (FHC) using a 10% BSA solution. The FHC decreased significantly with increased protein concentration. Nonetheless, a distinct protein retention from the 10% BSA solution of 7.4 g/g was observed for the debrider device*.

Conclusion

The monofilament wound debrider device* presents a novel, fast, and almost painless option for debridement. Due to its physicochemical nature it is advantageous with regard to fluid holding capacity. Furthermore, good results for the fluid holding capacities were obtained at high protein concentrations. Hence, this new technique should provide a valuable tool in treatment of patients with chronic wounds.

References

[1] Sibbald et al. Advances in Skin & Wound Care 2011; 24(9):415-436 [2] Fallabella AF. Dermatol Ther 2006; 19(6):317-325

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