

IN VITRO COMPARISON OF THE DEBRIDEMENT PERFORMANCE OF TWO DEBRIDER DEVICES

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Introduction

Wound debridement is a challenge in treatment of patients with chronic wounds. Conventional methods relying on cotton gauze may not be enough. Surgical debridement requires trained personal, operation theatre and is often pain associated. Debrider devices consisting of monofilament fibres or polyester fibres present a novel, fast and painless option. We compared the performance of the debrider DS* and the debrider DM** *in vitro* and compared it to cotton gauze.



Figure 1: Mechanical debridement with the new debrider*. ©Weindorf and Dissemond, Department of Dermatology, Venerology and Allergology, University Hospital Essen.

Material & Methods

The debridement model consists of glass plates coated with a protein crust, imitating wound slough. DS and DM as well as cotton gauze were used to clean the glass plates under standardized conditions ($p=0.067N/cm^2$, $v=1.6cm/s$). Images were obtained before and after treatment and processed using ImageJ 1.45m.

*DS - Debrisoft® (Lohmann&Rauscher); **DM - DebrMitt™ (CrawfordHealthcare)

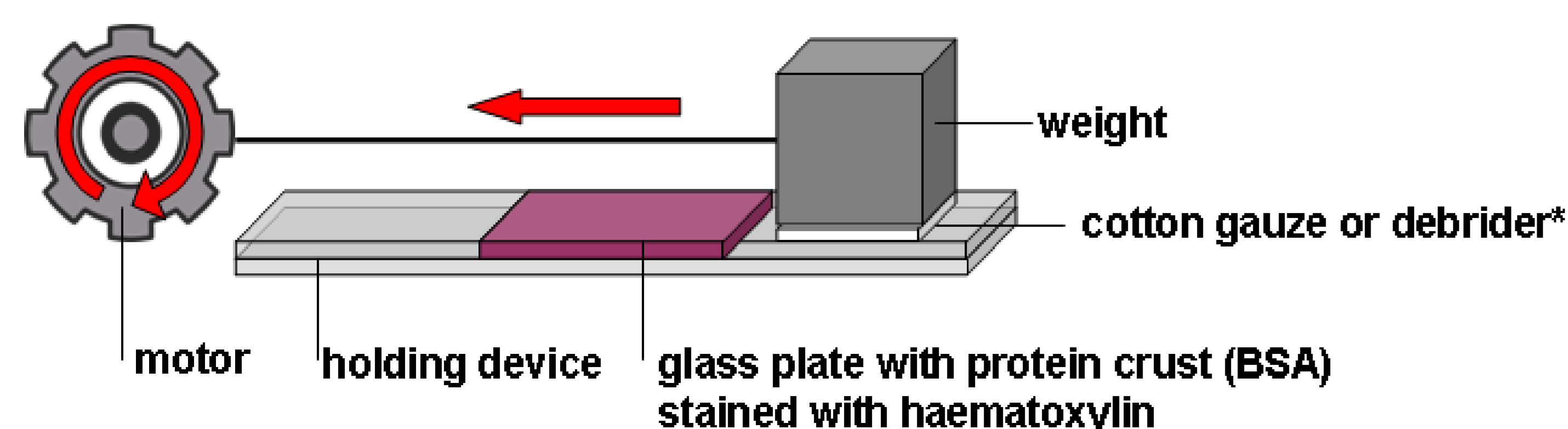


Figure 2: The wound debridement model: Glass plate with BSA cover was put into the holding device and cotton gauze or debrider* were attached to a weight. The weight was pulled over the glass plate at a constant speed of 1.6 cm/s.

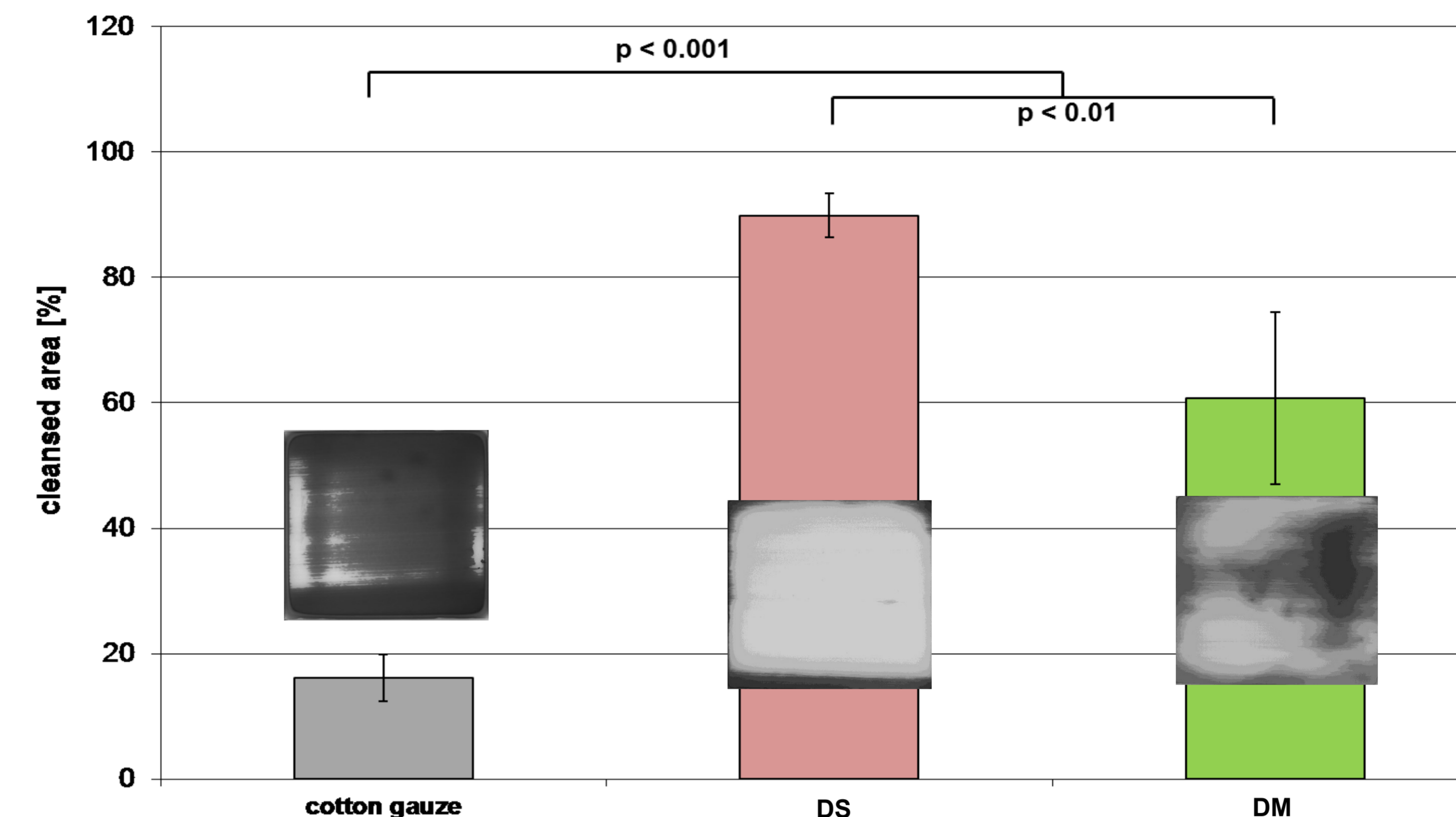


Figure 3: The debrider DS and DM exhibited a significantly higher cleansing efficacy compared to cotton gauze when glass plates prepared with 1.5% BSA simulating a thick protein crust were used in the wound debridement model. Data presented as mean \pm SE from 5 independent experiments. Images show representative examples of glass plates before and after cleansing. Inserts show representative examples of the glass plates after cleansing.

Results

DS and DM exhibit significantly higher cleansing efficacy compared to cotton gauze (figure 3). Cotton gauze reduced clogged area about 16% while DS and DM removed about 90% and 60% of slough, respectively. Moreover, cleansing capacity of DS and DM was examined (figure 4). It could be shown that DS retained its cleansing capacity during wiping of ten plates while DM lost its effectiveness after the fifth plate.

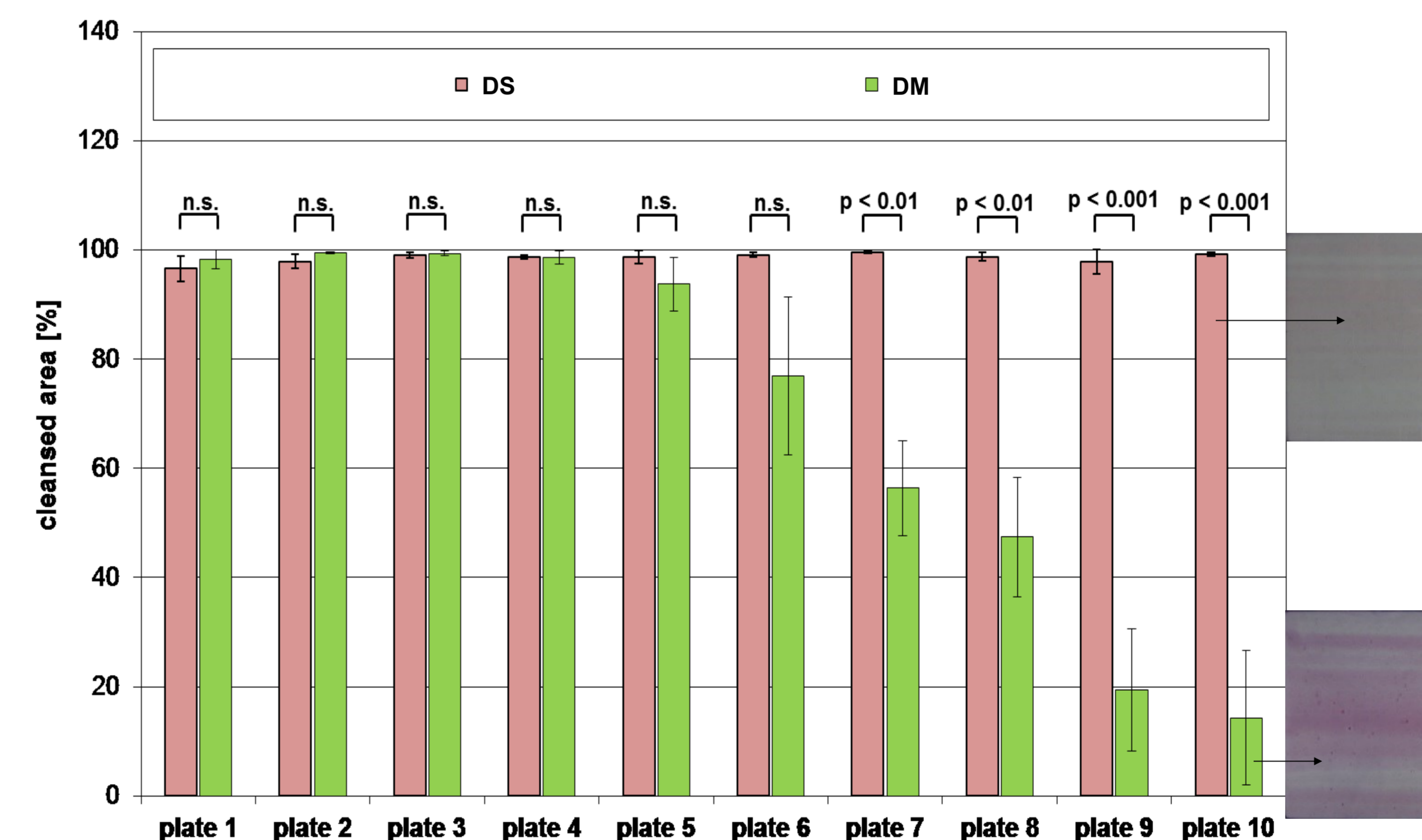


Figure 4: The debrider DS and DM were used to subsequently cleanse ten glass plates (0.45% BSA) each. While DM lost its efficacy, a significant cleansing effect of DS was observed. Data presented as mean \pm SE from 5 independent experiments. Inserts show representative examples of the glass plates after cleansing.

Conclusions

Debridement performance of the debrider devices is significantly higher than that of cotton gauze. They present a non-invasive and therefore almost painless alternative, providing a valuable tool in the treatment of patients with chronic wounds to improve the quality of life. Differences in the effectiveness were observed *in vitro*. Under the test conditions, DS showed higher cleansing efficacy as well as superior cleansing capacity compared to DM.