

Evaluating the removal of bacteria and biofilm with monofilament fibre debridement technology, compared to a cleaning product using a wound intelligence device

Clare Morris, Senior Clinical Services Manager, L&R

Aims

To evaluate the performance of monofilament fibre debridement technology* compared to a pre-moistened cleansing and debridement cloth** in the removal of bacteria and biofilm using a wound intelligence device*** which leverages the principles of fluorescence.

Methods

Patients were selected with chronic wounds who demonstrated signs that biofilm was the primary cause of the wound being static or slow to heal. The treatments were carried out by a Nursing Sister who ran a leg ulcer clinic in North Wales.

A monofilament fibre debridement pad was used to mechanically debride the chronic wounds and expedite wound bed preparation. The same procedure was repeated using a pre-moistened cleansing and debridement cloth with poloxamer following manufacturer's instructions for use.

A wound intelligence device was used to take images of fluoresce in bacteria $\geq 10^4$ CFU/g on the surface of the wound bed before and after using the monofilament fibre debridement pad and compared with the before and after images using the pre-moistened cleansing and debridement cloth.

Results

Fourteen patients were recruited into the evaluation, nine using the monofilament fibre debridement pad and five using the pre-moistened cleansing and debridement cloth.

In all cases, the monofilament fibre debridement technology has superior ability to remove bacteria and biofilm when compared to the pre-moistened cleansing and debridement cloth with poloxamer.

Case study 1

Patient LC. A 26 year old male patient who had a post trauma DVT when he was 18 years old and was on Warfarin therapy. History of leg ulceration for the last 8 years.



Figure 1 & 2 – 6.3.18 before treatment with a pre-moistened cleansing and debridement cloth



Figure 3 & 4 – 6.3.18 after treatment with a pre-moistened cleansing and debridement cloth



Figure 5 & 6 – 12.4.18 before treatment with monofilament fibre debridement technology

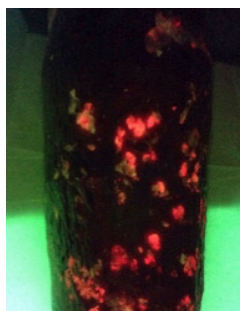


Figure 7 & 8 – 12.4.18 after first treatment showing removal of superficial bacteria and uncovering deeper pockets of bacteria with monofilament fibre debridement technology



Figure 9 & 10 – 12.4.18 after second treatment showing removal of deeper pockets of bacteria with monofilament fibre debridement technology

Case study 2

Patient WG. A 47 year old man with a history of a venous leg ulcer



Figure 11



Figure 13



Figure 15



Figure 17



Figure 19

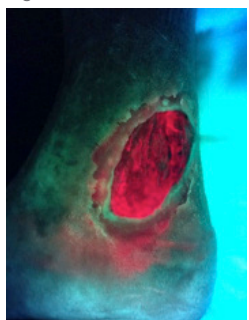


Figure 12 – 6.3.18 before treatment with a pre-moistened cleansing and debridement cloth

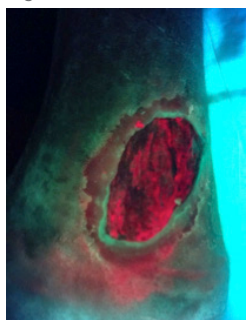


Figure 14 – 6.3.18 after treatment with a pre-moistened cleansing and debridement cloth



Figure 16 – 12.4.18 before treatment with monofilament fibre debridement technology



Figure 18 – 12.4.18 after first treatment with monofilament fibre debridement technology

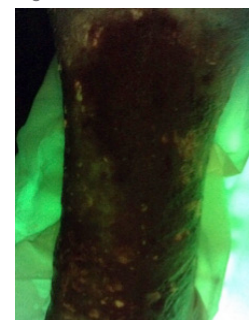


Figure 20 – 12.4.18 after second treatment with monofilament fibre debridement technology

Discussion

It was interesting to note that the red, bacteria/biofilm within the fluorescence images were often not within the chronic wound but on the peri wound skin, especially when there was dry scaly skin. This highlighted the importance of good peri wound skin management.

The case studies using monofilament fibre debridement technology demonstrated a two-step approach;

- Step 1 – remove the devitalised tissue peri wound skin and superficial bacteria/biofilm, then
- Step 2 – remove the deeper pockets of bacteria/biofilm

Conclusion

The monofilament fibre debridement technology has shown better removal of bacteria and biofilm when compared with a pre-moistened cleansing and debridement cloth using fluorescence imaging in this evaluation.

Acknowledgement

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* Debrisoft® - L&R UK Ltd

** UCS™ Debridement - Medi UK Ltd

*** MolecuLight i:X™ Imaging Device – distributed in the UK by Smith & Nephew