

Application of nanofibrous wound dressings: A handheld electrospinning device



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01 INTRODUCTION

Electrospun nanofibers dressings have received attention as an ideal dressing due to their unique architectural features that mimic the extracellular matrix and provide an ideal wound environment for wound healing.¹ Despite the mounting evidence surrounding the efficacy of nanofiber technology, there is currently no self contained handheld portable device that uses electrospinning technology to form a polymer nanofibrous dressing for commercial use.²

02 AIM

The aim of this study determined the feasibility of a handheld electrospinning device for the application of wound dressings.²

03 METHODS

A porcine model was used to apply four polymer nanofibers dressings onto superficial partial thickness wounds and compared with a traditional paraffin tulle gras dressing. Using a handheld portable electrospinning device, four polymer nanofibrous dressings were applied at a short distance from the wound. Donor sites were evaluated on day 2, 7, and 14 after removal of dressings. Tissue samples were taken for histological assessment (See Figure 1).²

04 RESULTS

There were no significant differences detected between the electrospun nanofibrous and paraffin tulle gras dressings. Advantageous characteristics of the electrospun nanofiber dressings included a *non-touch technique, the ease of application, adherence and reduction in wound oedema and inflammation*. There was no delayed wound healing or signs of infection in either of the electrospun nanofiber and traditional tulle gras dressings.

05 INNOVATION

Used on partial thickness wounds, polymer electrospun nanofiber dressings are semi-permeable, biocompatible with **excellent surface topography**, and a non-touch technique to promote wound healing with the potential to reduce wound infections.² Easily applied without inflicting unnecessary trauma to the wound bed, it has potential to **reduced pain, trauma, scarring, number of dressing changes**, and added cost benefit.

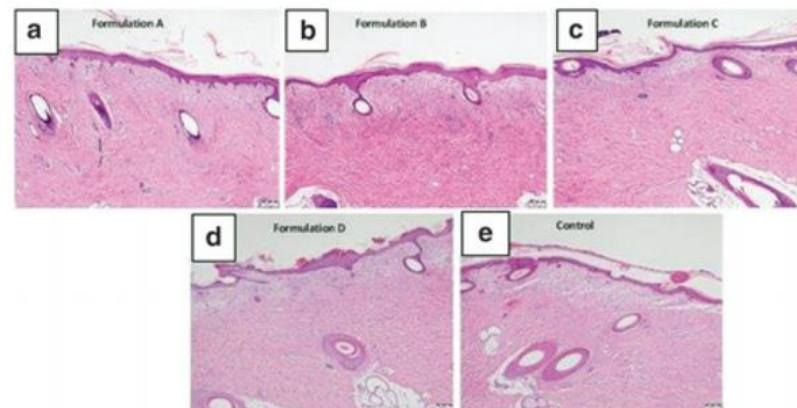


Figure 1. (a–d) Representative images of histology sections of the tested formulations; (e) The control dressing (Jelonet); All slides stained with Hematoxylin and Eosin.



References

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