

REDUCTION IN THE NUMBER OF BACTERIA USING AN OCCLUSIVE DRESSING

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INTRODUCTION

The goal of wound care is the prompt closure of wounds without complications. This goal is not always achieved and is especially difficult to obtain when treating burn wounds. Occlusive dressings are an advantage when treating wounds since they enhance epithelization, reduce scar formation and reduce pain and tenderness at the wound site. Unfortunately their use in burn patients has been very limited due to the fear of infection. Burn wounds have a highly exudative nature and present an optimum environment for the multiplication of bacterial pathogens. *Pseudomonas aeruginosa* is an opportunistic gram-negative motile bacteria that thrives in moist environments, readily colonizing burn wounds. *Pseudomonas aeruginosa* is the pathogen most commonly associated with burns, contributing substantially to burn-associated morbidity and mortality. A dressing that does not favor the multiplication of *Pseudomonas aeruginosa* would be a definite advantage in the treatment of burn wounds.

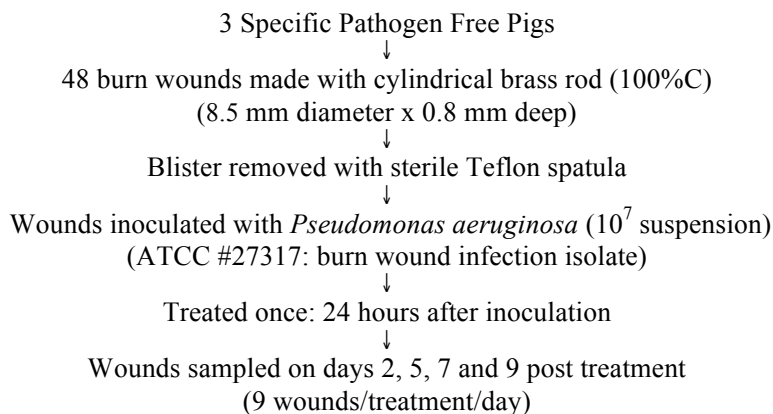
CHARACTERISTICS OF *ELASTO-GEL*™

Elasto-Gel™ is a hydrogel that contains 65% glycerine. Glycerine is a humectant formed from the hydrolysis of fat. It interferes with the water activity level, reducing the amount of readily available water, thus creating an environment that is not conducive to the multiplication of bacteria. Glycerine also prevents the dressing from dehydrating and rewounding during removal. The glycerine and water are entrapped in a cross-linked polymeric acrylamide matrix which enables the dressing to absorb exudate. The elastic backing makes it possible for the *Elasto-Gel*™ to conform to wounds and stretch with body movements.

QUESTION

What effect does a hydrogel dressing containing glycerine have on the proliferation of *Pseudomonas aeruginosa* on burn wounds?

MATERIAL AND METHODS



TREATMENT GROUPS

- **Untreated**
(Air exposed control)

- **Hydrogel**
65% glycerine, 17.5% water, 17.5% cross linked acrylamide (*Elasto-Gel™*)

- **Hydrogel**
22% polymer (PVP), 18% propylene glycol, and 60% water (Clear-Site®)

- **Hydrocolloid**
Pectin and sodium carboxymethyl-cellulose (DuoDERM®)

RECOVERY METHOD

At each sampling time *Pseudomonas aeruginosa* was recovered quantitatively. The bacteria were recovered using a modified scrub technique which recovers surface and tissue invading organism and has been shown to be comparable to tissue biopsy. In this technique each burn area is encompassed by a sterile glass cylinder and 1 ml. of scrub solution (3% Asolectin and 10% Tween 80) is pipetted into the glass cylinder. The wound is then vigorously scrubbed with a Teflon spatula for 30 seconds. The scrub solution is then aspirated aseptically and the bacteria quantitated using the Spiral Plater System. The geometric log (CFU/ml) and standard deviation was calculated for each time and treatment. Significance was determined using the Student T Test.

RESULTS

The number of *Pseudomonas aeruginosa* recovered from *Elasto-Gel™* treated wounds was significantly lower than those recovered from DuoDERM® treated wounds on all sampled days. *Elasto-Gel™* treated wounds also had a significantly lower CFU/ml than the Clear-Site® treated wounds on days 5, 7 and 9. Air exposed wounds had a significantly lower number of *Pseudomonas aeruginosa* than *Elasto-Gel™* treated wounds on days 5 and 7, with no significant difference on days 2 and 9. Epithelization was not evaluated in this study.

ANSWER

A hydrogel containing glycerine reduces the number of *Pseudomonas aeruginosa* in burn wounds.

CONCLUSION

Elasto-Gel™ significantly reduced the number of *Pseudomonas aeruginosa* recovered from second degree burn wounds compared to other occlusive dressings examined.

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