

ABSTRACT

**A GLYCERIN-BASED WOUND DRESSING IMPROVES**

**HEALING OUTCOMES IN PRECLINICAL PORCINE MODEL**

**OF MAXILLOFACIAL BURN TRAUMA**

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**Background**: Thermal injury of the face results in ectropion (epithelial-ocular

junction), eversion of the lip (epithelial-oral junction), skin contracture, and excessive

scar formation. The resultant facial disfiguration along with features such as

oral incompetence burdens the subject socially, emotionally, and psychologically.

The goal of this work was to test the healing outcomes of a glycerin-based wound

dressing Elasto-Gel on a preclinical porcine model of maxillofacial burn trauma.

Methods: Fourth degree burn wounds involving 50% of the face were made on

female domestic Yorkshire pigs using a gauged, electrically powered burner which

continually measures the temperature of the instrument and increases the power to

the heated stylus to maintain the desired temperature. Wounds were treated with placebo

dressing (Acticoat) or Elasto-Gel once a week for 84 days. The burn affected

50% of the face and caused injury to the mandibular bone. Progression of burn

wound healing was followed using noninvasive imaging such as (1) laser speckle

microperfusion imaging, (2) harmonic ultrasound Doppler imaging, and (3) computed

tomography with angiography for 3D reconstruction of face and vasculature.

**Results:** The application of heat resulted in a fourth degree burn with bone

involvement showing severe deficits including ectropion, eversion of the oral

mucosa, overt contracture and excessive scarring. Affected pigs suffered from

drooling during eating. Contracture and scarring were dramatically evident at d84

post burn. Elasto-Gel significantly accelerated the rate of wound closure during

the acute phase (p<0.05; n=3). The later phase of healing was characterized by

increased regression of blood vessels upon Elasto-Gel treatment (p<0.05; n=3).

Interestingly Elasto-Gel treated wounds showed significantly less scar area at all

time-points (d21, d42, d63 and d84; p<0.05; n=3).

**Conclusion:** This work constitutes maiden report on a porcine model of severe

facial burn contracture. Application of Elasto-Gel dressing minimized scar outcomes.

**Wound Rep Reg (2019) 27 A23 © 2019 by the Wound Healing Society**