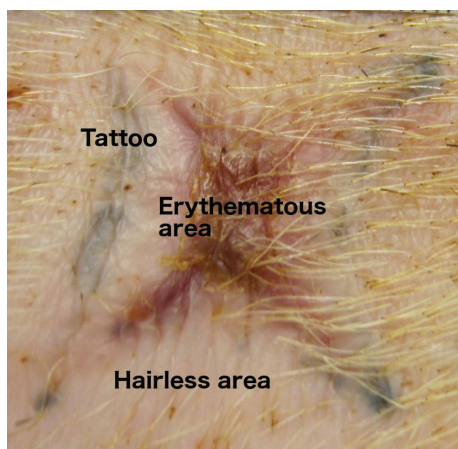


504 Accuracy of Scar Measurements in a Porcine Burn Model

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Introduction: Quantification of scarring includes measurement of scar contraction and scar depth. Identifying the outer borders of the scar is challenging and tattooing of the original wound is recommended. The scars are visually characterized by an inner zone of erythema and an outer hairless zone. We determined the reliability of scar surface area measurements as well as the agreement between scar surface area and scar depth.

Methods: We used data obtained from a previous study in which we created partial thickness 2.5 cm by 2.5 cm burns on the back of an anesthetized pig using a validated. The perimeter of the burns was tattooed and the wounds were then treated with a topical antibiotic ointment. Digital images and full thickness biopsies were taken at 28 days after injury to determine scar surface area and depth. The area of the scar devoid of any hair and the erythematous area in the scar center were measured by two observers (Figure). Inter-observer reliability for hairless area and erythematous area were determined using Pearson's correlation. Correlations between scar surface areas and scar depth were calculated.



Results: A total of 20 burns were assessed. Residual tattooing was present at 28 days in few wounds and did not completely surround the wounds. When present, the area within the tattoo was always hairless. Inter-observer agreement for hairless scar area was 0.89 ($p < 0.001$) and for erythematous area was 0.89 ($p < 0.001$). The correlation between hairless area and erythematous area was 0.81 ($p < 0.001$). In contrast, there was no correlation between hairless area or erythematous area and scar depth (-0.105 , $p = 0.661$ and -0.092 , $p = 0.701$ respectively).

Conclusions: Tattooing of burns is unreliable. Measurements of the area of the scar that is erythematous or devoid of hair are both reliable and highly correlated and therefore interchangeable. There is no correlation between scar surface appearance and histological scar depth.

Applicability of Research to Practice: Our results suggest that quantification of scar surface area by measuring either the erythematous area or the hairless area are interchangeable and that tattooing of the original wounds is not reliable or necessary.

505 Two Pig Studies. A New Dermatome vs. Weck and Standard Dermatomes for Excision and Graft Harvesting

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Introduction: A new pneumatic dermatome with a high-speed rotating excision ring (HSER) is designed to make debridement and graft harvesting easier while excising with a more consistent thickness. The dermatome has a window, allowing view of the area to be excised. Depth adjustment dial sits on top of the device, for quick depth adjustment "on the fly."

Methods: 2 proof of principle GLP pig studies were designed to test for safety and efficacy, excision consistency and ease of use. For the debridement study, 24 deep partial burns were created in 4 pigs: excision was performed with the new device which was compared to a Weck dermatome. For the graft harvesting, 24 STSG's were excised in 4 pigs, comparing HSER to 2 standard dermatomes. All procedures were randomized. The excised tissues (necrosis and STSG's) were evaluated for thickness-consistency. Ease of use was evaluated and wound healing was observed until the animals were euthanized (day 28); the test sites were sampled for histological evaluation of healing.

Results: Visually and histologically, no differences existed with regard to healing for donor sites and excised burns. All wounds had reached full reepithelialization on post-op. day 12 (donor sites) and 28 (excised burns). Overall thickness of STSG's and excised necrosis, subjectively as well as objectively (measured with a calibrated microscope. three locations of each excised piece of tissue) was more consistent for samples that were excised with HSER than for standard dermatomes or the Weck dermatome respectively. HSER scored better on overall ease of use than the comparators on maneuverability and (less) bleeding (STSG's). No adverse experiences were observed.

Conclusions: A new dermatome with a rotating excisional ring is designed to make graft harvesting and excision of necrosis more accurate and consistent on depth of the excision, as well as easier to use. In a comparative test of excision and grafting procedures on pigs trends show that the objectives of the design have been fulfilled. The number of wounds in this study was too small to reach statistical significance: superiority of the new dermatome will have to be confirmed in larger scale, comparative clinical trials in humans.

Applicability of Research to Practice: Results of studies indicate that a new dermatome may well offer a number of practical advantages over standard devices for excision and graft harvesting.