

An evaluation of fibrin tissue adhesive concentration and application thickness on skin graft survival.

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Abstract:

OBJECTIVES: To examine the effects of fibrinogen concentration and application thickness of fibrin tissue adhesive on skin graft survival.

STUDY DESIGN: Prospective controlled study.

METHODS: Ten domestic pigs were included in the study. A 20 x 5-cm area of skin was harvested bilaterally along the flanks of the animals using a Padgett dermatome. The harvested grafts were trimmed into four 4 x 4-cm squares. Donor sites were treated according to group assignment and the non-meshed grafts were placed on the side opposite their initial orientation and secured with staples. Both single- and multiple-donor human fibrin tissue adhesive preparations, with low and high average fibrinogen concentrations of 30 mg/mL and 60 mg/ mL, were used. Adhesive preparations were applied in either a thin layer (0.015 mL/cm²) or a thick layer (0.06 mL/cm²) using a spray applicator. A constant thrombin concentration of 10 U/mL was used in the study. No adhesive was used in the control group and grafts were stabilized with staples. No topical dressings were applied to any of the treatment sites. Animals were sacrificed 4 weeks after graft application.

RESULTS: Based on statistical analysis, thickness of adhesive application had a significant effect on skin graft survival. Percent mean graft survival in the control and thin application groups was found to be 92% and 97.8% respectively; the mean survival rate in the thick application group was

63.1%. Fibrinogen concentration, when evaluated independently within the thin and thick application groups, was found to have no significant effect on graft survival.

CONCLUSION: Independent of fibrinogen concentration, a thin layer of fibrin tissue adhesive, when applied between two opposing surfaces, does not interfere with and may support the healing process, whereas a thick layer of adhesive inhibits skin graft healing.