COMPARISON OF THE BIOMECHANICAL PROPERTIES OF BURNS GRAFTED WITH CONVENTIONAL SPLIT THICKNESS SKIN VS. INTEGRA™ ARTIFICIAL SKIN.

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The assessment of scarring following burn injury has been an ongoing challenge for burn care providers due to the lack of an accurate, objective, and quantitative standard of measure. The Biomechanical Tissue Characterization (BTC-2000, SRLI Technologies) is a clinical device that measures the deformation of skin, *in vivo*, in response to the application of a controlled vacuum. This study compared the biomechanical properties of skin in three groups: normal skin, burns grafted with conventional split thickness skin grafts (STSG) and burns grafted with Integra™ artificial skin as a dermal replacement.

Two females and 4 males with a mean burn size of 56.8% TBSA and a mean age of 43.5 years were studied. The mean postburn day of evaluation was 507 (range, 157-847 days). Measurements of tissue elasticity, elastic deformation, laxity, stiffness, and energy absorption were made in normal skin, meshed STSG, and Integra™ grafted sites on each patient. Comparisons were made using paired t-test and Mann-Whitney U-test.

Laxity, (acute deformation that occurs at very low vacuum, 95 ± 13% vs 37 ± 9%), elastic deformation (amount of deformation at the point of maximum vacuum, 1.30 ± 0.11 mm vs 0.73 ±0.10 mm), elasticity (elastic recovery that occurs immediately upon release of vacuum, 1.01 ± 0.11 mm vs 0.51 ± 0,07 mm), and energy absorption (overall softness, 47.20 ± 3.64 mmHg*mm vs 37.46 ± 3.86 mmHg*mm) were increased in Integra™ sites compared to conventionally grafted sites, respectively ($p<0.05$). Sites grafted with Integra™ were not statistically different from normal skin. Stiffness (mmHg/mm)was not different between the three groups.

The BTC-2000 may be a useful device for objective comparison of the biomechanical properties of wounds. Burns grafted with Integra™ artificial skin had properties more closely resembling normal skin than those wounds treated with conventional split thickness skin grafts.

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