

Negative Pressure Wound Therapy as a Dressing for Split-Thickness Skin Grafts: Our Experience



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Purpose

Split-thickness skin grafts (STSGs) are valuable tools for covering large soft-tissue wounds. Etiologies of STSG failure/loss include fluid accumulation under the graft, infection¹ and "shear" at the tissue interface. Graft immobilization is one of the mainstays of postoperative care to mitigate these risks. Negative pressure wound therapy (NPWT) improves overall graft survival, with fewer episodes of secondary grafting². NPWT may accomplish this by more optimally immobilizing the graft, thereby limiting shear, eliminating fluid accumulation in the wound bed and decreasing bacterial contamination³. NPWT simultaneously allows greater patient mobility and potentially decreases length of hospital stay. This represents a validation study of these concepts.

Methods

This is a prospective study of 23 STSGs treated with application of NPWT* postoperatively. Data regarding the patient's age, sex, co-morbidities, wound size, location of wound, reason for STSG, length of hospital stay, percentage of graft take, duration of NPWT, and follow-up time were collected and analyzed. The NPWT machine was set to -80mmHg in each patient.

Results

The average patient age was 44 years-old (range 21 – 69 years-old). Seven patients (32%) were female. Six of the patients (26%) were diabetic. The average wound size was 142cm² (range 8.6 - 550cm²). Seventeen of the STSGs were placed to the lower extremity and six STSGs were placed to the upper extremity. Average hospital length of stay was 6 days (range 0 – 15 days). The average STSG percentage take was 83%. The average STSG percentage take for diabetics was 50% and for non-diabetics was 95% (See Figure 1). Average duration of NPWT was 5 days. Average follow-up time was 3 months (range 0.13 - 6 months). There were no complaints of major discomfort and no significant infections.

Conclusion

We have utilized NPWT with STSG yielding 83% take. NPWT removes degradation products from the wound bed, allows graft conformation to irregular surfaces, and enhances neovascularization³. NPWT maintains a moist environment, while at the same time avoiding fluid accumulation in the wound bed. We found skin graft take on irregular and mobile surfaces was dramatically enhanced and care was facilitated. Future studies could analyze the postoperative care costs associated with a traditional bolster dressing versus NPWT in matched patient groups treated with STSGs.

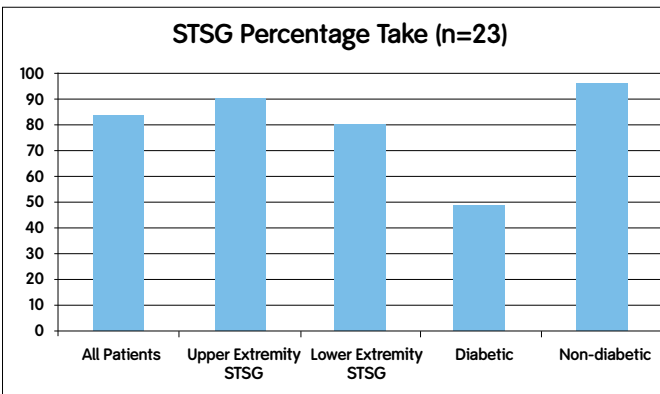
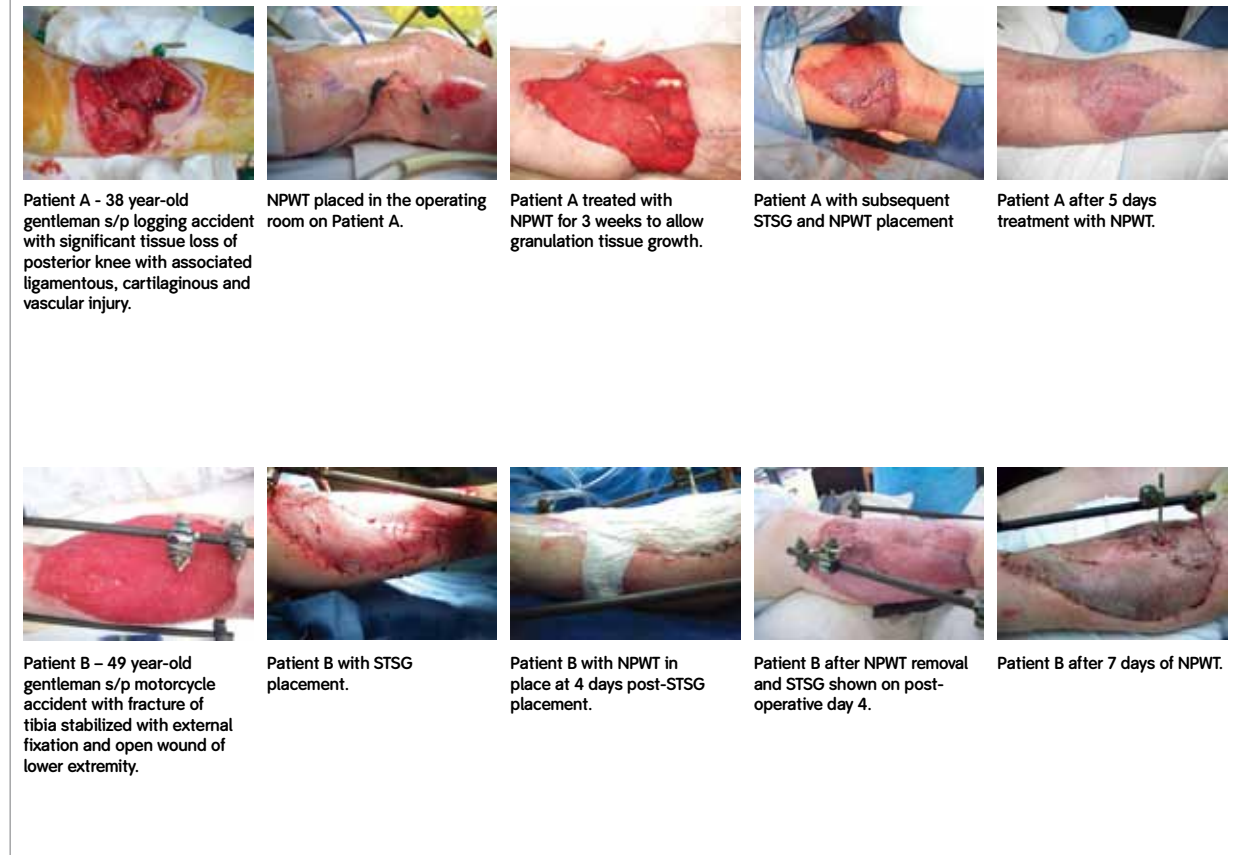


Figure 1: STSG percentage take of all patients, upper extremity, lower extremity, diabetic and non-diabetic patients.

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¹Llanos, Sergio, et al. "Effectiveness of negative pressure closure in the integration of split thickness skin grafts: a randomized, double-masked, controlled trial." *Annals of Surgery*. 244 (5), 2006: 700-5.
²Scherer, Lynette A., et al. "The vacuum assisted closure device: a method of securing skin grafts and improving graft survival." *Archives of Surgery*. 137 (8), 2002: 930-3.
³Blackburn, JH, et al. "Negative-Pressure Dressings as a Bolster for Skin Grafts." *Annals of Plastic Surgery*. Vol 40 (5), May, 1998.

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