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A Study on the Role of Split-Thickness Skin Grafting in the Management of Diabetic Foot Ulcers

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Abstract

Background: Diabetic foot ulcers (DFUs) are a common complication of diabetes and can result in significant morbidity, prolonged hospitalization, and amputations. Split-thickness skin grafting (STSG) is emerging as an effective intervention with improved healing outcomes.
Methods: A prospective study involving 100 patients with various Wagner grades of diabetic foot ulcers was conducted from January 2024 to June 2025 at ASRAM Hospital, Eluru. Patients were randomized into two groups—one receiving STSG and the other managed with conventional dressings.
Results: Patients treated with STSG showed a 50% reduction in healing time compared to conventional care. STSG significantly improved healing rates and decreased complication incidences.
Conclusion: STSG is a clinically superior approach in managing DFUs, minimizing complications and healthcare burden.
Keywords: Diabetic Foot Ulcer, Split-Thickness Skin Grafting, Wagner Classification, Wound Healing

1. Introduction

Diabetes mellitus is a metabolic disorder characterized by chronic hyperglycemia, resulting in vascular and neuropathic complications. Among these, diabetic foot ulcers are particularly debilitating. Traditional management often falls short, prompting the exploration of more effective options like STSG, originally used in plastic surgery. This study assesses the efficacy of STSG in diabetic ulcer care.

2. Literature Review

Globally, ~15% of diabetics are at risk of foot ulcers. These ulcers frequently precede lower limb amputations, increasing morbidity and mortality. Contributing factors include neuropathy (sensory, motor, autonomic), peripheral arterial disease, and infections. Existing studies have reported success with STSG in chronic ulcer cases, highlighting its utility beyond aesthetic surgery.

3. Materials and Methods

This was a prospective, randomized comparative study conducted between Jan 2024 and June 2025 on 100 diabetic patients with foot ulcers of varying Wagner grades.

Groups:

- **Control Group (n=50):** Received conventional dressings
- **Test Group (n=50):** Underwent STSG

All patients received:

- Preoperative wound debridement
- Antibiotic therapy based on sensitivity reports
- Glycemic control using insulin
- Surgical intervention after anesthetic clearance

Exclusion Criteria:

Patients with vascular anomalies, malignancies, systemic diseases affecting healing, or those unwilling to consent.

Patients were followed postoperatively for healing time, complication rates, and recurrence.

4. Results

- Majority aged 51–60 years; male predominance (M:F = 2.7:1)
- Right foot most commonly affected
- Wagner Grade 2 ulcers were most prevalent (58%)

Healing Outcomes:

Metric	STSG Group	Control Group
Complete Graft Take	46/50	—
Partial Graft Failure	4/50	—
Healing Duration	<4 weeks (majority)	12–20 weeks
Non-Healing/Complications	1 necrosis, 2 infections	6 non-healing, 1 death

STSG group showed faster healing, fewer complications, and reduced need for re-intervention compared to traditional care.

5. Discussion

STSG effectively accelerated wound healing across all Wagner grades. Benefits included reduced hospital stay, fewer dressing changes, and improved mobility. The results align with prior studies (e.g., Yammine et al.—85% healed in 5.3 weeks). Compared to standard treatment outcomes (Margolis et al.), STSG demonstrates clear clinical superiority in ulcer management.

6. Conclusion

- STSG ensures faster, more reliable healing of DFUs.
- Reduces postoperative care burden and hospital costs.
- Improves patient outcomes and quality of life.This procedure should be considered a viable first-line option in diabetic ulcer therapy.

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