

# HEALING SEVERELY INFECTED DIABETIC FOOT ULCER USING AUTOLOGOUS STAMP-SHAPED SKIN MICROGRAFTS. A PROSPECTIVE CASE SERIES.



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## AIM

To evaluate the clinical outcome using autologous stamp-shaped skin micrografts after limb salvage surgery in diabetic foot ulcers (DFU) with moderate/severe infection.

## METHOD

Fourteen diabetic patients with neuropathic or neuroischemic ulcer and moderate/severe infection, who required a large debridement, drainage and Negative Pressure Therapy (NPT), were included from May 2023 to September 2024.

Patients were included after surgical drainage + NPT for moderate/severe infection of neuropathic or neuroischemic DFU. If necessary, revascularization was performed. Ambulatory autologous stamp- shaped skin micrografts containing epidermis and the papillary dermis and placed on DFU to improve healing was used, including in all cases NPT again, in order to raise graft adherence. In addition to enhance healing time, it improves pain, anti-inflammatory response, and the release of growth factors and cells to promote epithelization. In all cases the anterolateral aspect of the thigh was used as donor site. Wound size, degree of infection, revascularization, mean time for complete wound healing, and possible graft complications were collected.

## RESULTS

Thirteen patients (92.9%) were male, with a mean wound size of  $24.6 \pm 16 \text{ cm}^2$ ; nine (64.3%) presented with absent distal pulses, Ankle Brachial Index (ABI) was not compressible in 4 patients and another 3 patients had ABI  $>1$ , and eight (61.5%) underwent surgical (37,5%), endovascular revascularization (37,5%) and deep venous arterialization (25%). On admission, nine patients (64.3%) had a severe infection according to IDSA classification. The most frequent grafting site was the transmetatarsal amputation level (64.3%). Two patients (14%) required repeat grafting due to incomplete adhesion. All patients achieved complete healing, with a mean closure time of  $3.0 \pm 2.4$  months and with enhance pain control in DFU.

## CONCLUSION

Autologous stamp-shaped skin micrografts have demonstrated to be an ambulatory, effective and safe technique for quickly healing on large ulcers in diabetic foot with a previous moderate/severe infections.

| DFU characteristics               | Patients (n=6)             |
|-----------------------------------|----------------------------|
| Wound size                        | $24.6 \pm 16 \text{ cm}^2$ |
| Wound bed tissue characteristics  |                            |
| Sloughy tissue, n (%)             | 1 (7,14%)                  |
| Granulation tissue, n (%)         | 11 (78,57%)                |
| Granulation + Bone exposed, n (%) | 2 (14,28%)                 |
| Exudate level                     |                            |
| Low, n (%)                        | 3 (21,42%)                 |
| Medium, n (%)                     | 5 (35,71%)                 |
| High, n (%)                       | 6 (42,86%)                 |
| Edge and periwound skin           |                            |
| Rolled edges, n (%)               | 2 (14,28%)                 |
| Healthy, n (%)                    | 5 (35,71%)                 |
| Maceration, n (%)                 | 5 (35,71%)                 |
| Hyperkeratosis, n (%)             | 2 (14,28%)                 |
| Positive culture, n (%)           | 14 (100%)                  |

| DFU location                   | Patients (n=6) |
|--------------------------------|----------------|
| Atypical TMT amputation, n (%) | 9 (64,3%)      |
| Chopart amputation, n (%)      | 4 (28,56%)     |
| Aquilles Tendon, n (%)         | 1 (7,14%)      |

| Texas classification | Patients (n=6) |
|----------------------|----------------|
| Texas 2B, n (%)      | 2 (14,28%)     |
| Texas 3B, n (%)      | 10 (71,4%)     |
| Texas 3D, n (%)      | 2 (14,28%)     |

| IDSA classification    | Patients (n=6) |
|------------------------|----------------|
| Moderate/severe, n (%) | 5 (35,7%)      |
| Severe, n (%)          | 9 (64,3%)      |

| HEALING | AVERAGE HEALING TIME | COMPLICATIONS |
|---------|----------------------|---------------|
| 100%    | $3.0 \pm 2.4$ months | 0%            |



1. Infection control (drainage and debridement) and revascularization if needed



2. Local anesthesia in donor area (anterolateral thigh)  
3. Stamps micrograft taken up to the papillary dermis with forceps and scalpel



4. Placing stamps on wound bed with 0.5cm between them  
5. Placement of NPT after protection with silicone dressing (5-7d)



6. Weekly follow-up using alginate dressing + zinc oxide paste until healing. On donor area from the start.

