Optimizing Skin Graft Success in Venous Leg Ulcers Using Aseptically Processed Dehydrated Allograft Placental Membrane

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INTRODUCTION

Venous Leg Ulcers (VLUs) are challenging for the wound care clinician and surgeon. Autologous skin grafting is considered the mainstay of surgical treatment of venous leg ulcers to expedite healing and definitive closure. However, postoperative loss of skin graft loss can be quite common. Chronic bacterial burden and continued inflammation can contribute to poor skin graft take.

Placental allografts are frequently used in the management of chronic wounds, specifically to provide native matrix proteins and support wound progression. Split thickness skin grafting (STSG) may benefit from the addition of aseptically processed dehydrated allograft placental mini membrane to support surgical healing and graft take, while also reducing the risk of post-surgical infection at the wound site.

METHODS/RESULTS

We present 5 cases of VLU surgical management utilizing placental allograft as a mini matrix following split thickness skin grafting to the lower extremities. Following wound bed preparation, STSG was obtained at 13/1000th inch and placed on the recipient site. The dehydrated placental mini membrane* was placed throughout the STSG and interstices. A nonadherent dressing was applied followed by Negative Pressure Wound Therapy (NPWT) at 125 mmHg of pressure and continued for 7-10 days.

Successful wound closure was achieved in all 5 cases, as characterized by 100% epithelialization. Furthermore, in those patients who developed small areas of epidermal slough, secondary healing was achieved without postoperative infection or need for further skin grafting.

DISCUSSION

Surgical approach to VLUs can be challenging. Optimizing skin graft take with wound bed preparation is important for success. However, the addition of dehydrated allograft placental mini membrane without terminal sterilization may improve surgical outcomes. The aseptically processed placental tissue without terminal sterilization is contains preserved native matrix proteins and growth factors, which supports wound closure. Additionally, preserved native antimicrobial properties by avoiding terminal sterilization may also support positive outcomes. We also found that skin graft take was improved with a reduced incidence of skin graft loss and/or post operative infection.

CASE 1

Patient Information: 72 year old male with venous stasis ulcer left lower extremity. Extremely painful.

Medical History: PVD

Treatment:
- Taken to OR for excision non viable tissue
- V.A.C. Veraflo ® Therapy initiated for wound bed preparation
- Returned to OR for STSG
- Dehydrated placental mini membrane placed to optimize healing
- V.A.C.® Therapy initiated to assist with STSG take

Outcome: Successful outcome with well healed skin graft.

Day 1 | Day 4 | Day 14 | 6 Weeks

CASE 2

Patient Information: 69 year old female with non healing wound BLE.

Medical History:
- Arthrogryposis, Obesity, Asthma, Venous insufficiency
- Multiple surgeries RLE for Charocot deformity

Treatment:
- Admitted to hospital for acute infection RLE wound.
- 3M™ Veraflo™ Therapy with 3M™ V.A.C. Veraflo Cleanse Choice™ Dressing initiated for wound bed preparation RLE
- 3M™ Promogran Prisma™ Matrix initiated LLE
- Taken to OR for STSG RLE
- Dehydrated placental mini membrane placed to optimize healing
- Promogran Prisma™ Matrix continued LLE

Outcome: Successful outcome with well healed skin graft.

Day 0 | Day 7 | Day 10 | Day 17 | Day 24 | 4 Weeks

CASE 3

Patient Information: 71 year old female with history of BLE venous stasis ulcers s/p venous ablation. Recent Prednisone use for hyper-inflammatory response and non healing VLUs despite wound management.

Medical History: Obesity

Treatment:
- Taken to OR for staged debridements and V.A.C.® Vera Flo™ therapy
- V.A.C. Veraflo Therapy initiated with Dermatac Drape for extra periwound skin protection
- Returned to OR for STSG placement.
- Dehydrated placental mini membrane placed to optimize healing
- V.A.C. Therapy with Dermatac Drape initiated and continued as outpatient for extra periwound skin protection

Outcome: Successful outcome with well healed skin graft.

Day 1 | Day 3 | Day 10 | 6 Weeks

CASE 4

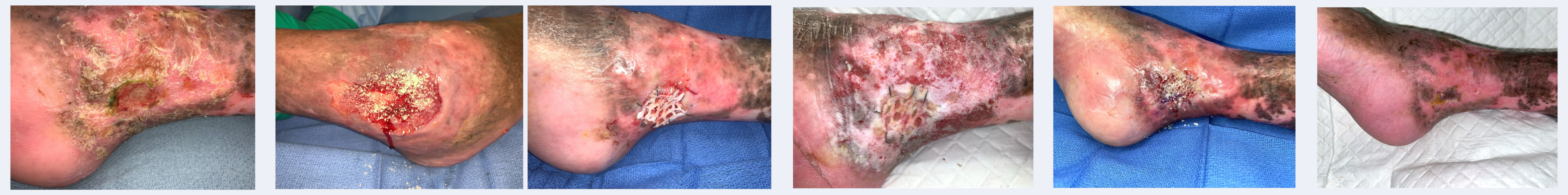
Patient Information: 72 year old male with history of venous stasis ulcers RLE resistant to conservative wound management. Referred for surgical evaluation and skin grafting.

Medical History: Former smoker

Treatment:
- Taken to OR for staged debridements and VeraFlo™ therapy with Cleanse Choice dressing.
- Meshed HR-ADM** placed as tissue scaffolding for soft tissue replacement.
- Dehydrated placental mini membrane placed to optimize healing
- V.A.C.® Therapy initiated and continued as outpatient.
- Returned to OR for STSG
- Dehydrated placental mini membrane placed to optimize healing

Outcome: Successful outcome with well healed skin graft.

Day 1 | Day 4 | Day 10 | 6 Weeks | 12 Weeks



CASE 5

Patient Information: 66 year old male with history of DVT presented with left lower extremity complex wounds with full thickness necrosis after an episode of "cellulitis". Findings were consistent with a deep tissue necrotizing infection.

Medical History: Obesity and DVT

Treatment:
- Admitted to hospital for IV antibiotics for persistent infection with full thickness necrosis.
- Initiated NPWTi-d was .
- Taken to OR for staged debridement.
- Meshed HR-ADM was placed to serve as a scaffold to expedite granulation and support the healing process.
- NPWT was continued as outpatient

Outcome: Successful outcome with well healed skin graft.

Day 1 | Day 7 | 6 Weeks | 3 Months

REFERENCES

1. Labropoulos, N Wang, ET Lanier, Sami U. Khan U, Factors Associated with Poor Healing and Recurrence of Venous Ulceration. *Plast. Reconstr. Surg.* 2012; 129(1):179-186.
2. Zelen CM, Orgill DP, Serena TE, *et al.* An aseptically processed, acellular, reticular, allogenic human dermis improves healing in diabetic foot ulcers: A prospective, randomized, controlled, multicenter follow-up trial. *Int Wound J.* 2018: 1-9.
3. DiDomenico LA, Orgill DP, Galiano RD, *et al.* Use of an aseptically processed, dehydrated human amnion and chorion membrane improves the likelihood and rate of healing in chronic diabetic foot ulcers: A prospective, randomized, multi-centre clinical trial in 80 patients. *Int Wound J.* 2018; 15: 950-957.

***Salera® Mini Membrane (MTF Biologics, Edison, NJ)**

****SomaGen® (MTF Biologics, Edison, NJ)**