Bilayer Wound Matrix in Challenging Situations and Compromised Patients to Obtain Coverage of Bone and Tendon

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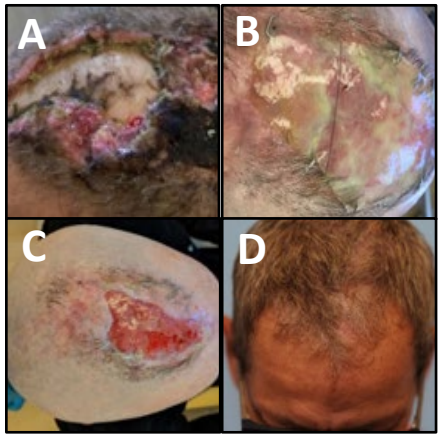
Introduction

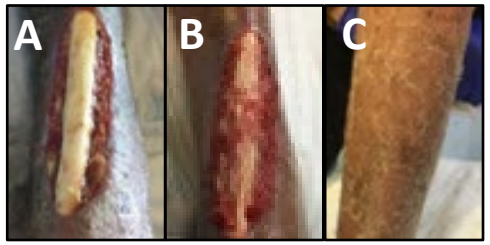
Soft tissue defects in compromised patients present a significant challenge to the reconstructive surgeon, particularly when vital structures are exposed. Acellular dermal matrices are now widely used in reconstructive and plastic surgery and offer new opportunities for soft tissue coverage. We report 4 cases of adult patients with a variety of competing and challenging medical problems whose wounds were managed with Meshed Bilayer Wound Matrix (MBWM).

Methods

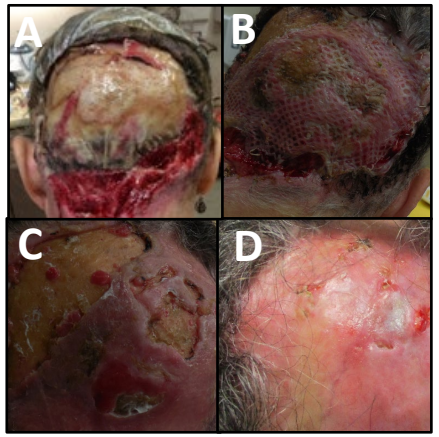
All patients gave informed written consent for the use of the data collected. Patient 1, a heavy smoker with a well-controlled HIV infection, had a significant degloving of the scalp down to the calvarium. Patient 2 with a giant neglected tumor of the posterior scalp, had a defect comprising the entire occipital skull down to the calvarium. Patient 3, with venous stasis, congestive heart failure and a necrotizing infection, had an open wound of the lower extremity. Patient 4, with neglected diabetes, non-compliance and necrotizing infection, had a right pretibial wound. All the wounds had exposed structures, and were managed using different modalities, including the serial application of dermal matrices.



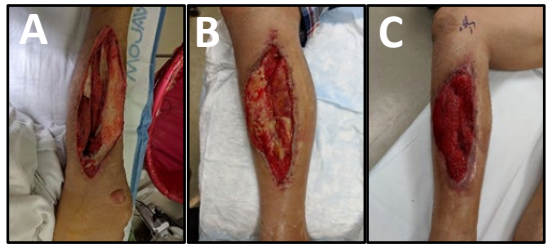
Patient 1. A-Initial wound, B-3 weeks after MBWM placement, C-area was allowed to close by secondary intention over the next 2 months, D-After reconstructive surgery (8 months), patient's hairline appeared near normal.



Patient 3. A-After debridement, B-3 weeks after MBWM placement, C-Re-epithelialization occurred over the next 16 months; stable healing achieved.



Patient 2. A-Debrided wound; B-Wound managed with MBWM (matrix take 75%) and skin graft; 6 weeks late 2nd application of dermal matrix (FBADM) D-one year after placement and reconstructive surgery.



Patient 4. A-After debridement, B-Wound managed with MBWM (matrix take 90%) after 3 weeks, C-Second application of MBWM (3 weeks). Three weeks after 2nd MBWM placement, STCG was settled; wound went on to heal 2 months after (not shown).

Results

In patients 1, 2 and 3, the wounds were allowed to close by secondary intention, whereas a split-thickness skin graft (STSG) was settled in patient 4. The hairline was restored in patient 1. Wound closure ultimately occurred over the next 16 months after matrix placement in patient 3, with the size of the wound fluctuating as the patient's heart failure waxed and waned. A second application of dermal matrix was performed on patient 2 (matrix take 75%):fetal bovine acellular dermal matrix (FBADM), and patient 4 (matrix take 90%), MBWM, to obtain full coverage of the wounds.

Serial application of dermal matrix

Case #	Initial application (dermal matrix)	Incorporation (% wound bed)	Serial application (dermal matrix)	Incorporation (% wound bed)
1	MBWM	100	-	100
2	MBWM	75	FBADM	100
3	MBWM	90	-	90
4	MBWM	90	MBWM	100

Discussion

Each patient obtained stable soft tissue coverage and successful reconstruction, with satisfactory cosmesis and no functional issues. Results from these 4 cases highlight the capacity and capability of MBWM to allow coverage of exposed bone and tendon, in a diverse set of cases with very compromised patients and a variety of competing medical problems. The benefits of the serial application of dermal matrices remain to be further studied and evaluated.

Reference: Silk J, Taupin P. The Use of Integra® Bilayer Wound Matrix in Challenging Situations and Compromised Patients to Obtain Coverage of Bone and Tendon. Wounds. *In press*
Trademarked Items: Integra® Meshed Bilayer Wound Matrix, PriMatrix® Dermal Repair Scaffold (Integra LifeSciences, Princeton NJ)