724 Role of synthetic dermal matrix for reconstruction of complex non-graftable wound defects

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Introduction: The aim of this study was to investigate the role of a synthetic dermal matrix, Biodegradable Temporising Matrix (BTM), for coverage of complex wounds. The authors defined complex wounds as wounds not amenable to reconstruction with skin grafting alone due to an inherent avascularity of the wound bed, such as the presence of exposed bone, tendinous or neural structures.

Methods: A retrospective review of a prospectively maintained database of complex wounds as defined above was carried out. Clinical and operative notes were reviewed along with review of an extensive photographic database demonstrating wound healing progress using staged dermal matrix (BTM) and autologous skin graft reconstruction.

Results: 55 patients were identified who underwent staged dermal matrix and autologous skin graft reconstruction for complex wounds affecting a wide variety of patient demographics, treatment indications and body sites. Wound aetiology varied between burn injury, non-burn related trauma including degloving injury and infective complications. We discuss caveats relating to successful application of a dermal matrix, technique tips, prevention and management of complications.

Dermal substitutes play an integral role in providing biological wound cover for avascular wound beds which may otherwise require complex distant flap or microsurgical free flap reconstruction. BTM is a completely synthetic dermal matrix comprised of a 2-mm-thick sheet of biodegradable polyurethane foam bonded to a non-biodegradable polyurethane sealing membrane. Our department has developed significant expertise in the use of BTM throughout its development from initial animal studies through to recent human clinical trials. The synthetic composition of BTM does not require rapid neo-vascularisation for its integrity or survival. As such, two-stage BTM reconstruction has proven robustness in the face of unfavourable wounds compared with other popular dermal matrices, physiologically covering avascular structures, allowing for early graft take, expediting rehabilitation and mobilisation with excellent scar cosmesis and limited contracture formation.

Conclusions: Dermal matrices such as BTM play an important role in complex wound healing, frequently achieving excellent results with a low complication profile. BTM has been used successfully in cases where biological matrices would not routinely be considered as demonstrated by this clinical series. It has provided a valuable alternative to free-tissue transfer in patients with significant co-morbidities, vascular insufficiency and/or those for whom long operations are undesirable.

725 Case Series: New Porcine Placental ECM for Burn Injuries

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Introduction: Human amniotic membrane (HAM) has been used as a biologic dressing for burn wounds since 1955 but limited due to availability, size, and processing costs. In 2021 a new porcine placental product was FDA-approved overcoming challenges with human-sourced products. Our study is the first case series to report outcomes using porcine placental extracellular matrix (PPECM) in the use of adult burn patients.

Methods: Adults with thermal burns resulting in partial-thickness burn wounds (PTBW) were consented and included in the study from 03/2021 to 09/2021. Patients with full-thickness injures, concomitant trauma, or adverse beliefs to porcine products were not included in the study. Serial still images and initial wound measurements were obtained intraoperatively and post-operatively. PPECM trial product processed with a proprietary decellularization method to produce single sheets up to 15x20cm was approved by the facility value assessment committee. Adverse events were defined a priori as infection, increased pain or itching relative to adjacent autografts, or failure to heal. Infection was defined as a PPECM treatment site requiring any change from standard of care or initiation of local or systemic antibiotics. Pain was assessed using a visual analogue scale. Itching was assessed at discharge and follow-up. Healing was assessed using the FDA guidance for wound closure with 2 consecutive visits 2 weeks apart demonstrating 100% epithelialization without drainage or dressing requirements.

Results: Four patients were treated during the study period with wounds involving the torso and major joints such as the hands/wrists and knees. None of the PPECM wounds demonstrated failure to heal or required revision excision, or autograft. None of the PPECM wounds had evidence of infection. PPECM wounds had decreased pain/itching relative to adjacent burn wounds which were treated with split-thickness autograft, autologous skin cell suspension, or allogeneic cultured skin substitute (VAS mean 1 vs 3.1). Healing was noted in all wounds at 1-week primary dressing removal with confirmation at 2-week interval follow-up.

Conclusions: PPECM treatment of PTBW was not associated with adverse events and resulted in favorable outcomes clinically. The large size, ease of use, and lower costs relative to HAM is an intriguing alternative for PTBW. Comparative studies are needed in the field to determine best practices and overall value.