Extracellular matrix-based regeneration over exposed bone and tendon: A prospective case series

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Purpose

• Evaluate the clinical performance of a bio-engineered extracellular matrix (ECM) graft in complex lower extremity reconstruction.

• Four cases evaluated with exposed bone and tendon in complex patients.

Can ECM graft provide rapid granulation tissue over exposed structures?
<table>
<thead>
<tr>
<th>Sex, Age</th>
<th>Comorbidities/Past Medical History</th>
<th>Surgical Management</th>
<th>Outcomes</th>
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</table>
| Male, 28 | • Juvenile onset diabetes, prior DKA  
• Unresolved infection to 5th ray | • Amputation of 5th toe and metatarsal head  
• 10 x 15 cm defect | • Graft granulated at 1 week  
• STSG at 1 week  
• Healed at 8 weeks |
| Female, 61 | • CAD, CKD, HTN, hyperlipidemia, poorly controlled DM2, PAD, extensive history of vascular and podiatric procedures | • Non-healing full-thickness calcaneal defect  
• -5 x 5 cm defect with exposed calcaneus | • Fully granulated at 1 week  
• Patient remains under care |
| Male, 73 | • CKD, HTN, DM2, chronic kidney disease, hyperlipidemia, hypothyroidism | • Prior trans metatarsal amputations of 4th and 5th rays  
• -4.5 x 13.0 cm defect  
• Exposed bone along the distal aspect of the wound and joint capsule of the 3rd metatarsal | • Fully granulated in 2 weeks  
• STSG at 8 weeks  
• Patient remains under |
| Female, 35 | • DM2, ADHD, bipolar, pancreatitis  
• Previous partial toe amputation | • Recurrent foot ulcerations managed with debridement’s  
• -2 x 2 cm defect  
• ECM graft threaded through dorsum to plantar with primary closure on dorsal aspect | • Granulated at 2 weeks  
• Patient remains in care |
Case #1

Pre-debridement

Post-debridement

ECM graft placement
Case #1

Week 1 – graft fully granulated with coverage of exposed B/T. STSG placed.

Week 3 - ~90% STSG take. Patient 100% healed at week 8
Case #2

Pre-debridement

Week 1 – Graft fully granulated

Week 4 – patient continues to close via secondary intention
Case #3

- Post-debridement
- Week 2 – Graft fully granulated
- Week 8 – STSG placement post planned amputation of 2nd and 3rd
Case #4

Pre-debridement – plantar aspect

Graft placement – dorsum to plantar

Week 2 – ECM graft incorporated. Dorsal closure healed.
Conclusions

• ECM graft easy to use and provides immediate coverage to exposed structures
• Graft integration and granulation achieved within 1-2 weeks
• Suitable for use under NPWT
• Easy to use, handles well and strength to resist ‘pull-out’
• Can be used as an implant
• Compliments staged procedures as well as closure via secondary intention.