

Ovine Forestomach Matrix in the Surgical Management of Complex and Contaminated Soft Tissue Trauma

Roberto Taarea (DO), Jeffrey J. Donahue (MD), and Christine Castater (MD)

Department of Trauma/Acute Care Surgery, Wellstar Kennestone Hospital

INTRODUCTION

High velocity soft tissue trauma is a surgical emergency and can frequently lead to suboptimal outcomes for patients due to significant soft tissue loss, compromised vital structures (viscera, tendons, neurovascular structures, etc), and contamination. OFM has demonstrated clinical success in the surgical management of acute and chronic soft tissue defects, especially in contaminated fields providing a clinically effective option for surgeons to provide immediate coverage of exposed vital structures and rapidly build viable granulation tissue to shortened the time to definitive closure whether by skin graft, flap, or secondary intention¹.

METHODS

This case series (n=5) evaluated the clinical effectiveness of OFM (graft* and/or particulate^) in the surgical management of contaminated soft tissue defects as a result of high-velocity injury (such as gunshot wound or motor vehicle accident). All patients were treated with OFM as part of their inpatient surgical management following high-velocity trauma resulting in significant soft tissue loss. Primary endpoints included time to 100% granulation tissue coverage of exposed vital structures, complications, and time to definitive closure. Secondary endpoints included the total time to closure and final cosmesis and integrity of the healed skin and soft tissue.

RESULTS

All five cases resulted in full closure of the traumatic soft tissue injuries whether by split thickness skin graft (STSG), flap, or secondary intention. All cases required only one surgical application of OFM prior to development of adequate granular neodermis sufficient for definitive closure. There were no complications nor recurrence following the use of OFM.

REFERENCES AND DISCLOSURES

[1] Bohn, G.A. and A.E. Chaffin, Extracellular matrix graft for reconstruction over exposed structures: a pilot case series. J Wound Care, 2020. 29(12): p. 742-749. RT and CC have received honoraria from Aroa Biosurgery Limited. *Myriad Matrix, Aroa Biosurgery Limited, New Zealand, ^Myriad Morcells, Aroa Biosurgery Limited, New Zealand

CASE 1: 36-Year-old male, full thickness gunshot wound to face.

Week 0: Initial Defect
4cm x 2cm x 2cm



Week 0: OFM particulate^ application



Week 1: Significant depth fill



Week 6: Healed



CASE 2: 38-Year-old female, gluteal de-gloving due to motor vehicle accident. 9cm of undermining to right side, 4cm undermining to left.

Week 0: Initial Defect
17cm x 15cm x 14cm



Week 0: Post-debridement



Week 2: Improved depth and undermining



Week 5: >50% area reduction, no undermining



CASE 3: 51-Year-old male, abdominal trauma from motor vehicle accident. Exposed viscera, unable to close (loss of domain).

Week 0: Initial Defect
25cm x 4cm



Week 0: OFM particulate^ plus graft*



Week 3: Depth filled, covered exposed viscera



Week 6: Ready for STSG



CASE 4: 49-year-old male, abdominal trauma from motor vehicle accident. Due to multiple procedures, unable to close primarily.

Week 0: Initial defect.



Week 0: application of OFM particulate^



Week 3: Significant depth fill



Week 6: Healed



CASE 5: 33-Year-old, full-thickness posterior leg defect due to motorcycle accident with exposed muscle, tendon, neuro-vasculature.

Week 0: Initial Defect



Week 2: OFM graft placed dermally & partial implant



Week 3: 100% depth filled



Week 6: Significant epithelialization, close by secondary intention



CONCLUSION

The promising results of this case series highlights the use of OFM as a clinically effective tool in the surgical management of contaminated and volumetric soft tissue defects from high-velocity trauma. OFM required only a single application to provide coverage of exposed vital structures therefore decreasing the number of surgical debridement's' and shortening the time to definitive closure, while potentially reducing the length of stay.