

Continuity of Care: Retrospective Review of Ovine Forestomach Matrix Efficacy Across All Phases of Wound Healing

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INTRODUCTION

Ovine Forestomach Matrix (OFM) has demonstrated great clinical efficacy in the treatment of acute and chronic wounds in the out-patient setting¹. Recently, newer particulate+ and robust layered-sheet^ iterations of OFM have shown excellent results in the operative setting to facilitate granulation tissue in complex volumetric wounds². Oftentimes, clinicians must choose between temporizing matrices and biology-rich bio-scaffolds depending on the site of care and phase of wound healing. The authors sought to investigate the effectiveness of OFM to stabilize complex contaminated wounds as part of initial surgical management and subsequently use of single-layer OFM* to facilitate closure. In this retrospective case series, the authors highlight their initial experience with OFM across all phases of wound healing and various points-of-care to streamline product usage and consequent cost of those treatments.

METHODS

This was a retrospective case series including eight patients (n=8) who underwent in-patient surgical management of complex lower extremity soft tissue defects utilizing OFM layered-sheet^ and/or OFM particulate† to firstly build up robust granulation tissue and provide coverage to exposed structures. Subsequently closure was achieved via treatment with single-layer OFM on an outpatient basis to facilitate full epithelialization. Single-layer OFM* was used in these patients as their comorbidities and/or cost negated the use of split-thickness skin grafts (STSG) or skin substitute products. All patients had significant factors complicating healing trajectory such as wound chronicity, un-controlled diabetes, sickle cell anemia, and history of non-compliance.

RESULTS

All eight patients went on to full closure and suffered no complications related to the use of OFM at any point. Average time to closure from initial procedure was 12.1 weeks. One patient had lost STSG due to non-compliance and achieved full closure with weekly OFM application 4 weeks thereafter.

CONCLUSION

These promising results provide preliminary insights into the clinical efficacy of OFM to facilitate granulation in complex, volumetric, contaminated wounds initially and promote ultimate epithelialization as an out-patient. This can reduce costs and streamline product selection for clinicians.

REFERENCES AND DISCLOSURES

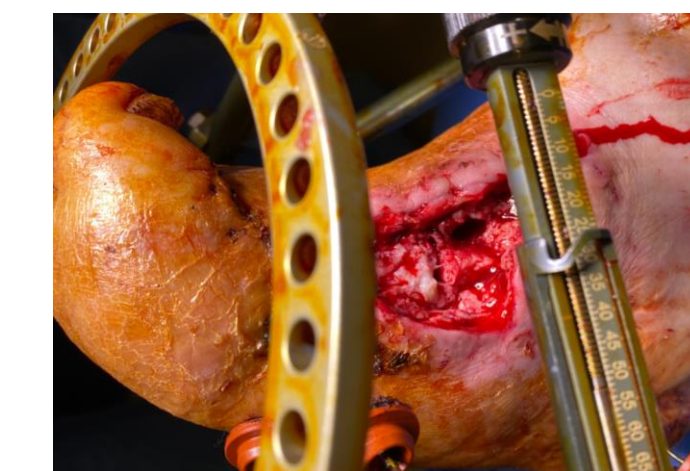
[1]Ferreras, D.T., S. Craig, and R. Malcomb, Use of an ovine collagen dressing with intact extracellular matrix to improve wound closure times and reduce expenditures in a US military veteran hospital outpatient wound center. *Surg Technol Int*, 2017. 30: p. 61-69.
 [2]. Bohn, G.A. and A.E. Chaffin, Extracellular matrix graft for reconstruction over exposed structures: a pilot case series. *J Wound Care*, 2020. 29(12): p. 742-749. *Myriad Matrix, Aroa Biosurgery Limited, New Zealand, †Myriad Morcells, Aroa Biosurgery Limited, New Zealand. *Endoform Natural, Aroa Biosurgery Limited, New Zealand

TABLE 1. PATIENT DEMOGRAPHICS AND STUDY OUTCOMES

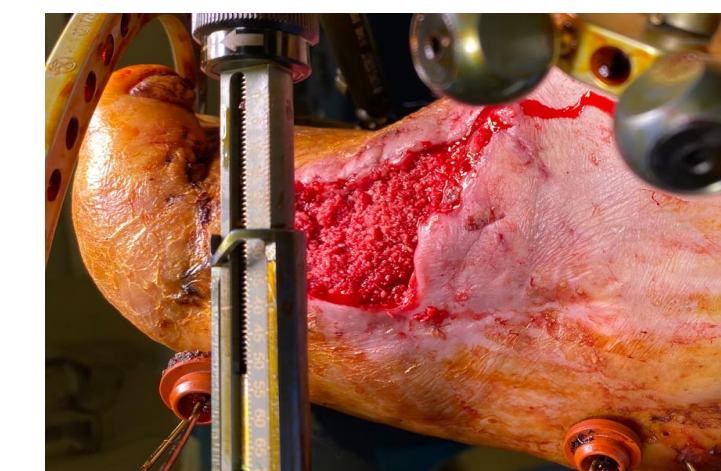
| Sex/Age | Comorbidities | Patient History | Size | Intervention and Outcomes |
|---------|--|--|---|---|
| M, 52 | <ul style="list-style-type: none"> Insulin-dependent Diabetes Peripheral Arterial Disease Chronic Venous Insufficiency Charcot arthropathy | <ul style="list-style-type: none"> Patient underwent Charcot reconstruction by multiple joint fusion of the right foot Complicated by surgical dehiscence resulting in full-thickness dehiscence with exposed bone and joint Failed conservative outpatient management Not candidate for split-thickness skin graft (STSG) | 7cm x 6cm x 5cm (exposed bone and joint) | <ul style="list-style-type: none"> Surgical debridement, antibiotics, and placement of OFM particulate and 3-layer OFM graft 100% depth filled with granulation tissue at 17 days External fixator removed, 3-layer OFM graft applied at 4 weeks for more robust granulation Weekly application of single-layer OFM resulting in full closure at 16 weeks No recurrence as of >4 months |
| M, 68 | <ul style="list-style-type: none"> Peripheral Vascular Disease Atrial Fibrillation Anti-coagulation therapy | <ul style="list-style-type: none"> Patient presented with infected traumatic hematoma of the right leg untreated for 6 weeks since the injury Not candidate for STSG | 8cm x 8cm x 3cm (exposed bone) | <ul style="list-style-type: none"> Surgical debridement with curettage and placement of OFM particulate† into undermining areas overlay of 5-layer OFM graft onto defect Cavity completely filled, no undermining at 17 days Weekly application of single-layer OFM resulting in full closure at 20 weeks No recurrence as of >5 months |
| F, 37 | <ul style="list-style-type: none"> Insulin-dependent Diabetes | <ul style="list-style-type: none"> Patient presented with abscess that progressed to necrotizing soft tissue infection of right foot History of DFU and non-adherence to treatment Not candidate for STSG | 5cm x 4cm x 2cm (exposed bone) | <ul style="list-style-type: none"> Surgical debridement, antibiotics, and placement of OFM 5-layer graft 100% depth filled at 21 days Weekly application of single-layer OFM resulting in full closure at 12 weeks No recurrence as of 3 months |
| F, 45 | <ul style="list-style-type: none"> Sickle Cell Anemia Chronic Venous Insufficiency | <ul style="list-style-type: none"> Patient presented with recurrent mixed vascular ulceration of the right ankle Significant discomfort and cellulitis noted | 3cm x 2.5cm x 0.2 | <ul style="list-style-type: none"> Surgical debridement, antibiotics and placement of OFM 3-layer graft Patient noted immediate improvement in pain Weekly application of single-layer OFM resulting in full closure at 6 weeks No recurrence as of >3 months |
| M, 73 | <ul style="list-style-type: none"> Hypertension Chronic Kidney Disease Non-insulin dependent Diabetes Hyperlipidemia | <ul style="list-style-type: none"> Patient previously underwent left foot lateral ray amputation due to osteomyelitis and gangrene Resulted in surgical dehiscence, failed outpatient local wound care for 6 weeks Non-adherence to treatment result in lost STSG | 4.5cm x 13cm x 2 cm (exposed bone and tendon) | <ul style="list-style-type: none"> Surgical debridement and placement of OFM 5-layer graft 100% depth filled at 14 days STSG applied at 4 weeks, lost after 1 week due to non-adherence to non-weightbearing protocol Weekly application of single-layer OFM resulting in full closure at 16 weeks No recurrence as of 6 months |
| M, 64 | <ul style="list-style-type: none"> Non-insulin dependent Diabetes Chronic Kidney Disease Prostate cancer with history of radiation | <ul style="list-style-type: none"> Non-healing right heel DFU Failed conservative outpatient wound care for 6 weeks | 2cm x 2cm x 0.5 cm (exposed bone) | <ul style="list-style-type: none"> Surgical debridement, and placement of OFM 5-layer graft 100% depth filled at 21 days Weekly application of single-layer OFM resulting in full closure at 13 weeks No recurrence as of 6 months |
| M, 33 | <ul style="list-style-type: none"> Insulin-dependent Diabetes Peripheral Vascular Disease | <ul style="list-style-type: none"> Wagner 3 DFU of left foot complicated by cellulitis and abscess to 5th MTPJ capsule | 3cm x 3cm x 1 cm (exposed joint capsule) | <ul style="list-style-type: none"> Surgical debridement, antibiotics, and placement of OFM 5-layer graft 100% depth filled at 7 days Weekly application of single-layer OFM resulting in full closure at 10 weeks No recurrence as of >3 months |
| M, 69 | <ul style="list-style-type: none"> Insulin-dependent Diabetes Charcot arthropathy | <ul style="list-style-type: none"> History of Charcot arthropathy, non-adherence to diabetes management and wound care Wagner 3 DFU of left lateral foot non-healing for 12 weeks that progressed to necrotizing soft tissue infection | 6cm x 3cm x 1cm (exposed bone and tendon) | <ul style="list-style-type: none"> Surgical debridement, antibiotics, and placement of OFM 5-layer graft 100% depth filled at 21 days Weekly application of single-layer OFM resulting in full closure at 13 weeks No recurrence as of 24 months |

CASE 1: 52-Year-old obese male diabetic with Charcot, and peripheral neuropathy. Surgical dehiscence of Charcot reconstruction.

Week 0: Sharp debridement with exposed bone and joint.



Week 0: OFM particulate applied in void, covered with OFM 3-layer graft and NPWT



Week 6: 100% depth filled with granulation tissue.



Week 12: Healed by weekly single-layer OFM



CASE 2: 73-Year-old male with DM, CKD, prostate cancer and history of partial 4th&5th ray resections, now with necrotizing infection

Week 0: Prior to surgical debridement, exposed bone



Week 2: 100% granulation over bone



Week 8: STSG applied, lost 1 week later due to patient walking



Week 16: Healed by weekly single-layer OFM

