

A retrospective review of an extracellular matrix used to treat complex chronic wounds

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INTRODUCTION

Chronic wounds have a dramatic impact on the US health care system. In a recent Medicare data set review, cost projections for all wounds ranged from \$US28.1 to 96.8 billion, including costs for infection management, among which surgical wounds were one of the most expensive to treat [1]. In this retrospective review we analyzed seven post operative wounds and 1 chronic wound that all failed to improve with standard of care wound management. We evaluated an intact extracellular matrix derived from the forestomach of ovine sheep (OFM). The theory behind adding OFM to these chronic wounds was to address underlying inflammation, aid in the formation of new dermal tissue and facilitate epithelialization of the wounds.

METHODS

There was a total of 5 patients (8 wounds) where OFM was used to facilitate wound closure. Four of the patients (7 wounds) had post-surgical wounds that had fail to heal and one case was a chronic wound that had been managed in the outpatient wound care center for ~one year without improvement. In three patients OFM grafts^ were affixed to the wound bed, one patient had OFM particulate+ and one patient had OFM single layer*. All the wounds were only treated with a single application and followed up until complete closure of the wound allowing for the final aesthetic and functional outcomes to be evaluated.

RESULTS

Four patients demonstrated complete closure between 7-13 weeks after a single application of OFM. One patient utilizing OFM single layer had a 50% reduction by 4 weeks with all tunneling and undermining resolved by week 3. The healed wounds demonstrated good cosmesis and functional tissue was re-established at the defects. Patients were satisfied with the outcomes achieved.

CONCLUSION

This case series highlights how the addition of an advanced extracellular matrix such as OFM graft can aid the rate of wound healing and closure, via the formation of new dermal tissue and facilitating epithelialization of the wounds

REFERENCES AND DISCLOSURES

AR has received honorarium from Aroa Biosurgery Limited. *Myriad Morcells, Aroa Biosurgery Limited, New Zealand. ^Myriad Matrix, Aroa Biosurgery Limited, New Zealand, *Endoform Natural, Aroa Biosurgery Limited, New Zealand

TABLE 1. PATIENT DEMOGRAPHICS AND STUDY OUTCOMES

Sex/Age	Comorbidities	Patient History	Area	Intervention and Outcomes
M, 64	<ul style="list-style-type: none"> Hypertension Coronary artery disease Hyperlipidemia Former smoker 	<ul style="list-style-type: none"> Patient sustained 3rd degree burn to lower extremity. OSH performed STSG, 3 months prior to evaluation Three nonhealing full thickness wounds with exposed tendons remained after STSG procedure Previous management: collagenase ointment and Kerlix™ wrap, then Medihoney™, without improvement Wound type: Failed coverage of tendon to lower extremity 	<ul style="list-style-type: none"> (1) 7 x 3 cm (exposed tendon) (2) 3 x 3 cm (Exposed tendon) (3) 10 x 5 cm (Exposed tendon) 	<ul style="list-style-type: none"> Wound debridement and placement of a OFM graft to all three defects (1) wound healed by week 7 (2) wound healed by week 8 (3) wound healed by week 8 All wounds treated with single application of OFM graft
F, 75	<ul style="list-style-type: none"> History of breast cancer History of radiation 	<ul style="list-style-type: none"> Patient sustained an insect bite to the breast, that developed into an abscess leaving a non healing tunneled wound Cultures were positive for <i>klebsiella</i> Prior management at outside wound care center for ~ 1 year. Failed to heal after multiple round of debridement's, collagen dressings and advanced skin substitute products Firm fibrotic and calcified tissue was debrided Wound type: Chronic wound secondary to abscess 	~4 x 4 x 4 cm	<ul style="list-style-type: none"> Wound debridement with curettage and placement of OFM particulate+ into defect Cavity completely filled by week 4 Wound fully epithelialized by week 13 Resulting tissue soft and supple Single application of OFM particulate
F, 54	<ul style="list-style-type: none"> Hypertension Morbid obesity (BMI 43) Hyperlipidemia 	<ul style="list-style-type: none"> History of an abscess that progressed to necrotizing soft tissue infection of right gluteus that tracked to retroperitoneum Required intra abdominal debridement's and developed resulting abdominal wound that could not be closed Wound type: Full thickness post operative wound 	<ul style="list-style-type: none"> Gluteal defect ~20 x 15 x 10 cm Abdominal wound ~25 x 5 x 4 cm 	<ul style="list-style-type: none"> Gluteal wound and abdominal wound had OFM graft placed into defect with NPWT Gluteal wound fully healed by week 9 Abdominal wound fully healed by week 12 Resulting soft tissue was soft and pliable Both wounds treated with only single application of OFM graft
F, 58	<ul style="list-style-type: none"> Active smoker Obesity 	<ul style="list-style-type: none"> Patient sustained a large flap laceration to the right lower extremity Initial surgical debridement and primary closure resulted partial necrotic flap Wound type: Full thickness wound from flap necrosis 	~10 x 6 cm	<ul style="list-style-type: none"> After surgical debridement of necrotic flap, OFM graft fixed to defect. NPWT was initiated Wound fully healed by 13 weeks Treated with only single application of OFM graft
F, 49	<ul style="list-style-type: none"> Morbid obesity 	<ul style="list-style-type: none"> Patient developed an abscess that tracked between subcutaneous tissue and breast adipose tissue after a breast biopsy Required 3 debridement's to control infection Resulting wound contained sinus tracking seen to chest wall Wound type: Full thickness post operative wound 	~15 x 5 x 2 cm Undermining around perimeter of wound roughly 2 cm	<ul style="list-style-type: none"> Once infection was controlled, OFM single layer was applied to the wound bed and into the undermined and tunneled areas followed by NPWT Depth of wound filled in and undermining resolved by 17 days Wound size reduced ~50% by 4 weeks

CASE EXAMPLE

54-Year-old female with significant past medical history of diabetes, hypertension and morbid obesity. The patient developed an abscess that progressed to a necrotizing soft tissue infection of the right gluteal region. The infection tracked into the retroperitoneal space as well which required multiple surgical debridement's of the gluteal region and an intra-abdominal approach to the retroperitoneal space. Once the infection was controlled the decision was made to reconstruct the two wounds utilizing an OFM graft comprised of 3 layers of OFM. This graft was placed in both wounds followed by a Xeroform gauze contact layer and negative pressure wound therapy (NPWT). The patient was discharged to a long-term care facility for the remaining post operative course. The NPWT dressing was changed every 5 days and utilized for the first 5 weeks. By 5 weeks post op the wounds had filled in significantly with healthy granulation tissue and decreased by 75% in total wound area. The graft had fully integrated, and the patient was receiving standard wet to dry dressings while at the long-term care facility. By 9 weeks post op the gluteal wound had completely healed, and the abdominal wound was fully healed by week 12.

Gluteal Wound*



Week 5



Week 9



Abdominal Wound



OFM graft placement*



Week 9



*OFM grafts shown prior to in situ rehydration