A retrospective review of the early experience with a morselized extracellular matrix

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INTRODUCTION

Morselized or powdered extra cellular matrix (ECM) products have been employed for a wide array of surgical indications. Morselized ECM's have improved surface area and provide a biological catalyst to accelerate wound healing. Recently, ovine forestomach matrix (OFM) was commercialized in a morselized format†. The morselized format retains the rich biology and matrix structure of OFM and has a relatively variable particle size to match the irregularities seen in wound beds. In this retrospective case series, the initial experience with this unique morselized ECM product was reviewed across a wide range of surgical cases.

METHODS

A retrospective case review was undertaken of five patients who had received morselized OFM as part of their soft tissue reconstruction including one patient who received morselized OFM in combination with an OFM graft^.

RESULTS

All five patients went on to have an uncomplicated post-operative course. Four patients who had a STSG augmented with morselized OFM achieved 100% epithelization of their wounds at 2.5 to 5 weeks. The intent of the morselized OFM in these instances was to first improve STSG take by reducing wound inflammation and second to accelerate epithelialization at the interstices. The fifth patient was reconstructed using a combination of morselized OFM and sheet OFM due to a lower extremity necrotizing soft tissue infection. The wound achieved full granulation by week 13.

CONCLUSION

These promising early results provide preliminary insights into the benefit of morselized OFM across a range of soft tissue reconstructions. The morselized format OFM augmented use of the sheet format in a complex reconstruction. Morselized OFM provides an additional tool for general and more challenging reconstructions.

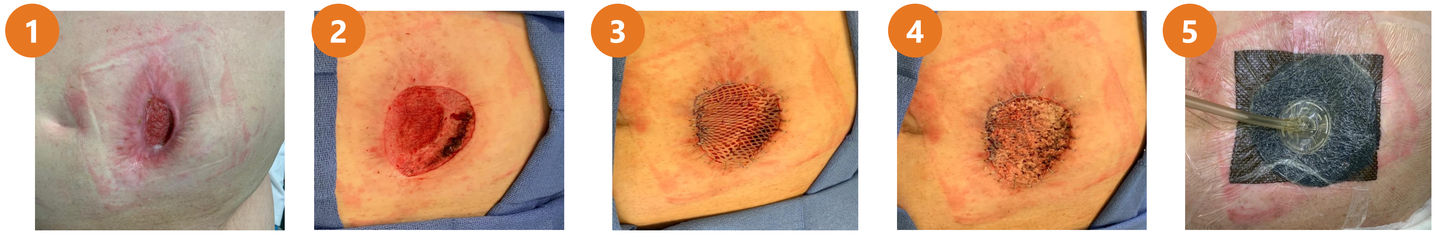
REFERENCES AND DISCLOSURES

AEC has received an educational grant from Aroa Biosurgery Limited.
†Myriad Morcells, Aroa Biosurgery Limited, New Zealand. ^Myriad Matrix, Aroa Biosurgery Limited, New Zealand.

TABLE 1. PATIENT DEMOGRAPHICS AND STUDY OUTCOMES

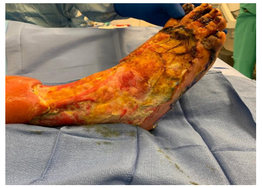
Sex/Age	Comorbidities	Patient History	Area	Intervention and Outcomes
M, 66	• Obesity • Hypertension • History of acute kidney injury	• 1 year old surgical dehiscence from ALIF; infected seroma leading to sepsis • Multiple debridements and 6 weeks of intravenous antibiotics • Previous wound care consisted of NPWT and collagen dressings • Stalled chronic wound remained	~6 x 8 cm	• Wound debridement and placement of a meshed (1:1.5) split thickness skin graft with OFM Morcells applied on top • 95% graft take at 1 week post op • 100% healed at 4 weeks post op
M, 74	• Rheumatoid arthritis (on chronic prednisone) • Former smoker	• 3-month-old surgical dehiscence after a Baker cyst excision • Poly-microbial wound infection requiring a wound debridement and 6-week antibiotics • Stalled without progression for 2 months	~12 x 4 cm	• Wound debridement and placement of a meshed (1:1.5) split thickness skin graft with OFM Morcells applied on top • 100% graft take at 1 week post op • 100% healed at 2.5 weeks post op
M, 72	• Hypertension • Morbid obesity (BMI 43) • Chronic lymphocytic leukemia	• Progressively severe hidden penis deformity with inability to retract penis out to length due to scarring and lichen sclerosis	~8 cm x 4 cm	• Excess pubic pannus tissue resection and skin graft to penis (0.5mm thickness) with scrotal resection and z-plasty. • OFM Morcells applied on top of STSG with fibrin glue, Mepitel Ag, kerlix wrap and fluff gauze. • Graft fully incorporated at 5 weeks
M, 66	• Morbid obesity (BMI 40)	• Buried penis deformity causing recurrent UTI and lichen sclerosis of the penis	~6 x 4 cm	• Excess pubic pannus tissue resection and skin graft to penis (0.5mm thickness) with scrotal resection and z-plasty. • OFM Morcells applied on top of STSG with fibrin glue, Mepitel Ag, kerlix wrap and fluff gauze. • Graft fully incorporated at 5 weeks
M, 59	• Obesity • DM (unknown Ha1c) • Smoker (using nicotine patch)	• Necrotizing soft tissue infection from catfish spine envenomation • History of Aeromonas infection treated with IV antibiotics x 6 weeks	~15 x 10 x 1 cm	• Wound debridement and OFM graft and OFM Morcells placed to cover soft tissue resection • Full graft adherence at 1 week post op • Fully granulated by week 13

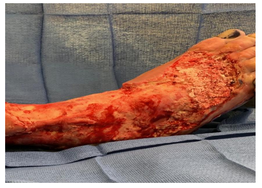
REPRESENTATIVE SURGICAL ALGORITHM

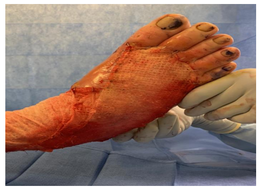


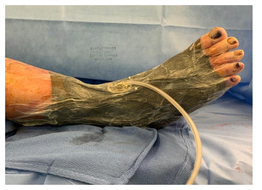
COMBINATION SHEET AND MORSELIZED OFM

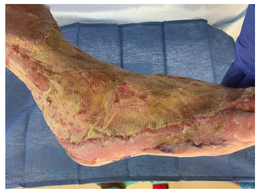
59-Year-old male with a history of a necrotizing soft tissue infection from a catfish spine envenomation to his right lower extremity. Initial debridement performed at an OSH and referred for soft tissue reconstruction. The patient was also treated with 6 weeks of antibiotics for the *Aeromonas* infection. Area of diseased tissue ~15 x 10 x 1 cm. The wound has remnant nonviable tissue, friable edges with areas of undermining and exposed flexor tendons. After debridement, the morselized OFM† (500 mg) was placed on the dorsum of the foot covering the exposed extensor tendons. This was followed by placement of OFM grafts^ (10 x 20 cm) to cover all exposed soft tissue. The OFM grafts^ were fixed to the wound edges with surgical staples and quilted together in the interior portion of the wound with absorbable polyglactin sutures. A silver contact layer was placed over the incision followed by NPWT. At the 1-week dressing change the graft was fully adherent to the wound bed and granulation tissue was forming at the wound edges. At 3 weeks post op there was complete coverage of the exposed tendons, granulation tissue was forming in approximately 30% of the wound. At week 13 the graft had fully granulated and was ready for a split thickness skin graft.

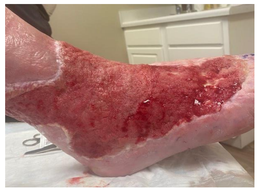

Initial defect


Morselized OFM placement


OFM sheet graft placement


NPWT placement


3 weeks post op


13 weeks post op