

# Morselized Ovine Forestomach Matrix (OFM) for Limb Salvage: A Case Report on Innovative Reconstruction in Lower Extremity Traumatic Pressure Injuries

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## Introduction

Treatment of uniquely located pressure injuries, such as those to lower limbs, present a particular challenge to plastic surgeons. Extensive lower extremity pressure injuries often necessitate challenging clinical decisions, including considerations for major flap reconstructions or amputation [1]. For patients that are poor candidates for autologous flap reconstruction [2], there is a need for an adaptive tool that supports rapid soft tissue coverage and tissue infill to aid limb salvage efforts. This case report investigates the utilization of morselized ovine forestomach matrix (OFM)\* in reconstructing a left lower limb following severe traumatic pressure injury. The aim was to explore the potential of morselized OFM to support coverage of exposed contaminated bone without the need for complex free tissue transfer reconstruction while preserving ambulation.

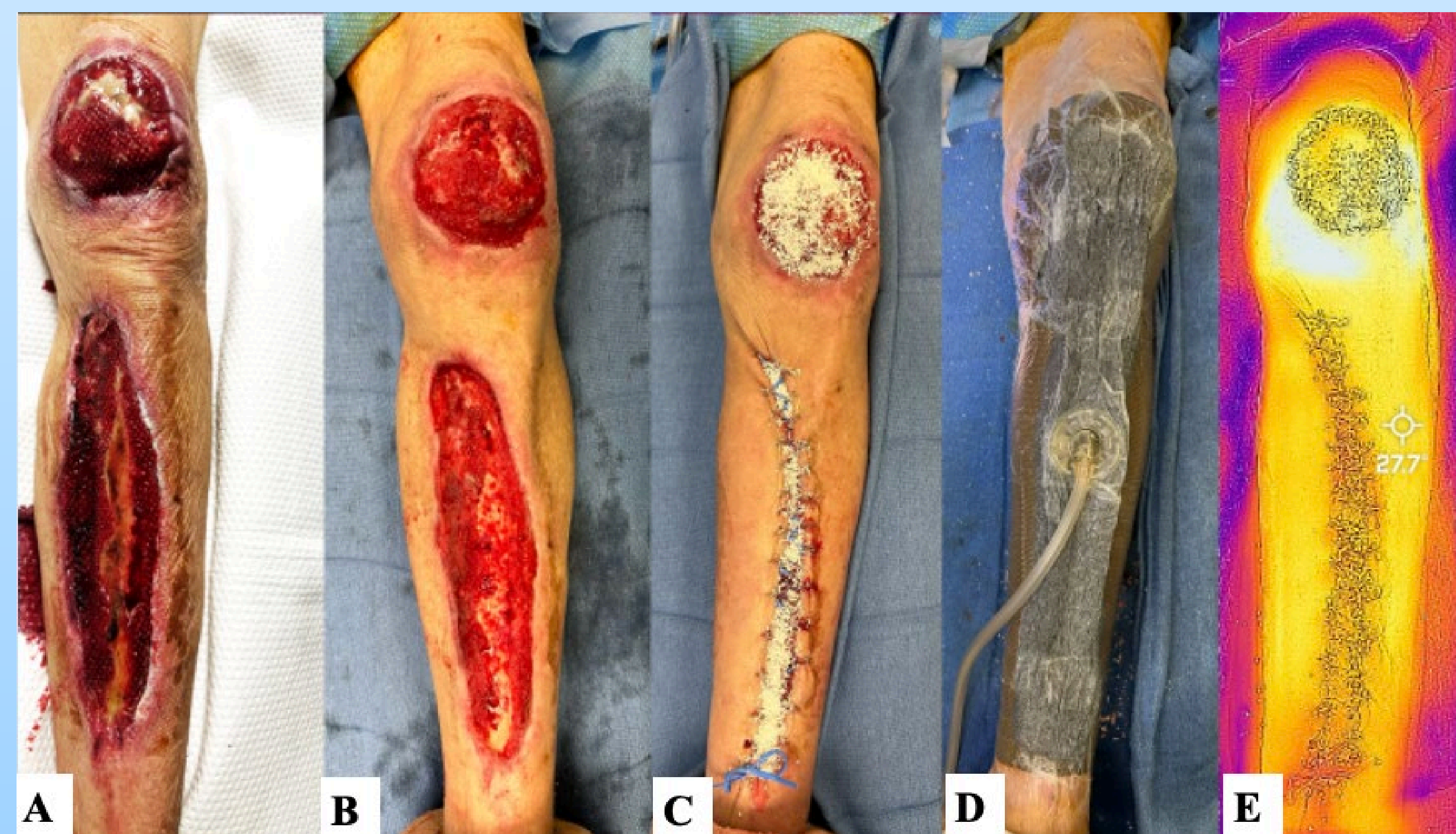
## Methodology

Bone burring was performed with a drill to debride all nonviable bone. Partial wound closure was achieved with the vessel loop shoelace technique and local skin flaps in a complex layered closure. Morselized Ovine Forestomach Matrix (OFM) was applied. Subsequent wound management included incisional negative pressure wound therapy (NPWT) and left iliac artery stent placement. Follow up procedures included staged surgery with advancement flap closure of the tibial incision with skin grafting, and local flap and skin grafting at the knee. An adjacent tissue transfer flap of 7 x 5 cm (45 sq cm) as well as a full thickness skin graft placement of 6 x 3 cm (18 sq cm) were placed to the knee wound. A split thickness graft of 12 x 2 cm (24 sq cm with 0.5 mm thickness) was placed to the remaining central area of granulated tibial bone at the lower leg. Patient was offloaded and non-weightbearing within a knee immobilizer.

## Case

A 62-year-old Caucasian female with significant comorbidities presented with extensive pressure injury to the lower extremity, including exposed patella and extensor mechanism as well as exposed tibia, both with associated osteomyelitis. She had a history of 45 pack years of cigarette smoking and associated PAD, illicit drug use, and malnutrition. Initial debridement was done by orthopedics after which, they recommended regional muscle flap reconstruction or amputation.

### First Stage of Reconstruction



**Figure 1:** LLE defect (A) prior to surgery (B) after debridement (C) after placement of morselized OFM (D) after NPWT placement (E) post operative forward-looking infrared imaging

### Second Stage of Reconstruction



**Figure 2:** LLE defect (A) prior to second stage surgery (B) after debridement (C) local flap advancement (D) after placement of morselized OFM (E) post operative forward-looking infrared imaging (F) post operatively

### Healed Wound



**Figure 3:** Left lower extremity 4- weeks post-op



**Figure 4:** Full knee flexion at 4-weeks post-op

## Results

Reevaluation on postoperative day 9 revealed well-integrated morselized OFM with vascularized tissue covering previously exposed tibial regions. Staged interventions resulted in successful coverage of bone areas with flaps and skin grafts. Forward looking infrared imaging confirmed adequate blood flow for healing. At 4-weeks post-op, the patient exhibited well-healed flaps and grafts, full knee flexion and extension, and satisfactory ambulation.

## Conclusions

This case underscores the successful limb salvage achieved by employing morselized OFM in conjunction with staged surgical interventions. The utilization of morselized OFM helped achieve granulation which facilitated coverage of contaminated bone with skin grafts and functional recovery of the limb, enabling the avoidance of above-the-knee amputation and extensive free flap surgeries. The case emphasizes the potential of morselized OFM as a promising alternative in true limb salvage cases, offering insights into innovative approaches for preserving limb function and mobility in severe lower extremity pressure injury cases as an alternative to covering similar wounds with a gastrocnemius muscle rotation flap or a soleus muscle rotation flaps which mobility of the joint. Further research and long-term follow-ups are ongoing in a prospective registry and are essential to validate these results in a broader population.

## Acknowledgements

1. Potter, C.B.K. and M.J. Bosse, American Academy of Orthopaedic Surgeons Clinical Practice Guideline Summary for Limb Salvage or Early Amputation. *J Am Acad Orthop Surg*. 2021. 29(13): p. e628-e634.  
 2. AlMagare, F.M., et al., Best Local Flaps for Lower Extremity Reconstruction. *Plast Reconstr Surg Glob Open*. 2020. 8(4): p. e2774.  
 \*Myriad Morsells™ (Arona Biosurgery, LTD - Auckland, NZ)  
 AEC has a consulting agreement with Arona Biosurgery, LTD