

Morselized Ovine Forestomach Matrix (OFM) for Treatment of Degloving Injury: A Case Study in Innovative Treatment of Complex Wounds

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Background

Degloving injuries: Traumatic events where skin and tissue are torn away from underlying structures, often exposing bones and muscles.

Common causes: High-impact accidents.

Challenges: These injuries present complex challenges, requiring prompt surgical intervention and innovative wound care strategies.

Case report focus: Utilization of morselized ovine forestomach matrix (OFM) in reconstructing a severely injured right lower limb following a traumatic degloving injury.

Objective: Explore the use of morselized OFM to:

- Support coverage of severely damaged tissue at high risk of necrosis.
- Accelerate the healing process.
- Decrease the time interval between injury and skin grafting.

Methods

Patient injury: Left proximal fibular fracture and severe degloving injuries to the right lower extremity, resulting in extensive soft tissue damage.

Initial treatment:

- Wound washout and application of wet-to-dry Kerlix dressings in the emergency department.
- Early debridement of 162 sq cm of skin and subcutaneous tissues.
- Intermediate closure of a 97 cm laceration on the right leg by the orthopedic team.

Surgical interventions:

- **First procedure:**
 - Sharp debridement of a 768 sq cm area to excise nonviable tissue.
 - Tissue viability confirmed through pinprick testing.
 - Application of *Myriad Morcells graft** to promote rapid granulation.
 - Mepitel Ag dressing applied over the wound.
 - Initiation of negative pressure wound therapy (NPWT) set to 125 mmHg.
 - Immobilization of the extremity in a Cam walker boot.
- **Second procedure:**
 - Further debridement using ultrasound-assisted irrigation.
 - Observation of adequate granulation five weeks post-Morcells application.
 - Harvesting and meshing of a 120 sq cm split-thickness skin graft from the thigh.
 - Application of the skin graft to debrided areas on the anterior lower leg, posterior knee, and anterior tibia.
 - Grafts secured with staples and sealed with fibrin glue.
 - Reapplication of VAC dressing and wrapping of the limb in a four-layer compression bandage.

Postoperative outcome: Patient tolerated both procedures well and remained stable.

Case Presentation

A 78-year-old patient with a high functional status presented with extensive injuries to the left leg following a pedestrian-vs-automobile collision. The patient suffered a proximal fibular fracture as well as severe degloving injuries. At the time of presentation, her injuries were such that immediate skin grafting was not advisable due to extensive tissue necrosis and venous congestion.

First Stage of Reconstruction

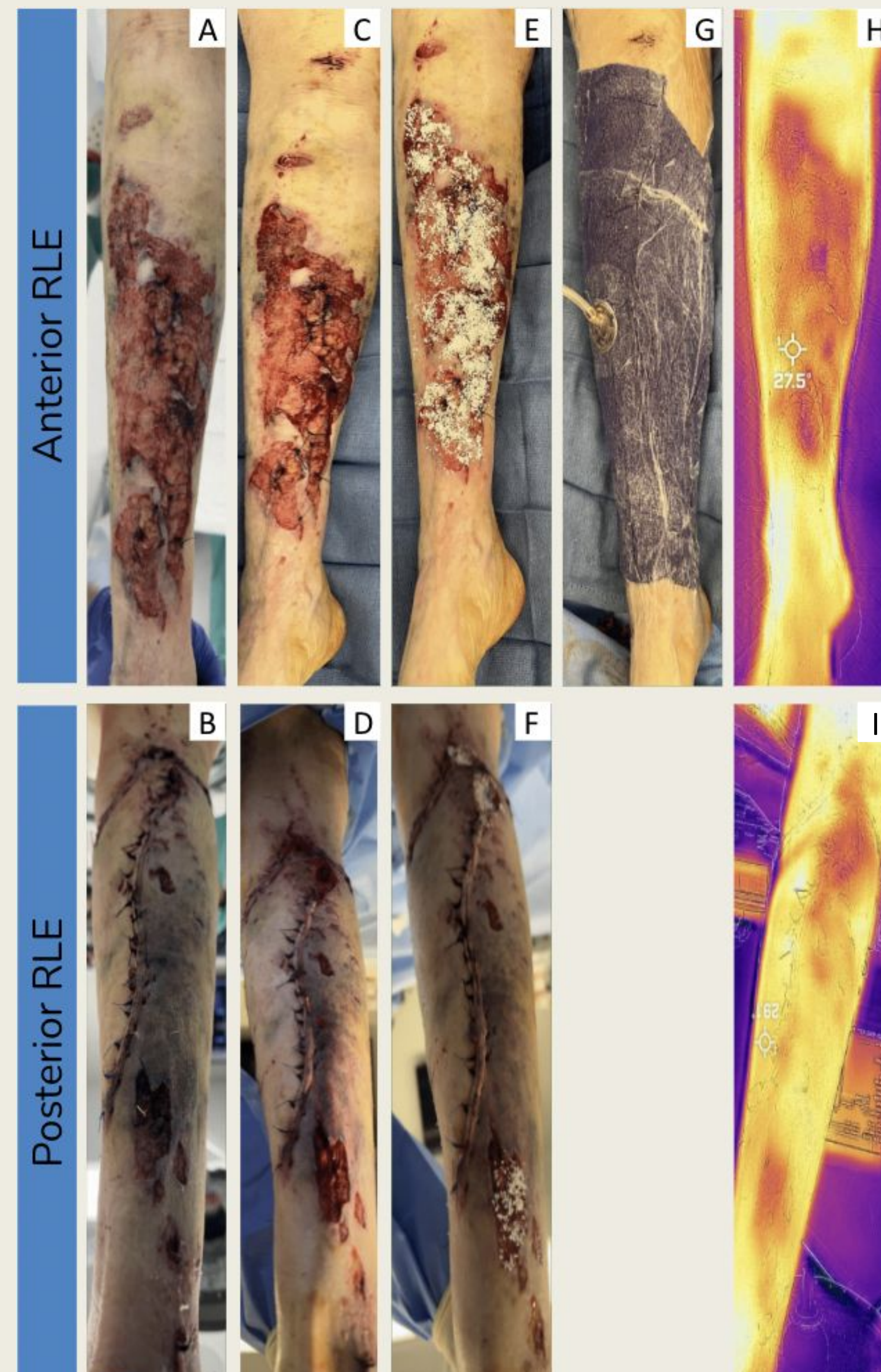


Figure 1: RLE injury pre-debridement (A,B); post debridement (C,D); placement of morselized OFM (E,F); NPWT placement (G); post operative forward-looking infrared imaging anterior (H,I)

Second Stage of Reconstruction



Figure 2: 13-day follow up (A,B); second surgery post-debridement (C,D); skin graft placement (E,F); 2-month follow up (G,H)

Results

Follow-up assessments:

- Decrease in wound exudate.
- Reduction in signs of infection, indicating a positive treatment response.

Post-op day 13:

- Satisfactory granulation.
- Reduced risk of scar contracture.
- Adequate blood flow.
- Preserved knee extension and ambulation.

Discharge and recovery:

- After two months of wound care and rehabilitation, the patient was discharged with minimal residual defect.
- Notable complication: Foot drop, likely due to the initial crush injury affecting the anterior tibial region and peroneal nerve.
- Current status: Patient is improving with physical therapy.

Conclusion

- **Success of treatment:** Skin grafting in degloving injuries was successfully achieved by using morselized OFM alongside surgical interventions and wound care.
- **Role of morselized OFM:**
 - Facilitated proper granulation, enabling effective skin grafting.
 - Demonstrated potential as a promising tool in complex degloving cases.
- **Insights gained:**
 - Innovative approaches utilizing morselized OFM can preserve mobility and function in severe lower extremity trauma cases.

References and Acknowledgements

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