

Pyoderma Gangrenosum: A case study with multiple surgical debridements and application of ovine forestomach matrix graft as alternative to below knee amputation

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Statement of Purpose and Background

- Limb salvage utilizing ovine forestomach matrix in surgical management of severe pyoderma gangrenosum as an alternative to amputation.
- Pyoderma gangrenosum (PG) is a rare, inflammatory skin disorder characterized by rapidly progressing, painful ulcers with irregular, undermined edges. The exact cause of PG remains unclear but believed to be an autoimmune-driven disorder involving genetic predisposition, immune dysregulation, and environmental triggers¹. Managing PG is challenging due to its unpredictable course and potential resistance to treatment.
- Therapeutic strategies such as corticosteroids and immunosuppressive agents, aim to control systemic inflammation and address underlying comorbidities with varying success, however, successful management of the dermatological lesions remains challenging. To date, the literature is scant with successful treatment options for ulcerative lesions unresponsive to systemic treatments.
- Ovine forestomach matrix (OFM) is a naturally-derived xenograft with demonstrated anti-inflammatory and regenerative properties especially over exposed bone and tendon^{2,3} which may be a successful treatment for PG lesions.

Case Details and Results

- 74-year-old female with medical history of severe rheumatoid arthritis and anemia presents with full thickness ulceration and significant pain (7/10).
- Presented to Emergency Department multiple times treated with IV antibiotics and surgical debridement. Biopsy suggested pyoderma gangrenosum. Due to multiple admissions, severe pain, and inability to bear weight due to pain- below knee amputation recommended, but patient refused.
- **Index Procedure:** After 6 weeks of failed conservative treatment, plan for OR debridement with application of OFM particulate* and OFM matrix graft^ concurrent application. OFM particulate was hydrated with saline and applied into irregular wound bed and covered with OFM 3-layer graft hydrated and secured with staples to periwound. NPWT @ 125mmHg was used as secondary dressing.
- 2 weeks post-op, there is notable vascularized tissue formation noted and after 3 weeks, improvement in pain noted (5/10).
- At 4 weeks, a second debridement and OFM application performed. Continued improvement of pain and granulation tissue noted with coverage of exposed bone and tendon noted at 6 weeks.
- At Week 7, notable neo-epithelialization and pain eradication noted. Final debridement and OFM application performed at Week 11.
- Lesion is ready for skin graft at Week 17, but decision to delay skin graft to continue to improve systemic condition made by interdisciplinary treatment team. STSG applied at Week 25 with 100% take noted at 2 weeks. Twelve month long-term follow up shows continued remodeling of tissue with no recurrence, complication, nor pain noted in subsequent follow-ups.

Conclusion

- **PG can have significant implications for patient quality of life. The development of targeted therapies remains challenging and requires a multidisciplinary approach.**
- **Surgical debridement with application of ovine forestomach matrix challenges the established paradigm which generally avoids sharp debridement of these lesions, but shown to be an effective treatment option in this case report of extensive PG.**

REFERENCES

*Myriad Morcells and ^Myriad Matrix, Aroa Biosurgery Limited, New Zealand.
 [1] Maronee CA, Pimentel MA, Li MH, Genovese G, Ortega-Loyza AG, Marzano AV. Pyoderma Gangrenosum: An Updated Literature Review on Established and Emerging Pharmacological Treatments. Am J Clin Dermatol. 2022 Sep;23(5):615-634. doi: 10.1007/s40257-022-00699-8. Epub 2022 May 24. PMID: 35606650; PMCID: PMC9464730. [2] Negron L, Lun S, May BC. Ovine forestomach matrix biomaterial is a broad spectrum inhibitor of matrix metalloproteinases and neutrophil elastase. Int Wound J. 2014 Aug;11(4):392-7. doi: 10.1111/j.1742-481X.2012.01106.x. Epub 2012 Nov 1. PMID: 23116239 [3] Bohn GA, Chaffin AE. Extracellular matrix graft for reconstruction over exposed structures: a pilot case series. J Wound Care. 2020 Dec 2;29(12):742-749. doi: 10.12968/jowc.2020.29.12.742. PMID: 33320746.

Initial Presentation



Initial Debridement



Week 0 - Debridement



Week 0 – OFM Particulate Application



Week 0 – OFM Matrix Application



Week 4 – Debridement



Week 4 - 2nd OFM Application



Week 7



Week 11



Week 29 – Ready for Skin Graft



Healed

