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A complex case study showing the use of biodegradable bilayer synthetic matrix in the treatment of necrotizing fasciitis of the forearm and hand

Tara Robertson, MBA, BSN, RN - Medical Science Liaison at PolyNovo | Mahnoush Momeni, MD - Fellow at The University of Tennessee Health Science Center
David Hill, PharmD, BCPS, BCCCP, FCCM - Regional One Health | Mahmoud Hassouba, MD, PhD - The University of Tennessee Health Science Center

Introduction

Necrotizing fasciitis, a soft tissue infection, travels along the fascial plane, causing secondary infection of surrounding tissue (1).

Skin breakdown, accompanied by bullae and cutaneous gangrene, can progress to sepsis. Treatment involves empiric antibiotics, an aggressive surgical approach, and adjustment of antimicrobial coverage to identified pathogens (1).

Methods

This patient [history of lupus (on steroids), nicotine use and obesity], presented with a blister on the right hand with pain, hypotension, redness, swelling, with bullae and ecchymoses.

She went for surgical irrigation and debridement (I&D) of right hand, with purulence noted in dorsum of her hand. Necrotizing infection of the right hand and forearm was noted, accompanied by sepsis. Over the subsequent nine days, she went through four more I&D surgeries with the ortho service.

Once systemic infection was improving, plastic surgery was consulted for soft tissue coverage over right dorsum of hand with exposed tendons. The wound was excised and a biodegradable bilayer synthetic matrix (BBSM) applied, with negative pressure wound therapy (NPWT) initiated for three weeks. Daily PT/OT was started following BBSM placement, and continued outpatient.

Thirteen days following BBSM placement, it appeared well vascularized. Plastic surgery did an outpatient wound excision and application of split-thickness skin graft ten weeks following placement of BBSM. NPWT was utilized following grafting and PT/OT continued.

Lost to follow-up, the patient presented with an unrelated injury 13 months later where 100% skin graft take was noted, though there was a chronic DIP ulnar deviation deformity in her right index finger that was amputated at the level of DIP joint.

Results

The mortality rate of necrotizing fasciitis is 30-90%, with better prognosis with immediate radical debridement and treatment with empiric antibiotics (1). This patient's favorable outcome was due to the rapid initiation of treatment. The BBSM provided a scaffold that allowed neovascularization and fibroblastic activity, with the sealing membrane protecting the wound, creating a dermal-like bed for subsequent grafting (2).

Discussion

The use of BBSM for treatment of necrotizing fasciitis is a viable alternative to traditional reconstruction due to its resilience to infection. This case presented a challenging wound with exposed avascular structures.

References

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- Craughan, A., Corbett, M, Conlin, E., Cullen, S., et al. (2025). "Neck-rotising Fasciitis"—A case report of extensive cervicofacial necrotizing fasciitis reconstructed with use of NovoSorb biodegradable temporizing matrix. Otolaryngology Case Reports, 36, Article 100681. <https://doi.org/10.1016/j.xocr.2025.100681>

NovoSorb® – PolyNovo® North America LLC, Carlsbad, CA 92011 Disclosure: Tara Robertson is a full-time employee of PolyNovo. Dr. Hassouba is a consultant for PolyNovo.



Figure 1: Initial injury post aggressive debridement to remove non-viable tissue



Figure 2: Biodegradable bilayer synthetic matrix placed

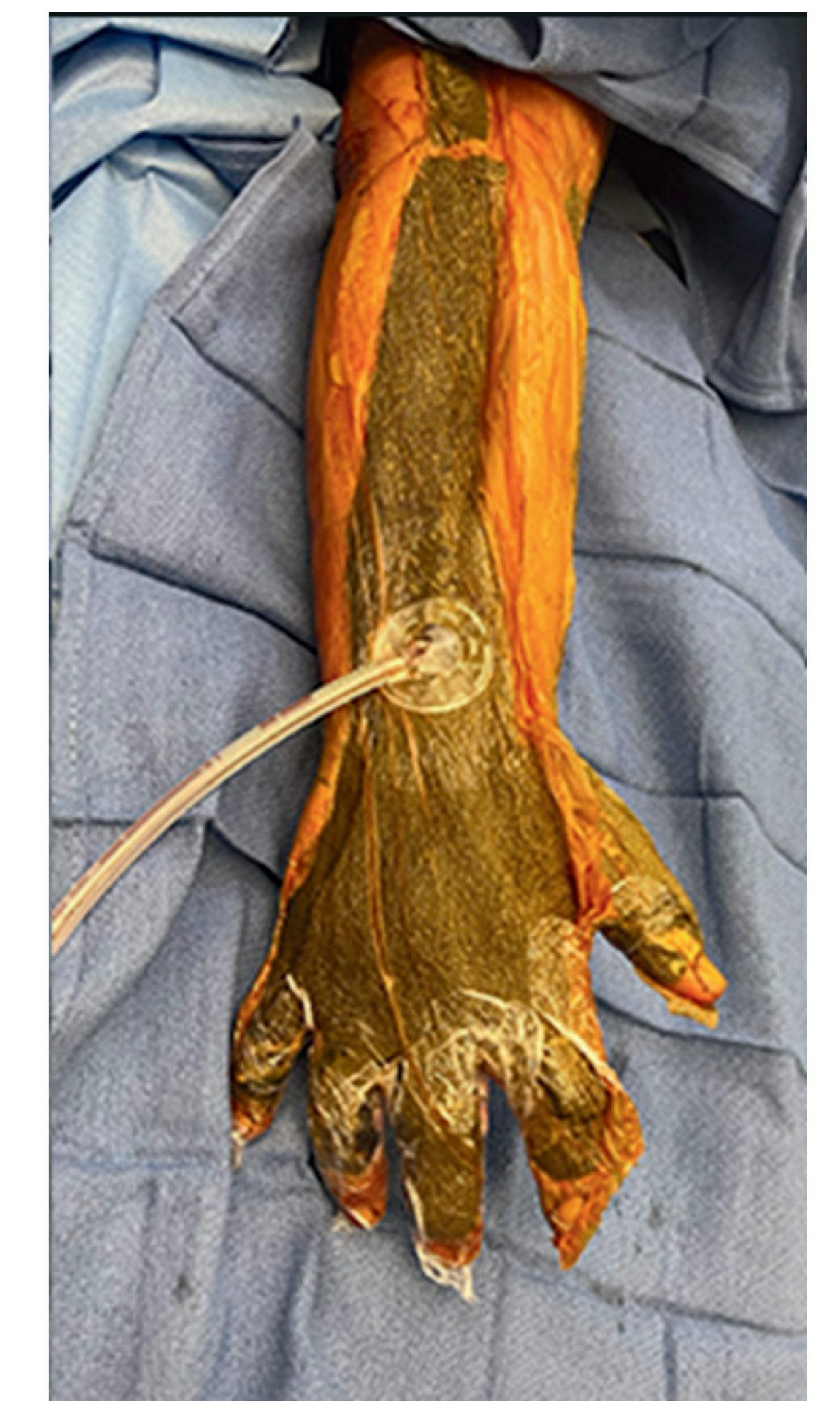


Figure 3: Wound vac placed over biodegradable bilayer synthetic matrix



Figure 4: Biodegradable bilayer synthetic matrix delaminated (sealing membrane removed)



Figure 5: Split-thickness skin graft placed over well vascularized dermal-like wound bed