

A Novel Application of Incisional Negative Pressure Wound Therapy for Patients at High Risk of Poor Amputation Healing

Xiaoyan Liu, PhD, PA; John P. Kirby, MD, FCCWS, FACS; Lindsay M. Kranker, MD, FACS

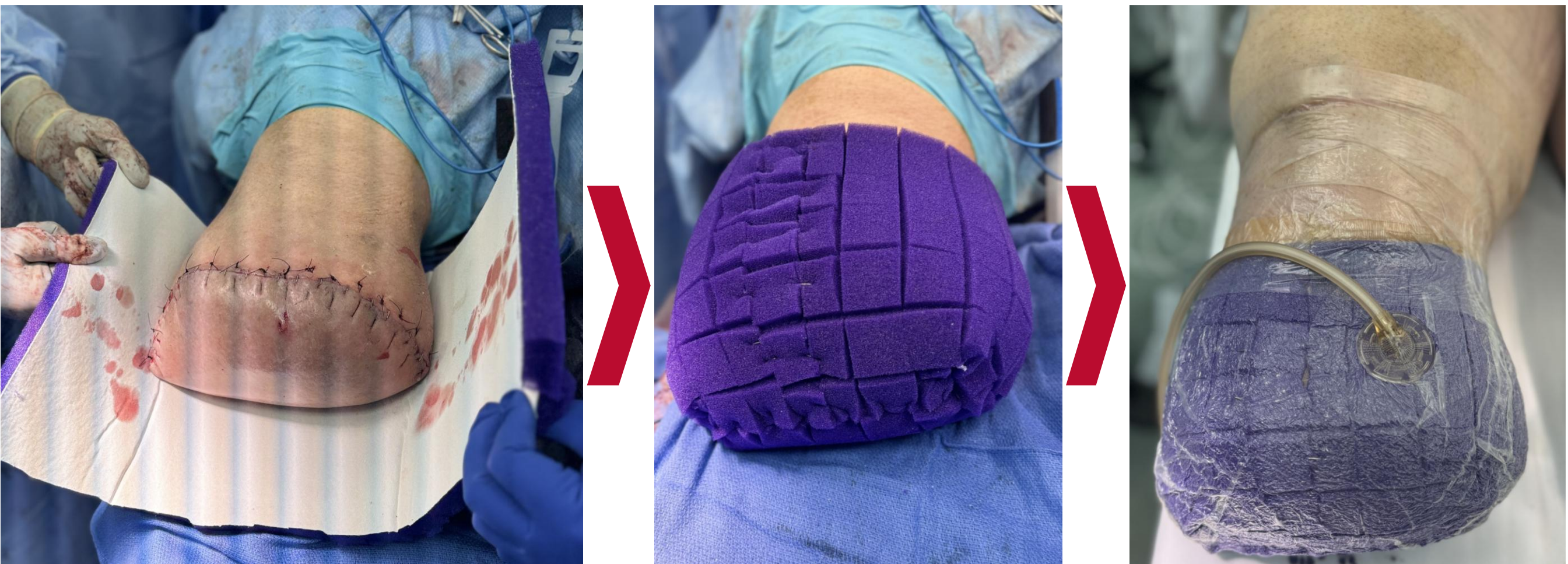
Section of Acute and Critical Care Surgery, Department of Surgery, Washington University, St. Louis, MO 63110

Introduction

- ❑ Major limb amputation is a life-altering procedure requiring effective post-operative incision management to prevent complications like surgical site infections (SSIs), wound dehiscence, and prolonged edema, which hinder recovery, raise costs, and delay rehabilitation.¹⁻³
- ❑ High-risk patients with diabetes, obesity, or peripheral vascular disease (PVD) face greater challenges.
- ❑ Incisional negative pressure wound therapy (iNPWT) has proven effective in reducing SSIs, seroma, and hematoma, especially in these populations.
- ❑ This study investigates the innovative use of the Prevena Restor™ Adapti-Form™ (Solventum, St. Paul, MN), a next-generation iNPWT system designed to improve incision healing, manage larger soft tissue, and enhance lymphatic drainage in high-risk amputees.

Methods

Intra-operative application of iNPWT, encapsulating residual limb



- ❑ **Procedure:** Major limb amputation or revision
- ❑ **Intervention:** Applied post-op for 5 days
- ❑ **Outcomes Measured**
 - ❑ Surgical site infections (SSIs)
 - ❑ Wound dehiscence
 - ❑ Residual limb edema (qualitative)
 - ❑ Time to rehab/prosthetic fitting
- ❑ **Data Source:** Medical records and 3-month follow-up

Cases

Case 1

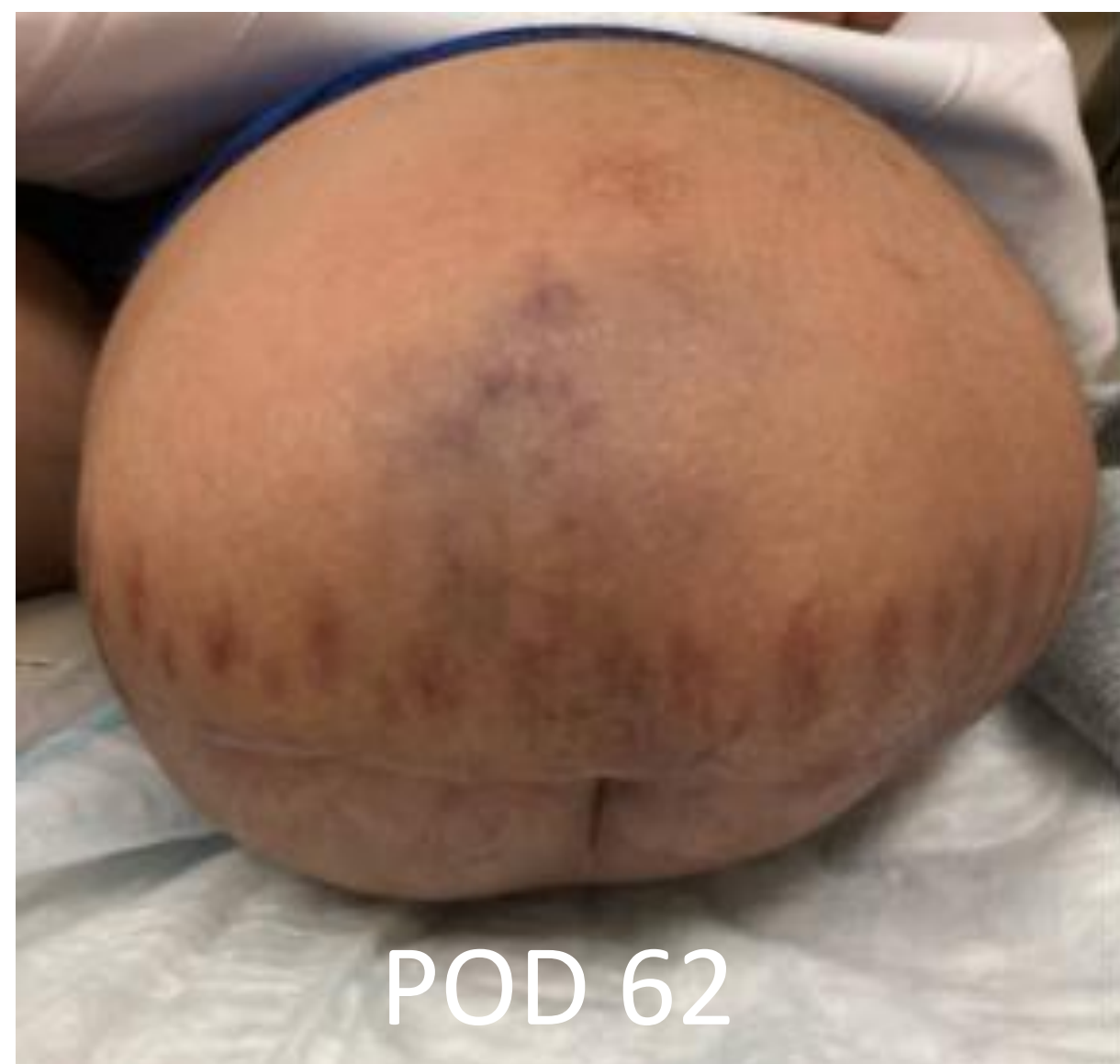
36yo M with Cirrhosis, Severe Sepsis underwent Left AKA



Pre-op



POD5: WV Off



POD 62

Case 2

47yo F with Morbidly obesity, HTN, HLD underwent Right BKA



Pre-op



POD5: WV Off



POD 34

Case 3

58yo M with HTN, CHF, DM, BLE lymphedema underwent Left BKA



Pre-op



POD5: WV Off



POD 44

Discussion

Clinical Outcomes

- ❑ 100% uncomplicated healing in all patients
- ❑ No surgical site infections or wound dehiscence observed
- ❑ Visible reduction in residual limb edema
- ❑ Faster rehabilitation and prosthetic fitting with average 4 weeks earlier than historical outcomes

Provider & Patient Feedback

- ❑ Easy to apply and conforms well to complex soft tissue geometries
- ❑ Patients reported improved comfort during use

Device Advantages

- ❑ Enhanced surface coverage supports lymphatic drainage and reduces edema
- ❑ Continuous tension relief along incision lines
- ❑ Designed to meet challenges of larger soft tissue envelopes in high-risk amputees

Conclusion

- ❑ Reduces wound complications after major amputations, including in high-risk patients
- ❑ Prevents SSIs effectively in multi-morbid individuals
- ❑ Recommended for routine use in major LEAs when appropriate
- ❑ Further research needed to refine protocols

References

1. Ziegler-Graham et al. Arch Phys Med Rehabil. 2008, 89:422-429.
2. Zayan et al. Adv Wound Car. 2019, 8:368-373.
3. Sumpio et al. Wounds. 2011, 23:301-308.

Disclosures

This case series received no funding or supplies from Solventum/3M/KCI, but discussions are underway for development of future research/education collaboration.