

# Negative Pressure Wound Therapy In Conjunction With Silver Collagen Dressings: A Case Series

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## Introduction

- Negative pressure wound therapy (NPWT) has been well documented in the management of a variety of wound types. Traditionally, negative pressure is delivered via foam dressings directly to the wound bed.
- Recently, we have begun implementing oxidized regenerated cellulose (ORC)/collagen/silver-ORC dressing as a fenestrated contact layer underneath NPWT dressings.
- In the presence of wound exudate, the collagen dressing transforms into a biodegradable gel that supports granulation and epithelialization,<sup>1</sup> without impeding negative pressure to the wound.
- This allows the benefits of both NPWT and silver collagen dressings to be delivered simultaneously.

## Purpose

- The aim of this study is to describe the outcomes of this combined therapy in five patients with lower extremity wounds.

## Methods

- Deidentified data were collected after obtaining informed patient consent and stored in accordance with federal regulations.
- Patients had foot, ankle or lower leg wounds and received NPWT\* at -125 mmHg.
- At the wound interface, a fenestrated ORC/collagen/silver-ORC<sup>†</sup> dressing was placed, as determined by medical necessity. This was covered with NPWT foam dressing and drape.
- NPWT dressings were changed every 2-3 days.

## Results

- The patients were 1 male and 4 females, aged 52 to 67 years old.

## Representative Cases

**Figure 1.** A 67-year-old male presented with a Morel-Lavallee lesion of the right lower leg. He underwent prompt surgical exploration and debridement. Postoperatively, an ORC/collagen/silver-ORC dressing was fenestrated and placed at the wound interface. NPWT was applied over the dressing and a vacuum seal was created using a hybrid silicone-acrylic drape.<sup>‡</sup> This therapy was continued until nearly complete wound closure. Wound care was then transitioned to advanced wound dressings until complete closure.



**Fig 1A.** Wound appearance at 1<sup>st</sup> dressing change after initiation of NPWT.



**Fig 1B.** Wound at Week 1, showing reduced wound depth.



**Fig 1C.** Wound at Week 2.



**Fig 1D.** Wound at Week 3, with red granulation tissue in the wound bed.



**Fig 1E.** Wound at Week 5, after transition to advanced wound dressings.



**Fig 1F.** Wound at Week 6.



**Fig 1G.** Wound nearly closed 7 weeks from initial presentation.

**Figure 2.** A 22-year-old female presented with significant post-traumatic left foot arthritis, deformity, and intractable pain. Ultimately, after all other non-operative treatment options were exhausted, she chose an elective left below-knee amputation. She developed delayed surgical wound healing and was offered additional surgical debridement. Postoperatively, an ORC/collagen/silver-ORC dressing was fenestrated and placed over the wound, and NPWT foam dressing was applied. A seal was created using a hybrid silicone-acrylic drape, and NPWT was initiated. Therapy continued until the wound was nearly closed, after which care was transitioned to advanced wound dressings.



**Fig 2A.** Wound appearance at 1<sup>st</sup> dressing change after initiation of NPWT.



**Fig 2B.** Wound at Week 1.



**Fig 2C.** Wound at Week 2, showing red granulation tissue in the wound bed.



**Fig 2D.** Wound at Week 3, showing reduced depth and surface area.



**Fig 2E.** Wound at first dressing change after transition to advanced wound dressings.



**Fig 2F.** Wound nearly closed 5 weeks from initial presentation.

## Results (Cont'd)

- Wound etiologies included trauma, surgical wound healing delay and diabetic foot ulcerations.
- Representative cases are shown in **Figures 1-2**.
- NPWT with silver-impregnated collagen dressings was applied for 7 to 21 days.
- After NPWT was discontinued, patients were continued on the silver-collagen dressing regimen or transitioned to other advanced wound dressing protocols if indicated.

## Conclusions

- This was a novel application of NPWT used simultaneously with ORC/collagen/silver-ORC dressings.
- In these patients, NPWT with silver-collagen dressings effectively managed the wound, resulting in positive healing outcomes.
- No patients experienced significant wound complications, including infection, while receiving this combined therapy.
- In our observations, healing time while utilizing this combined therapy was decreased, compared to our prior experience using NPWT with foam dressings alone.

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## References

1. Holmes C, Wrobel JS, Maceachern MP, Boles BR. Collagen-based wound dressings for the treatment of diabetes-related foot ulcers: a systematic review. *Diabetes Metab Syndr Obes.* 2013;6:17-29.