

Use of 3M™ Tegaderm™ Ag Mesh Dressing with Silver in Patients with Recurrent Lower Extremity Ulcers

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Introduction

There has been increasing focus on the role of microbes in recurrent and chronic wounds in general and specifically, lower extremity ulcers. Conditions of “bioburden,” “microbial imbalance” and “critical colonization” are now commonly advanced as possible explanations for these ulcers being slow to heal or non-healing.^(1, 2)

Numerous silver dressings have been commercialized for chronic wound care and topical ionic silver is now commonly used to “jump-start” healing and impact wound improvement or closure.⁽³⁾ The clinician must choose from an array of diverse and often expensive dressing materials, each with limitations. The challenge has been to find a versatile silver dressing with the ability to rapidly reduce microbial load without cytotoxicity and staining. Absorption, ease of use, and extended wear are additional features that are highly desirable.

3M™ Tegaderm™ Ag Mesh Dressing with Silver is a novel silver dressing* composed of non-woven, cotton fibers that are coated with silver sulfate. *In vitro* testing with conventional assays** has demonstrated rapid and sustained effectiveness of the dressing against a wide range of microbes. The soft, absorbent material is conformable and can be used as a primary contact layer or wound filler.

A pilot study in an outpatient wound clinic was conducted to evaluate the clinical performance of the dressing.* Our clinic is located in a public tertiary-care facility and provides services for a large, primarily urban population. Many of the patients have complex socio-economic deficits. We are constantly challenged to provide quality care at minimal cost and all departments are fiscally accountable. Topical dressing protocols have been standardized using basic wound care materials (zinc paste and woven elastic wrap).

Following IRB approval, patients were screened for enrollment. These patients presented with a variety of wounds including venous leg ulcers. Consent was obtained and patients were followed weekly for at least two dressing* changes. Study protocol allowed the silver mesh dressing to be used dry if wound exudate was adequate, or moistened with saline, water or a liquid hydrogel. Wound assessment was conducted by a wound care specialist which included measurement (via tracing), condition and color of base including presence of necrotic tissue, amount and characteristics of drainage, and condition of surrounding skin.

Results from two patients are presented in this paper.

* 3M™ Tegaderm™ Ag Mesh Dressing with Silver

** Testing on file

Patient 1:

A 61-year-old, morbidly obese male presented with recurrent venous leg ulcers, first starting in 1992, which had been present for approximately one year. The patient was a smoker, with suspected venous insufficiency. There was no indication of hypertension or the patient being diabetic. Wound care had included scheduled weekly visits for cleansing, debridement (as required) and topical management using a hydrogel, non-adherent contact layer with a zinc paste bandage (UNNA-FLEX® Elastic Unna Boot) and elastic wrap. Wound progress had stalled. This was suspected to be due to bioburden without signs and symptoms of wound infection. With two leg ulcers on the same leg, this patient was an excellent study candidate, being able to serve as his own control.

This patient missed several scheduled appointments resulting in situations where the time between treatments may have been two or more weeks in spite of efforts to contact him and get him to come to the clinic for follow-up and dressing changes. All dressing changes were done at the clinic.

10/22/04



Figure 1.1: A venous leg ulcer on the lateral aspect of the lower left extremity (LLE) measured 7.0 cm (l) x 2.5 (w-widest aspect); 2.0 cm (narrowest aspect) with a clean base and moderate amount of serous drainage.



Figure 1.2: Silver mesh dressing* was moistened with normal saline and folded to fit the wound.



Figure 1.3: Paste bandage after application.



Figure 1.4: Elastic wrap in place over paste bandage.



Figure 1.5: A smaller control wound on the anterior aspect of the LLE was dressed with Adaptic™ Non-Adhering Dressing and a paste bandage applied.

10/29/04



Figure 2.1: Lateral wound measured 7.2 x 2.5 cm (at widest aspect); 1.7 cm (at narrowest aspect). Improvement was noted.



Figure 2.2: Silver mesh dressing* was moistened with hydrogel*** and folded to fit to wound. Paste bandage was reapplied.

11/05/04

The patient failed to attend the appointment.

* 3M™ Tegaderm™ Ag Mesh Dressing with Silver
*** 3M™ Tegaderm™ Hydrogel Wound Filler

11/12/04



Figure 3.1: Silver mesh dressing* had been in place for 14 days. Significant decrease in wound size was noted. The wound measured 7.0 cm. x 1.7 cm (widest); 0.6 cm (narrowest) with a clean base and a bridge of new epithelium in the center of wound. Some maceration was noted following extended wear. The control wound (not shown) showed no improvement.

12/03/04

The lateral wound now measured 7.0 cm x 1.2 cm. The silver mesh dressing* was applied along with a paste bandage and elastic wrap.

The control wound now measured 3.5 cm x 4.3 cm.

11/19/04

The lateral venous ulcer continues to respond to the silver mesh dressing.* The control ulcer was getting worse and not responding to compression therapy.

11/24/04

The patient failed to attend the appointment.

12/10/04



Figure 4.1: The lateral wound measured approximately 6.0 cm x 1.0 cm (widest); 0.2 cm (narrowest) and continued to show improvement.

The wound was redressed with the silver mesh dressing* and a non-adhesive foam was applied as a cover dressing for better absorbency given the possibility of the patient failing to attend his next appointment. The control wound had increased in size with current treatment.

12/17/04



Figure 5.1: The wound dressed with the silver mesh dressing* continued to improve with reduction in size and granulation tissue obvious in base.



Figure 5.2: The control wound continued to deteriorate. The silver mesh dressing* was initiated.

Result:

This patient's enrollment ended on December 17th. Since then both venous leg ulcers have healed and remain closed with the patient using support stockings for long-term compression.

* 3M™ Tegaderm™ Ag Mesh Dressing with Silver

Patient #2

A 50-year-old obese male had sustained a traumatic injury on August 28, 2004, to a previously healed wound site (sports injury 24 years prior) resulting in a venous leg ulcer with symptoms of cellulitis. The patient was a smoker with suspected venous insufficiency. His employment and volunteer activities required standing and edema was always noted at clinic visits. Wound care had included weekly visits for cleansing, debridement (as required) and topical management using a hydrogel, non-adherent contact layer with a zinc paste wrap and elastic wrap. A course of antibiotics had been prescribed. Wound progress had stalled. This was suspected to be due to bioburden without signs and symptoms of wound infection.

10/29/04



Figure 6.1: The wound measured 4.5 cm (l) x 3.5 cm (w) with a clean base.



Figure 6.2: The silver mesh dressing* was moistened with an amorphous hydrogel*** and folded to fit the wound base.

11/5/04



Figure 7.1: A paste bandage and elastic wraps were removed after 7 days wear. Zinc oxide residue was noted on skin and the dressing.* The silver mesh dressing* was easy to remove from the wound bed.



Figure 7.2: After wound cleansing, improvement was noted. The wound measured 3.0 cm (l) x 3.3 cm (w) with a clean base and a bridge of new epithelium in the center of the wound.

11/19/04



Figure 8.1: Greater than 50% closure was observed. The central portion of the wound had re-epithelialized. The wound now measured 2.4 cm x 1.5 cm (widest). A smaller open area measured approximately 0.8 cm x 0.6 cm. Drainage was markedly reduced; no maceration was noted; the patient reported the dressing* was comfortable during wear; and he was able to continue working.

11/24/04



Figure 9.1: Continued epithelialization was noted. The silver mesh dressing* was continued per study protocol.

12/10/04



Figure 10.1: Only a tiny superficial wound remained. The silver mesh dressing* protocol was discontinued and the patient was measured for compression stockings.

Result:

The patient was pleased with his rapid progress, the comfort of the dressing and that he could continue with his usual work and activities.

* 3M™ Tegaderm™ Ag Mesh Dressing with Silver

*** 3M™ Tegaderm™ Hydrogel Wound Filler

Findings and Conclusions

Patient #1 had a wound that was greater than 10 cm² and existed for more than one year. In work by Margolis et al⁽⁴⁾ they found that the likelihood of a venous leg ulcer healing in 24 weeks was significantly associated with the size of the wound and how long the wound had existed; ulcers greater than 10 cm² in size and greater than 12 months duration were not likely to heal in 24 weeks. The observed likelihood of not healing was 78% for these types of venous leg ulcers. Based on this data, patient #1 had about a 1 in 5 chance of having his wound heal within 24 weeks. Yet results of using the silver mesh dressing over approximately **eight weeks** show that this patient's wound progressed toward healing despite poor compliance and prolonged intervals between dressing changes. While the etiology of the second case was trauma to previously injured skin, significant edema made management comparable to that required for a venous ulcer patient. This patient's wound healed in **six weeks**.

Though qualitative cultures are not obtained routinely in this clinic, we believe the bioburden present in these static, non-healing wounds was effectively managed by the silver mesh dressing.* This was evidenced by rapid healing response for both patients. Wound bed improvement was evidenced by autolysis, granulation tissue development, and reduction in size. No adverse events, notably adherence to the wound bed or tissue staining were noted.

We found this silver mesh dressing* easy to handle and apply. We chose a dressing size larger than needed and then folded it to fit the wound; the dressing could have been easily cut if desired. The dressing was compatible with a variety of cover dressings and we did not note any problems when used under a paste compression bandage or an absorbent foam dressing.

Patients found this dressing comfortable to wear with painless dressing changes and were extremely pleased with the results.

This practical silver mesh dressing's effectiveness, ease of use and versatility merit consideration in settings where bioburden control and cost are frequent concerns.

* 3M™ Tegaderm™ Ag Mesh Dressing with Silver

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