Management of Recalcitrant Ulcers with 3M™ Tegaderm™ Ag Mesh Dressing with Silver*

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Background

Numerous dressings delivering ionic silver are available for wound care. These dressings differ in primary material and construction, silver content, silver type, moisture management properties, versatility and ease of use.

Ability to kill or control microbes is of primary importance to clinicians caring for patients with recalcitrant wounds. To achieve an antimicrobial barrier effect, a dressing must contain a form of silver that readily releases soluble ionic silver when exposed to moisture. The greater the solubility of the dressing’s silver compound, the more readily ionic silver can be generated.

The dressing must release enough silver to kill microbes commonly seen in chronic wounds, e.g. *S. aureus* and *Pseudomonas*.[3] Delivery of excessive silver is undesirable and has been shown to interfere with healing[2] and cause skin staining.

The dressing’s material and the method of incorporating a silver compound also impacts effectiveness. Pad or fibrous dressings with embedded silver must first absorb moisture. The silver then must dissolve and diffuse to the surface of that material before being available to control bacteria. This may impair ability of the material to provide rapid reduction of microbes. A silver compound on the surface of a material such as mesh or fiber, results in more silver available to readily dissolve and generate ionic silver when it comes into contact with moisture. Faster microbial kill will typically occur when a more water soluble type of silver is incorporated on the dressing surface.

Versatility of the material is also important to clinicians. The ability to cut the dressing and use it in a variety of wounds is desirable. Conformability allows packing into cavities, areas of undermining or tunnels commonly encountered in pressure ulcers and open surgical wounds.

A dressing that can be moistened with normal saline (readily available in most care settings) is more convenient than one that requires sterile water.

A new silver dressing* has recently been introduced. In vitro testing with conventional assays[3] has demonstrated rapid and sustained effectiveness of the dressing against a wide range of microbes. Composed of 100% cotton non-woven gauze, it is porous and coated with silver sulfate, a form of silver that is readily soluble. (Figure 1) A material familiar to clinicians, the soft cotton gauze may be moistened with normal saline, sterile water or a liquid hydrogel. Alternatively, it may be applied dry to heavily draining wounds where exudate can be sufficient to dissolve the silver sulfate. It can be cut to fit the wound or fluffed and used as a wound filler making it useful for wounds with varying depth and undermining.

This poster illustrates use of the new silver mesh dressing* in two patients with recalcitrant wounds that had failed to improve with multiple topical treatments including alternative silver dressings.
Case #1
A 79-year-old female presented with a chronic venous stasis ulceration to the right medial malleolus. Past medical history included chronic venous insufficiency with persistent bilateral lower extremity edema and blanche atrophy, obesity, and sedentary lifestyle. Ulceration had started more than two years ago after the patient noted a minor skin breakdown on a small area on her right medial malleolar area. At the start of care on 05/20/05 the ulcer measured 1.5 x 1.8 cm. Slough, copious exudate, and periwound inflammation were noted. The wound was exceedingly painful. A series of treatments had been attempted including compression, sharp and enzymatic debridement, nanocrystalline silver and biocellulose dressings, small intestinal submucosa wound matrix graft, and serial silver nitrate cautery with essentially no progress.

Attempts were also made to improve circulation to the site by using monochromatic infrared photo-thermal energy therapy but that was discontinued due to lack of wound progress after weeks of therapy.

Diagnostic tests ruled out the presence of any osteomyelitis and tissue pathology. At this point (03-07-06) the patient was faced with the prospect of spending the rest of her life with an open, non-healing 1.9 x 1.3 x 0.1 cm wound. The goal of care was to keep the wound from becoming infected by using a silver antimicrobial gel dressing while controlling edema with daily application of compression stockings. A short course of monochromatic infrared photo-thermal energy was again resumed to promote circulation to the site.

On 03/20/06 a silver sulfate mesh dressing* became available for use on the patient, and with the patient’s consent, was started immediately. Ulcer measured 1.9 (l) x 1.0 x 0.05 cm with moderate serous exudate, open edges with irregular margins, and periwound erythema and edema. (Figure 2) Daily application of a compression stocking was maintained. The dressing was changed three times a week due to high exudate load. After two weeks of repeat application with the silver sulfate mesh dressing*, the patient’s ulcer now measured 1.0 x 0.3 x 0.025 cm (04/03/06) with significant decrease in exudate and periwound erythema. (Figure 3) By 04/17/06 the wound was down to 0.6 x 0.2 x 0.025 cm. Complete wound closure was reported by the nursing team on 04/24/06 with final evaluation and discharge on 05/05/06. (Figure 4)

Figure 2: Initial Assessment

Figure 3: After two weeks of topical treatment with silver sulfate mesh dressing

Figure 4: Wound closure confirmed at final visit
Case #2

A 90-year-old female presented with a history of a non-healing ulceration on the left index finger. The patient also had dementia, with a history of failure to thrive, depression, anxiety, hypothyroidism, anemia, stroke, dysphagia, and hypertension. The ulcer was longstanding and recurrent; the wound frequently deteriorated after any progress was made. The patient had been treated in the past for cellulitis with multiple courses of systemic antibiotic therapy. At the start of care on 02/03/06 the site measured 3.0 x 2.5 cm; crust was present over a very tender and inflamed wound. A series of wound protocols were then initiated over several months using absorbent and gel silver dressings, cellulose dressings, and even skin protectants. No sustainable results were achieved. The patient’s wound continued to deteriorate (Figure 5); as a result the wound measurement changed frequently. A dermatology consult was refused by family due to the patient’s advanced age. On 05/19/06, the ulcer measured 1.2 x 3.0 x 0.015 cm. A silver sulfate mesh dressing* was started with every other day dressing changes to prevent irritation or maceration to the periwound skin by any excessive exudate. The patient was reevaluated a week later. When the silver mesh dressing* was removed (Figure 6), a thin layer of dry crust was found over the entire wound bed. This peeled off gently and easily to reveal a completely healed wound. (Figure 7) The patient’s wound has remained closed since that time despite a later diagnosis of a malignancy in that finger.
Conclusion

Use of this silver sulfate mesh dressing* led to rapid closure of two chronic wounds thus ending a cycle of expensive wound protocols and allowing patients to regain their quality of life and dignity once again. This easy-to-use dressing led to rapid and permanent closure of difficult wounds not achieved with a variety of other treatments including alternative silver dressings.

References and Selected Bibliography

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