Silver Dressings on Partial-Thickness Burns


**Rationale:** Recently developed silver dressings are more moisture-retentive than the silver sulfadiazine (SSD) gauze, which is often considered the standard of care. These permit less frequent, less painful dressing changes and avoid the “pseudo-eschar” associated with SSD gauze. Few studies compare effects of these modern silver dressings on burn outcomes.

**Objective:** A prospective randomized controlled trial (RCT) compared healing, microbiology, economic, patient, and nursing outcomes of partial-thickness burns dressed with a nanocrystalline silver dressing (NS) or with a hydrofiber silver dressing (HS).

**Methods:** Informed consenting patients with superficial or dermal burns were assessed by laser Doppler blood flow imaging (LDI) on post-burn day 2 or 3 for likelihood of healing within 14-21 days. Each patient was randomly assigned to be dressed with either an NS dressing (n = 50) or an HS dressing (n = 50). Patients with comorbidities delaying healing or who had participated in another study within the prior 30 days were excluded. During the 2-3 days before study participation, all subjects’ burns received daily topical povidone iodine 10% solution followed by topical use of a hydrocolloid paste. Blisters and necrotic skin were removed before the study to allow accurate blood flow imaging. Dressings were moistened with saline or water, covered with secondary gauze-based dressings according to package instructions, and applied using 1 or more dressings to completely cover the burn, overlapping at least 2 cm of surrounding skin. Primary NS dressings were changed at least every 3 days or when dislodged. Hydrofiber silver dressings were left in place until healing, with sections replaced earlier if needed. Baseline demographics and outcome measures included burn area, site and LDI vascular perfusion, semi-quantitative swab microbial cultures rated on a 5-point scale, costs of care and professional or patient-reported wound care, appearance, and sensation outcomes. Wound progress was rated, culminating in “complete wound closure,” defined as 95% covered with epithelium and no longer needing a “substantial” wound dressing. Wound odor, maceration, and irritation were rated on standardized scales. Evaluation was unblinded due to dressing recognition. Statistical evaluations mainly applied the Mann-Whitney test, with statistical significance set at \( P = 0.05 \).

**Results:** Subjects in the 2 dressing groups were comparable at baseline. Nanocrystalline silver-dressed burns healed in an average of 16 days, or HS in 15 days, with no significant dressing effects on wound healing, microbiology, length of hospital stay, or time spent on individual dressing changes, ease of dressing removal, or baseline wound pain or itching. A cluster of outcomes favored the HS dressings including significantly fewer dressings used, easier application, less cost and total time spent

Dear Readers:

Burns affect patients of all ages and vary widely in site and depth. Partial-thickness burns heal in an average of 10 days if dressed with a moisture-sealing hydrocolloid dressing or in 15 days if dressed with gauze impregnated with silver sulfadiazine (SSD).\(^1,2\) One of the studies reviewed in this month’s *Evidence Corner* compares the effects of 2 current silver-containing dressings on partial-thickness burns.\(^3\) The second systematically reviews effects of topical dressings for superficial and partial-thickness burns.\(^4\) Together they add perspective on what works to improve outcomes for patients with partial-thickness burns.

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on dressing changes, less wound staining, and improved comfort with less pain on dressing application or wound inspection. These findings persisted for a subset analysis performed on 25 NS and 23 HS mid-dermal burns, except that differences in worst pain reported and patient comfort were no longer statistically significant. No outcome reported significantly favored NS dressings.

Authors’ Conclusions: Silver dressings are part of current partial-thickness burn care. What makes the HS dressing preferable for healing burns in 7 to 21 days is a combined result optimizing healing, microbial burden, patient comfort, ease of use, and cost effectiveness.

Dressings for Partial-Thickness Burn Management


Rationale: Burn dressing selection should be based not only on healing effects but also on ease of use, dressing change requirements, cost effectiveness, and patient comfort.

Objective: Explore effects of burn wound dressings on superficial and partial-thickness burns.

Methods: Authors searched The Cochrane Wounds Group Specialised Register and Central Register of Controlled Trials, MEDLINE, EMBASE, EBSCO, and CINAHL databases from January 2008 to November 2012 to update the same-subject earlier Cochrane review. Search terms included “bandages” and individual classes of wound dressings such as “alginates” or “hydrocolloid” for RCTs measuring burn healing as the primary outcome, with optional secondary outcomes including cost, quality of life, pain, length of hospital stay, need for surgery, or other burn patient outcomes. Two independent reviewers summarized and analyzed study quality, internal validity, and summarized outcomes.

Results: Among 30 RCTs included for analysis, most were small and of low quality for both conduct and reporting. Though heterogeneous data often precluded meta-analysis, weak evidence supported conclusions that superficial and partial-thickness burns treated with hydrogels healed faster than those treated with “usual care,” which consisted of gauze dressings impregnated with SSD 1% cream, or paraffin with or without antibiotic. Topical SSD gauze was associated with longer time to complete burn healing than biosynthetic or silicone-coated dressings or other silver dressings. Silver sulfadiazine gauze increased burn pain and number of dressing changes compared to other silver dressings. There were mixed or inconsistent effects of various dressings reported on nursing time, healing “rate,” percents of subjects healed after specific intervals of treatment, length of hospital stay, infections, or surgery required.

Authors’ Conclusions: These results should be interpreted with caution due to the low quality of the included studies and the requirement for daily dressing changes with SSD gauze. Some evidence suggests that silver-based dressings, silicon-coated nylon and biosynthetic dressings are associated with better healing outcomes than SSD, while hydrogel dressings improved healing outcomes compared to usual care.

Clinical Perspective

Healing remains the primary goal of partial-thickness burn care, yet both studies confirm the importance of limiting costs while improving patient comfort and reducing dressing change frequency. Partial-thickness burns dressed with either of 2 silver dressings healed within the 15-day time frame previously reported for SSD gauze-dressed burns instead of the significantly shorter 10-days reported for similar burns dressed with a hydrocolloid dressing. While burn characteristics make comparison across studies difficult, these earlier studies raise interesting questions. Might healing effects of absorbent silver dressings be improved by applying a more effective hydrocolloid moisture barrier secondary dressing or by appropriate use of a hydrocolloid primary dressing?

A closer look at studies supporting the conclusion that SSD delays healing reveals that SSD was delivered from gauze dressings in every study where it was used, and that gauze was used in all the control groups that made hydrogel seem to heal partial-thickness burns more quickly than “usual care.” Did conclusions of this systematic review confuse the recognized adverse effects of gauze on healing, pain, and infection of partial-thickness burns, donor sites, or other wounds with supposed adverse effects of SSD applied on gauze, or with the supposed benefits of hydrogel over gauze-based “usual care?” Perhaps SSD has acquired an undeserved bad reputation from being applied with gauze. What would SSD add to a more moisture-retainent dressing protocol? Recent systematic reviews have added topical honey to agents that are significantly improving healing (6 RCTs on 574 subjects) and reducing bacterial populations (4 RCTs on 424 subjects) of partial-thickness burns, though it is incorrect to compare honey to the tangential excision and grafting required for deeper burns. As with evidence...
supporting most topical wound care interventions, the best available evidence quality is low but improving with each RCT and worth considering to inform clinical decisions about partial-thickness burn care.

References

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