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BACKGROUND. *Over the last decade the benefits of occlusive dressings have been appreciated. These dressings allow the epithelium to resurface easier. The wound heals quicker.*
OBJECTIVE. *To evaluate a new silicone sheeting for immediate post-op wound care. Our objective was to determine its benefit in the wound care management after laser skin resurfacing.*
METHOD. *The silicone sheeting was applied immediately after laser resurfacing in 35 individuals. This temporary skin replacement was held in place with 4 × 4 gauzes and tube gauze netting. Although the tube netting and the 4 × 4 gauzes were changed daily the silicone sheeting remained in place for 4 or 5 days. Following this, applications of a petrolatum-based ointment were continued for another 5 days. At day 10 the skin care program was changed to a moisturizing sunscreen. Bleaching cream was added at day 15 in darker complexed individuals.*
RESULTS. *The dressing accelerated wound healing. Pain and swelling were minimized under the sheeting. Histologic examinations demonstrated a more rapid reepithelialization at these treated sites. Other than technical problems, such as the riding up of the dressing over the jawline or retraction of the dressing off the lips or off the eyelids, there were no adverse sequelae. The wound healed rapidly and allowed the rapid progression to the application of a moisturizer-sunscreen or a skin-bleaching cream. Other than these technical problems there were no complications. No wound infections were noted.*
CONCLUSION. *The use of silicone sheeting following skin resurfacing facilitated a rapid reepithelialization of treated areas. There was a remarkable reduction in erythema and edema accompanying the use of the dressing. The program made it possible for patients to return to work in 12–15 days.* © *1998 by the American Society for Dermatologic Surgery, Inc. Dermatol Surg 1998;24:567–570.*

Before the last decade, the most preferred wound dressing following skin resurfacing was permitting the development of the natural biological crust.[1] This natural crust developed from the exudate following a facial sanding or dermabrasion. In theory this exudate became a biological barrier that facilitated skin rejuvenation underneath. However, bacterial infections could develop unnoticed and extend the wound deeper. This could lead to the development of persistent erythema or loss of skin texture.[2] Also, with talking or chewing, fissures would develop in the perioral area. These ulcerations would bleed and the repeated trauma could leave another scar. The demonstration by Winter that the skin proliferated and healed quicker under occlusion led to a modification of wound healing techniques.[3] Early articles demonstrated the beneficial effects of hydrogels.[4,5] Hydrogels (Vigilon; C.R. Baird, Murray Hill, NJ) had the advantage of moisturization of the wound and the disadvantage of requiring frequent wound dressing changes. These changes wash off epithelial wound healing factors.[6] The hydrogels were also difficult for the patient to change daily at home. A synthetic trilaminate (Biobrane; Dow B. Hickam, Inc., Sugar Land, TX) could become incorporated into the wound or allow the wound to become secondarily infected.[7] Patients objected to the odor. A Saran Wrap–like membrane (Omniderm; Omnikron, Scientific Ltd., Retronot, Israel) became popular but is not readily available or cost-effective.[8] A meshed polyethylene membrane (N-terface; Winfield Labs, Dallas, TX) became the most useful of the dressings for an exudative wound such as a dermasanding or dermabrasion.[9] However, it is difficult for N-terface to stick on a dry wound such as a laser wound. A plastic sheeting (Flexan; Dow B. Hickman, Inc.) was advocated initially by Weinstein.[10] This dressing is great for small lesions but it is difficult to keep the dressing in place during the healing of a full-face resurfacing. A new dressing of silicone with a polytetrafluorethylene inner polymer network (Silon-TSR; Bio Med Sciences, Bethlehem, PA) is proving useful for healing the laser-induced resurfacing.[11] This dressing has the advantage of full-face masks that can be left in place for 4 or 5 days. The dressing captures the wound healing factors; shuts down the exudative phase of wound healing; yet, allows visualization through the dressing to examine the wound. This paper will demonstrate our results utilizing this membrane over our last 35 cases of partial or full-face laser resurfacing.

Materials and Methods

After preconditioning the skin for 2–8 weeks with a vitamin A/glycolic skin conditioning program, the skin was resurfaced with the UltraPulse carbon dioxide (CO_2) laser (Coher-

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Table 1. Settings for Skin Resurfacing Using the UltraPulse CO_2 Laser

Area	Energy (mJ)	Power (W)	Pattern	Size	Density*
Glabrous skin	300	60	3	8	5
Eyelid skin†	250	50	3	5	4

The laser was equipped with the computer pattern generator (CPG) handpiece.
** Avoid density settings of 7 or more.*
† Also used for feathering.

ent, Palo Alto, CA). The Computer Pattern Generator (CPG) was used at the standard facial and eyelid settings (Table 1). Usually, three to four passes completed the resurfacing. The facial area was blotted dry and the Silon-TSR dressing applied. The facial mask was applied initially in the central face area and, then, extended out to the ears and tied behind the head with the drawstrings. This dressing was held in place with 4 × 4 gauze dressings covered with tube gauze. Small openings for the eyelid area, nostrils, and central lips were perforated through the silicone sheeting. The additional patch of Silon-TSR provided in the face mask kit was placed over the lip area to reinforce this covering as the sheeting tended to retract off this area (Figures 1 and 2). The patient was seen on the subsequent day to teach them how to change the 4 × 4 and tube gauze dressing and/or to patch any of the exposed areas with the silicone sheeting. After 5 days the dressing was removed and a moisturizing ointment (Aquaphor; Beiersdorf Inc., Norwalk, CT) was applied three or four times daily. Excess could be blotted off or washed with a mild soap (Cetaphil; Galderma Laboratories Inc., Ft. Worth, TX). By the 10th day a moisturizer-sunscreen was applied and by the 15th day a bleaching cream program could be instituted in Fitzpatrick Type 3 or darker skin.

Limited skin resurfacing of the scalp or around the eyes or mouth was dressed in a similar fashion. These limited one-half face dressings of Silon-TSR were held in place by a coat of Mastisol (Ferndale Laboratories, Inc., Ferndale, MI) applied next to the resurfaced area. Then, the dressing was held in place with tape (Figures 3 and 4). This dressing was also left in place for 4 or 5 days and, then the area was treated with ointments and moisturizers as described above.

Figure 1. *The application of the Silon-TSR dressing. We usually apply the additional "patch" of silicone dressing to the lip area.*

Figure 2. *The Silon-TSR dressing held in place with 4 × 4s and tube gauze. Note the cotton balls compressing the Silon-TSR dressing around the bridge of the nose.*

Some minor technical difficulties developed in approximately half of the cases. The Silon-TSR would ride up on the eyelid area or around the lip area. The patients were instructed to roll the Silon-TSR back into place with a cotton-tipped applicator or to apply the petrolatum-based ointment to keep exposed areas moist. If an area became uncovered, an additional Silon-TSR patch was often added to the area to keep the occlusion for the 5 days. Occasionally, the patient would become disgruntled with the occlusive dressing after 3 or 4 days and remove it. We either reapplied a new Silon-TSR face mask or allowed the patient to move into the ointment dressing phase prematurely.

Two punch biopsies were taken from treated and untreated sites after 5 days of wound healing in three patients. The biopsies were placed in formaldehyde, embedded in par-

Figure 3. *A partial facial resurfacing of the eyelid area treated with the Silon-TSR dressing. The Silon-TSR is held in place with Mastisol and paper tape for 4–5 days.*

Figure 4. *The Silon-TSR dressing also works well for scalp skin resurfacing.*

affin, cut at six μm, and stained with hematoxylin-eosin for microscopic examination (100×).

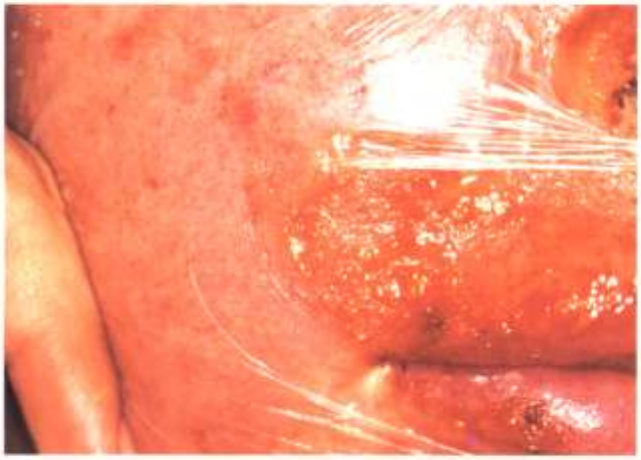
Results

There was a lack of pain and the reduction in swelling under the dressing. If the dressing came off the lips, the jawline, or eyelid area, the patients immediately complained of pain and swelling developed from the exposure to the air. They were immediately relieved when a silicone patch was put back in place. There was a rapid progression of wound healing under the dressing. The erythema was minimum and the wound closed in 5–7 days.

Both the physicians and the patients noted the lack of exudate in the treated sites. The adjacent exposed areas developed a thick crust that was difficult to manage. The occluded site had essentially no film under the dressing (Figure 5).

Biopsies of the treated and untreated areas showed a remarkable difference (Figures 6 and 7). The occluded area demonstrated a mature epidermis, a compact dermis, and lack of inflammatory infiltrate. The unoccluded area demonstrated a disorganized epidermis, a very swollen, pale dermis, and an active inflammatory cell infiltrate. This edema and inflammatory response may have been responsible for the exudative phenomenon noted at the untreated sites.

Figure 5. *Note the exudative "build up" that developed in the exposed area after the Silon-TSR slipped off.*



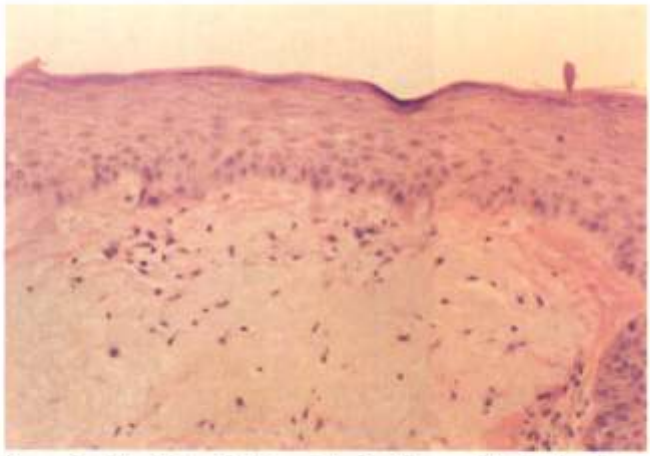
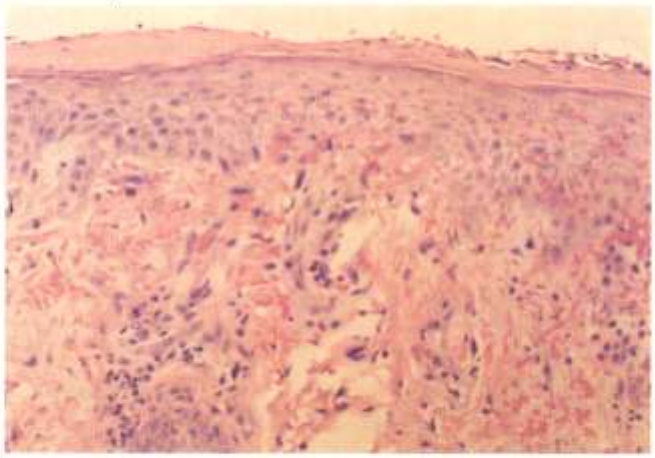


Figure 6. *The Silon-TSR treated site. The reepithelization is complete. Note the compact dermis and lack of inflammatory response (×100).*

Compared with patients only using ointment-based dressings, these patients noted less troublesome erythema and edema after the 10-day wound healing period. They were able to put on their makeup and go back to work or apply their bleaching creams at day 14 or 15 (Figures 8).

There were no complications other than the technical ones of keeping the dressing in place. There were no instances of persistent erythema, bacterial infections, or skin texture changes when the resurfaced skin was treated with the Silon-TSR occlusive dressing.

Figure 7. *The untreated site. There is limited reepithelization and the dermis is pale and edematous. An active inflammatory reaction is present (×100).*



A B

Figures 8. *A) Before and B) after skin resurfacing. With the application of the Silon-TSR dressing, there is minimal erythema and edema. The patient was back to work in 14 days without makeup.*

Discussion

In teaching the stages of wound healing, authors state that the exudative stage is necessary for the progression onto the reepithelialization and remodeling phases.[12] In our experience, however, it was quite beneficial to shut down this exudative phase of wound healing. If we keep the wound occluded there was less exudate, less edema, and more rapid wound healing. We feel the exudative phase of wound healing is one to avoid. We have seen no benefit from the development of these thick crusts. The necessity for the "complete" wound healing cycle disappears in the presence of the silicone sheeting.

With this disappearance of the exudative phase of wound healing, the pronounced erythema following laser resurfacing did not develop or disappeared much more rapidly. Clinically, the erythema in the occluded areas was one-half as intense as the erythema in open areas. As we gained more experience with the Silon-TSR dressing we felt more confident with the laser resurfacing method and found that we could complete an extra pass over areas of wrinkles or increase the density of the CPG to extend the wound deeper to obtain a more beneficial clinical result without difficulties (Table 2).

Table 2. Silon-TSR: Silicone Semi-occlusive Dressing

Advantages	*Disadvantages*
Ease of management, rapid application	Difficult to keep around orifices
Less exudative wound healing	May be too occlusive for exudative wounds
Less painful, less erythema	Potential for increased bacterial growth*
Nonadherence to wound	Some patients can't tolerate a "mask"
Traps natural growth factors	
Can visualize wound	
Rapid reepithelization	

* *Does not appear to be clinically significant.*

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