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Postoperative Care

By R.S. Batra, MD, Msc, MPH

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Ablative Laser Resurfacing – Postoperative Care

R.S. Batra, MD, MSc, MPH

*Department of Dermatology, Stanford University School of Medicine, Palo Alto, CA, USA
University, Nashville, TN, USA*

ABSTRACT

Wound care after laser skin resurfacing (LSR) is critical for achieving a successful result. The superficial thermal injury created by LSR heals more quickly and with a reduced risk of scarring under occlusion. While open and closed wound care regimens can be employed to expedite reepithelialization, closed methods with semi-occlusive dressings may decrease morbidity. Effective medications and management techniques can help to minimize expected effects of the procedure such as crusting, discomfort, pruritus, erythema, and swelling.

Key Words: laser skin resurfacing, wound care, postoperative care

Laser skin resurfacing (LSR) for the rejuvenation of facial skin remains a popular cosmetic procedure. Meticulous postoperative care is essential and is as important as intraoperative technique in achieving optimal results after laser ablation. Epidermal regeneration following the thermal injury of LSR is improved in a moist environment, since a dry crust or scab impedes keratinocyte migration.¹ Both open and closed wound care methods can be applied to minimize morbidity and expedite postoperative wound healing. Numerous studies indicate that closed wound care regimens utilizing occlusive dressings for 48-72 hours postoperatively may hasten reepithelialization and reduce crusting, discomfort, erythema, and swelling.²⁻⁴ Appropriate medications and management techniques can also minimize the predictable effects of LSR.

Resurfacing with carbon dioxide (CO₂) or Erbium:YAG lasers results in ablation of the epidermis and upper papillary dermis. During reepithelialization, the wound produces copious serous discharge along with sloughing of denatured collagen. Resultant crusting may predispose the wound to secondary infection. Other immediate expected sequelae of LSR include discomfort, pruritus, erythema, and edema. Reepithelialization after resurfacing occurs at a mean of 8.5 days after CO₂ and a mean of 5.5 days after Erbium:YAG lasers.⁵

Wound Care Methods

Open wound care techniques allow ongoing surveillance of resurfaced skin; as well they minimize the feeling of claustrophobia by the patient. These regimens, theoretically, would seem to be less likely to foster infection, since there is no dressing under which bacteria may be trapped.⁶ However, open methods may be more painful and inconvenient for the patient. Most open wound care regimens consist of frequent soaks with 0.25% acetic acid, normal saline, or cool tap water lasting 20 minutes every 2-4 hours, followed by gentle wiping of the skin. Cold compresses are immediately followed by the application of a bland emollient ointment. Popular ointments include Catrix®-10 (Lescarden) and Aquaphor® Healing Ointment (Beiersdorf AG). Patients are routinely seen on the first and third days postoperatively, and any excess crust is gently removed with saline. The frequency of soaks and

ointment application decreases as reepithelialization progresses and is tapered off when reepithelialization is complete. Gentle cleansings begin a day or two later. The use of ointment is replaced during the day by use of a lighter moisturizer-sunscreen. At nighttime, ointment is more slowly replaced.

Dressings utilized in closed wound care techniques provide a semi-occlusive environment that may protect the wound from exogenous bacteria and foster exchange of oxygen and water vapor.⁷ Drainage of the wound exudates via the dressing may prevent excess crust and simplify wound management. Popular dressings include the composite foam Flexzan® (Dow Hickam Pharmaceuticals), the hydrogel product 2nd Skin® (Bionet), the plastic mesh N-terface® (Winfield Laboratories), and the polymer film Silon-TSR® (Bio Med Sciences).

After LSR, occlusive dressings are applied for 2-3 days postoperatively. Longer applications increase the risk of bacterial or fungal colonization and infection with subsequent scarring.

We prefer the Silon-TSR®, a silicone dressing with a polytetrafluorethylene inner polymer network. Immediately after the procedure, the face is blotted dry and the dressing is applied. The dressing comes in a transparent face mask design with perforations to allow excess fluid drainage. Drawstrings tied behind the head hold the mask in place. Openings are cut for the eyelids, nose, and central lips, and a smaller patch of dressing is applied to cover the nasal bridge. Gauze 4 x 4 dressings are applied over the mask to absorb exudates and are held in place by tube gauze.

Patients are seen on the first postoperative day and the tube gauze and 4 x 4 gauze are removed. The resurfaced area is inspected through the mask, and accumulated exudate or crust is removed from uncovered areas with saline. Patients are instructed to begin ice-water soaks through the mask for 20 minute periods at 2-4 hour intervals while awake. Patients return at the third postoperative day and the dressing is removed. Patients continue soaks at 3-4 hour intervals followed by application of Aquaphor® healing ointment. By 7-10 days after the procedure, soaks are replaced with gentle cleansing, and patients switch to the application of a moisturizer-sunscreen.

Antibiotic ointment should be avoided in both open and closed wound care regimens. Bacitracin contained in antibiotic ointments is a common cause of allergic contact dermatitis after resurfacing.⁸

Medications

Regardless of the wound care technique chosen, certain medications and principles of postoperative management can help to reduce morbidity. Postoperative infection can cause permanent scarring. Prophylactic antibiotics such as dicloxacillin or azithromycin are begun at least 24 hours before LSR and continued for a minimum of 5 days postoperatively. Antivirals such as acyclovir or valacyclovir are also begun 24 hours before LSR and continued until epithelialization is complete (10 days). Recovering patients are advised to avoid contact with anyone actively infected with herpes simplex virus.

Patients often awaken after LSR with mild burning discomfort, and over 80% note pain in the immediate postoperative period.⁹ This can be minimized by intraoperative use of supplemental local anesthesia as well as ketorolac (Toradol®) 60mg IM.¹⁰ After the procedure, ice packs, cold compresses and acetaminophen help to alleviate pain. Approximately 85% of patients require pain medications for the first 3 days postoperatively,³ and those not relieved by acetaminophen often benefit from acetaminophen with codeine phosphate (Tylenol® with Codeine) or acetaminophen with hydrocodone bitartrate (Vicodin®) 1 to 2 tablets every 6 hours as needed.

Mild-to-moderate pruritus occurs during reepithelialization and typically lasts about 10 days. Recent evidence suggests that this symptom relates to a yeast infection or colonization in healing skin.¹¹ Pruritus is often relieved by cool compresses and emollients. Over half of all patients require antihistamines such as hydroxyzine hydrochloride (Atarax®) 25mg at night. Moderate pruritus is often controlled with diphenhydramine hydrochloride (Benadryl®) 25-50mg or hydroxyzine hydrochloride (Atarax®) 25mg 2-3 times daily.⁹ In cases of severe pruritus, medium-to-high potency topical steroids, more potent antihistamines such as doxepin 25-50mg at night, and very rarely, systemic corticosteroids may be required. Control of pruritus is essential since excoriation may result in scarring.

Immediate Predictable Effects of LSR

Erythema typically occurs for up to several months after LSR. The mean maximum severity is reduced, and the duration of noticeable erythema and the time until complete resolution of erythema are shorter in patients treated with closed as compared to open wound care techniques.³ Erythema can be camouflaged with make-up containing green foundation. In addition, sun protection and avoidance should be encouraged during the entire period of post-LSR erythema to minimize post-inflammatory hyperpigmentation. This is particularly important in patients with skin phototypes III through VI. Hyperpigmentation occurs in nearly a third of patients. Preoperative hydroquinone for at least 1 month prior to LSR may decrease this risk.¹²

Edema develops in the first 48 hours postoperatively. The severity can be controlled with ice packs and head elevation at night. In cases where marked edema develops during or immediately after the procedure, oral corticosteroids may be necessary. The time until complete resolution of edema is significantly less when closed dressings are utilized than with open wound care postoperatively.³

Conclusion

In addition to explicit instructions to patients for postoperative care, careful physician follow-up is essential for at least several months after LSR to observe for side-effects and complications. In most cases, untoward effects can be completely reversed if treated promptly and effectively. In addition, ongoing follow-up care can help to reinforce shared, realistic expectations of the physician and patient regarding possible outcomes of the procedure and may influence patient satisfaction after LSR.¹³

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