DERMATOLOGIC SURGERY

VOLUME 44 NUMBER 4 APRIL 2018 ISSN 1076-0512

IN THIS ISSUE

Melanoma of the Face and Mohs Micrographic Surgery: Nationwide Mortality Data Analysis

Healing Time Correlates With the Quality of Scaring: Results From a Prospective Randomized Control Donor Site Trial

Randomized, Double-Blinded, Sham-Controlled, Split-Hand Trial Evaluating the Safety and Efficacy of Triamcinolone Acetate Injection After Calcium Hydroxylapatite Volume Restoration of the Dorsal Hand

THE OFFICIAL PUBLICATION FOR

ASDS American Society for Dermatologic Surgery
EXPERTISE FOR THE *life* OF YOUR SKIN

ACMS American College of Mohs Surgery
Fellowship trained skin cancer and reconstructive surgeons

ISHRS International Society of Hair Restoration Surgery

www.PRSCASL.org

Wolters Kluwer

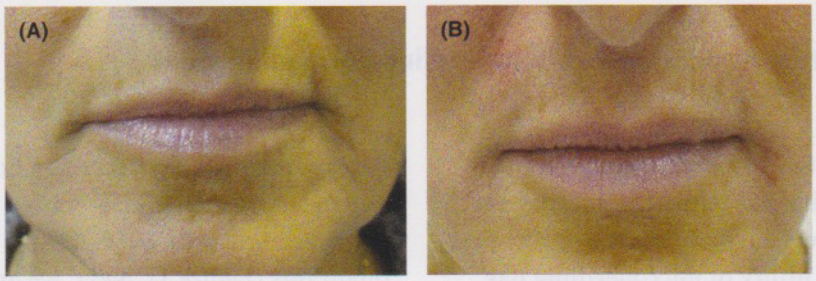

Figure 2. (A) Before treatment of the upper cutaneous lip with microneedling. (B) After 3 treatments at monthly intervals of the upper cutaneous lip with microneedling. (Photo courtesy of Michael S. Kaminer, MD.)

individuals bleed almost immediately on starting treatment, and others have minimal bleeding even after 90 seconds of treatment. To mitigate this variation, we treat for 60 to 90 seconds, using time as an end point in an effort to ensure uniformity in the treatment technique between visits, within patients and between patients. For cautious individuals or in patients who bleed quickly and excessively, we treat for 60 seconds and in those who do not bleed much or who have deeper lines we treat for 90 seconds. It is important to record the treatment duration for each quadrant. At subsequent treatments, we either increase or decrease the treatment time depending on outcome and how well the patient tolerated the post-treatment course. On treatment completion, we rub the blood into the treated area, after which we wipe off with wet gauze and apply topical hyaluronic acid gel. Patients are instructed to reapply the hyaluronic acid gel or Aquaphor healing ointment (Beiersdorf, Inc., Wilton, CT) every 3 to 4 hours until they are fully healed.

All patients have postprocedural erythema that usually lasts for 3 to 5 days. Dryness and slight scaling are not uncommon but crusting is rare. Patients are advised to avoid makeup on the area until the next morning, at which point they are able to apply sunblock and conceal the redness with the makeup of their choice. Patients report that the erythema is barely noticeable with a concealer. Occasionally, a patient on blood thinners may develop a bruise that resolves within a few days. Patients with a history of herpes labialis are treated prophylactically with antiviral therapy. Overall, the procedure is well tolerated. On informal questioning of approximately 20 to 30 patients, the average pain score was 1 to 2 (on a scale of 0–10) with 0 being no discomfort and 10 unbearable pain. The vermilion border and philtrum tend to be the most sensitive areas.

As with any cosmetic procedure, patient education and the establishment of realistic expectations are essential. We educate patients that microneedling will soften, yet not completely erase their perioral rhytides and that multiple treatments are often required (Figure 2). Younger patients with finer and more superficial lines tend to have greater improvement compared with patients with deeper and more etched lines. Although a few of our patients have reported some improvement after their first session, studies suggest that multiple treatments are needed for maximum benefit.[4] We recommend a total of 3 treatments at 4-week intervals. Maximum benefit is seen approximately 6 months after the last treatment as neocollagenesis has been shown to continue for 6 months after the final session.[2,4] Additional single treatments can be added or a second series of 3 treatments can be performed, but we usually wait 6 months after the first treatment before reevaluating for additional treatments.

References

1. Hou A, Cohen B, Haimovic A, Elbuluk N. Microneedling: a comprehensive review. Dermatol Surg 2016;43:321–39.
2. Aust MC, Fernandes D, Kolokythas P, Kaplan HM, et al. Percutaneous collagen induction therapy: an alternative treatment for scars, wrinkles, and skin laxity. Plast Reconstr Surg 2008;121:1421–9.
3. Cohen BE, Elbuluk N. Microneedling in skin of color: a review of uses and efficacy. J Am Acad Dermatol 2016;74:348–55.
4. El-Domyati M, Hosam W, Abdel-Azim E, Abdel-Wahab H, et al. Microdermabrasion: a clinical, histometric, and histopathologic study. J Cosmet Dermatol 2016;15:503–15.

Ensuring Consistent Results When Microneedling Perioral Rhytides

Microneedling is a safe and effective, minimally invasive therapy that has gained popularity for the treatment of fine wrinkles and scars over the past several years. The utility of microneedling has expanded from the treatment of fine lines to full face rejuvenation, transdermal drug delivery, and the treatment of acne vulgaris, surgical and traumatic scars, dyspigmentation, striae, alopecia, and hyperhidrosis.[1] Microneedles create minute wounds in the skin triggering a wound healing response, growth factor production, and neocollagenesis.[2] With minimal epidermal damage, microneedling is considered to be a safe procedure in all skin types.[3]

There are 2 available devices that are most commonly in use. First, dermarollers are needle-studded rollers that vary based on roller size and needle depth. The needles range in length from less than 0.15 mm for home use to 3 mm for medical practitioners. Second, microneedling pens are automated oscillating devices with disposable needle-studded cartridge tips. The 32-gauge needles move in a vertical position and can be set to varying depths often ranging from 0.5 to 2.5 mm.

In our practice, we have adopted the use of a microneedling pen to treat perioral rhytides with favorable results. We have observed that the consistency of treatment can vary widely given the operator-dependent nature of microneedling. Thus, we arrived at the following question: How can we standardize our technique to guarantee reproducible and consistent results from one treatment to the next and between physician to physician? Over the past few months, we have honed our procedure for the treatment of perioral lines with microneedling.

First, the treatment area is divided into zones. When treating the upper cutaneous lip, we divide the area into 2 halves (extending from the philtrum to the nares superiorly, the vermilion border inferiorly, and the nasolabial fold laterally). When we treat the entire perioral area, we divide the treated area into 4 quadrants (Figure 1). Next, we apply topical anesthesia such as a eutectic mixture of lidocaine and prilocaine or 30% lidocaine to the skin for a minimum of 30 minutes. The anesthesia is then wiped off with dry gauze and the area is thoroughly cleansed with alcohol. The microneedling pen is locked at a depth of 2 mm. Prepackaged hyaluronic acid gel that is supplied with each disposable cartridge is then applied to the skin. The pen is turned on before placement on the skin, which allows the patient to become accustomed to the sound of the pen. We complete one quadrant of treatment at a time by gliding the pen over the skin in a variety of patterns, including a combination of a circular motion, linear horizontal, or vertical strokes (**Supplemental Digital Content 1**, Video 1, http://links.lww.com/DSS/A76, displays our technique for perioral microneedling). Care is taken not to dwell in 1 spot and not to apply excessive pressure. Each quadrant is treated for 60 to 90 seconds. Although the literature suggests the treatment end point is the induction of uniform pinpoint bleeding, we find that there is marked variation in the time it takes to induce pinpoint bleeding among patients. Some

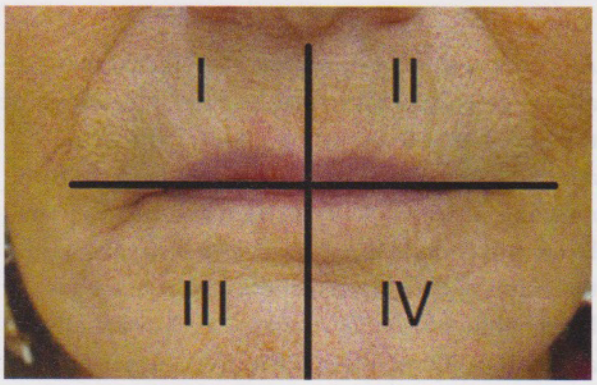

Figure 1. Figure 1 delineates the 4 quadrants we treat in the perioral area. Depending on the patient, our treatment is localized to the upper cutaneous lip (Quadrants I and II) or includes the entire perioral area (Quadrants I–IV). Each quadrant is treated for 60 to 90 seconds.

Adele Haimovic, MD
Omer Ibrahim, MD
Nicole Y. Lee, MD, MPH
SkinCare Physicians
Chestnut Hill, Massachusetts

Jeffrey S. Dover, MD, FRCPC
SkinCare Physicians
Chestnut Hill, Massachusetts

Department of Dermatology
Yale University School of Medicine
New Haven, Connecticut

Supplemental digital content is available for this article. Direct URL citations appear in the printed text and are provided in the full text and PDF versions of this article on the journal's Web site (www.dermatologicsurgery.org).

The authors have indicated no significant interest with commercial supporters.

Use of Hypochlorous Acid as a Preoperative Antiseptic Before Placement of Dermal Fillers: An Alternative to the Standard Options

The use of antiseptics in the preparation of surgical sites helps decrease pathogen loads and therefore the risk of postoperative infections. In the case of cosmetic fillers, the practitioner must be aware of the possibility of acute and chronic infections in addition to the formation of granulomas and biofilms. Given the emergence of longer lasting fillers, prevention of infection at the time of injection has become an even more pressing concern. Should the patient develop any of these sequelae, they are at risk of increased pain, swelling, induration, asymmetry, and discoloration, which can be prolonged, and scarring, which is permanent. Oral and intravenous antibiotics may be required, exposing the patient to potential side effects of the medication and turning a cosmetic procedure into a concerning medical issue. To minimize these risks, the practitioner should follow hygienic technique, including the use of an antiseptic before injection of the filler.

Some of the more commonly used antiseptics for cutaneous preparation include isopropyl alcohol, povidone–iodine and chlorhexidine. Isopropyl alcohol, although inexpensive, can cause irritation and is flammable. Povidone–iodine is rapidly effective but is neutralized by blood and sputum and can dye hair and clothing. Chlorhexidine has a sustained effect but has both ocular toxicity and ototoxicity. In a 2017 review article on chlorhexidine keratitis, Steinsapir and Woodward recently discussed these potential hazards but did not mention the use of neutral superoxidized agents as an alternative. Indeed, there is relatively little, particularly in the dermatologic surgery literature, regarding this agent. The authors would like to highlight its potential use as a surgical scrub and its safety and efficacy profile.

Mechanism of Action

Neutral superoxidized agents are created using electrolysis on a water and sodium chloride combination. Electrolysis is the passing of a direct current through an ionic substance to drive a chemical reaction. This process separates the components, forming reactive oxygen and chlorine species. These components can denature bacterial cell walls.[1] Previous agents that are made to be more alkaline or acidic and contain higher concentrations of free available chlorine (FAC) are more corrosive[1] and have a shorter shelf life.[2] The newer neutral agents have a longer shelf life and are less irritating to the skin.

Hypochlorous acid (HOCl) has been used in the disinfection of water (e.g., in pool water) and hospital instruments and as the active component of household cleaners. It is also created by neutrophils as part of the innate immune system. Rubinsky and colleagues noted in a 2016 article that hypochlorite (OCl-) was reported as early as 1825 to be effective in wound sterilization. As bacteria are unable to deactivate HOCl, no resistance to this substance can develop. This makes HOCl a particularly attractive option for wound and surgical site sterilization at a time when antibiotic resistance is a growing concern.

Methods

In the authors' practice, they use a neutral superoxidized product called Alevicyn Dermal Spray (IntraDerm Pharmaceuticals, Petaluma, CA). This product contains HOCl and 120 parts per million of FAC. The gel form contains both HOCl and sodium hypochlorous acid (NaOCl). The Alevicyn Dermal Spray is dispensed in a bottle that is not a single-use item and may be used after opening for up to 30 days.

Before injection of a filler, patients are asked to cleanse their face, eliminating makeup and other products. A 4 × 4-cm gauze is soaked with Alevicyn, which is then wiped evenly over skin at the injection site(s). After a delay of 30 seconds, filler is then injected at the site. The spray leaves behind no noticeable residue, is nearly odorless, and does not require removal after the procedure. It may be safely used around the eyes and ears, but care should be taken to avoid spraying the liquid directly into the eye. After the procedure, patients are given standard wound care instructions and a direct contact number should any issues arise. Patients are seen back in clinic as needed. Since beginning this protocol a year ago, and using it in over 1,000 cases, the authors have had no known cases of postfiller infection. As the authors have had no filler injections before initiating use of this product, Alevicyn can be considered a noninferior product in the authors' practice.

Pathogenic Targets and Efficacy

HOCl is well tolerated and effective at reducing microbial loads, thus decreasing the risk of infection. Tests have shown that neutralized HOCl is highly effective against a range of bacterial pathogens including *Staphylococcus aureus, Pseudomonas aeruginosa,* and *Escherichia coli* (Table 1) (BioScience Laboratories reports #080841-201 and #150423-201), all of which have been identified in biofilms. In addition, it is effective against fungal pathogens such as *Candida albicans, Trichophyton mentagrophytes,* and *Trichophyton*

TABLE 1. A Sample of the Variety of Bacterial and Fungal Entities Against Which Hypochlorous Acid Has Activity (BioScience Laboratories Reports #080841-201 and #150423-201)

Organism	*Exposure Time*	*Percent Reduction*
Acinetobacter baumannii	30 s	99.9999
Aspergillus *niger*	60 s	10.9756
Bacteroides fragilis	30 s	99.9560
Candida albicans	30 s	99.9999
Corynebacterium diphtheriae	30 s	99.9995
Clostridium difficile	30 s	99.9975
Enterobacter aerogenes	30 s	99.9999
Enterococcus faecalis (Vancomycin-resistant *Enterococcus*)	30 s	99.9998
Escherichia coli	30 s	99.9999
Haemophilus influenza	30 s	99.9996
Klebsiella oxytoca	30 s	99.9999
Klebsiella pneumoniae and *Klebsiella ozaenae*	30 s	99.9999
Malassezia furfur	30 s	99.9996
Micrococcus yunnanensis	30 s	99.9998
Propionibacterium acnes	30 s	99.9995
Proteus mirabilis	30 s	99.9999
Pseudomonas aeruginosa	30 s	99.9999
Serratia marcescens	30 s	99.9999
Staphylococcus aureus	30 s	99.9999
Methicillin-resistant *Staphylococcus aureus*	30 s	99.9999
Streptococcus pyogenes	30 s	99.9999
Trichophyton mentagrophytes	30 s	99.9979
Trichophyton rubrum	30 s	99.7004
Vibrio vulnificus	30 s	99.9994