

SELECTED READINGS
IN
ORAL AND
MAXILLOFACIAL SURGERY

COSMETIC SKIN CARE

Tirbod Fattahi, DDS, MD, FACS

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INTRODUCTION

Each year, millions of people in our country seek professional medical advice regarding skin care. Because cosmetic surgery is now an integral part of daily practice for many oral and maxillofacial surgeons, it is imperative to have a thorough understanding of various modalities used in cosmetic skin care. Skin care can also be viewed as an “entry level” approach for practitioners interested in incorporating cosmetic surgery into their daily office-based practices. Skin care is a rather expansive field; it means different things to different practitioners. It is also riddled with “new” and “exciting” innovations (sometimes on a daily basis) that can at times confuse the practitioner. The purpose of this review is to describe a simple, step-wise approach to skin care for the practicing surgeon.

THE BASICS

All skin care products aim to produce the same result: a youthful, rejuvenated, unblemished skin. This is primarily directed at reversing photoaging. The spectrum of options in order to achieve this goal can run from basic over-the-counter products, all the way to procedures performed under anesthesia such as laser skin resurfacing. The most commonly used techniques in skin care are listed in Table 1.

TABLE 1: COMMONLY USED SKIN CARE TECHNIQUES

Over the counter lotions/creams
Prescription medications/creams
Commercial skin care lines
Chemical peels
Light therapy (IPL - Intense Pulsed Light)
Dermabrasion
Laser Resurfacing

The Aging Process

Before discussing advantages and disadvantages of the above options, a complete understanding of the aging process is necessary. The aging process is a dynamic, multi-factorial process; it involves intrinsic as well as extrinsic aging. Intrinsic aging refers to the physiologic, genetically-driven process passed on from one generation to another; it is the component of aging that cannot be modulated. Factors such decrease in cellular function, impairment in DNA signal transduction, loss of collagen and elastic fibers, as well as ethnicity and sexual differences (hormonal changes in women), all play significant roles in intrinsic aging. Extrinsic aging, on the other hand, is the focus of all skin care modalities; it involves environmental as well life style factors that enhance the aging process. Smoking, prolonged sun exposure, and living in areas with high pollution are just three examples of the causes of extrinsic aging. Most patients

seeking cosmetic skin care need reversal of chronic sun damage or photo aging. (See Also *Selected Readings in Oral and Maxillofacial Surgery* Vol. 8, #5; Vol. 9, #3; Vol. 20, #5)

Epidermal Anatomy and Physiology

Another integral component in skin care is a clear understanding of epidermal anatomy and the cell cycle. Facial skin is comprised of stratified squamous epithelium below which papillary and reticular dermis are found. There are various thicknesses of facial skin (lower eye lid skin—thinnest skin of body) but typically speaking, the epidermis is between .05 mm to 0.1 mm in thickness, while papillary dermis and reticular dermis are 0.1 mm to 0.4 mm and 0.4 mm to 1.0 mm in thickness, respectively. Epidermal cell cycle is between 28-40 days approximately, therefore, it is important to remember that any skin care treatment may take 2 to 3 months to affect all epidermal cells of the facial skin.

As is with any cosmetic-surgery patient seeking elective surgery, all skin care patients should undergo a complete history and physical exam prior to initiation of any skin care.¹ Unrealistic expectations should be identified. Also, all skin care patients should be stratified based on their Fitzpatrick and Glogau classifications (see Appendix, P. 9).

SKIN CARE AND TREATMENT

Lotions, Potions, and Medications

Lotions (creams, moisturizers, etc) are items sought and used by most patients. They are the backbone of any skin care

regiment. Essentially, all lotions do one of three functions: they cleanse, repair, or hydrate. Various skin care lines (Obagi Medical Products, Inc, Long Beach, CA, Obagi.com; , Murad Inclusive Medical Group®, El Segundo, CA, Murad.com; etc) are commercially available with various combination of the above functions in order to address specific patient needs. Offering a skin care line in the office is an integral part of an established skin care practice. Not only does it allow the practitioner to treat various skin conditions (acne prone, oily skin, etc) with appropriate therapy, it also provides a source of financial income for the practice. Clearly, the financial gains are not anywhere close to office-based surgical procedures; however, having a skin line in the office also assists in establishing the practice as a source of cosmetic products. Patients will routinely ask for and purchase products after having a simple skin care consultation with the practitioner.

Prescribed medications also play a role in cosmetic skin care; tretinoin (Retin-A) is one of the most frequently prescribed skin care products. It compacts the stratum corneum of the epidermis, increases cell turnover, and causes neocollagen formation. Although used often in the treatment of acne, Retin-A is an excellent product for everyday use in all patients seeking skin rejuvenation.

Various concentrations of Retin-A are available; the most often used is a 0.1% ointment in a 45 gm tube. It is used on a daily basis (once a day), typically at night time, followed by application of a moisturizer. It is important to inform patients about potential fetal toxicity (i.e., do not use during

pregnancy), photosensitivity and dryness of skin during its use. In our practice, all patients are placed on Retin-A for routine skin care maintenance. Retin-A is also an excellent product to use prior to application of chemical peels or laser resurfacing; it enhances the penetration of these therapies by compacting the epidermis and allowing a faster turnover of surface epidermal cells.

Chemical Peels

There are several different types of chemical peels.² Peels can be categorized based on their depth of penetration (superficial, medium, deep), or based on their mechanism of action (keratolytics vs. protein denaturants). Both concepts are important and can certainly affect the outcome.

Peels essentially remove some components of the epidermis and dermis. Exfoliants (typically sold over the counter) simply affect the epidermis and do not penetrate deeper. Superficial peels affect the upper (papillary) dermis, medium peels go through the papillary dermis, and deep peels can affect the deep papillary and upper reticular dermis. Generally speaking, the deeper the depth of penetration of a peel, the longer the recovery period for the patient (longer sloughing, erythema, etc). Critical factors when contemplating use of chemical peels are listed in Table 2.

Keratolytic peels such as alpha hydroxyl acids (AHA) or glycolic acids are commonly used peels that disrupt the adhesions between keratinocytes (epidermal cells), thereby causing sloughing of cells and in turn stimulating new collagen formation. AHA

TABLE 2: FACTORS IN USE OF CHEMICAL PEELS

Type of peel (keratolytic vs. protein denaturant)
Number of applications (how many layers of peel placed on skin)
Duration of contact with skin (how long did the peel stay on skin)
Concentration of the chemical peel (35% vs. 50% concentration)
Pre-treatment with Retin-A
Neutralization of peel (if necessary)

peels are great “starter” peels for practitioners. AHA’s are citrus fruit acid derivatives and come in various concentrations; 35% glycolic acids are considered superficial, while higher concentrations are considered medium and deep peels. Commonly available AHA acids include glycolic acid, lactic acid, and citric acids. Jessner’s solution, named after Max Jessner, is a popular superficial peel comprised of lactic acid, salicylic acid and resorcinol (a benzene product used for acne). Again, it is important to realize that a superficial peel can penetrate much deeper if duration of skin contact or the number of layers of application are increased. Typical length of time for application of these peels range from 4 to 10 minutes.

Trichloroacetic peels (TCA, Obagi Blue) are considered protein denaturant peels; they cause coagulation and denaturation of intracellular proteins, thereby causing epidermal disruption.³ TCA’s tend to be considered as medium to deep peels; therefore, their effect is more pronounced and has a longer recovery period. Many

practitioners perform a combination therapy of pretreatment with AHA peel followed by a TCA for a more profound result. Again, TCA peels have a longer recover period and are generally more expensive than glycolic acid peels.

Deep peels can also include phenols, Baker's or Litton's solutions. These are the strongest of chemical peels and are indicated for treatment of moderate to severe photoaging. They are typically done under some level of anesthesia (sedation) and require cardiovascular monitoring since they pose an arrhythmogenic risk. As expected, recovery for phenol peels can be quite lengthy (several weeks) and chances of prolonged erythema exist.

In our practice, all patients are placed on tretinoin on a daily basis, including prior to chemical peel applications. Most commonly performed chemical peels in our office continue to be glycolic and Jessner's peels. They typically do not cause prolonged erythema, allowing the patient to return to normal daily activities in a short period of time. They are also cost effective. Glycolic acids need to be neutralized (with sodium bicarbonate) whereas Jessner's solution does not require neutralization (self neutralizes).

Prior to the actual peel, facial skin is cleansed, all make-up is removed and the peel is applied (single to multiple layers based on specific skin conditions). A timer is necessary to record length of the peel contact with the skin. Also, a hand held fan is sometime necessary to cool off the "stinging" sensation during the peel. Often times, areas of "frosting" which denote sloughing and



Figure 1. Note "frosting" of skin upon application of chemical peel.

protein coagulation are observed during the peel (Fig. 1). If necessary, the peel is then neutralized and a heavy moisturizer is applied. The patient is instructed not to use any tretinoin for a few days after the peel. Most superficial peels need to be applied in a series (usually 6 to 8 weeks apart) to obtain the best result. Patients are also encouraged to use appropriate commercial skin care products (cleansers, sunblock, etc) in between their chemical peel sessions (Fig. 2).

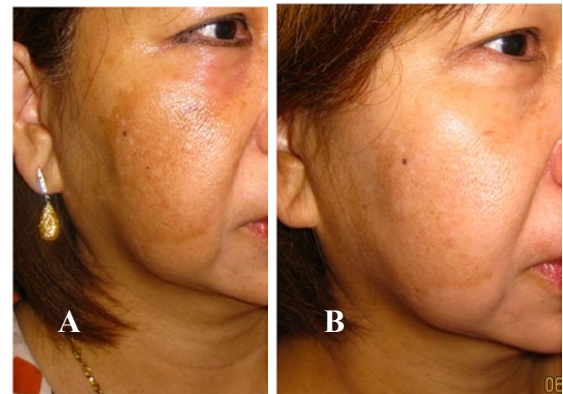


Figure 2. A. Pre- and B. Post photos following two rounds of superficial peels

Laser Resurfacing

In the spectrum of options for skin care, if superficial chemical peels and tretinoin are on one end, laser resurfacing would occupy the other end. Laser resurfacing is perhaps the most comprehensive skin care treatment available.⁴ It is indicated for a myriad of indications including moderate to severe wrinkling and photo aging, melasma and dyschromia, premalignant conditions, and acne scars and pitting. There are multiple different configurations of lasers aimed for resurfacing purposes; however the gold standard remains to be an ultrapulse, ablative carbon dioxide laser.

Resurfacing lasers correct melanocytic hypertrophy, cause epidermal turnover and stimulate a significant neo-collagen deposition. Most resurfacing lasers are used in patients with Fitzpatrick classifications of III or less; use of these lasers in darker patients may cause significant pigmentation issues, including hypopigmentation, which can be permanent.

Because lasers, similar to chemical peels, remove epidermis and portions of the dermis, it is important that the patient not have any wound healing conditions that might interfere with normal skin healing. Any condition that reduces or eliminates the pilosebaceous units of the skin, such as previous radiation therapy, long term isotretinoin (Accutane®) therapy, or recent electrolysis hair removal will interfere with healing following laser resurfacing.

Most laser resurfacing patients require pretreatment with tretinoin for several

weeks prior to the procedure to enhance the penetration of the laser. It is also customary to place the patient on broad spectrum antimicrobials (antibiotic, antiviral, antifungal) prior to the surfacing the procedure and continuing the treatment until complete epithelialization has occurred.

Most commonly used lasers for resurfacing purposes include CO₂ and Erbium-YAG (Yttrium, Aluminum, Garnet) lasers. Like all lasers, each of these two lasers has a specific wavelength (10,600 nm and 2,940 nm, respectively) and share the same chromophore target (water). Since the depth of penetration is shorter with the Erbium laser than the CO₂ laser, there is less long term erythema associated with the Erbium laser; this clearly adds to its popularity. However, as mentioned with chemical peels, the deeper the penetration of the agent (peel, laser) the greater the amount of neo-collagen formation. One of the main benefits of the CO₂ laser is its significant neocollagen formation.

Recently, fractionated resurfacing has become popular. This technology, while still eliminating the epidermis and upper dermis, creates “skip” areas on the skin where no resurfacing occurs. Similar to a polka dot pattern, a “fraction” of the skin is lasered and a “fraction” is not. The benefit of this technology is decrease in overall erythema and a quicker recovery.

As with all lasers, precautions should be taken in order to decrease peri-operative complications.⁵ Prior to the procedure, the patient should be examined for the presence of herpetic outbreaks around lips or any other active skin infection. Although pre-operative

antivirals and antibiotics should reduce the incidence of these, no resurfacing should be performed in the presence of active cutaneous infections.

Preoperative skin preparation (scrub) should be alcohol-free to decrease risk of fire in the operating room. Also, if performed under general anesthesia, it is important to use laser-safe endotracheal tubes or alternatively, one can cover the endotracheal tube with soaked towels to decrease the risk of combustion. Metallic eye shields, as opposed to plastic corneal shields, must be used to protect patient's cornea.

While performing the resurfacing, it is beneficial to laser beyond the inferior border of the mandible by approximately 1 cm to 2 cm to avoid leaving a visible line of demarcation on the face (Fig. 3). (See also *Selected Readings in Oral and Maxillofacial Surgery*, Vol. 12, #2; Vol. 20, #5) Lasering beyond the inferior border of the mandible allows the



Figure 3. Intraoperative photo of laser resurfacing. Note lasering below the inferior border of the mandible (blue line).



Figure 4. Appearance of scar before (A) and after laser resurfacing (B)

demarcation line to “hide” on the neck skin and submandibular concavity.

Laser resurfacing can also be used in the treatment of traumatic facial scars following the initial healing process. While one may not be able to laser to the exact depth of the initial scar, resurfacing an entire facial subunit will decrease irregularities of the skin so that light is reflected more evenly and the area blends in more easily with surrounding skin. (Fig. 4).

CONCLUSION

Cosmetic skin care covers an entire spectrum of options. Most patients interested



Figure 5. Typical appearance before (A) and after (B) full face laser resurfacing

in cosmetic surgery have an interest in skin care as well. Having a clear understanding of skin care and treatment modalities is imperative for surgeons wishing to offer these services to patients. Incorporating skin care into an oral and maxillofacial surgery practice can be a rewarding and fruitful endeavor; and it can certainly add to patient's and the practitioner's satisfaction (Fig. 5).

Dr. Tirbod Fattahi is an associate professor of Surgery and the interim Chair of Oral and Maxillofacial Surgery at the University of Florida Health Science Center in Jacksonville, FL. Dr. Fattahi has been at UFHSCJ since 2002. After attending dental school, he completed medical school as well as his residency in oral and maxillofacial surgery at the University of Kentucky Chandler Medical Center in Lexington, KY. Upon finishing his residency, he enrolled into a one year facial aesthetic surgery fellowship under the guidance of Dr. T. Williams Evans in Columbus, OH. Dr. Fattahi's practice currently includes management of facial trauma, orthognathic surgery, as well as facial aesthetic surgery. His training in facial aesthetic surgery following his residency has allowed him the opportunity to establish an aesthetic surgery practice while at the university setting.

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APPENDIX: FITZPATRIC AND GLOGAU SKIN CLASSIFICATION.

FITZPATRIC SKIN TYPE CLASSIFICATION		
Type	Color	Reaction to year's first sun exposure
I	White	Always burn/never tan
II	White	Usually burn/never tan
III	White	Sometimes mild burn/ tan average
IV	Medium Brown	Rarely burn/ tan with ease
V	Dark Brown	Rarely burn/ tan very easily
VI	Black	Never burn/ tan very easily

GLOGAU SKIN PHOTO AGING CLASSIFICATION				
Group	Classification	Typical Age	Description	Skin Characteristics
I	Mild	28 - 35	No wrinkles	Early photo aging: mild pigment changes, no keratosis, minimal wrinkles, minimal or no make-up
II	Moderate	35 - 50	Wrinkles in motion	Early to moderate phot aging: early brown spots visible, keatosis palpable but not visible, parrallel smile lines begin to appear, wears some foundation
III	Advanced	50 - 65	Wrinkles at rest	Advanced photo aging: obvious discoloration, visible capillaries, visible keratosis, wears heavier foundation
IV	Severe	60 & up	Only wrinkles	Severe photo aging: yellow/grey skin color, prior skin malignancies, wrinkles throughout, no normal skin, cannot wear make-up because it craks and cakes

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