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CHEMICAL PEELINGS – WHEN AND WHY?

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SUMMARY – Chemical peels are growing in popularity with new agents, formulas and methods giving them greater reliability and safety. Although the operative procedure may seem relatively simple, proper knowledge and skills of the physician and education of the patient is crucial. It is very important for the physician to know chemical structure of the peels, level of necrosis they make in the skin, indications, absolute and relative contraindications, side effects and complications. It is also very important to evaluate the patients, their needs and their expectations, and to present them objective possibilities of the procedure. In chemical peels and their efficacy, preoperative and postoperative care plays an important role, which is out of the reach of the physician and therefore should be emphasized in consultation with the patient.

Key words: *chemical peels, aesthetic medicine, anti-aging*

Introduction

Chemical peeling, according to historical data, was first practiced in ancient Egypt, where people used chemexfoliation methods to rejuvenate skin. The original chemexfoliant was lactic acid, an active ingredient of sour milk that was used topically by the nobles as part of an ancient skin rejuvenation regimen. In ancient Rome, old wine with tartaric acid as its active ingredient was used for the same purpose. Today, these historical chemexfoliants are known to contain alpha hydroxy acids. Modern chemical peeling was originally promoted by dermatologists such as P.G. Unna, who first described the properties of salicylic acid, resorcinol, phenol, and trichloroacetic acid (TCA). Slowly, the early practitioners of chemical peels began to develop other peeling agents for varying depths of penetration. In the 1960s, Baker and Gordon developed a deep peeling agent, which was able to smooth deeper furrows, especially around the mouth[1].

Chemical peeling is accelerated exfoliation or skin damage induced by caustic agents that cause controlled damage, resulting in thickening of the epidermis, deposition of collagen, reorganization of structural elements, and increase in dermal volume. This process decreases solar elastosis. The result is an improved clinical appearance of the skin, with fewer rhytides and decreased pigmentary dyschromia[2,3].

Chemical peelings can be divided into three categories. According to the histological level of necrosis, they cause[4]:

1. very superficial (exfoliation) – destruction of stratum corneum without creating a wound below the stratum granulosum;
2. superficial (epidermal) – destruction of part of or all epidermis; anywhere from stratum granulosom to basal layer;
3. medium (papillary, dermal) – destruction of epidermis and part of dermis (to upper reticular dermis); and
4. deep (reticular dermis) – destruction of epidermis and dermis (into reticular dermis).

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This classification helps predict which skin abnormalities will be corrected by a particular chemical peeling according to the histological level of peel.

The most commonly used superficial, medium and deep peelings are[5]:

1. very superficial – glycolic acid 30%-50% (applied for 1 to 2 min), Jessner solution (applied in 1 or 2 coats), low concentration resorcinol (20%-30%) applied briefly, TCA 10% (applied in 1 coat)
2. superficial peels - resorcinol, 40%-50% applied for 30 to 60 minutes; and TCA, 10%-30%.
3. Medium-depth agents include the following: glycolic acid 70% applied for a variable time (3 to 30 minutes); TCA, 35%-50%; and augmented TCA (carbon dioxide plus TCA 35%; Jessner solution plus TCA 35%; glycolic acid 70% plus TCA 35%)[6].
4. Deep agents include the following: phenol 88% and Baker-Gordon phenol formula[7].

Healing Process

The healing process after a chemical peel must be as rapid as possible to avoid infections that may deepen the wounds, extending the peel from superficial to deep, with an increased risk of scarring.

Production of controlled chemical burns of the epidermis and/or dermis results in exfoliation. The first phases of this process must be understood well to control the depth of penetration of chemical peelings.

Phases are as follows:

1. Development of diffuse homogeneous erythema indicates epidermal penetration.
2. Development of white frost indicates coagulative necrosis of the papillary dermis.
3. Development of gray-white frost indicates coagulative necrosis of the reticular dermis.

Evaluation of the patient by the clinician is necessary to determine appropriate treatment based on dermal defect. When evaluating the patient before the peel, extensive history should be taken. If it is determined that chemical peel is warranted, appropriate agent is chosen based on the patient's Fitzpatrick skin type and Glogau photoaging group, as well as other variables that may affect peel penetration. The patient should be educated about the chemical peel process and give a signed consent in case of medium or deep peel. The patient has to be questioned about his/her general health status, medications (e.g., oral isotretinoin), smoking, previous cosmetic procedures (e.g., surgical lifts, fluid silicone injections), recurrent herpetic outbreaks, and keloid formation.

Indications for chemical peel

Pigmentary disorders

- Melasma
- Postinflammatory hyperpigmentation
- Freckles
- Lentigines
- Facial melanoses

Acne

- Superficial acne scars
- Postacne pigmentation
- Comedonal acne
- Acne excoriée
- Acne vulgaris – mild to moderate acne

Aesthetic

- Photoaging
- Fine superficial wrinkling
- Dilated pores
- Superficial scars

Epidermal growths

- Seborrheic keratoses
- Actinic keratoses
- Warts
- Milia
- Sebaceous hyperplasia
- Dermatosis papulosa nigra

Relative contraindications

Relative contraindications are determined by the patient's skin type and the defect being treated. To optimize the procedure, some classifications are very useful, such as Fitzpatrick and Glogau photoaging classifications. Fitzpatrick skin typing is graded 1-6, with the first 3 skin types being white skin with a progressively more active response to tanning[8]. Type 4 is light-brown skin, and type 5 is dark brown skin. Type 6 skin never tans and is essentially black skin with an

equivalent sun protective factor (SPF) of 8. Fitzpatrick skin types 5 and 6 are usually not ideal candidates for medium and deep peels. The best candidates are the light skin types 1, 2 and 3, which are at a lower risk of complications such as pigment dyschromia and scarring. Although skin types 5 and 6 are not ideal for peels, they can be peeled using superficial agents such as salicylic acid or glycolic acid. Glogau photoaging classification is a visual grading system used to quantify photodamage[9]. Patients with photoaging type I are not good candidates for deep peeling because the peel may be more damaging than beneficial, while a superficial peel would be more efficacious. Patients with type IV photodamage may benefit from deep peeling, while a superficial peel may not make much of a difference. Patients with skin types II and III ordinarily benefit from superficial or medium-depth peels, depending on the exact circumstances of the patient. Other variables should also be considered, including the Fitzpatrick skin type, when determining which peeling agent to use.

Absolute Contraindications

- Active bacterial, viral, fungal, or herpetic infection
- Open wounds
- History of drugs with photosensitizing potential
- Preexisting inflammatory dermatoses (e.g., psoriasis, atopic dermatitis)
- Uncooperative patient (patient is careless about sun exposure or application of medicine)
- Patient with unrealistic expectations
- For medium-depth and deep peels, history of abnormal scarring, keloids, atrophic skin, or isotretinoin use in the last 6 months[10].

Instructions and Consent

A detailed consent form listing details about the procedure and possible complications should be signed by the patient[11]. The consent form should specifically state the limitations of the procedure and should clearly mention if more procedures are needed for proper results. The patient should be provided with an opportunity to seek information through brochures, presentations, and personal discussions. The need of postoperative medical therapy should be emphasized[12]. Following the peel, the patient must follow the instructions given by the physician to prevent complications. If possible, the patient should stay out of the sun; when unavoidable, the patient should apply a strong sunscreen and wear a hat. An ointment such as petroleum jelly or bacitracin should be applied to the involved skin. The patient should be made aware that the skin will exfoliate and may look cosmetically unattractive for a period of time, depending on the depth of the peel. For superficial peels, a follow-up appointment can be scheduled at the time of the next peel. For deeper peels, patients should be seen 2-3 times a week following the peel to provide for early intervention if problems develop. The patient should be instructed to remain vigilant for signs of infection. If the patient has a history of cold sores, treating the patient with acyclovir (400 mg PO bid) or an equivalent antiviral therapy, is mandatory.

Complications

Scarring remains the most dreaded complication of chemical peels. The contributing factors are not well understood. By matching the patient and peeling agent properly, the risk of scarring can be decreased. In addition, to further decrease the risk of scarring, the patient should be advised to refrain from picking at the healing skin. Pigmentary changes are not uncommon complication, especially with deeper peeling agents. Patients with lighter complexion have a lower risk of hyperpigmentation, but genetic factors play an important role. A combination of hydroquinone and tretinoin cream (Kligman formulation) before a superficial or medium-depth peel and early introduction of this preparation after deep peels reduces the rate of this complication[13]. Infections are relatively uncommon. Herpes simplex infection can be prevented with acyclovir (400 mg PO bid), beginning 2 days prior to the peel and continuing for 7 days after it. The most important potential complication of deep peels is cardiotoxicity[14]. The complications also include prolonged erythema (longer than 90 days) that can be cured with local application of corticosteroids, acne that usually develops between days 3 and 9, and milia that usually appear 2-3 weeks after re-epithelialization.

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Sažetak

KEMIJSKI PILINZI – KADA I ZAŠTO?

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Kemijski pilinzi zauzimaju sve značajnije mjesto u estetskoj kozmetologiji. Velikom zanimanju za ove zahvate doprinosi visoka učinkovitost, relativna jednostavnost postupka, dostupnost, relativno malo nuspojava i komplikacija. Kako bi se postigao što bolji učinak kemijskog pilinga potrebna je obostrana angažiranost klijenta i liječnika. Liječnik treba znati sve o kemijskoj podlozi pilinga, stupnju nekroze koji pojedini piling izaziva u koži, indikacijama i kontraindikacijama te nuspojavama i komplikacijama. Prilikom prijeoperacijskih konzultacija važno je dobro procijenti klijenta, ne samo vrstu njegove kože već i njegova očekivanja od samoga postuka te ga upoznati s objektivnim mogućnostima istoga. Također je važno naglasiti i značenje prijeoperacijske i poslijeoperacijske njege, što je isključivo u rukama klijenta.

Ključne riječi: *kemijski pilinzi, estetska medicina, antiaging*