

Combination Salicylic Acid/ TCA Chemical Peeling

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Pearl E. Grimes

The author has no financial interest in any of the products or equipment mentioned in this chapter.

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10.1 History

In 2002, Grimes reported the efficacy of combination salicylic acid/TCA 10% peeling [1]. She treated patients with moderate to severe melasma with this combination regimen. In the series, nine patients were classified as Fitzpatrick skin type IV, eleven were skin type V, and seven were skin type VI. Many of the subjects included in the study had not responded to salicylic acid or glycolic acid peels. The concentration of salicylic acid was 20 and 30%, and the TCA concentration was 10%. A series of four peels was performed at 2-week intervals. Thirty percent of the patients experienced moderate improve-

ment, and 70% experienced significant improvement in hyperpigmentation. Sixteen percent had minimal to mild side effects, which cleared within 1 week. The results of the study suggested that the combination peel is safe and efficacious for treatment of moderate and severe melasma in darker racial ethnic groups. The peel has since been used successfully in all skin types. Swinehart pretreated a series of patients with lentiginos, pigmented keratoses and actinic damage of the dorsal hands with TCA 20% prior to application of a 50% salicylic acid paste [2]. He reported excellent results.

10.2 Chemical Background/Properties

Salicylic acid (ortho hydroxybenzoic acid) is a beta hydroxy acid agent. It is a lipophilic compound which produces desquamation of the stratum corneum via removal of intercellular lipids [3] (see salicylic acid section). Given its keratolytic effects, it has become an increasingly popular superficial peeling agent. Salicylic acid peels induce injury via thinning or removal of the stratum corneum. In addition, salicylic acid potentially enhances the penetration of TCA.

Trichloroacetic Acid (TCA) causes precipitation of proteins and coagulative necrosis of epidermal cells [4]. The extent of damage is indeed concentration dependent. Concentrations range from 10 to 50%. Superficial TCA peeling is induced by concentrations of 10–30% whereas higher concentrations cause medium depth or deep peeling. The combination of salicylic acid followed by TCA 10–15% induces superficial wounding.

10.3 Formulations

Ethanol formulations of salicylic acid (20 and 30%) are used for combination peeling (see salicylic acid section). Trichloroacetic acid is prepared as an aqueous solution, since ethanol solutions do not penetrate the skin. It is prepared by mixing the appropriate concentration of crystals with up to 100 cc of distilled water. Ten and fifteen percent TCA is prepared by mixing 10 or 15 g of crystals in up to 100 cc of total volume, respectively. Aqueous solutions of TCA remain stable for up to 6 months unless contaminated. Other methods have been used to formulate TCA peeling solutions; however, the weight/volume methods appear to be the most reliable formulation [5]. Premixed TCA solutions are available from a variety of medical

suppliers (Delasco, Council Bluffs, IA; Moore Medical, New Britain, CT).

10.4 Indications

Despite the benefits of superficial peeling agents such as glycolic acid or salicylic acid, it is not uncommon to observe treatment failures. Some patients may require a more aggressive peeling regimen while minimizing the risk of side effects such as hyperpigmentation or hypopigmentation (Table 10.1). While TCA remains the gold standard of peeling agents, it is maximally efficacious in Fitzpatrick's skin types I-III [6]. In darker skin types, even TCA 15 or 20% can be fraught with post-peel complications. The combination of salicylic acid 20/30% and low-

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Fig. 10.1. a African American male with severe post-inflammatory hyperpigmentation. b Note significant improvement after combination salicylic acid/TCA peeling

Table 10.1 Indications for salicylic acid/TCA peeling

Hyperpigmentation
Melasma
Post-inflammatory hyperpigmentation
Solar lentigines
Photodamage
Acne
Texturally rough skin

strength TCA peeling produces additional efficacy compared with salicylic acid peels or TCA 10% peels, while minimizing complications reported with higher concentrations of TCA or glycolic acid, particularly in darker racial ethnic groups (Figs. 10.1a, b and 10.2a, b).

The combination of salicylic acid and TCA 15% is also an effective treatment for mild to moderate photodamage, acne and melasma in types I–III. Moderate to excellent improvement has been observed (Figs. 10.3a, b, 10.4a, b and 10.5a, b). Hence, the combination salicylic acid/TCA peeling protocol can be used in all skin types.

10.5 Contraindications

There are few contraindications to combination salicylic acid/TCA peeling. The combination regimen is tolerated in all skin types and all racial/ethnic groups. General contraindications include salicylate hypersensitivity; unrealistic patient expectations; active inflammation/der-



Fig. 10.2. **a** Patient with recalcitrant melasma unresponsive to glycolic acid or salicylic acid peels. **b** Responded to combination salicylic acid/TCA peeling

Fig. 10.3. **a** Patient with photodamage of the chest. **b** Note significant improvement after combination salicylic acid/TCA peel



matitis of the site to be peeled; acute viral infection; pregnancy; isotretinoin therapy within 6 months of peeling; or history of poor or delayed wound healing. Having peeled more than 1,000

patients with salicylic acid, the author has observed no cases of salicylate hypersensitivity from topical peeling.



Fig. 10.4. a Facial melasma in skin type III. b Note significant improvement after combination salicylic acid/TCA peel

10.6 Peeling Preparations

A detailed history and cutaneous examination is performed in all patients prior to chemical peeling. The peeling procedure should be explained in depth to the patient including a discussion of the benefits, as well as the risks of the procedure. In addition, standardized photographs are taken of the areas to be peeled, including full frontal and lateral views.

The author has never observed a flare of Herpes following a superficial chemical peel. Hence, pretreatment with antiviral therapy is

usually not indicated. However, one can prophylactically treat with antiviral therapies including valacyclovir 500 mg bid, famciclovir 500 mg bid or Acyclovir 400 mg bid for 7–10 days beginning 1 or 2 days prior to the procedure.

Use of topical retinoids (tretinoin, tazarotene, retinol formulations) for 2 to 6 weeks prior to peeling thins the stratum corneum, reduces the content of epidermal melanin, and expedites epidermal healing. Retinoids also enhance the penetration of the peeling agent. They should be discontinued several days prior to the peeling procedure. Retinoids can be resumed post-operatively after all evidence of



Fig. 10.5. **a** Patient with facial melasma. **b** Note improvement after combination salicylic acid/TCA peel

peeling and irritation subsides. When treating conditions such as melasma, post-inflammatory hyperpigmentation, and acne, as well as darker skin types, retinoids should be discontinued one or two weeks before peeling to avoid post-peel complications, such as excessive erythema, desquamation, and post inflammatory hyperpigmentation. The skin is usually prepped for two to four weeks with a formulation of hydroquinone 4% or higher compounded formulations (5–10%) to reduce epidermal melanin. Other topical bleaching agents include azelaic acid, kojic acid, arbutin, and licorice (see photoaging section). Patients can also resume use of topical bleaching agents post operatively after peeling and irritation subsides [7, 8].

10.7 Peeling Technique

After thorough cleansing of the face with alcohol and acetone, two or three coats of salicylic acid (20 or 30%) are applied to the entire face with a 2 × 2 wedge sponge, 2 × 2 gauze sponges, or cotton tipped applicators for 3–5 min. Typically, the cheeks are treated first, applying the peel from medial to lateral areas, followed by application to the chin and forehead. Most patients experience some mild burning and stinging during the procedure. Some patients experience a sensation of peel-related facial anesthesia. Portable hand-held fanning during the procedure substantially mitigates the sensation of burning and stinging.

A white precipitate which represents crystallization of the salicylic acid begins to form at 30 s to 1 min following peel application. This should not be confused with frosting or whitening of the skin, which represents protein agglutination. After 3–5 min the face is thoroughly rinsed with tap water to remove salicylic acid crystals. The face is gently blotted to remove excess water. When treating hyperpigmentation, TCA 10 or 15% is then applied to the areas of hyperpigmentation with a cotton-tipped swab for 2–3 min, producing minimal (Level 1) or no (Level 0) frosting. The face is again rinsed with tap water. If treating photodamage, acne, or texturally rough skin, TCA is applied to the entire face. This protocol usually involves a regimen of two or three combination peels performed at 2- to 4-week intervals.

10.8 Post-peeling Care and Complications

Bland, non-irritating moisturizers and cleansers are used after peeling until all desquamation and/or erythema subsides. Crusting, desquamation, or erythema can be treated with low to high potency steroids for 7–10 days. Given the depth of peeling, the author has observed no cases of scarring or persistent post-peel hyperpigmentation. Any residual post-inflammatory hyperpigmentation has responded to treatment with either hydroquinone 4% or higher strength formulations (5–10%)

10.9 Advantages

The advantages of combination salicylic acid/TCA peeling include:

- Efficacy in all skin types
- Well tolerated in darker racial/ethnic groups
- Most beneficial in treating recalcitrant melasma and post-inflammatory hyperpigmentation

10.10 Disadvantages

- Increased depth of superficial peeling
- Increased desquamation in some patients lasting up to 7–10 days
- Post-inflammatory hyperpigmentation more common than with salicylic acid peeling

10.11 Side Effects

As with salicylic acid peeling, the incidence of side effects is usually low. However, given the combination effects, erythema and desquamation can last longer than the usual changes observed with salicylic acid peels or TCA 10%. In a larger series of 50 patients treated by the author with combination peeling, six patients exhibited mild post-inflammatory hyperpigmentation which resolved within 1–2 weeks after the use of mid to high potency topical steroids.

10.12 Patient's Informed Consent

I, _____, hereby consent to having my _____ (site) treated with CHEMICAL PEELING USING A COMBINATION SALICYLIC ACID 20 AND 30% AND TRICHLOROACETIC ACID 10 OR 15%. The peeling procedure can improve dark spots (hyperpigmentation), photodamage (sun damage), textural roughness, acne, tone, and the overall appearance of the treated area. This combination peeling agent will cause shedding of the outermost layers of the skin. There may or may not be visible peeling. The procedure involves first having the peel site prepped with alcohol, acetone or other pre-peel cleansing agents. The salicylic acid peeling agent is applied first, followed by application of the trichloroacetic acid. The area is rinsed and blotted dry.

You may experience redness, crusting, and flaking of the skin. The effects could possibly

last for 1–2 weeks. In general, the combination salicylic acid/Trichloroacetic acid peel is extremely well tolerated.

I understand that there is a small risk of developing permanent darkening or undesirable pigment loss at the treated site. There is a rare chance that a scar could develop. There is a small risk that a bacterial infection could develop. There is a small chance the peel could also trigger a flare of a pre-existing Herpes infection at the treated site. There is a small chance that the condition being treated could worsen after the peeling procedure. The benefits and side effects of the procedure have been explained to me in detail. All of my questions have been answered.

- I am in stable health.
- I have not used Isotretinoin in the past 6 months.
- I have no allergies to salicylic acid, or trichloroacetic acid.
- I am not pregnant.

Outcomes are not guaranteed.

Signature of Patient

Date

Patient Name (Please Print)

Witness

Date

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Part III

How to Choose the Best Peeling for the Patient

