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Step by Step® TREATMENT OF ACNE SCARS

Niti Khunger

Step by Step®

2nd Edition

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CHAPTER

6 Chemical Peels

Niti Khunger

IN A NUTSHELL

- Chemical peels are useful for erythematous and hyperpigmented macular acne scars, acne excoriée, and atrophic mild superficial scars.
- Additive improvement occurs when they are combined with other procedures such as subcision, microneedling, and chemical reconstruction of skin scars technique.
- They are a useful adjunct when patient has active acne, photodamage, and postinflammatory hyperpigmentation.
- Salicylic acid, mandelic acid, glycolic acid, Jessner's solution, and trichloroacetic acid are most frequently used, singly or as combination peels.

INTRODUCTION

Traditionally, medium-depth and deep peels were carried out for the treatment of acne scars. Trichloroacetic acid (TCA) and phenol were the common agents used.[1] However, medium-depth and deep peels carry a higher risk of complications, particularly in darker skins, and they have been largely supplanted by fractional lasers. Still, repeated superficial chemical peels can play an active role in the treatment of persistent macular hyperpigmented and erythematous lesions and superficial acne scars, particularly in darker skin types. An advantage is that superficial peels can be utilized for mild

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acne scars and additionally help to improve pigmentary dyschromias, photoaging, and the texture of the skin.

PRINCIPLE

Superficial chemical peels ablate the epidermis only. This is followed by epidermal regeneration and collagen formation in the dermis. The exfoliating effects and the increased epidermal turnover explain their efficacy on macular scars. Because they are mildly potent, repeated treatments are required to obtain the desired effects. They are predominantly useful in hyperpigmented and erythematous macular lesions and mild atrophic rolling and boxcar scars. Medium-depth chemical peels extend to the papillary dermis. The inflammatory reaction has stimulatory effects on fibroblasts resulting in new collagen formation. This explains their efficacy on atrophic scars.

INDICATIONS

- Macular erythematous acne scars
- Hyperpigmented acne scars
- Acne excoriée
- Atrophic mild superficial scars.

For atrophic scars, better results are obtained if they are combined with subcision. The subcision is done first, followed by the chemical peel. An advantage of chemical peeling is that it can be used when patient has active acne, particularly comedones and inflammatory papules, and pustules. It also leads to improvement of skin texture and pigmentation **(Figs. 1 and 2)**.

CONTRAINDICATIONS

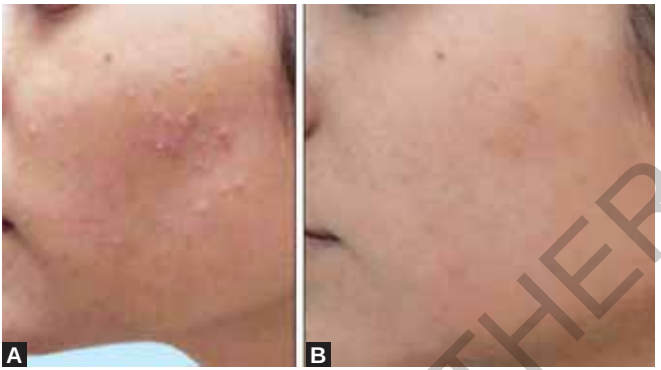
- *Active herpes simplex*: It is safer to treat the herpes simplex with antivirals and then do the peels under the cover of prophylactic antivirals starting 2 days prior to the procedure and continuing for a week after the peel **(Fig. 3)**.

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Figs. 1A and B: Improvement of active acne and macular acne scars. (A) Using a combination; (B) Peel containing acetic acid, salicylic acid, jasmonic acid, citric acid, and lactic acid as monotherapy at weekly intervals after three peels (Black peel® Theraderm, Korea).



Figs. 2A and B: Improvement of active acne and improvement in pigmentation and texture following mandelic acid peels 50% at weekly intervals after six peels.



Fig. 3: Active herpes simplex with acne. Peeling should be postponed.

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- *Viral warts or molluscum contagiosum* on the area to be peeled. These should first be treated.
- *Open wounds on the peeling area*: These can lead to increased penetration of the peel followed by scarring.

- *History of taking photosensitive drugs*: Chemical peels should be performed with caution in patients on photosensitive drugs, particularly doxycycline and minocycline, as they can lead to greater and persistent erythema, followed by postinflammatory hyperpigmentation (PIH).
- *History of hypertrophic scars and keloids*: Medium-depth and deep peels should be avoided, while superficial peels may be performed with caution.
- *Isotretinoin use in the last 6 months*: This is a contraindication only in patients who require deep peels. Superficial peels can be safely done.
- *Uncooperative patient*: Patients who do not apply the sunscreen and medications as frequently as prescribed or are careless about sun exposure should be cautiously taken up for chemical peels. They have higher chances of pigmentary complications, which can worsen the clinical condition.
- *Timing of the peel*: Peeling should not be done immediately before an important event as an unexpected reaction can lead to a very angry patient.
- *Patient with unrealistic expectations*: Superficial chemical peels are useful only for macular and mild superficial atrophic acne scars. They are not useful for deeper ice pick and boxcar scars or in a patient with extensive atrophy.

All these are relative contraindications and it implies that peels may be done following all precautions and the patients must be warned of the higher risk of complications. Adequate instructions should be given to patients to follow all the instructions provided.

Choosing the Peeling Agents

A wide variety of peeling agents have been used for acne scars:

- Salicylic acid—20–30%
- Mandelic acid—40–50%

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- Lactic acid—90%
- Glycolic acid—35–70%
- Modified Jessner's solution—14% salicylic, 14% lactic, and 14% citric acid
- TCA—15–35%
- Pyruvic acid—40–60%
- Combination peels.

Salicylic and mandelic acid are the peeling agents of choice in macular and superficial acne scars.[2] The advantage of these two peeling agents is that they can also be used in the presence of active acne lesions. They are particularly useful for hyperpigmented scars and are safe for darker skin types. A combination peel, salicylic and mandelic acid peel (SMP), is widely used for active acne and superficial acne scars. A study that compared glycolic acid 70% with the combination SMP reported a modest 13.2% improvement in ice pick scars with SMP versus 10.4% with glycolic acid. The boxcar scars improved by approximately 20%, while the rolling scars showed no improvement.[3] There was no statistically significant difference between the two peels, but SMP had fewer adverse effects and was better for treating acne and hyperpigmentation.

Lactic acid is safe during pregnancy and low concentrations are safer for sensitive skins. A study utilizing full strength 92% lactic acid in seven patients with Fitzpatrick skin type IV–V reported significant improvement (>75% clearance of lesions) in one patient (14.28%), good improvement (51–75% clearance) in three patients (42.84%), moderate improvement (26–50% clearance) in two patients (28.57%), and mild improvement (1–25% clearance) in one patient (14.28%).[4]

Glycolic acid, TCA, and pyruvic acid are more aggressive peeling agents and can reach a greater depth in the dermis. A study comparing serial glycolic acid peels with increasing concentration from 20 to 70% with topical glycolic acid cream 15% reported significantly better results with glycolic acid peels as compared to the home regimen.[5] At least six peeling sessions

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were required to obtain a significant response. Glycolic acid is a good peeling agent if there are many comedones. However, there may be an initial flare due to comedolysis. Patient should be counseled regarding this.

Sequential peels increase the depth of peels, and are reported to be safe in darker skins. A study utilized a sequential peel with Jessner's solution followed by 35% TCA.[6] The Jessner's solution was applied in 2–3 coats first till frosting occurred.[6] Following this, 35% TCA was applied over the same areas in three consecutive layers, 2 minutes apart, till a complete frost occurred, which took about 3–4 minutes.[6] The uniform frost indicates an upper reticular dermis peel. From the second peeling session onward, 50% TCA was used to treat the edges of deeper scars, followed by the standard 35% TCA application to the remainder of the treatment areas. Significant improvement was seen only in one patient (6.6%), moderate improvement in six patients (50%), mild improvement in three patients (25%), minimal improvement in one patient (8.3%), and no response in one patient. Hence, chemical peels are not very effective for deeper acne scars, and also carry a higher risk of pigmentary changes. A modified phenol peel, Exoderm®, has also been used in Asian patients with acne scars.[7] Though an improvement was observed in 7 out of 11 patients (64%), PIH was observed in 74%, and 1 patient developed persistent hypopigmentation. Hence, phenol peels are better avoided in darker skin types, besides the risk of cardiac arrhythmias. The newer combination peels have multiple modes of action and have a wide margin of safety, though they may require more sessions and may be only moderately effective.

LIMITATIONS

Superficial chemical peels cannot be utilized for deep scarring that extends beyond the papillary dermis, such as ice pick scars and deep boxcar scars. Medium-depth and deep peels

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that were previously extensively used for deep acne scars are now best avoided in darker skins. Microneedling and fractional lasers are better alternatives.

The chemical reconstruction of skin scars (CROSS) technique using 65–100% TCA is a modified form of a chemical peel used for ice pick scars. It is a focal deep chemical peel and is effective in all skin types. For details, see Chapter 7.

PRECAUTIONS

The patient should be primed with skin lightening agents such as hydroquinone 2–4%, tretinoin 0.025%, or adapalene at least 2–4 weeks before the procedure. Triple combination creams containing steroids should be strictly avoided as it can lead to aggravation of acne. The peeling agent should be chosen with care as there can be aggravation of acne and PIH with aggressive treatments. Sun exposure should be avoided and sunscreens should be regularly applied. A gel-based noncomedogenic or aqueous sunscreen is preferred.

PREPROCEDURE PREPARATION

Priming is very important and should be done at least 2 weeks before peeling. Photoprotection along with sunscreens and skin lightening agents containing hydroquinone, azelaic acid, kojic acid, and tretinoin or adapalene should be used. Antivirals should be given 2 days prior in patients with history of herpes simplex.

TECHNIQUE

- Ensure that the patient has been adequately counseled and primed.
- Take informed consent and adequate photographs.
- Contact lenses should be removed before the peel.

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Salient Features

- A practical and illustrated guide to the management of acne scars
- Step-by-step easy approach to learning new techniques
- Defines the art and skill of combining various techniques such as subcision, microneedling, and CROSS technique with fractional lasers to optimize results
- Highlights the management of complications that can occur in darker skins
- Text is enhanced by numerous photographs to give a clear picture
- Interesting case discussions with pertinent management issues along with some recent advances in diagnostics and therapeutics pertaining to the clinical entity
- Useful for dermatosurgeons, plastic surgeons and esthetic surgeons dealing with scars.

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Areas of interest include developing innovative and cost-effective solutions to common problems, particularly in vitiligo, acne and acne surgery, pigmentary disorders, chemical peels, scar revision techniques, skin rejuvenation and sclerotherapy.

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