

Chemical Peels for the Prevention and Treatment of NMSC: An Overview for Patients

Zaim Haq

What are Chemical Peels?

Chemical peels are a skin treatment where a chemical solution is applied to remove the top layers of skin. This treatment is used to address various skin concerns, including fine lines, acne scars, uneven skin tone, and for the prevention of certain types of skin cancer, particularly non-melanoma skin cancer (NMSC). They are particularly effective for treating actinic keratoses (AK), which are rough, scaly patches that can develop into squamous cell carcinoma (SCC). By removing these precancerous cells, chemical peels can prevent their progression to cancer.

The process involves applying a chemical solution to the skin, causing it to exfoliate and eventually peel off. The new skin underneath is usually smoother and less wrinkled. Different types of acids are used for various depths of peels, such as glycolic acid, trichloroacetic acid (TCA), salicylic acid, lactic acid, or phenol. The depth of the peel can be superficial, medium, or deep, affecting the epidermis and portions of the dermis to varying degrees^{1,2}.

Chemical Peels for Skin Cancer Treatment

Chemical peels can be an effective treatment for actinic keratoses, which are precursors to squamous cell carcinoma (SCC). By removing the outer layers of skin where precancerous cells are located, they reduce the risk of these cells turning into cancer. This makes chemical peels a less invasive option compared to surgery. However, for more invasive NMSCs, more aggressive treatments like surgery or radiation are needed^{1,3}.

Mechanism of Action

Chemical peels work by applying a chemical solution to the skin, causing controlled damage to the outer layers and promoting exfoliation and the eventual removal of damaged skin. This process stimulates the skin's natural healing mechanisms, leading to increased cell turnover and collagen production, resulting in healthier, rejuvenated skin. When the chemical solution, such as glycolic acid, salicylic acid, or trichloroacetic acid (TCA), is applied, it penetrates the skin to varying depths depending on the type and concentration of the peel, dissolving the bonds between dead skin cells and allowing them to be shed more easily. By removing these outer layers, chemical peels promote the regeneration of new skin cells, replacing the old, damaged cells with new, healthier ones, which leads to smoother and more even-toned skin^{1,4}.

Types of Chemical Peels Used for NMSC

1. Superficial Peels: Use mild acids like alpha-hydroxy acid to gently exfoliate. Only the outermost layer of skin is removed. These peels are generally used for actinic keratoses and other superficial lesions^{1, 5}.
2. Medium Peels: Use trichloroacetic acid (TCA) to reach the middle and outer layers of the skin. They are more effective for deeper precancerous lesions^{1, 5}.
3. Deep Peels: Use phenol to penetrate the skin deeply, which is used for more severe damage and extensive actinic keratoses. Deep peels offer more dramatic results but require a longer recovery time^{1, 5}.

Efficacy and Outcomes

Chemical peels, especially those using trichloroacetic acid (TCA), have been previously shown to be effective at reducing the number of AKs by up to 75% at 12 months. In a study where one side of the face was treated with TCA and the other with 5% fluorouracil (FU), both treatments prevented lesion recurrence for at least a year, with TCA having fewer side effects. Another five-year study compared TCA peels with FU and laser treatments, finding all three methods equally good at reducing AKs, but with a lower rate of new skin cancers in the TCA group. These results suggest that chemical peels are a strong short-term solution for treating AKs and lowering skin cancer risk^{1, 2}.

Safety and Side Effects

While chemical peels are generally safe, they can cause side effects, particularly when deeper peels are used. Common side effects include redness, swelling, changes in skin color, and scarring. Despite their benefits, concerns about the safety of chemical peels persist, especially regarding potential toxicity. Some studies have linked certain peeling agents, such as trichloroacetic acid (TCA), to cancer in animals. However, no definitive evidence has shown that TCA or other peeling agents cause cancer in humans. Most research indicates that the risk of systemic toxicity from chemical peels is low, especially when used under professional supervision^{1, 4}.

Chemical Peels for the Prevention of NMSC

Chemical peels offer a viable option for the treatment and prevention of non-melanoma skin cancers. By removing precancerous cells and promoting the growth of healthy skin, chemical peels can significantly reduce the risk of skin cancer progression. As part of a comprehensive skin cancer prevention strategy, chemical peels can complement traditional methods, providing patients with a proactive approach to maintaining skin health.

References

1. Sidiropoulou P, Gregoriou S, Rigopoulos D, Kontochristopoulos G. Chemical Peels in Skin Cancer: A Review. *J Clin Aesthet Dermatol*. 2020;13(2):53-57.
2. Jiang AJ, Soon SL, Rullan P, Brody HJ, Monheit GD, Lee KC. Chemical Peels as Field Therapy for Actinic Keratoses: A Systematic Review. *Dermatol Surg*. 2021;47(10):1343-1346. doi:10.1097/DSS.0000000000003144
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5. Soleymani T, Lanoue J, Rahman Z. A Practical Approach to Chemical Peels: A Review of Fundamentals and Step-by-step Algorithmic Protocol for Treatment. *J Clin Aesthet Dermatol*. 2018;11(8):21-28.

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References

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