Chemical Peels for Darker Skin Types

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KEYWORDS

- Chemical peel • Acne scars
- Postinflammatory hyperpigmentation
- Chemabrasion • Multimodal treatment

This article focuses on chemical peels for darker skin types. All races comprise a range of Fitzpatrick skin color types (**Table 1**)[1]: light skin types III and IV in African Americans, Asians, Middle Easterners, and Latinos and dark skin type IV in whites. With the focus on Fitzgerald skin types IV to VI, the article discusses chemical peels, providing current information on types of peels, detailed techniques, preoperative and postoperative care, complications, hazards, and nuances of management. When evaluating a patient for a skin-resurfacing procedure, it is often inaccurately assumed that race and ethnicity equate with skin color. This rainbow of skin tones within any race erodes the notion that all nonwhites are dark skinned, or that all whites are light skinned.

In addition to the wide intraracial variation in skin color, the global population is becoming increasingly mixed. Although categorization of race and ethnicity is useful in demographic or socioeconomic evaluation, it has poor predictive value for skin-resurfacing outcomes. The American melting pot (the result of migration, wars, and inter-race relationships) shows why classification systems based on original geographic distributions have become archaic. Although the scientific literature is sparse on this topic, clinicians practicing aesthetic facial surgery and medicine should be aware of the nuances of evaluating and managing patients across the spectrum of Fitzpatrick skin types. This awareness is accentuated by the results of the 2000 US Census, which showed that Latinos are the fastest increasing minority in the United States and Filipino Americans are the fastest increasing group of Asian Americans.

International census reports illustrate similar observations. Mixed race (2 or more races in the heritage) and darker skin types (IV–VI) constitute most of the global population and one-third of the US population.[2] Terms like mestizo, mulato, trigueno, moreno, pardo, Chindian, and Eurasian reflect how widespread and varied the mixed race has become all around the world. Celebrities like Alicia Keys (African American, Irish, Italian) and President Barak Obama (English, Cherokee, Irish, Kenyan, Scottish) reflect this phenomenon.

HISTOLOGY AND FUNCTION

Skin types and races have key differences other than tone. The darker tone is caused by a higher melanin content within keratinocytes (the number of melanocytes is the same as in lighter skin).[3] Dark skin contains eumelanin, a highly cross-linked dark brown to black pigment. Melanin is synthesized in melanosomes in a pathway controlled by the enzyme tyrosinase. The skin of blacks has a high content of large, singly dispersed melanosomes (stage IV) within melanocytes and keratinocytes.[4–6] In contrast, pale white skin has few melanosomes in the epidermis. However, the skin of darker-skinned whites, on sun exposure, can temporarily produce melanosomes similar to black skin.[7] Likewise, blacks

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Table 1
Fitzpatrick skin classification

Type	Color	Reaction to Sun Exposure
I	Very white or freckled	Always burn
II	White	Usually burn
III	White to olive	Sometimes burn
IV	Brown	Rarely burn
V	Dark brown	Very rarely burn
VI	Black	Never burn

Data from Fitzpatrick TB. The validity and practicality of sun-reactive skin types I through VI. Arch Dermatol 1988;124(6):869–71.

with a lighter complexion have a combination of large dispersed and smaller aggregated melanosomes like whites. In Asians, skin that has not been exposed to sun has aggregated melanosomes like whites, whereas areas that have been exposed to the sun have predominantly dispersed melanosomes. These similarities and differences suggest significant intraracial and inter-racial variation in pigmentation. Recent work suggests that the activity of the protease-activated receptor-2 correlates with skin color and may influence ethnic skin color phenotypes.[8,9]

The stratum corneum in skin of color has more layers and more phospholipids than white skin. The dermis tends to be thicker because of the increased number and size of fibroblasts.[10] Because of the photoprotective nature of melanin, aging in dark-skinned individuals is associated with soft tissue and gravitational changes rather than wrinkles. Whereas whites and Asians undergo significant epidermal changes with photodamage,[11] blacks have only marginal changes. Fibroblasts, elastic fibers, mast cells, blood vessels, hair follicles, and other dermal structures also differ in quantity and function between races.

Melanocytes are labile in darker skin, resulting in a high incidence of dyschromia, such aspostinflammatory hyperpigmentation (PIH) following injury or cutaneous surgery.[12] Similarly, melasma is more prevalent in blacks, Hispanics, and Asians, and is attributed to hormonal factors, ultraviolet (UV) and infrared radiation exposure, and lability of melanocytes.

INDICATIONS, NUANCES, AND HAZARDS FOR CHEMICAL PEELING IN SKIN TYPES IV TO VI

Individuals with darker skin typically request correction of conditions such as PIH, melasma, acne vulgaris and scarring, textural changes (fine wrinkles), lentigos, dermatosis papulosa nigra, and seborrheic keratosis (SK). Diagnostic mistakes commonly occur in the initial evaluation of patients of dark skin. Brown lesions are lumped together as pigmented instead of hyperkeratotic-like (eg, SK). This misclassification leads to ineffective ablative treatments that may actually worsen the complexion, whether these peels are from light sources or chemicals. Chung and colleagues[13] assessed Korean patients and found that pigmentary changes are common features of photoaging in Asians, with SK being the major pigmentary lesion in men and lentigo in women. Physicians therefore need to individualize their treatments to different types of lesions. For example, careful electrocautery of individual SK lesions is not only more effective than chemical or laser ablation, it is also safer (associated with lower risk of PIH). Long-pulsed 532-nm neodymium:yttrium-aluminum-garnet laser treatment was similarly found to be more effective and have a lower incidence of PIH for lentigines in darker-skinned patients than other modalities.[14] Intense pulsed light has also been studied extensively in Asians for the treatment of lentigines and freckles[15] but would be ineffective in patients with a misdiagnosis of SK. The novel use of modified phenol formulas for spot peels of lentigines (eg, with Hetter VL) had been routinely practiced for years by 1 of the authors (PPR) (**Fig. 1**). Benign dermal tumors, such as syringomas, must be

Fig. 1. Lentigines on the cheek of a Latina woman with skin type IV to V. (*A*) Before treatment; (*B*) with spot treatment with Hetter VL (medium depth) showing frost; (*C*) 1 month after treatment with normal skin tones.