Laser Resurfacing Procedures in Dark-Skinned Patients

The author provides his perspective on resurfacing procedures in dark-skinned patients, advising a cautious approach to laser resurfacing. Laser complications in Fitzpatrick skin types III to VI, including hyperpigmentation, hypopigmentation, and scarring, are well documented. Unlike chemical peeling and dermabrasion, with laser resurfacing, preoperative treatment does not control postoperative hyperpigmentation. (Aesthetic Surg J 2005;25:625-627.)

Currently, 29% of the United States population is non-white, and it is anticipated that by the year 2056 more than 50% of the US population will be non-white.¹ According to the American Society for Aesthetic Plastic Surgery, 20% of all cosmetic procedures are performed on racial and ethnic minorities.² Simultaneously, there has been a virtual explosion of laser technology that has fueled an increase in the number of both ablative (CO₂, Erbium) and nonablative procedures such as Thermage (Thermage Inc., Hayward, CA); N-lite (ICN Pharmaceuticals Inc., Costa Mesa, CA); and Fraxel (Reliant Inc., Liberty Corner, NJ). Therefore, it is reasonable to anticipate that more dark-skinned patients will request aesthetic laser procedures. Here, I discuss what I have learned from my considerable experience in performing resurfacing procedures in dark-skinned patients.

Considerations

Most dark-skinned patients seek aesthetic consultation for dyschromia and acne scarring, rather than wrinkles. Notably, the onset of rhytides occurs fairly late in the aging process of dark-skinned patients, usually presenting in the late 60s or early 70s. Musculofascial laxity usually presents before the onset of rhytides.³

Dyschromia is most frequently caused by postinflammatory hyperpigmentation, resulting from previous procedures, acne, or trauma. Another form of dyschromia is melasma, which may be caused by sun exposure, birth control pills, and pregnancy in patients who are vulnerable to this condition. Dermal acne scars are most commonly the result of adolescent acne but occasionally may result from adult-onset acne.

Contrary to the commonly held clinical view, some authors have demonstrated that pretreatment with hydroquinone, tretinoin, and alpha-hydroxy acids have not been shown to be effective in controlling hyperpigmentation in laser-induced wounds.⁴ In direct contrast to pretreatment for chemical peels and dermabrasion, laser wounds do not appear to respond to these topical pretreatment regimens.⁵ However, these formulations are effective in controlling posttreatment hyperpigmentation.

Because pigmented skin tends to absorb about 40% more laser energy than nonpigmented skin, thermal injury can extend beyond targeted areas. For this reason, most clinicians using ablative lasers in dark-skinned patients use them with low-power settings and frequently limit the number of passes.⁶ Reports of treatment with nonablative procedures, although promising, have yet to yield significant long-term results.

Complications

It is very important to be cautious in laser skin resurfacing procedures in patients with Fitzpatrick skin types III to VI because of the well-known and well-documented side effects that may occur in this group, including hyperpigmentation, hypopigmentation, and dermal scarring.⁷

1. Hyperpigmentation occurs from 6 weeks to 6 months after laser ablation in almost 100% of dark-skinned patients. Although transient in most patients, it can persist from 9 months to a year. Treatment for this condition is bleaching with hydroquinone.

2. Hypopigmentation may occur 6 months after laser abrasion. Although incidence of hypopigmentation is much less than that of hyperpigmentation, hypopigmentation may result in permanent hypo-
pigmented scars. In dark-skinned people these scars are much more obvious and difficult to conceal. Take a careful pretreatment history, including the patient’s previous exposure to trauma, dermabrasion, or chemical peels. These factors carry increased risk for hypopigmentation.

3. Scarring is a consideration with laser resurfacing. Darker skin types are more predisposed to the formation of hypertrophic and keloid scars. The presence of melanin can cause as much as 40% more laser light energy to be absorbed in Fitzpatrick skin types III to VI than skin types I to II, putting dark-skinned
patients at even further risk for scarring. Therefore, I recommend conservative power settings.8

Preferred Treatment

Because of the higher rate of complication and because pretreatment bleaching does not control posttreatment hyperpigmentation (unlike pretreatment for chemical peeling and dermabrasion), I use chemical peeling exclusively for full-face resurfacing in dark-skinned patients. Preoperative treatment includes 4% hydroquinone with 0.1% tretinoin for a minimum of 6 weeks before the procedure. Once re-epithelialization has occurred, I begin a combined posttreatment regimen of bleaching and blending with hydroquinone and tretinoin.

I typically treat dyschromia with a 15% trichloroacetic acid (TCA) peel, using 2 to 3 coats, with the objective of targeting the papillary dermis (Figures 1 and 2). I treat acne scars with 20% TCA, targeting the deep papillary dermis/reticular dermis.

References


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