Laser treatment of ethnic skin: Seeing the light

Requires adjustment for differences in physiology

Idiosyncrasies of darker skin

Compared to lighter skin, the epidermis of darker-skinned patients possesses increased melanin (but the same number of melanocytes) and larger, more melanized melanosomes which degrade more slowly than those of fair-skinned patients, Dr. Khatri says.

Because of these factors, he says, "Darker skin absorbs and scatters more UV light, which gives dark-skinned patients better photoprotection. This results in less photodamage, skin cancers and wrinkles" than Caucasian patients typically experience.

However, Dr. Khatri adds, "The dermis itself is also thicker in darker skin, and the mesenchymal activity within the dermis is higher, which leads to greater risk of developing hypertrophic and keloidal scars."

Accordingly, he says that if one treats dark-skinned patients with the same settings as one would use for Caucasian patients, the increased amount of melanin within the epidermis of the darker-skinned patients means their skin would absorb more energy and suffer more complications — namely, hyperpigmentation, hypopigmentation or depigmentation — as a result.

Cool it

To avoid these problems, common cooling techniques include use of gel packs, ice packs and cryogenic sprays, all of which physicians typically recommend.

A patient with skin type V before (left) and after Er:YAG laser ablation of dermatofibrosis lipoïdica nigra.

Photo: Anil Khatri, M.D.
employ before and, if desired, after
treatment, Dr. Khatri notes.
"Contact cooling is probably the
best way, because it allows one to cool
the area being treated before treat-
ment, during treatment and right after
treatment," he says.

Contact cooling mechanisms
include water-based systems and saph-
phire crystals.

With such mechanisms, Dr. Khatri
says, "One can parallel cool as well —
while one is delivering the pulse —
because the pulse is going through
the sapphire crystal, which is already
making the epidermis cold."

One also can lower energy levels to
make treatments safer for darker-
skinned patients, although this prac-
tice decreases efficacy, he says.

In contrast, he says, "Cooling helps
in two ways — it reduces the risk of
complications and allows us to use
higher energy settings, which can pro-
vide better efficacy."

Furthermore, Dr. Khatri says that
with most laser devices, "We use a
longer pulse when treating darker-
skinned patients."

He likens this practice to pouring a
pail of water slowly — which allows con-
tinuous energy to dissipate during treat-
ment — as opposed to dumping it all at once.

Regarding wavelengths, he says that
for applications such as hair removal,
1,064 nm Nd:YAG lasers and intense
pulsed light (IPL) devices (near the
higher end of their 500 nm to 1,200
nm range) probably are safest for
darker-skinned patients.

"With the 1,064 nm laser," Dr.
Khatri explains, "the absorption of mel-
anin is very low. That's one of the
reasons it's better for darker skin."

As for pulse durations, he says that
for hair removal in dark-skinned
patients, "One would probably want to
use a setting of 40 ms or higher," com-
pared to 10 ms to 20 ms or perhaps
lower in Caucasian patients.

Moves to meet the need

By the same token, he says one can use
bleaching creams to lower dark skin's
melamin content before treatment.

But if one does this, Dr. Khatri rec-
ommends making sure that patients
use sunblock before and after laser or
light treatments.

Along with hair removal, he says
that state-of-the-art laser and pulsed-
light technologies also can be used for
photorejuvenation, skin resurfacing,
vascular treatments and tattoo
removal in darker skin.1,7

Disclosure: Dr. Khatri reports no financial inter-
tests relevant to this article.

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