Two fractional laser types are better than one for addressing broader spectrum of indications, providing options to patients

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The answer to the question, “Is there a need for both ablative and nonablative fractional resurfacing technologies?” is unequivocally “yes,” especially if surgeons aim to meet their patients’ varying needs and provide optimal results, according to Roy G. Geronemus, M.D.

While there is some overlap in the uses of nonablative and ablative fractional resurfacing, there are certain indications where one technology offers unique advantages for delivering better efficacy and/or safety,” explains Dr. Geronemus, director, Laser & Skin Surgery Center of New York, and clinical professor of dermatology, New York University Langone Medical Center, New York.

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Although the indications for ablative and nonablative fractional lasers show some overlap, unique advantages can also be identified for each type of technology.
"In addition, there are a number of practical considerations that might favor one treatment modality over another despite the ability to achieve a similar outcome. These issues include the patient's ability to accept the greater pain and longer healing time associated with an ablative fractional procedure or the need for more sessions with a nonablative fractional treatment. Skin phenotype also plays a role in treatment selection, taking into account the increased likelihood for developing postinflammatory hyperpigmentation using ablative versus nonablative technology in patients with darker skin types," he says.

**ABLATIVE ADVANTAGES** Ablative fractional resurfacing excels over nonablative fractional procedures when there is a need for skin tightening or when treating many atrophic and surgical scars, vertical lip lines, deeper rhytids, cosmetic tattoos and festoons. Fractional resurfacing also excels for eyelid lifting and facilitating healing with tattoo removal.

To achieve good skin tightening, surgeons should select an ablative CO₂ fractional laser that produces deep dermal ablation (depth >1 mm — Fraxel re:pair, Solta Medical; UltraPulse with DeepFX, Lumenis). Nonablative fractional resurfacing isn't effective at producing skin tightening, while the ablative fractional treatment is safer than nonfractional CO₂ resurfacing, and with judicious settings, it can be used on the neck.

"While others have reported scarring on the neck, we limit the total amount of energy and avoid bulk heating and have not seen that problem," Dr. Geronemus says.

Fractional resurfacing with a CO₂ laser has also been used successfully for reducing the appearance of lower eyelid fat pads. It is uniquely effective compared with nonablative fractional lasers for this indication because of the ability to deliver higher energy into the fat. However, special safety precautions are necessary here, including use of eye protection and careful preoperative assessment of patients with a history of lower eyelid blepharoplasty.

Fractional ablative CO₂ laser treatment has also been effective for upper eyelid lifting, whether used to treat the lids alone or in combination with the forehead as part of a larger resurfacing procedure.

"Eyelid tightening has also been achieved after nonablative treatments with a 1,550 nm laser, but the amount of tightening achieved is greater using the ablative laser," Dr. Geronemus says.

Ablative fractional resurfacing also has a unique role in treating festoons, compared with nonablative

"This cosmetic concern has been a difficult-to-treat challenge, and while ablative fractional laser treatment is not always effective, it often is," Dr. Geronemus says.

Non-dynamic vertical lip lines can also be improved significantly using an ablative fractional laser, whereas resurfacing with nonablative fractional technology does not work well. However, even when using the ablative laser with higher energy, more than one treatment may be required.

Either nonablative or ablative fractional resurfacing can improve the appearance of acne scars, although research conducted by Dr. Geronemus and colleagues using an objective technique to measure change (PRIMOS Imaging, GFM) showed the ablative treatment was associated with greater average depth of scar improvement compared with the nonablative procedure (70 versus 50 percent) and achieved this benefit with fewer treatment sessions.

Both ablative and nonablative fractional technologies can also be used to improve the appearance of atrophic postoperative scars, but again, the results are better with an ablative fractional laser. Dr. Geronemus says he has also found a niche use for the ablative fractional laser in treating scars in pediatric patients.

"The settings need to be more conservative relative to adults, but we have achieved results in treating traumatic and burn scars that would be difficult to match with nonablative treatment," he says.

**NONABLATIVE ADVANTAGES** There are three conditions for which treatment with nonablative fractional resurfacing appears to offer unique benefits compared with ablative fractional technology — actinic keratoses (AKs), actinic cheilitis and extracellular diffuse photodamage — and for all three of these indications, the advantage of nonablative technology relates to use of the 1,927 nm thulium nonablative fractional laser (Fraxel re:store Dual, Solta Medical) in particular.

"The moderate-to-high water absorption of this wavelength makes it ideal for superficial resurfacing, and with up to 70 percent coverage, it is possible to produce high-density microthermal zones of injury," Dr. Geronemus says.

A study by Dr. Geronemus and colleagues including 25 patients demonstrated the utility of the 1,927 nm thulium laser for treating multiple facial AKs. Patients received up to four treatments, usually under topical anesthesia, at intervals of two to six weeks, with laser settings varying from 5 mJ to 20 mJ for fluence and between 30 and 70 percent for coverage density. The clearance rate at six months was 88.5 percent.

"I would not claim this provides a long-term cure for AKs, but relative to other modalities, the results are at least as good and the treatment is fast, simple, well-tolerated, causes no scarring or infection, while simultaneously improving overall skin quality," Dr. Geronemus says.

Positive results have also been achieved after a single session using the 1,927 nm thulium laser to treat actinic cheilitis and diffuse photodamage off the face, and nonablative fractional resurfacing with any of the available laser types may also have an advantage over ablative treatment for improving the appearance of mature striae. For these indications, effective alternatives exist, but their use is limited by greater post-treatment morbidity, Dr. Geronemus says.

**Disclosures:**

Dr. Geronemus holds stock in Solta Medical, serves as an advisor for Solta Medical and is an investigator for these procedures.

"A 60-year-old female patient with extensive photodamage including actinic keratosis (left). Post-treatment (right) shows improved skin quality and reduced actinic keratoses following nonablative resurfacing with the thulium (1,927 nm, Fraxel re:store, Solta Medical) laser. (Photo credit: Roy G. Geronemus, M.D.)"