Advances in Scarring Treatment with Lasers

As new developments in technology provide a glimpse of the future, they also create new opportunities for clinicians and patients right now.

A Q&A WITH E. VICTOR ROSS, MD

Scars come in all shapes and sizes and respond to different forms of treatment. While surgery remains the best option for more severe scars, many scars can be treated with lasers. Over roughly the last decade, the number of options to treat scars in the laser realm has steadily grown, giving both patients and physicians more flexibility to determine the best method of treatment. To shed light on these issues, E. Victor Ross, MD discusses current modes of laser therapy and shares insights on what the future might hold for scar treatment in general.

Can you provide an overview of the current state of scar treatment and what the first steps you might take when performing it?

“What you tend to see with scars is an increase in contrasts between scar tissue and surrounding skin,” says Dr. Ross. There are many reasons why scars appear different, depending on the injury sustained. According to Dr. Ross, the color may be white, red, or brown, and sometimes the color is an indicator of the type of texture the scar will show. “The two main goals with treatment are: first, to make the scar smooth so that it is not depressed or elevated; and then to homogenize the color around and within the scar so that it blends with the outlying pigment.” For depressed scars, Dr. Ross notes that hyaluronic acid fillers represent the best options to add volume and fill out depressed areas, whereas for raised, hypertrophic scars, he opts for injectable steroids. “After these preliminary steps, the introduction of laser treatment represents the best direction for further treatment,” says Dr. Ross. Z-plasty also can be used to decrease tension in particular scars, he adds.

Can you walk through the types of scars and which lasers are optimal for each?

Among the most common types of scars dermatologists are likely to see are red scars. “For these, the goal is to flatten them as well as reduce redness, which can be achieved with either a pulse dye laser, a KTP laser, or intense pulse light device,” says Dr. Ross. Then, once the scar appears white or less red, Dr. Ross moves to fractional lasers. A number of different fractional lasers are available, from ablative CO₂, to erbium or non-ablative lasers, and each represents a potential option for scar treatment, notes Dr. Ross. “The conventional wisdom is that ablative lasers work faster and better. However, there are no studies that prove that,” Dr. Ross explains. “Most of the time, I’ll start with the non-ablative Fraxel restore (Solta) or 1540nm laser (Palomar), which is beneficial for patients because there is no downtime and no open wound. The site may be just a little bit pink, but the patient can walk out right after the procedure and few people would know they were treated,” says Dr. Ross. “Until we know that ablative technology works more effectively, clinicians will likely opt for non-ablative technologies for mild scars, at least initially,” says Dr. Ross, who often favors non-ablative treatment first before making a conversion to ablative lasers, depending on the severity of the scar. “It’s worth noting, however, that non-ablative treatments can flatten out in terms of response over time and some patients can continue to have scarring despite treatments.”

For larger and more severe scars, such as burns and contractions associated with scars, ablative technology is likely a better tool, according to Dr. Ross. “Ablative technology puts tiny holes in the skin that allow tissue to bend more easily, thus potentially increasing the range of motion in severe scars,” says Dr. Ross. Moreover, in the ablative realm, technology continues to improve to enable deeper penetration of the laser. For example, the Lumenis SCAAR FX allows clinicians to go 3mm deep, as opposed to 1 or 2mm that other ablative technologies offer. “They have increased the energy and now allow you to go to 150mJ at a lower density, which is critical for fractional lasers,” Dr. Ross observes. In addition to providing a more encompassing treatment for deeper scars, Dr. Ross notes that the particular parameters of the SCARR FX might also provide the added
benefit of skin tightening. “The ability to tighten skin has not been one of the strengths of fractional devices, but with the capacity to go 2-3mm deep with a very low density, SCARR FX might also give the added effect of skin tightening as well,” says Dr. Ross. With any fractional technology, the most important parameters are depth, density, degree of coagulation, and microbeam spot size, Dr. Ross points out.

With recent advancements in ablative technology, what do you predict about the future of scar treatment with lasers?

With lasers now offering the ability to go deeper into the skin, Dr. Ross speculates that scar treatment may change dramatically in the future. “The purported advantage of deeper treatments is that they might allow for more range of motion in scars that restrict movement, which may open up whole new possibilities for scar treatments,” says Dr. Ross. “One theory that has been introduced is that transsecting the whole scar should improve range of motion.” While this has yet to be proven, it could be a major advantage if such a technology were developed. “Dr. Rox Anderson has done work on taking fragments of the skin—tiny pieces of tissue—and doing a fractional replacement,” Dr. Ross says. This represents what Dr. Ross calls the “final frontier” of scar treatment that, while still only an idea at this point, it can spell significant advances in the specialty.

Whether such technologies are ever perfected, Dr. Ross predicts they would compliment rather than displace other existing therapies. Given the nature of scars, there will likely never be a definitive treatment for all scars, no matter how much the technology advances. “One of the problems with scar treatment is that every scar is different. Where wrinkles tend to be the same, scars have different dimensions and thicknesses, and thus we will always be presented with the difficult challenge of culling out what works better than something else for a given type of scar,” Dr. Ross explains.

One aspect of laser technology and use that Dr. Ross expects to be addressed in the near future is how they are studied and their effects are measured. “In order to really understand this technology and the benefits of its application, we are going to need better controlled studies in which we can identify individual parameters and optimized algorithms, which will improve the reliability of reported findings,” says Dr. Ross. “We need to see controlled trials in which we’re treating scars with different methods and looking at the outcomes prospectively.”

Aside from study design, Dr. Ross observes that much remains to be learned about scarring that continued research and technological advances will help to articulate. “We are on the cusp of learning more about how wounds heal after interventions. I also hope that we will learn more about collagen synthesis and how to objectively assess scars with tools that allow us to measure elasticity and thickness,” Dr. Ross says. “A patient’s impression is a helpful tool, but not for measuring the serial progression of scars or understanding how they work,” he continues. Once more is known about scars on a molecular basis, Dr. Ross predicts that clinicians will be able to make better decisions on how to optimize therapy.

These improvements are going to require time and a significant investment of money, but Dr. Ross is optimistic that given the wide range of scars, there is a need for continued investment on the part of manufacturers as well as the Department of Defense (which sponsors studies such as the one Dr. Ross recently co-authored on ablative fractional resurfacing) in ensuring better outcomes of treatment.

What final advice can you offer to clinicians who regularly use devices for the treatment of scarring?

Given the range of scar types and now that more is being learned about what laser approaches work better, Dr. Ross implores clinicians to involve the patient in the treatment process as much as possible. Aside from selecting a device/treatment that is most conducive to the patient’s desired timeline for healing and downtime, Dr. Ross feels that it is also important to convey to the patient that scar treatment takes time. “Sometimes patients come in and tell me they used an over-the-counter cream and wonder why it hasn’t worked and then expect that laser treatment will instantaneously cure them,” he says. “That’s why I tell all patients that it may take some time and that patience will likely be required on their part and that I will do the very best that I can to ensure optimal treatment within a realistic timeframe.”

Dr. Ross has disclosed relationships with Palomar, Lumenis, Alma, Sciton, and Syneron.

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