Nonablative Fractional Resurfacing Dulls Burn Scar Severity

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NATIONAL HARBOR, MD. — Nonablative fractional laser resurfacing produced significant improvement in scar severity in a study of 10 patients with second- and third-degree burn scars.

A total of five treatments delivered at 4-week intervals using a 1,550-nm nonablative erbium-doped fiber laser (Fraxel re:store) resulted in objectively-assessed reductions in overall scar severity, as well as improvement in topographical and textural abnormalities, Dr. Jill Waibel reported at the annual meeting of the American Society of Laser Medicine and Surgery.

"Burn scars are a challenge because they have traditionally been difficult to treat, and they are among the worst scars seen in clinical medicine. There is compelling evidence to suggest that nonablative fractional resurfacing improves the appearance and functionality of scarred tissue following burns. I think fractional lasers are the gold standard for scars," said Dr. Waibel, who is in private practice in West Palm Beach, Fla.

Burn scars are extremely heterogeneous, often comprising areas of hypertrophy, atrophy, and hyperpigmentation. Fractional photothermolysis, which provides a greater depth of penetration than traditional CO2 laser resurfacing, appears to benefit the variety of scar types that arise from burn injury, she said.

The eight men and two women in the study ranged in age from 23 to 68 years. Nine had third-degree burns and one had second-degree burns. Treatment areas included the face, neck, chest, arms, hands, abdomen, calf, and leg. Patients were treated with energy levels ranging from 40–70 mJ/pulse, treatment level range 6–13, density 29–65 MTZ/cm

Three blinded investigators evaluated changes in overall improvement, dyschromia, degree of atrophy or hypertrophy improvement, and texture improvement graded on a quartile scale of 0–3, with 0 being none, 1 mild (1%-33%), 2 moderate (34%-66%), and 3 excellent (67%-100%). The patients also scored their own levels of self-esteem, and both the patients and the investigators independently evaluated changes in erythema, edema, hyper- and hypopigmentation, and burn scars overall at 1, 3, and 6 months after the final treatment. Photos were also taken at baseline and at 3 months post treatment.

Based on a protocol recommended by the Food and Drug Administration, the evaluators were given random before and after patient photographs. In one patient, none of the three blinded investigators
identified the before and after photos correctly. All three investigators correctly identified the other 9 patient photos, so those 27 evaluations were used for the data analysis.

Overall improvement was noted in all 27 (100%), with 37% scored as excellent, 41% as moderate, and 22% as mild. Improved dyschromia was noted in 96% of the blinded evaluations, with 60% having at least moderately improved. Improvements in atrophy/hypertrophy were also noted in 96%, with 63% having at least moderately improved. Improved skin texture was seen in 100%, with 63% having at least moderately improved texture, Dr. Waibel reported.

The average of the patients' self-assessments of self-esteem at 3 months was 8.2 on a scale of 1–10 with 10 being "I feel great about myself." On a 0–3 scale of improvement in burn scar area with 0 being "no improvement" and 3 being "excellent improvement," the average of the patients' self-assessment at 3 months was 2.3. Anecdotally, patients also spoke of diminished pain, improved motion with a decrease in contractures, and better cosmesis, Dr. Waibel added.

The findings from this study will be submitted to the FDA to support a new indication for burn scars. (Fraxel re:store is currently approved for skin resurfacing.) Additional studies will be necessary to determine the optimal parameters for burn patients, Dr. Waibel said in an interview.

The next phase of studies that Dr. Waibel and her associates are studying include the use of nonablative fractional resurfacing in combination with intralesional triamcinolone (Kenalog), and also the use of ablative fractional resurfacing devices.

Dr. Waibel and her associates received a research grant from Reliant Technologies Inc. (now Solta Medical, Fraxel manufacturer) to conduct this study, and have received honoraria from the company for lectures.

The patient's hand is shown before undergoing treatment with the Fraxel re:store laser.

Three months and five laser treatments later, overall severity of the burn scar is reduced. Photos courtesy Dr. Waibel

Links: