Pulsed Dye Laser Aids Vascular, Pigmented Lesions

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BOSTON — A modified, high-energy, variable-pulse-duration, pulsed dye laser safely and effectively treated both vascular and pigmentary changes in patients with photoaged skin, a study has shown.

The findings suggest that what has typically been considered a "vascular" laser can be safely used to treat sun damage and associated pigmentary changes as well, Dr. Nathan Rosen said at the annual meeting of the American Society for Laser Medicine and Surgery.

The pulsed dye laser is considered the laser of choice for most vascular lesions because of its superior clinical efficacy and low risk profile. It has a large spot size, so large lesions can be treated quickly, but the resultant high-energy pulses can cause postoperative bruising and transient pigmentary changes.

The device used in this investigation employs a modified pulse structure, whereby each pulse comprises six uniform micropulses that evenly distribute the pulse energy, reducing the likelihood of bruising, compared with earlier devices, Dr. Rosen explained.

"The purpura threshold is increased because pigment more selectively absorbs the individual micropulses," he said.

In addition, the investigational device includes a compression handpiece that, by removing the competing vascular target, prevents the development of purpura. "The handpiece compresses the blood vessels in the region, allowing all of the energy to be concentrated in the pigmented area," said Dr. Rosen, who is in private practice in New York.

To evaluate the impact of the new technology on vascular and pigmentary changes associated with photodamage and long-term sun exposure, Dr. Rosen, along with his colleagues Dr. Arielle N.B. Kauvar and Dr. Tatiana Khrom, who are also in private practice in New York, considered the outcomes of its use on 24 patients with photoaged, phototype I-IV skin.

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Of the 24 subjects who were enrolled in the study, 14 were treated for vascular and pigmented lesions and 10 were treated for pigmented lesions alone. All of the subjects received a total of one to three treatments at 4-week intervals, and all underwent follow-up evaluations at 3 and 12 weeks.

To treat background erythema, the dermatologists used a 10-ms pulse width and a 12-mm spot at a fluence of 7 J/cm². For telangiectasia, they used a 7-mm spot, a 10-ms pulse width, and fluence of 9-12 J/cm². Pigmented lesions were treated using the compression handpiece with a 7-mm spot, 1.5-ms pulse width, and fluence of 9-15 J/cm².

Only the vascular lesions were treated with cryogen spray cooling (30-ms spray, 30-ms delay) before each laser pulse, and none of the patients received a topical anesthetic prior to laser treatment, Dr. Rosen noted.

"All of the patients tolerated the treatment well, and there was no purpura with the parameters that we used," Dr. Rosen said.

Three of the patients developed transient hypopigmented macules, and one patient developed a transient atrophic scar as a result of pulse stacking for treating pigmented lesions.

Using blinded comparisons of 35-mm photographs as well as patient self-reports to assess treatment efficacy, the dermatologists observed improvement in the vascular and pigmentary lesions in all of the patients, "and, more importantly, all of the patients were satisfied with their clinical improvement," he said at the meeting.

The clinical implication of these findings "is that we now are able to use one system, rather than multiple systems, to safely treat both the vascular and pigmentary changes associated with sun damage," said Dr. Rosen, who reported receiving a research grant for this investigation from Candela Corp., manufacturer of the laser device that was used in the study. ■