

Varifocal LASIK for Hyperopic Presbyopia

Supracor can provide improvements in near vision immediately; however, distance vision requires a period of adaptation.

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Several surgical solutions for presbyopia are available to patients who do not want the burden of wearing bifocal or progressive spectacles or contact lenses for near vision. For hyperopic patients in particular, refractive lens exchange (RLE) may be an appropriate choice when signs of cataract begin to develop in the later years of the presbyopic process. Among patients in their late 40s or early 50s, however—before lenticular changes begin to make an intraocular procedure more attractive—a corneal laser approach may be preferred.

Supracor, performed with the Technolas Excimer Workstation 217P (Bausch + Lomb Technolas), creates a small zone of high refractive power in the central cornea to facilitate near focus. This procedure was derived from the Intracor procedure, in which a femtosecond laser was used to create rings in the central corneal stroma. Investigators of Intracor realized that creating a small zone of increased steepness had a phenomenal effect on near vision, and Supracor was subsequently conceived as an excimer laser approach to presbyopic correction. Supracor uses a much smaller optical zone than presbyopic LASIK procedures, approximately 1.6 mm in diameter (Figure 1), and outcomes to date appear promising. Supracor for both myopia and hyperopia has received the CE Mark. This article summarizes our clinical experience with the procedure in hyperopic patients.

CLINICAL RESULTS

We have treated a series of 58 eyes of 32 hyperopic patients with Supracor. The target refraction for these patients was -0.50 D. An initial cohort of 21 patients underwent treatment with full-strength Supracor in both eyes, five (10 eyes) with mild-strength Supracor in the dominant eye and full-strength in the nondominant, and six with full-strength monocular treatment. Two monocular cases were patients who had previously undergone myopic LASIK at least 10 years previously and were now hyperopic, prompting us to perform Supracor in only one eye.

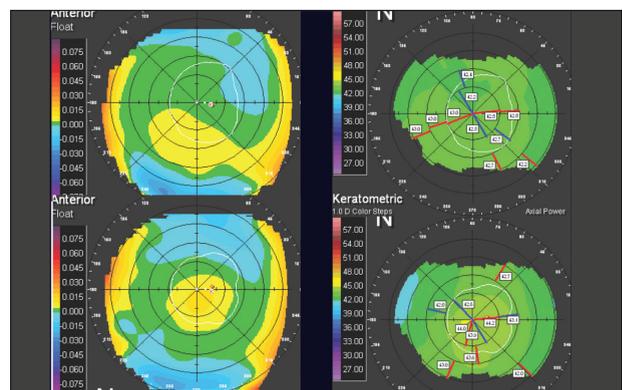


Figure 1. Central area of elevation after Supracor is visible on Orbscan (Bausch + Lomb) corneal topography (left); the central increase in power is shown on the power map (right).

The mean preoperative distance refraction was 1.03 D and, 12 months after Supracor was performed, the mean was -0.47 D, which was close to our target refraction. Supracor requires a period of adaptation for distance vision, with improvements occurring over the first year postoperatively. By 1 year, all patients had achieved 20/20 distance UCVA binocularly. This adaptation period with initially poor distance vision must be explained to patients as part of the informed consent process. Otherwise, they will not be happy in the early months after treatment.

Regarding predictability, there is a slight overcorrection; however, this myopic shift ameliorates over time. Furthermore, there is a narrow standard deviation with a drift over time toward the target of -0.50 D.

Near vision results were extremely good monocularly and even better binocularly. Patients reported clear near vision in as little as 10 minutes after this procedure.

Overall, higher-order aberrations were reduced and, as would be expected with the central steepening caused by the procedure, there was a reduction in spherical aberration. There was also a statistically significant increase in trefoil.

TAKE-HOME MESSAGE

- Supracor is a varifocal laser ablation technique that intends to facilitate near focus by creating a small zone of high refractive power in the central cornea.
- The procedure requires an adaptation period for distance vision; improvements occur over the first year.
- Patients must be made aware of the time it takes for stabilized distance vision.

In terms of safety, there was an initial loss of lines of vision, but this improved over time. There were no intraoperative complications. One patient with previous LASIK developed epithelial ingrowth and another with narrow angles required Nd:YAG laser iridotomies, following which vision improved.

CONCLUSION

Supracor is a varifocal laser corneal ablation technique that intends to facilitate near focus by creating a small zone of high refractive power in the central cornea. The procedure immediately improves near vision, but it requires a period of adaptation for patients to achieve optimal distance vision.

Patients must be counseled individually. Hyperopes may have some difficulty with adaptation if they become slightly myopic in the early months after the procedure. Those who are sensitive to such changes and who have high demands for distance vision performance may be better off with an initial monocular treatment. Another option for these patients is a mild treatment in the dominant eye and full treatment in the nondominant. With either treatment plan, all patients must be made aware of the time it takes for stabilization of distance vision.

Overall, Supracor is a promising, potentially bilateral operation for patients in the early presbyopic age group for whom RLE may not be the preferred option. ■

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