

# Laser Blended Vision With the MEL 80

A nonlinear aspheric ablation profile improves quality of vision compared with simple monovision.

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The laser blended vision (LBV) module for the correction of presbyopia, designed by Dan Z. Reinstein, MD, MA(Cantab), FRCSC, DABO, FRCOphth, and Carl Zeiss Meditec, offers improved quality of vision compared with simple monovision. LBV is a nonlinear aspheric ablation designed to increase not only the prolate shape of the cornea but negative asphericity and spherical aberration as well. When applied to the eye, LBV strengthens the depth of field by increasing the spherical aberration in a nonlinear, controlled manner. The nondominant eye is adjusted to be slightly myopic (-0.50 to -1.50 D) with a selected degree of spherical aberration, and the dominant eye is treated (full correction) to increase its spherical aberration.

After treatment in both eyes, the resultant binocular vision provides an increased depth of field for far and intermediate vision in the dominant eye and for intermediate and near vision in the nondominant. Combining the specific strengths in depth of field in each eye creates overlapping blended vision zones that allow the patient to be free of spectacle correction for any distance (Figure 1). Creating a micro-monovision strategy such as LBV reduces suppression and the dissociation of vision between the eyes.

## APPLICATION OF THE LBV METHOD

We have been using the LBV profile for the treatment of presbyopia in ametropic and emmetropic patients for 2 years, slowly increasing the volume of treatment to now include approximately half of our patients. This pro-

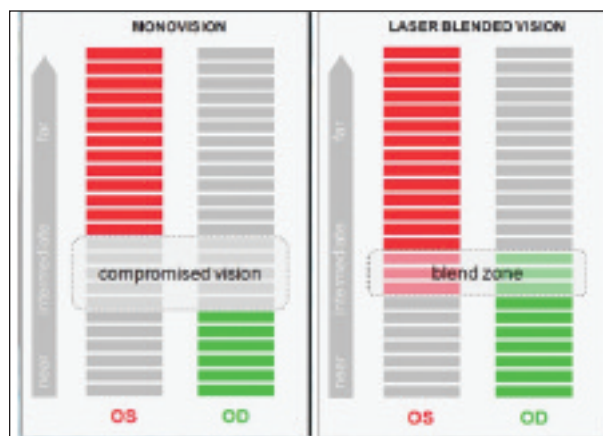


Figure 1. Combining the specific strengths in depth of field of each eye creates overlapping blended vision zones that allow the patient to be free of spectacle correction for any distance.

file provides a viable treatment option for presbyopic LASIK candidates, simultaneously correcting their ametropia and presbyopia.

Patient selection is crucial. LBV can be combined with any LASIK treatment from -9.00 D of myopia to 6.00 D of hyperopia, including emmetropia, with astigmatism up to 4.00 D. Suitability is determined by the ability of the patient to accept the addition of between 0.75 and 1.50 D in one eye for micro-monovision. The key to success with LBV is to ensure before surgery that the patient will tolerate the newly adjusted binocular vision. This is achieved with a spectacle test. After surgery, patients will adjust to

## COVER STORY

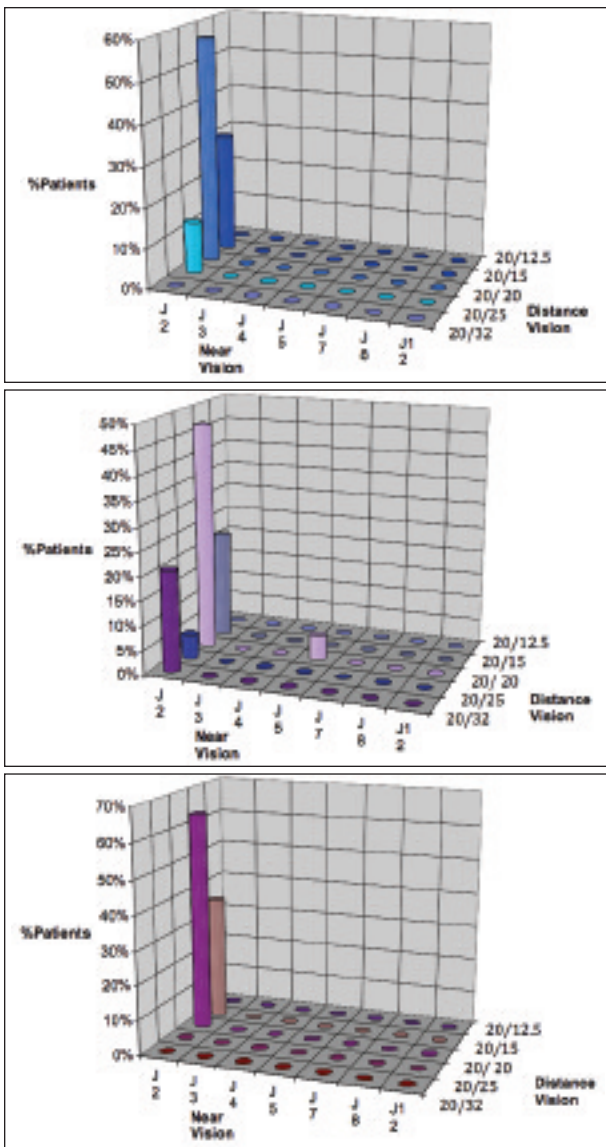


Figure 2. Three-dimensional graphs of myopic, hyperopic, and emmetropic treatments in the first 60 patients to receive LBV treatment at the authors' clinic.

their new refractive status after a neural adaptation period, which in our experience lasts maximum 2 to 3 months. Patients with a high level of expectation for near vision are excluded. Patients who are nonbinocular due to strabismus might tolerate a higher addition for near vision. Emmetropic patients are the most difficult patients to treat because we have the added challenge of maintaining their contrast sensitivity and stereoacuity.

Binocular function after LBV has been very good in all myopic, hyperopic, and emmetropic patients. In a review of our first 60 patients, distance visual acuity of 20/25 and near vision of J2 were achieved in 100% of myopic

and emmetropic patients and 68% of hyperopic patients. All emmetropic patients had a distance visual acuity of 20/20 and near vision of J2. Safety was also demonstrated in all groups, as no patient lost more than 2 lines of BCVA. Binocular UCVA is shown in Figure 2. Overall, 99% of patients tolerated this micro-monovision LBV strategy. This is due to our thorough preoperative screening process.<sup>1</sup> By contrast, 40% to 65% of simple monovision cases create intolerable anisometropia.<sup>2</sup>

## CONCLUSION

We have performed more than 1,500 LBV treatments to date, and it has increased patient volume at our wholly refractive surgical practice by more than 40%. The proportion of patients operated at MV Santé Vision with the LBV system has increased from 36.2% in 2010 to 43.5% in 2011. We estimate that this number will stabilize at between 50% and 55% over the next 3 years. The retreatment rate after 6 months is less than 6%, which is only slightly higher than the rate for our standard femtosecond LASIK treatment (3.6%), which does not address presbyopia. The accuracy of the target refraction is high, increasing our success rate with this method.

LBV is a reliable method for correcting presbyopia in a large percentage of patients who want to achieve spectacle independence, including those who like athletic activities, those who want to be rid of spectacles or contact lenses for cosmetic reasons, and those who like the simple convenience of being free from spectacles. LBV also represents a cost-effective solution for a large number of 45- to 60-year-olds, among whom there is great demand. Since we acquired this system, the average age of our patients has increased from 30 years in 2009 to 41.5 years in 2011. ■

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