Hoffer Split Bifocal Technology

I read with great interest the article by Song et al.1 regarding their study of the positioning of the near segment of the Lentis MPlus Split Bifocal intraocular lens. They state that “Inferior placement of the near segment is recommended by the manufacturer.” Their study conclusion was that “The position [superior, inferior or temporal] of the near segment...demonstrates no significant effect on visual performance.”

As the inventor of this first concept in multifocal technology in 1982,2,3 I proposed the Split Bifocal would not be susceptible to the rotational positioning of the near segment. I stated: “The ‘common sense’ position would be to place it inferiorly just as the bifocal add in spectacles. Whether it is superior, inferior, or oblique, the near segment focus is superimposed over the distance focus and the brain selects the clear image of regard. With spectacles, the patient chooses the focus of the two separate lenses and, when looking downward (inferiorly) to read the bifocal add, needs to be in the inferior part of the spectacle. This makes no difference when the two focal lenses are fixated behind the pupil.”

As far as I am aware, since 2010, there are only two manufacturers in the world producing the Split Bifocal: the Lentis MPlus by Oculentis Optikgeräte GmbH (Wetzlar, Germany) and the SBL-3 Segmented Bifocal by Lenstec, Inc. (St. Petersburg, FL). Both manufacturers were not specific about the unimportance of the position of the near segment. I hope Song et al.’s study will relieve the surgeon from being concerned in this regard.

Another issue has not been heeded by either manufacturer (Figures 1A-1B). I recommended in 1982 that the axis of the haptic loops be parallel to that of the axis of the Split Bifocal (Figure 1C). The lens was first implanted in 1993. Doing it this way will prevent either segment being moved outside the pupil if there is decentration due to the loops causing the patient to then have a monofocal lens for either near or distance. With the haptics parallel, an equal percentage of distance and near segment would remain in the pupil. NanoVision (Hertfordshire, United Kingdom) has just begun producing a lens with this proper design (Figure 1D).

Finally, I do not understand how my concept was given the arcane name “rotational asymmetric multifocal” when the original term I used, “Split Bifocal,” is so much more descriptive of the lens design. Reviewing the literature on this lens, it has been referred to as a “new-generation multifocal,” “zonal refractive multifocal,” “rotational asymmetry multifocal,” “sectorial addition multifocal,” “refractive segmented multifocal,” and “inferior sector-shaped near-addition multifocal.” Although the Split Bifocal may be “rotationally asymmetric,” there are many other configurations that might also be so defined. The lens optic is essentially split roughly in half; one segment for distance, the other for near. Why not end the confusion and call it what the inventor did: a Split Bifocal?

Figure 1. (A) Oculentis Split Bifocal (Oculentis Optikgeräte GmbH, Wetzlar, Germany) and (B) Lenstec Split Bifocal (Lenstec, Inc., St. Petersburg, FL), both with axis of haptic loops perpendicular to the split in the bifocal. (C) Original 1985 Iolab Hoffer Split Bifocal (Iolab, San Dimas, CA) and (D) NanoVision Hoffer Split Bifocal (NanoVision, Hertfordshire, United Kingdom), both with axis of haptic loops parallel to the split in the bifocal.
Correspondence

My congratulations to the authors for an excellent study proving a 34-year-old concept as true.

REFERENCES

Kenneth J. Hoffer, MD
Santa Monica, California

The author has no financial or proprietary interest in the materials presented herein.

Reply
We appreciate Dr. Hoffer’s comments concerning our article.1 The intraocular lens (IOL) of concern has two refractive zones (one for far vision and one for near vision) and both are on the optical axis of the lens.

We agree that a better descriptive term is needed so that the term would be able to indicate the design of this IOL more specifically. The term “rotationally asymmetric multifocal” has some limitations when describing the IOL’s specific design because there could be many other configurations that might also be rotationally asymmetric.

In addition, the position of the near segment with this IOL had no significant effect on visual performance in eyes with normal corneas in our study. We agree that whether it is superior, inferior, or oblique, the near segment focus is superimposed over the distance focus and the brain selects the clear image of regard. Our study will relieve the surgeon from being concerned in this regard, as Dr. Hoffer commented.

Another issue was the relative position of the axis of the split to the axis of the haptic. We think several conditions should also be considered, such as the difference of C-loop haptic and plate haptic over the IOL stability in the capsular bag,2 the possibility of orthogonal displacement of IOL against the haptic axis,3 and the difference of rigidity between the two haptics.

REFERENCES

In Seok Song, MD
Sam Young Yoon, MD
Jae Yong Kim, MD
Myoung Joon Kim, MD
Hungwon Tchah, MD
Seoul, Korea

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