

Ten Years With an Accommodating IOL

This type of lens will always offer a greater quality of vision than a multifocal IOL.

BY STEVEN J. DELL, MD

This year marks a decade of US commercial availability for Bausch + Lomb's Crystalens. My initial experience with this accommodating IOL began a few years earlier with the original FDA trial. Since then, the lens has undergone a number of refinements, and it has experienced a considerable resurgence in popularity, as the limitations of multifocal IOLs have become better understood. Today, surgeons recognize where the Crystalens excels and where it does not. It remains the only FDA-approved accommodating IOL.

The history of the Crystalens dates back to 1989, when hinged plate haptic IOLs were first developed by Stuart Cumming, MD. After years of Dr. Cumming's refining the design and struggling with an undercapitalized startup venture, his project evolved into a company called Eyeonics, which was subsequently acquired by Bausch + Lomb.

MECHANISM OF ACTION

Although the IOL's actual mechanism of action is controversial, it seems clear that the lens provides better near and intermediate visual acuity than does a standard IOL.¹ Some have argued that the Crystalens achieves most of its near visual acuity through translational movement, whereas others believe that flexing and tilting of the optic deliver improved near vision. The debate is complicated by the technical challenge of measuring movement in the context of accommodation. Additionally, it seems likely that both mechanisms of action are at work.

Any implantable moving device raises concerns about the permanence of its effectiveness. The near vision achieved with the Crystalens has been found to persist for up to 7 years.² Ninety-eight percent of patients who receive bilateral implants could read J3 or better, and 96% could see 20/32 or better at distance

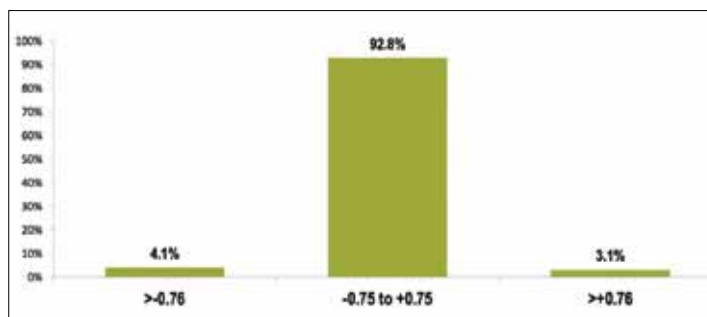


Figure. Achieved spherical equivalent versus intended target with the Crystalens in 181 eyes. Refractive predictability was excellent, with 93% of eyes within ± 0.75 D of the intended target. Data on file with Bausch + Lomb.

without correction. These results are superior to those reported in the original FDA trial.

OPTICAL QUALITY

The current model, the Crystalens AO, features an aberration-neutral aspheric optic. This type of optic is known for providing high-quality visual results.³ In this regard, the Crystalens provides a stark contrast to multifocal lenses. Without question, accommodating IOLs will always offer better optical quality than multifocal lenses, whereas the latter will provide better levels of distance-corrected near vision. The Crystalens provides visual quality that is comparable to that produced by a standard IOL.⁴ In addition, many patients seeking presbyopic correction either currently are or will become noncandidates for multifocal IOLs owing to retinal issues, glaucoma, irregular astigmatism, or myriad other current or future conditions.

REFRACTIVE PREDICTABILITY

A criticism occasionally levied against the Crystalens is that the IOL has inferior refractive predictability. In my opinion, if the capsulotomy is inconsistently sized,

the refractive outcome of the Crystalens will definitely suffer. On the other hand, a surgeon who carefully executes the procedure and maintains a capsulotomy of approximately 5.5 mm can achieve excellent refractive predictability with this IOL (Figure). With the advent of highly accurate laser capsulotomies, I expect further refinement of these results.

OPTIMIZING RESULTS

Despite surgeons' desire for an accommodating IOL that provides sustained, high-grade, near UCVA, there are limits to the degree of accommodation achieved with the Crystalens: most patients cannot achieve comfortable, sustained reading at a close range. In my experience, successful users of the Crystalens obtain excellent clinical results by means of three principal strategies.

The first strategy is to target plano to -0.25 D bilaterally for patients desiring good uncorrected distance and intermediate vision. This outcome works very well, but patients will require readers for close reading. The second strategy involves targeting the distance eye for plano and -0.75 D of mini-monovision in the nondominant eye. I find that this strategy also highly satisfies patients. The third strategy involves placing a Crystalens in the dominant eye and a multifocal IOL in the nondominant eye, both with a plano target. In

my experience, this underutilized technique results in extremely high-grade uncorrected distance, intermediate, and near vision as well as excellent satisfaction among patients. They benefit from the optical quality of the Crystalens in their dominant eye and the near performance of a multifocal IOL in their nondominant eye. After using this technique for many years, I am convinced of its value.

CONCLUSION

Although multifocal IOLs will always have the advantage of a greater quantity of vision, accommodating IOLs like the Crystalens will always offer a greater quality of vision. ■

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