

# Mixing Multifocal IOLs

The technologies of the Rezoom and Restor lenses are complementary, not antagonistic.

BY FRANK A. BUCCI, JR, MD

Since June 1, 2005, I have implanted 550 Rezoom refractive multifocal (Advanced Medical Optics, Inc., Santa Ana, CA) and Acrysof Restor diffractive multifocal (Alcon Laboratories, Inc., Fort Worth, TX) IOLs. Following is what I have learned about achieving a high level of spectacle independence and patient satisfaction with these lenses.

## FOUR CRITERIA FOR SUCCESS

I believe there are four essential elements to successfully treating presbyopic patients. They must receive (1) a high quality of distance visual acuity, (2) functional intermediate vision in order to read a computer screen at arm's length, (3) functional near vision in both bright and moderate light (they should be able to read a newspaper unaided after surgery), and (4) all this with an acceptable amount of light phenomena while driving at night.

None of the presbyopia-correcting IOLs currently available in the US consistently meets all these requirements when implanted bilaterally in a lensectomy patient. The Crystalens accommodating IOL (Eyeonics, Inc., Aliso Viejo, CA) provides excellent distance and intermediate vision when placed in the capsular bag correctly. It gives relatively poor near vision, with only 1.00 to 1.25 D of accommodation. It has minimal light phenomena at night because it lacks multifocal optics.

The Rezoom lens gives excellent distance and intermediate vision, especially in daylight when the pupil is smaller and the patient is looking through the central distance zone. Under these conditions, the quality of distance vision is similar to that of a monofocal IOL. The reading vision the Rezoom provides is fair in bright light and very good in moderate light (in the latter, the pupil expands and encompasses the second zone for near vision). In my experience, this lens has more light phenomena than the Crystalens and Restor IOLs but considerably less than the Array multifocal lens (Advanced Medical Optics, Inc.).

Distance vision with the Restor IOL has been problematic, in my experience. Patients can have waxy, shadowy, three-dimensional, and double vision, and they can also lose BCVA. However, the Restor optic's outer refractive component can minimize visual symptoms as the pupil dilates, because it does not hit any additional diffractive rings. The Restor's excellent reading power can drop off rather quickly

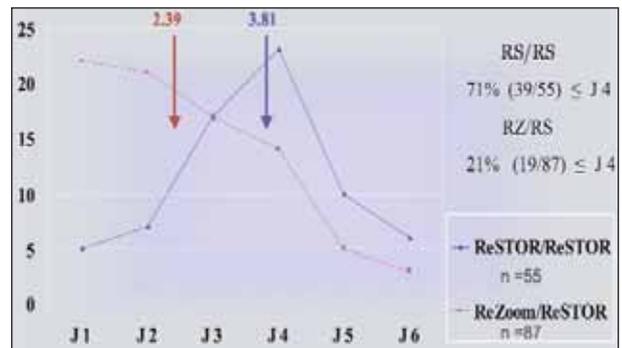


Figure 1. This frequency curve shows bilateral intermediate visual results for the study.

as the pupil dilates. Further, many patients perceive the lens' focal point as being somewhat too close. It delivers poor intermediate vision, in my experience, and trying to make the lens hyperopic to improve intermediate vision sacrifices distance visual acuity substantially.

I see less light phenomena with the Restor than with the Rezoom and Array lenses, but I do not hear strong complaints about halos from either Restor or Rezoom patients. I began using the Restor IOL in June 2005. My first cohort included 55 bilaterally implanted patients, two-thirds of whom underwent lensectomies. I observed poor intermediate vision in general, and 17 of the 55 patients had spontaneous, voluntary, severe complaints about their intermediate vision.

## FIRST EXPERIENCE MIXING AND MATCHING

During this time, patients in whom I had unilaterally implanted an Array IOL were returning for their routine exams. They had been waiting for new multifocal technology that would give them stronger detailed reading vision. I placed a Restor IOL in their opposite eyes, and it improved their reading vision and induced no serious halos. They were some of the happiest people I had ever treated. Based on my success with these Array/Restor patients, I decided to test the efficacy of a Rezoom/Restor combination.

## REZOOM/RESTOR DATA

I have since implanted 145 patients with a Rezoom IOL in one eye and a Restor lens in the other. My follow-up data are complete for 110 of the 145 patients. All the patients'

astigmatism has been corrected and their posterior capsular opacification treated when needed.

My 55 bilaterally implanted Restor patients (cohort I, mean follow-up = 16 months) were allowed to use their best focal near point to bring in an object as close to their face as they wanted. One hundred percent of these patients saw J1 at near. Cohort II includes my 110 Rezoom/Restor patients (mean follow-up = 9 months). Some might have expected the near vision in these patients to be weaker than the bilateral Restor group's, but there was no significant difference. The mean near vision was J1.07 bilaterally. Interestingly, some of these patients were happier with their near vision than some of the Restor/Restor patients, because their focal point was less close in their Rezoom eye, and they had a wider range of reading vision. The two groups were not equal with intermediate vision. Cohort I had intermediate vision of J3.81. Cohort II's intermediate vision was J2.39. These findings are both statistically and clinically significantly different ( $P=.0001$ ).

A frequency curve (Figure 1) shows that 71% of the Restor/Restor patients' bilateral intermediate vision was J4, compared with only 21% of the Rezoom/Restor patients. The frequency table in Figure 2 includes yellow dots that represent the patients who had severe intermediate complaints (17 out of 55). Separating these complaints by procedure, 13 of the 17 patients with complaints underwent lensectomies versus cataract surgery. Eleven of those 13 lensectomy patients were under 60 years of age. Therefore, these results define a subgroup of patients who perform very poorly with bilaterally implanted Restor IOLs.

## CORROBORATING STUDIES

Why are the Rezoom and Restor lenses synergistic and complementary instead of antagonistic, like many predicted? Each one's strengths overcome the other's weaknesses. The Rezoom covers the Restor by giving better distance vision during the day, excellent intermediate vision, and good reading in dim light. The Restor covers the Rezoom

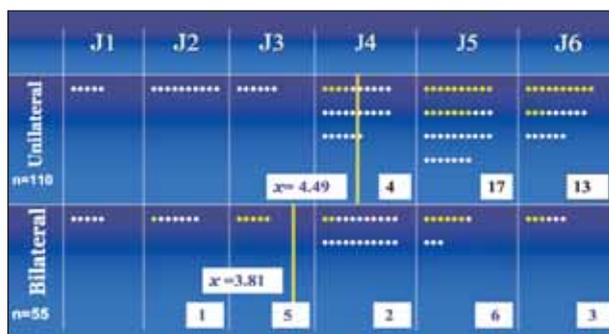


Figure 2. The yellow circles in this frequency table represent the 17 of 55 eyes that experienced severe intermediate visual complaints.

TABLE 1. RESTOR/RESTOR VERSUS REZOOM/RESTOR

| WORLD CORNEA CONGRESS <sup>1</sup> |                           |                           |
|------------------------------------|---------------------------|---------------------------|
|                                    | RS/RS (N=100)             | RZ/RS (N=88)              |
| Near                               | 1.40 (11.8") (Bucci 1.00) | 1.50 (15.4") (Bucci 1.07) |
| Intermed                           | 3.85 (Bucci 3.81)         | 2.30 (Bucci 2.39)         |
| Distance                           | 20/25                     | 20/20                     |
| Speed (Read)                       | 165 wpm                   | 155 wpm                   |
| Spec Indep                         | 89%                       | 100%                      |
| Halos/Glare                        | (1+)                      | (1+)                      |

with better reading vision in bright light and fewer halos at night. At the 2006 World Cornea Congress in Brazil, Drs. Akaishi and Fabri presented their results from a similar comparative study that showed that a refractive/diffractive lens combination outperforms a diffractive/diffractive combination.<sup>1</sup> Of my 145 Rezoom/Restor patients, even those who had not yet received astigmatic correction, none has reported spontaneous intermediate visual complaints of the character and depth that I saw in the Restor/Restor group.

Unknowingly, the Brazilian study group was performing its comparison at the same time. Our bilateral results are remarkably similar and reinforce one another. Our bilateral intermediate visual results are almost identical (Table 1). The other group's near visual results are slightly different because they required patients to read at near at a specific focal length, and I did not. Note that in the Brazilian study, the investigators also observed some reduction of distance vision with the Restor/Restor combination. Its Rezoom/Restor group achieved 100% spectacle independence versus 89% in its Restor/Restor group.

## SUMMARY

To date, the Rezoom/Restor combination appears to completely mitigate intermediate visual complaints. The relative risk of these complaints with bilaterally implanted Restor lenses increases with younger age and in lensectomy procedures. The unique optical characteristics of the two IOLs appear to be complementary, and this synergistic effect produces high levels of spectacle independence and patient satisfaction. ■

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1. Akaishi L, Fabri PP. PC IOLs mix and match technologies: Brazilian experience. Paper presented at: The World Ophthalmology Congress; Feb., 2006; São Paulo, Brazil.