

Presbyopia Correction With the Kamra Inlay

The greatest improvement in visual acuity occurs after 1 month.

BY ALOYSIUS JOSEPH LOW, MBBS, FRCS

Developing presbyopia is an early sign of aging, and for many people this may be the first time they need corrective eyewear. Counseling patients on the use of reading glasses, progressive or bifocal glasses, or multifocal contact lenses for presbyopia correction is often our first step. However, we also review the options for surgical correction of presbyopia with these patients. Current options include monovision LASIK; clear lens extraction (CLE), also known as refractive lens exchange (RLE); and conductive keratoplasty. These options at times can appear overwhelming to patients, but we must perform due diligence as surgeons to inform patients of their choices.

All current presbyopia-correction methods have drawbacks, such as cosmetic appearance with reading glasses, the need to adapt to progressive or bifocal glasses, the inconsistency of clear vision and occurrence of dry eye with multifocal contact lenses, compromised distance vision and depth perception with LASIK monovision, risk of retinal detachment after CLE/RLE, and regression after conductive keratoplasty. After my patients are made aware of these issues, many say they prefer to wait for a better technology that provides more predictable and permanent results with fewer tradeoffs. To these patients, I can now offer the Kamra inlay (AcuFocus Inc., Irvine, California).

I have used monovision LASIK for the correction of presbyopia for the past 10 years, undercorrecting patients from -0.75 to -2.00 D in the nondominant eye depending on their age. I have also used conductive keratoplasty for correction in plano presbyopes—although within 2 years their symptoms return. I typically implant multifocal lenses in hyperopic patients with presbyopia. But I never had a good solution for myopic presbyopes until the introduction of the Kamra inlay.

We became interested in this technology more than 2 years ago, and our first 17 patients were implanted with the inlay in May 2010. Below is an overview of our results in these patients as well as an outline of patient selection criteria (Table 1).

TABLE 1. KAMRA INLAY PATIENT SELECTION CRITERIA

- Minimum corneal thickness of 500 μm
- Stable tear film
- Reading ability of N8 (J6) or worse
- Age 42-54 years
- Mild to moderate hyperopia or myopia
- No previous corneal procedures or problems

OUTCOMES

In total, 50 patients were evaluated for Kamra inlay implantation, and 17 potential candidates (six myopic presbyopes and 11 plano presbyopes) were identified. We excluded patients with signs of unstable tear film or mild cataract. The inlay was implanted in the nondominant eye of 14 patients after refractive correction in one or both eyes (a procedure we call *sim-LASIK*), and in three patients the inlay was implanted in the nondominant eye without any refractive correction. We have followed some patients for more than 6 months; however, full results are currently available only through 1- and 3-month follow-up.

Near vision. It is hard to compare postoperative results between the Kamra inlay and LASIK, as the former does not produce the instant wow factor that patients under the age of 40 years typically experience with LASIK. However, all but three patients in our series had an immediate improvement in near vision (Figure 1). At 1 month, the majority of patients were J2 or J3 (Table 2).

Our research has indicated that the largest near vision improvement with the inlay is noted at 1 month and beyond. At 3 months, most of the patients in our series were satisfied with both distance and near vision.

Distance vision. At 1 month, most patients had good distance UCVA, with the exception of three patients (6/30, 6/30, and 6/38); however, these patients still achieved very good near vision, with a clinically significant improvement of at least 5 lines. The same three patients

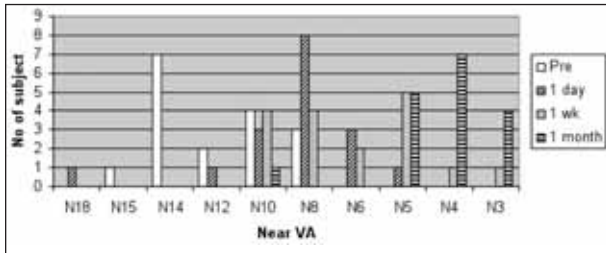


Figure 1. Near visual acuity continues to improve out to 1 month.

were measured at 3 months, and in two of them the distance UCVA improved to 6/6 and 6/7.5. In the other outlier, the Kamra is a bit decentered superotemporally. Five months after surgery, I repositioned it inferonasally. His current UCVA has improved to 6/24 from 6/38 with a midpoint refraction of -0.625 D and J3 near vision.

PATIENT SELECTION

Patient selection plays a major role in the success of the Kamra inlay. This implant is contraindicated in patients with high myopia, thin corneas, signs of early cataract, peculiar corneal findings, or severe dry eyes. For our first few cases, we used the selection criteria recommended by the manufacturer (Table 1).

During the preoperative exam, we use glasses and a pin-hole to simulate the predicted or potential near, intermediate, and distance postoperative vision with the Kamra inlay. Another component of patient selection is properly setting patient expectations, which can be a key factor in ensuring a good postoperative patient experience. In addition to introducing the topic of corneal inlays through videos and printed literature, we give our patients detailed explanations of the recovery and healing process and set appropriate expectations for their vision after the procedure.

Today, no procedure comes with the guarantee of spectacle independence, and therefore patients must understand that reading glasses may be necessary in certain conditions, such as in dim lighting, or for prolonged reading or reading small print. They should also be made aware that the Kamra inlay requires a period of neural adaptation. I typically tell patients that this process takes

TAKE-HOME MESSAGE

- The No. 1 goal with the Kamra inlay is to provide presbyopic patients with the opportunity to gain back their near vision without loss of distance vision.
- Patient selection plays a major role in the success of the procedure.
- The inlay requires a period of neural adaptation.

TABLE 2. VISUAL ACUITY

		Before surgery	After surgery		
			1 day	1 week	1 month
Near visual acuity (OU)	N point @ 40 cm	N10–N12 (J8–J10)	N8–N10 (J6–J8)	N6–N8 (J4–J6)	N4–N5 (J2–J3)
	logMAR (mean±SD)	0.56 ±0.10	0.42 ±0.13	0.31 ±0.16	0.12 ±0.13

Table 2. At 1 month, near visual acuity was J1 or J2 in the majority of patients.

6 months; if it occurs before this time, they are naturally impressed and satisfied.

CONCLUSION

The No. 1 goal with the Kamra inlay is to provide presbyopic patients with the opportunity to gain back their near vision without loss of distance vision. In our early results, this goal has been achieved in every case. On average, our patients come to us before surgery with near vision of approximately J6 or worse, and we are able to enhance their near vision to J2 or J3 after Kamra inlay implantation. In our experience, this technology has fulfilled its promise to patients to improve their near visual acuity, allowing them to see at close range again.

Postoperative refractive power in the Kamra eye is determined by the midpoint refraction method. Here, we gradually increase the positive spherical lens power in small increments to first blur the distance UCVA. Then we repeat—this time using a negative spherical lens—again in small increments until the patient’s distance UCVA becomes blurred. The mean of the sum of the positive and negative spherical lens power is the midpoint refraction spherical power.

Like most new things, implementing the Kamra inlay into our practice required perseverance, continuous education, and handholding. We have found that it is beneficial to ask an in-house representative who has received the inlay to share his or her experience with prospective patients. Luckily we have a staff member who has undergone Kamra inlay implantation in her nondominant eye. Of the patients with whom she shares her experience, the majority show enthusiasm for the procedure, especially when compared with the option of monovision. ■

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