Guest Editorial

Intraocular Lenses for the Correction of Myopia in Phakic Eyes: Short-Term Success and Long-Term Caution

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The guest editorialist enjoys a freedom not available to authors and editors; he is free to profess his personal point of view and biases. In that vein, I confess that during the majority of my professional career, I considered myopia neither a disease nor a blemish, since it is correctable with glasses or contact lenses. However, in 1986, I became involved with attempts to correct high myopia by the implantation of concave intraocular lenses into the phakic eye. This experience fostered my humane attachment to many myopic patients and taught me a worthwhile lesson: Individuals with myopia of 10 diopters or more, if they are contact lens intolerant, are often deeply unhappy human beings, conscious of their impediment in both their occupational life and their personal environment. They consider themselves members of a rejected minority whose visual handicap is little appreciated by their fellow men. The degree to which they suffer becomes obvious once they experience a cure, as expressed in a typical letter, "Every morning when I open my eyes I feel reborn, that my real life started just now." In other words, I think myopia is a disease because it is a physical state causing deep unhappiness. It is certainly a legitimate ethical aim of the ophthalmic profession to attempt a cure for myopia, provided it can be done safely with a reasonable degree of risk.

This issue of Refractive and Corneal Surgery contains two reports on this subject, one by Colin and colleagues and the other by Baikoff and Joly. The authors compare three important surgical methods of treating myopia: epikeratoplasty, keratome}


REFERENCES

Fechner

stomileusis, and minus power anterior chamber intraocular lenses. The oldest of the three, intraocular lenses, offers the most predictable results, but it has a checkered history and an uncertain future.

Historically, minus power anterior chamber intraocular lenses were placed in phakic eyes to correct myopia soon after the invention of the intraocular lens. Benedetto Strampelli was the first surgeon to do this in 1953. His published paper in 1954 showed a drawing of a concave lens in the anterior chamber. In 1959, Joaquin Barraquer optimistically reported 239 implantations. Peter Choyce had already implanted "a few such cases" and in 1964 he mentioned 12 cases. Many of the lenses implanted by Barraquer had to be removed, however, because of complications including corneal edema, chronic iridocyclitis and hyphema. When Drews later examined these lenses, he found them to be coarse and of poor quality with 1 mm thick haptics that were poorly polished; some of the findings might be artifacts because the lenses were preserved by an operating room nurse in Barcelona. Thus, the concept of intraocular lenses in the phakic eye lay dormant for over 20 years, until 1985 when M.L. Dvali reported the use of anterior chamber angle supported lenses to correct myopia in phakic eyes and when Dyodorov spoke at a Moscow symposium of a new concave silicone lens placed behind the iris in front of the crystalline lens. Interestingly, neither of the techniques has been heard of since, leaving one to speculate that something may have gone amiss with these lens types.

This brings us to the current situation, reported by Georges Baikoff in 1988 at the Sixth Congress of the European Intraocular Implant Lens Council in Copenhagen. Baikoff described a modification of the open loop, Kelman, multiflex style, angle supported, one piece, polymethylmethacrylate lens. It had solid haptics with 4-point contact in the angle and a prominent anterior vault and a concave optic for correcting myopia. To date, approximately 800 lenses are said to have been implanted in France, some of which are reported by Colin and Baikoff in this issue. Even though this lens design has advantages over other angle supported lenses (particularly the now extinct closed loop lenses) and these advantages may be acceptable in older patients, angle support can be associated with the uveitis-glaucoma-hyphema (UGH) syndrome. Therefore, whether such angle support can be safely tolerated for many years in the eyes of a younger patient remains to be seen.

Jan Worst and I had doubts about the desirability of angle fixation and explored another route. In 1977, Worst designed the iris claw lens (trade name, Ophthee, Groningen, Netherlands) for aphakic eyes. This anterior chamber lens is suspended in front of the pupil on the surface of the iris by incorporating a small fold of the midportion of the iris into the haptic of the lens on two opposite sides. The iris claw lens has shown its safety and effectiveness in aphakic eyes. In 1980, Worst implanted an opaque claw lens in the phakic eye of a patient who suffered from untreatable incommittent diplopia after ocular trauma. Four years after surgery he observed no complications from the lens; specifically the endothelial cell count remained high and the crystalline lens clear.

Based on this experience, Worst and I developed a biconcave iris claw lens in 1986 for the purpose of treating myopia. I have implanted 123 of these lenses. Sixty-eight of these eyes have been reexamined at the University Eye Clinic at Giessen, West Germany, by Juergen Strobel, using a laser flare cell meter which revealed a low protein content in the anterior chamber comparable to that seen after intraocular lens implantation in the capsular bag. Twenty-three of these were examined with iris fluorescein angiography, which showed no vascular leaks. These and other follow-up examinations have shown that the iris tolerates the iris claw lens well, without developing uveitis, glaucoma or hyphemas. In addition, we have found no cataract formation. A series of these cases will be reported subsequently.

Can we conclude that the myopic iris claw lens is safe and effective for the correction of myopia in phakic eyes? Unfortunately, no. The quintessential question is whether the corneal endothelium is damaged by the implant. Disquieting information in this regard has recently become available. Some of our eyes with the iris claw lens have demonstrated endothelial cell loss which was not explained by the surgery itself. In addition, there have been oral reports of some endothelial cell loss with the Baikoff angle supported and myopic anterior chamber intraocular lens. We think that the likelihood of endothelial cell loss is greater when the distance between the implant and the endothelium decreases. We have not observed endothelial cell loss in eyes with deep chambers where the lens is more separated from the cornea. In view of these findings, it seems advisable to call a moratorium on the implantation of anterior chamber myopic lenses in phakic eyes for the time being, to allow longer follow-up and documentation of the current series.

Such a moratorium would not quash our interest in myopic intraocular lenses, particularly in view of the superior refractive results reported by Colin and colleagues and by Baikoff and colleagues. Improved designs with thinner optics and improved materials that might not damage the endothelium upon periodic transient touch might lead to a myopic intraocular lens that is truly safe and effective.

Meanwhile, there will also be further study of other surgical methods to decrease and cure myopia. For lower amounts of myopia, radial keratotomy has...
its advantages; we are also learning about the advantages and disadvantages of excimer laser corneal surgery. Early studies of intracorneal lenses for the correction of myopia have not been as encouraging, but research is active. Colin and colleagues skillfully outline the strengths and weaknesses of myopic epikeratoplasty and myopic keratomileusis.

One alternative for the high myope is the removal of the clear crystalline lens. Unfortunately, no reliable published statistics exist to document the long-term risks of cystoid macular edema and retinal detachment in such eyes, especially if a posterior capsulotomy is necessary. We hope that careful prospective retinal consultation and therapy as well as improved lens design such as biconvex posterior chamber lenses that decrease capsular opacification might make this technique more risk free, since it has already been shown to be optically and technically effective. Multifocal intraocular lenses might help overcome the loss of accommodation in these eyes.

Therefore, we must remain extremely careful and circumspect of any intraocular lens implantation for the correction of high myopia. Simultaneously, we must continue to pursue research that might offer a cure for our handicapped, highly myopic patients.

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