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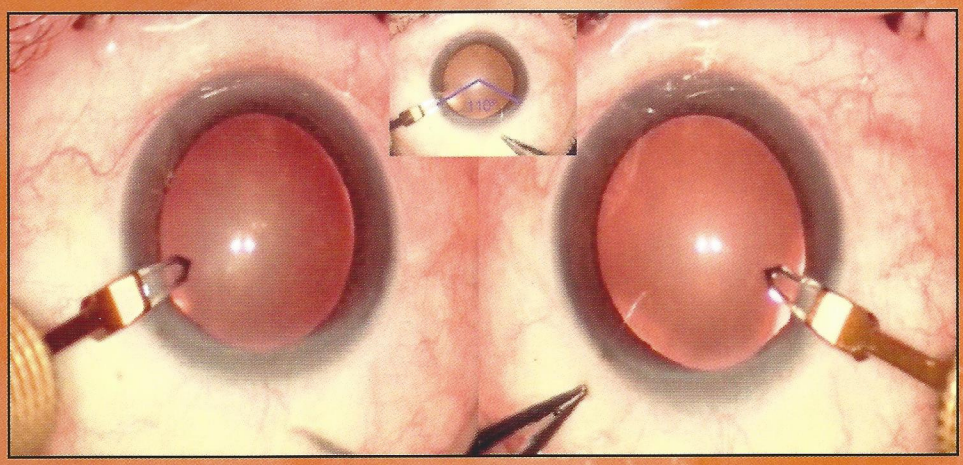

Clear corneal incisions in bimanual MICS (see page 1743)

Safety of ISBCS
Review: Intraoperative iris prolapse
Simultaneous PRK and CXL after ICRS
Ray-tracing IOL power calculation using AS-OCT
Long-term wound-healing architecture of CCIs in bimanual MICS

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AMD. The refractive target was plano to −3.0 D. Most eyes experienced a 2-line improvement in UNVA (compared with the preoperative CNVA), and 52% had a UNVA equal to or better than J5. The third group (n = 5) had advanced maculopathy, a CDVA of 20/400 to counting fingers, and no cataract. Those patients had clear lens extraction, and the refractive target was up to −8.0 D.

In all study eyes, the UNVA improved by 1 to 2 lines (60% J7) and the CDVA improved or remained stable. Although there was some benefit from multifocal IOL implantation, our patients did not achieve the level of improvement in CDVA and UNVA reported by Gayton et al.

Several factors should be considered when implanting multifocal IOLs in eyes with AMD:

- What should the recommended postoperative refractive target be? We believe that the more advanced the maculopathy, the more myopic the target should be.
- What grades of AMD may benefit from multifocal IOL implantation? Is it justified to offer AMD patients this surgical option or is it malpractice? We strongly discourage implantation of multifocal IOLs in eyes with even mild maculopathy depicted on optic coherence tomography testing.[B] Those eyes will perform better with a monofocal IOL. We reserve multifocal IOL implantation for selected moderate to advanced AMD cases that do need an LVA for near work.
- Does the magnification effect increase the scotoma size perceived by the patient? High dioptric addition can have this effect if the AMD area is large.

Will AMD patients who have already received a multifocal IOL benefit from a secondary supplementary IOL or a corneal procedure to create myopia instead of an IOL exchange? Is multifocality better offered as a supplementary IOL that can be removed if AMD develops? Further studies are needed to answer those questions.

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REFERENCE

1. Gayton JL, Mackool RJ, Ernest P, Seabolt RA, Dumont S. Implantation of multifocal intraocular lenses using a magnification strategy in cataractous eyes with age-related macular degeneration. J Cataract Refract Surg 2012; 38:415–418

OTHER CITED MATERIAL

A. Georgaras S, Weidemann P, Metaxaki I, "RESTOR as a Low Vision Aid," presented at the 20th International Congress of the Hellenic Society of Intraocular Implant and Refractive Surgery, Athens, Greece, February 2006

B. Patsoura E, Diamantopoulou K, Neureither B, Georgaras S, "OCT of the Posterior Pole as a Diagnostic Tool for Patients Pre-Assessed for Multifocal Intraocular Lens Implantation," presented at the XXIX Congress of the European Society of Cataract & Refractive Surgeons, Vienna, Austria, September 2011

Peripheral keratitis following low-pulse energy femtosecond laser in situ keratomileusis

In their recent case report, Bucci et al.[1] thoroughly documented the clinical course of peripheral necrotizing keratitis following femtosecond laser in situ keratomileusis (LASIK). In a large series of uneventful femtosecond LASIK with the 60 kHz Intralase (Advanced Medical Optics, Inc.), we have experienced 5 instances of severe peripheral stromal infiltration and subsequent focal corneal thinning.

Similar to Bucci et al.'s patient, all 5 of our cases were bilateral and recalcitrant despite hourly topical steroid therapy and enhanced fourth-generation fluoroquinolone application. However, patients in our series presented later in the first postoperative week with reports of foreign-body sensation and irritation. Similarly, rapid resolution was achieved only after administration of oral prednisone and 20/20 uncorrected distance visual acuity was maintained in 100% of the affected eyes.

The heightened inflammatory reaction with earlier femtosecond lasers is well documented.[2] However, advances in power modulation with current femtosecond models have demonstrated morphologic alterations to the corneal stroma comparable to those with the microkeratome.[3] A reduction in the total amount of deliverable energy would be expected to result in a decrease in the inflammatory response, highlighting the curiosity of Bucci et al.'s case.

Of possible significance is the fact that 4 of the 5 patients in our series were men and all had a history of atopy. A heritable trait mapping to multiple chromosomes and a slight male preponderance, atopy is exemplified in the eye by intensified immune responses to exogenous antigens. Previous recommendations for preoperative and perioperative maintenance of a prescription antiallergy medication have been encouraged for microkeratome-enabled LASIK procedures, particularly for patients with active disease.[4] None of our patients demonstrated active systemic or ocular inflammation in the immediate preoperative period or were currently being treated for atopic sequelae.

In our experience, expeditious management of the inflammation is the key to a swift resolution, but only after an infectious etiology can be assuredly discounted. Equally significant is the importance of a thorough review of the medical history to assess for atopy, and consideration of preoperative oral

steroids may be worthwhile. We have begun this practice in our high-risk atopic patients. We will be presenting this series in a subsequent publication and look forward to controlled studies to determine patients at risk for this rare postoperative complication.

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REFERENCES

1. Bucci MG, McCormick GJ. Idiopathic peripheral necrotizing keratitis after femtosecond laser in situ keratomileusis. J Cataract Refract Surg 2012; 38:544–547
2. Netto MV, Mohan RR, Medeiros FW, Dupps WJ Jr, Sinha S, Krueger RR, Stapleton WM, Rayborn M, Suto C, Wilson SE. Femtosecond laser and microkeratome corneal flaps: comparison of stromal wound healing and inflammation. J Refract Surg 2007; 23:667–676. Available at: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2698458/pdf/nihms118773.pdf. Accessed July 31, 2012
3. Santhiago MR, Wilson SE. Cellular effects after laser in situ keratomileusis flap formation with femtosecond lasers: a review. Cornea 2012; 31:198–205
4. Boorstein SM, Henk HJ, Elner VM. Atopy: a patient-specific risk factor for diffuse lamellar keratitis. Ophthalmology 2003; 110:131–137

Incorrect application of the clinical history method

A recent consultation section[1] involved a cataract surgery patient who had photorefractive keratectomy (PRK) in his left eye in 1992 (pre-PRK: −4.00 + 0.50 × 141, keratometry 41.87/42.25; post-PRK: +0.75 +0.75 × 62; keratometry 38.9/39.8 and 39.38/39.57). The intraocular lens (IOL) power was selected using biometry results and the American Society of Cataract and Refractive Surgery (ASCRS) online calculator.[A]

The recommended IOL powers were as follows: SRK/T, 12.5 diopters (D) targeting −0.38 D; Haigis-L, 15.0 D targeting −0.31 D; ASCRS calculator, range of 13.9 to 15.8 D; intraoperative wavefront aberrometry, 12.0 D for slight myopia. The respondents were asked which IOL power they would recommend. Many techniques were mentioned, including the clinical history method (CHM) (14.96 D), Feiz-Mannis (15.03 D), corneal bypass (14.88 D), Masket (13.17 D), modified Masket (13.63 D), Shammas (14.61 D), and Haigis-L (13.89 D); the mean power was 14.31 D and the range, 13.17 to 15.03 D. The respondents' IOL power selections ranged from 12.5 to 16.5 D.

One respondent applied the CHM incorrectly: The pre-PRK spherical equivalent (SE) refraction was −3.75 D and the postoperative SE refraction, +1.125 D; hence, the change in SE refraction due to PRK was 4.875 D. The change in the SE refraction is at the spectacle plane, and any application of the CHM to more accurately estimate the true keratometry following PRK requires the correction of this value to the corneal plane. For a vertex distance of 12.5 mm, the SE refraction change is 4.59 D. This simple calculation error robbed the respondent of a valuable 0.28 D of accuracy. (Patients with an SE refraction of −0.75 D are generally happier than those with an SE refraction of −1.0 D.) The keratometry as estimated by the CHM is 37.47 D, not 37.18 D (the figure used by the respondent). The IOL that was used (SN60WF, Alcon Laboratories, Inc.) is manufactured in 0.5 D increments, so one can assess whether this error would have made a difference to the IOL selection: Using an axial length of 28.4 mm and keratometry of 37.18 D, Hoffer Q suggests 16.0 D for −0.1 D SE refraction and SRK/T suggests 14.5 D for 0.13 D SE refraction. If, instead, the keratometry is 37.47 D, Hoffer Q suggests 15.5 D for an SE refraction of −0.1 D and SRK/T suggests 14.5 D for an SE of −0.16 D. My calculations may differ slightly from those of the respondent because we may use a different optimized anterior chamber depth (for the Hoffer Q) or A-constant (for the SRK/T); however, this is irrelevant as the misuse of the CHM commits this respondent to a different IOL power than would have been used if the CHM had been calculated correctly. This error is forgiven if the SRK/T formula is used, as the same IOL power would be chosen; even if the Hoffer Q is better suited to the CHM, as claimed,[2] this benefit is outweighed by the greater suitability of the SRK/T to a long axial length of 28.4 mm.

I assume the calculation error made by the respondent does not occur in the ASCRS calculator's application of the CHM. The IOL power selection following keratorefractive surgery is challenging so surgeons should minimize calculation error and use the chosen method accurately. I would choose +15.0 D and counsel the patient regarding the possibility of a refractive error and how the error could be corrected.

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REFERENCES

1. Yoo SH, ed. Consultation section. Refractive Surgical Problem. J Cataract Refract Surg 2012; 38:915–920
2. McCarthy M, Gavanski GM, Paton KE, Holland SP. Intraocular lens power calculations after myopic laser refractive surgery: a comparison of methods in 173 eyes. Ophthalmology 2011; 118:940–944

OTHER CITED MATERIAL

A. Hill W, Wang L, Koch D. IOL calculator for eyes that have undergone LASIK/PRK/RK. Verson 4.1. Available at: http://iolcalc.org/. Accessed August 1, 2012