

Refractive aspects of cataract surgery

I. Howard Fine, MD, and Richard S. Hoffman, MD

The emphasis in cataract surgery has shifted to perfecting the refractive outcome. More accurate lens power calculations and refinement in techniques to reduce or eliminate surgically induced and preexisting astigmatism have moved us closer to the ultimate surgical result—emmetropia. Multifocal lenses and surgically induced multifocal corneas have the potential to eliminate not only myopia and hyperopia but also the loss of accommodation resulting from the pseudophakic state.

Oregon Eye Associates, 1550 Oak Street, Suite 5, Eugene, Oregon 97401, USA.

Current Opinion in Ophthalmology 1996, 7;1:21–25.

Abbreviation

IOL intraocular lens

© 1996 Rapid Science Publishers
ISBN 1-85922-816-X ISSN 1040-8738

In his keynote address at the first Ocular Surgery News Symposium on Small Incision Cataract Surgery (New York, NY; 1992), Dr. William Maloney emphasized that we have entered a new millennium. The emphasis in cataract surgery had now shifted from strictly focusing on the extractive aspects of the surgery but the refractive as well. In the intervening years since that symposium much has been learned and new information and techniques have been applied in the quest for the most rapid, most precise uncorrected visual acuity following cataract surgery. With proper measurements including keratometry readings, the use of computerized corneal topography, A-scan measurements, and precise preoperative lens power calculations, we have come a long way in our desire to achieve freedom from postoperative myopia and hyperopia. Small-incision surgery has reduced surgically induced astigmatism and multiple modalities are currently being refined to address preexisting astigmatism and the loss of accommodation that results from the pseudophakic state. It is now possible for substantial numbers of patients to achieve uncorrected visual acuity of 20/40 or better on the first postoperative day, which for a long time had been viewed as an important milestone in cataract surgery.

Preoperative lens power calculations

Certainly the refractive status of the surgical result is going to depend on the precision of the lens power calculations. Although there is evidence that some formulas for lens power calculations are better for large amounts of preexisting hyperopia [1] and others for large amounts of preexisting myopia, Olsen *et al.* [2] suggested that for the bulk of patients, those with axial lengths between 20 mm to 26 mm, there is more accuracy of lens power calculation with his formula than with the Binkhorst, SRK/T, or the Holiday formulae. He believes the increased accuracy is related to improved anterior chamber depth prediction based on a regression formula that incorporates corneal height, preoperative anterior chamber depth, axial length, and lens thickness.

Control of surgically induced astigmatism

The move to smaller cataract incisions has been propelled by the desire to reduce or eliminate surgically induced astigmatism and obtain quicker and more stable postoperative visual rehabilitation. Numerous studies have recently been published that investigate the effects of incision size and location on surgically induced astigmatism.

