Managing Decentered Aspheric IOLs

BY GEORGE BEIKO, BM, BCH, FRCSC; SAMUEL MASKET, MD; STEVEN G. SAFRAN, MD; AND JEFFREY WHITMAN, MD

Does a significantly decentered aspheric IOL cause more visual disability than a traditional monofocal IOL with equivalent decentration? How do you manage this scenario?

GEORGE BEIKO, BM, BCH, FRCSC

Significant decentration of an IOL is a rare event. When significant tilt and decentration occur, they are usually due to surgery complicated by capsular rupture, inadequate 360° overlap of the anterior capsule on the optic, the IOL’s placement in the sulcus, compromised zonules, or ophthalmic trauma. Bench top studies using polychromatic light showed that aspheric lenses need to be decentered more than 0.8 mm or tilted more than 10° before they lose their optical advantage over traditional lenses. A meta-analysis of prior studies found that this degree of decentration occurs six times out of 10,000 and that this degree of tilt occurs one time out of 10,000; so, it is truly rare. More importantly, it has been reported that the single-piece acrylic Tecnis IOL (Advanced Medical Optics, Inc., Santa Ana, CA) design takes a location in the capsule that mimics the natural horizontal and vertical tilt and decentration of young phakic eyes; thus, a rare event should be even rarer. Patients with decentered IOLs typically complain of decreased vision, polypia, edge-related glare, or quivering vision.

My experience has been that the symptoms are similar with both aspheric and traditional lenses; I have not found that one is worse than the other. I manage these cases by repositioning and stabilizing the decentered lens; suturing it to the iris, lens capsule, or sulcus; or replacing the lens and stabilizing it via these strategies. My current IOL preference is the Tecnis single-piece acrylic IOL in routine cases and the Tecnis three-piece acrylic IOL (Advanced Medical Optics, Inc.) in complicated cases.

SAMUEL MASKET, MD

The corollary to this question is whether patients discern a clinically significant difference between spherical and aspheric IOLs. Although we measure a reduction in higher-order aberrations (spherical aberration) with aspheric IOLs under certain lighting conditions, patients do not seem to recognize a clinical difference between the vision of an eye that has an aspheric IOL and that of a fellow eye that has a spherical implant. Nevertheless, a significantly decentered IOL, especially an aspheric IOL, will reduce vision and induce symptoms if it is sufficiently off axis. Naturally, the degree of disturbance will vary with the degree of asphericity and eccentricity. Of course, any IOL, when decentered, is apt to produce undesired optical consequences, varying with pupillary size. I would manage a decentered three-piece IOL by bringing the optic into the ciliary sulcus and suturing it to the iris to maintain its positioning and stability.

Depending on the cause of a single-piece IOL’s decentration, I would place a three-piece IOL in the sulcus and suture it to the iris.

STEVEN G. SAFRAN, MD

Most of what we know about how decentration affects an aspheric IOL is theoretical rather than based on observation. In terms of perfectly centered IOLs, I have found it difficult or impossible to discern a difference between aspheric and standard monofocal IOLs in almost all patients in whom I have placed an aspheric in one eye and a standard implant in the other eye. The problem with studying decentration is that it is relatively rare, unique, and unilateral. Nevertheless, my clinical impression is that the decentration of most monofocal implants is relatively well tolerated as long as the edge of the IOL does not cause glare symptoms and the refractive change or induced prism is managed with glasses adjustment. On the other hand, I do believe that a decentered aspheric IOL with negative spherical aberration (eg, Tecnis or AcrySof IQ [Alcon Laboratories, Inc., Fort Worth, TX]) will perform less effectively compared with a similarly decentered monofocal implant. Anecdotally, I have seen a few eyes that had aphabetic
lenses with relatively small decentrations that I felt created problems that would not be as obvious in a similar type of case involving a monofocal implant. I am quicker to offer a repositioning or exchange as a solution to vague symptomatology in the case of mild decentration involving an aspheric IOL.

JEFFREY WHITMAN, MD

Aspheric IOLs are fairly user friendly in terms of decentration. As a general rule, decentration is less of an issue with a neutral aspheric such as the Sofport LI61AO IOL (Bausch & Lomb, Rochester, NY). Aspheric IOLs have the advantage of matching the appropriate negative or neutral spherical aberration to the patient’s wavefront measurement when needed. Decentration is more touchy with an aspheric IOL that adds negative spherical aberration, such as the Acrysof IQ monofocal aspheric IOL (SN60WF; Alcon Laboratories, Inc.) and the Tecnis IOL. Decentered spherical IOLs can also cause significant problems, because the power at the center is different than the power in the intermediate and peripheral areas. I base my intervention on the patient’s symptoms. I reposition the IOL if the patient is experiencing optical distortion or sees halos and glare.

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