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Editorial

Intraocular lens implants: Do they come with a life time guaranty?

Cataract surgery has become a commonplace event with an anticipated rapid improvement in visual function without significant risk; 98% of the surgeries are considered to be successes. Patients often ask ''how long will the implant last, doctor?'' The response is usually, ''we expect it to last your lifetime, we are so confident in this that we even implant them in children''. Although this response is said with all sincerity, is it really the case?

Initial IOLs were plagued by complications, in particular uveitis, glaucoma and hyphema. However, since the 1980's, with improved manufacturing and processing of materials, IOLs have been considered to be safe, and the standard of care in cataract surgery. Surgeons routinely implant IOLs in complicated cataract cases and patients with concurrent ocular disease, in spite of IOL package inserts which state that IOL implantation in these cases is contraindicated. Experience has trumped caution as outcomes have been positive.

However, reports of IOL related complications continue to remind ophthalmologists to be vigilant.

In the 1990's, delayed opacification of hydrophilic IOLs due were reported in 36% of some lens designs; granular deposits were found on the surface of the optics on Hydroview (B&L) and Memory (Ciba Vision) lenses, and within the substance of the optic in Aquasense (Ophthalmic Innovations International Inc) and SC60B-OUV (Medical Development Research) lenses. Silicone contaminants and phosphate buffers were identified as being causative; IOLs were recalled and manufacturing processes were altered.

More recently, attention has been drawn to opacification of hydrophilic IOLs in intraocular cases which involve the use of intracameral gas such as lamellar corneal surgery or retinal procedures. Avoidance of this material in these cases has been recommended.[1]

In the presence of asteroid hyalosis, silicone IOLs have been reported to undergo calcific opacification.[2]

A voluntary recall of opacified Hydrosmart foldable lenses (Lentis) stored in glass vials was announced in late 2014. Storage of these lenses in blister packs has resulted in resolution of the problem.

Recently, late onset ocular inflammation due to toxicity from aluminum has been identified with the Hoya Isert 251 and 255 models.[3]

However, opacification of the IOL optic in Alcon Acrysof lenses continues to be an issue since the 1990's. Glistening and subsurface nanoglistenings (SSNGs) (fluid filled gaps in the optic of the IOL) are found in virtually 100% of patients at 2–3 years post-operatively. Studies have found that the density of the glistenings and the consequent retinal straylight continue to increase 10–15 years post-operatively.[4]

The impact of glistenings and SSNGs on visual function is highly contested. Many studies show that visual acuity, contrast sensitivity and MTF's are not affected. Other studies come to the conclusion that visual function is negatively impacted. Although the conclusions may seem to be contradictory, they are not because findings depend on testing conditions. The inclusions in Acrysof lenses cause light scatter and disability glare. If a light source strikes the lens slightly off axis, light scatter occurs and visual function deteriorates. Visual acuity, contrast sensitivity and MTF measurements are made on axis and are minimally impacted. Repeating measurements slightly off axis will result in a significant decrease.

Explantation of glistening affected lenses and allowing them to air dry results in a resolution of the glistenings. If optical measurements are then performed on these lenses, no effect will be found.

Light transmission studies using an integrated sphere spectrophotometer will not find any difference between glistening affected lenses and glistening free lenses since all light is measured. A double beam spectrophotometer is a more appropriate instrument for measuring the effect of light scatter.

Disability glare has been implicated in the alteration of driving habit and the causation of motor vehicle accidents.[5] Ophthalmologists are familiar with and test for glare preoperatively in cataract patients in order to justify the intervention. Glistenings and SSNGs cause disability glare; so it should not be a complete surprise that they may impact on driving. A Swedish study found that 43% of patients with Acrysof lenses experienced night time glare at 6 years post-operatively, which influenced their driving abilities.[6] A recent study has determined that at 3 years post-op, Acrysof lenses may be associated with an increased incidence of self reported motor vehicle accidents.[7] With over 70 million Acrsof lenses implanted worldwide, it should be of some concern that disability glare and loss of driving may reach epidemic proportions.

Patients with Alcon Acrysof lenses complain of visual disturbances, glare and poor vision in spite of having good Snellen acuity. IOL exchange for a glistening free lens has resulted in a resolution of the symptoms.

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Hoya iSymm lenses were similarly affected by glistenings. Hoya has removed this lens from the market and has improved its manufacturing process. Alcon continues to produce its Acrysof material by a molding process which is prone to glistening formation. Recent claims have been made that glistenings have been addressed by current manufacturing processes; however, reports have been published that the new lenses continue to have significant glistenings.[8]

Given the possibility of impaired visual function due to glistenings and SSNGs, one has to question the implantation of Alcon Acrysof lenses in paediatric and young adults.

If a patient asks whether his intraocular lens will last a lifetime, the answer must be that it depends on his ocular health and choice of intraocular lens.

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