

The US Air Force's Experience With Premium IOLs

The surgeon's ability to explain complex visual concepts can affect a patient's impression of a successful outcome.

BY LT. COL. CHARLES "CHAZ" D. REILLY, MD

Premium IOLs have been a tremendous addition to the armamentarium of the ophthalmologists in the US Air Force. We can now provide a full range of vision to our patients in the military health system. The tremendous potential for this technology is fully realized when the selection of patients and their management are optimized.

We have the benefit of being able to offer to our patients any of the currently available technologies: accommodating, pseudoaccommodating, diffractive, refractive, and toric IOLs. Having a wide selection enables us to tailor the technology to the patient's visual needs, and patients' selection is key when considering the options. In general, we do not implant diffractive technology-based IOLs in patients who have retinal pathology (eg, epiretinal membranes, macular drusen or retinal pigment epithelial changes, glaucoma, irregular astigmatism, or other pathology).

PATIENTS' NEEDS

Another factor is the patient's occupation. For example, Air Force aviators are not allowed to receive refractive, diffractive, or chromophore-containing IOLs. Great care must be taken to ensure that a full occupational history is gathered along with a determination of the patient's visual needs before considering a premium IOL. An important aspect is what effect premium lenses have on the ability of men and women in uniform to fight and survive at night and in low-contrast environments. Because the importance of light discipline (ie, not using light when reading maps, navigating, etc.) can determine who survives combat, these considerations are paramount when deciding what lens technology to offer to patients.

I find the use of a questionnaire, similar to the Dell index (available at www.crstoday.com/pages/dellindex.doc), is exceptionally helpful in determining the visual needs of potential candidates for premium lenses. In addition, retinal optical coherence tomography is useful when I am trying to determine if a retinal finding may be significant. Corneal imaging (topography, etc.) is also important during the pre-

BOTTOM-LINE KEYS FOR SUCCESS

1. Patients' selection
 - a. Rule out retinal pathology.
 - b. Rule out glaucoma.
 - c. Rule out irregular astigmatism.
 - d. Use occupational history and visual needs assessment to assist in technology's selection.
 - e. Take a thorough past ophthalmic history, specifically inquiring about past refractive surgery.
2. Patients' management
 - a. Excellent biometry is exceptionally important (we use optical coherence interferometry).
 - b. Treat ocular surface disease preoperatively and postoperatively (be aggressive).
 - c. Ensure patients are counseled preoperatively about visual phenomena.
 - d. Ensure patients are counseled regarding visual aids for prolonged near or intermediate tasks.
3. The Air Force is unique:
 - a. We do not use refractive or diffractive IOLs in US Air Force aviators.
 - b. We do not use chromophore-containing IOLs in US Air Force aviators. For our pilots, we use a clear aspheric monofocal IOL (thankfully, we do not have to operate on them often).
 - c. We understand the tactical environment of combat and approach any IOL technology with great caution.

operative evaluation, as is excellent biometry. The ability to hit the target refraction postoperatively is one of the crucial factors that determine success. To ensure excellence in biometry and postoperative outcomes, meticulous attention to the ocular surface's rehabilitation and maintenance is necessary. Treating dry eye disease and quieting mild blepharitis preoperatively will assist the surgeon and the patient in reaching high levels of satisfaction.

MANAGING EXPECTATIONS

Managing patients' expectations directly affects their level of satisfaction. Each lens technology has advantages and disadvantages. The ability of the surgeon to explain these clearly to the patient—and the patient's ability to understand the complex concepts of glare, halos, and contrast acuity—can greatly affect his or her impression of surgical success.

The premium IOL Web sites that patients read advertise the technology's ability to allow them to see well at all distances. When we are counseling our patients, it is therefore important to discuss the idea of spectacle independence. It is also essential to use realistic scenarios to explain when the patient may experience a degradation of visual performance and to provide him or her with

copied techniques to maximize his or her satisfaction with the lenses. For example, those of us who perform laser vision correction with surgical monovision know that having glasses on hand to assist with night driving or driving in unfamiliar places increases a patient's satisfaction with the procedure—if the surgeon prepared the patient preoperatively. That same type of education can increase patients' satisfaction when we suggest they use a pair of reading glasses for prolonged near work or glasses for prolonged Internet surfing or database management and e-mail. Thankfully, many patients find those aids unnecessary after premium IOL implantation, but the conversation is much more difficult if delayed until postoperative problems arise. In addition, the expectation of some visual phenomena postoperatively like mild halos

Ocular Health and Cataract Surgery

Pearls for the evaluation and medical treatment of patients receiving presbyopia-correcting IOLs.

BY WILLIAM B. TRATTLER, MD

It is no secret that today's cataract surgical patients have high expectations, whether they will receive new-technology IOLs or monofocal implants. Because patients know that cataract surgery is associated with excellent postoperative visual acuity, it is important for eye care specialists to be thorough in terms of the preoperative evaluation of all patients. It must include a comprehensive determination of the patient's ocular health and appropriate strategies to treat any existing corneal disease.

Clinicians should consider four areas during the preoperative phase: (1) the ocular surface (ie, dry eye syndrome, meibomian gland dysfunction, and/or blepharitis), (2) the corneal surface (ie, epithelial basement membrane dystrophy and anterior stromal scars in the visual axis), (3) topography, and (4) optical coherence tomography of the macula.

OCULAR SURFACE

Dry eye disease and blepharitis are common among patients scheduled for cataract surgery, although many are asymptomatic. A failure to identify and treat patients with significant ocular disease can adversely affect the outcome of cataract surgery.

To determine the frequency of dry eye in individuals scheduled to undergo cataract surgery, my colleagues and I conducted a nine-site study.¹ Patients included in this investigation were aged 55 years and older, with a mean age of 71. The preliminary results of 102 patients (204 eyes)

revealed an average tear breakup time (TBUT) of 4.93 seconds. In addition, we found that

- 126 (61.7%) eyes had TBUTs of 5 seconds or less
- 169 (82.8%) eyes had TBUTs of 7 seconds or less
- 92 eyes (45.1%) had central corneal staining
- 95 eyes (46.0%) had a Schirmer score of 10 or less

We concluded that dry eye is very common among patients scheduled for cataract surgery. Preoperative testing for planning the IOL's power requires a healthy tear film to be accurate. Untreated corneal surface disease can negatively affect keratometry and thereby skew IOL calculations.

In another study, my colleagues and I looked at the prevalence of blepharitis in patients scheduled for cataract surgery.² The mean age of included patients was 72 years, and 100 patients were evaluated. We found that 59% of patients had blepharitis, and more than 85% of the eyes had an average TBUT of 9 seconds or less.

Based on our results, a large number of people scheduled for cataract surgery have abnormal TBUTs and central corneal staining. We determined that patients should be evaluated and treatment should be initiated for aqueous-deficient dry eye and/or blepharitis, if present.

ADDITIONAL EVALUATION

Corneal Surface

Physicians should examine the cornea to identify epithelial basement membrane dystrophy or small anterior scars in the

visual axis. These findings can negatively affect the patient's postoperative quality of vision and success with premium IOLs.

Topography

Eye care practitioners must perform preoperative corneal topography to determine a patient's candidacy for presbyopia-correcting IOLs. Topography can help rule out forme fruste keratoconus, keratoconus, pellucid marginal degeneration, and irregular astigmatism. It is also important to the evaluation of dry spots, which require treatment. If the patient has had prior LASIK or RK, clinicians should ensure that he or she has a large central optical zone. Topography can establish the patient's eligibility for corneal refractive surgery in case he or she needs a refractive enhancement after the cataract procedure.

THERAPEUTICS TO CONSIDER

For dry eye, possible treatments include

- (1) topical prednisilone acetate 1% or loteprednol 0.5% to the affected eye q.i.d. for 7 to 14 days
- (2) topical cyclosporine 0.05% to the affected eye b.i.d.
- (3) the placement of a punctal plug to increase the tear film
- (4) preservative-free lubricating drops

For patients with blepharitis or meibomian gland dysfunction, possible treatments include

- (1) topical azithromycin to the affected eye q.h.s.
- (2) topical prednisilone acetate 1% to the affected eye q.i.d. for 7 to 14 days
- (3) lid scrubs
- (4) warm compresses

Macular Examination

A preoperative optical coherence tomography scan of the macula assesses the health of the posterior segment prior to cataract surgery. This examination should be used to rule out epiretinal membranes (which increase the risk of cystoid macular edema), vitreomacular traction syndrome, and early macular holes.

CONCLUSION

Preoperative steps to evaluate and treat patients before they receive traditional monofocal IOLs optimize visual outcomes. In addition, a comprehensive evaluation and therapeutic plan help to identify proper candidates for presbyopia-correcting IOLs. Following these guidelines and identifying the conditions mentioned will foster a higher success rate with premium lenses and identify patients who may undergo a refractive enhancement if needed.

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1. Trattler W, Goldberg D, Reilly C. Incidence of concomitant cataract and dry eye: prospective health assessment of cataract patients. Presented at: World Cornea Congress; April 8, 2010; Boston, MA.
2. Luchs J, Buznego C, Trattler W. Prevalence of blepharitis in patients scheduled for routine cataract surgery. Poster presented at: ASCRS Symposium on Cataract, IOL and Refractive Surgery; April 11, 2010; Boston, MA.

at night should be discussed with patients prior to surgery. A well-prepared patient will understand these phenomena and will not be surprised or bothered by their appearance postoperatively.

CONCLUSION

The keys to success include important components of patients' selection and management. The experience of the US Air Force provides a unique perspective on the use of premium IOL technology and offers pearls for the successful implementation of this promising technology in day-to-day practice. ■

The views expressed in this article are those of Dr. Reilly and do not represent the official views of the Department of Defense, Department of the Air Force, or Wilford Hall Air Force Medical Center.

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