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PACIFIC VISION INSTITUTE
Life in Focus

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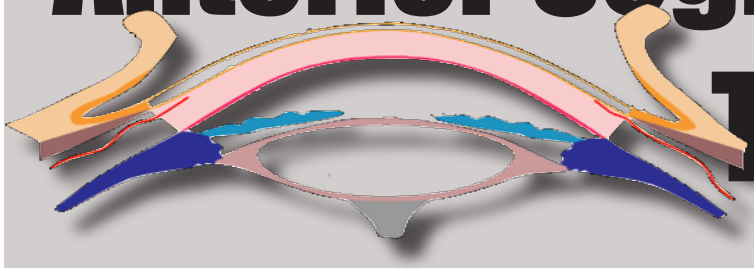
Anterior Segment Tips & Pearls



What's New

in anti-infectives, anti-inflammatories, and dry eye medications

- **AzaSite (Inspire Pharmaceuticals, Inc.) may be useful in treating patients with chronic blepharitis.** AzaSite (**Figure 1**) is currently approved for treatment of acute bacterial conjunctivitis, although 4th generation flouroquinolones still remain the first line therapy for this condition. AzaSite is 1% azithromycin in DuraSite vehicle that allows the antibiotic to stay in contact with ocular structures longer than antibiotics dissolved in aqueous formulations. Prolonged contact may be beneficial in treating chronic conditions, such as chronic blepharitis. A four-week pilot study found significant reduction of common eyelid bacterial flora associated with significant improvement in both signs and symptoms in patients with chronic blepharitis. Two phase 2 randomized placebo controlled multicenter trials have now been initiated on 300 blepharitis subjects at 30 clinical sites. Safety, efficacy, and tolerability of 2 week treatment vs. placebo and 4 week treatment vs. placebo is being evaluated. In the mean time, patients with chronic blepharitis resistant to the usual treatment methods may do well with an off-label use of AzaSite.

- **MRSA (methicillin-resistant staphylococcus aureus) is on the rise** with increasing number of community acquired cases reported this year. A recent conversation with emergency room physicians at CPMC Davies Campus revealed a growing number of patients presenting with cases of MRSA. MRSA cases resistant to fluoroquinolones, including the fourth generation moxifloxacin and gatifloxacin, are also on the rise. This means that when you have a patient with a corneal ulcer unresponsive to fluoroquinolones, the infiltrate needs to be gram stained and cultured. If there is a high suspicion of MRSA – hospital worker or exposure to hospital workers, history of skin abcess, exposure to people with MRSA, etc – the patient needs to be started on antibiotics effective against MRSA. The topical antibiotic of choice is Vancomycin. Traditionally, topical fortified Vancomycin has been used in concentration of 50 mg/ml. Due to corneal and conjunctival toxicity, lower concentrations have been investigated. Currently, we are using fortified Vancomycin at 25mg/ml concentration (Leiter's Pharmacy, San Jose, CA) to successfully cure infection with minimal toxicity to the sur-

Figure 1. AzaSite is an antiobiotic that may be helpful for patients with chronic blepharitis.

rounding tissues.

- **Avastin (bevacizumab, Genentch, Inc) can now be used to shrink corneal blood vessels** in patients with corneal neovascularization. VEGF drugs such as Avastin and Lucentis have been used successfully to shrink retinal blood vessels in patients with AMD and other retinal vascular disorders. In April 2009 Archives of Ophthalmology, 10 patients with stable corneal neovascularization have been treated with topical Avastin 1% for 3 weeks. They were followed up for 24 weeks. The area of neovascularization decreased and vessel caliber decreased as well. No side effects were observed. Topical Avastin can be formulated by Leiter's pharmacy in San Jose, CA.

- **Lacrisert (Aton Pharma) is available again for patients with dry eyes** who want to simplify their lubricating eye drop regimen. Lacrisert (Figure 2) is a pellet of hydroxypropylcellulose sustained release formulation that is placed in the inferior cul-de-sac once every 24 hours. It then releases the tear film thickening agent continuously. The patient can place it before going to bed allowing the insert to dissolve overnight preparing the tear film for the subsequent day. The need to use supplemental artificial tears is reduced. In a study presented at ARVO this year, 520 patients from the multicenter registry study showed more than 25% improvement in mean ocular surface disease (OSDI) scores and symptom improvement over the four week course of treatment. This increase was greater than what patients experienced from their previous dry eye therapies.

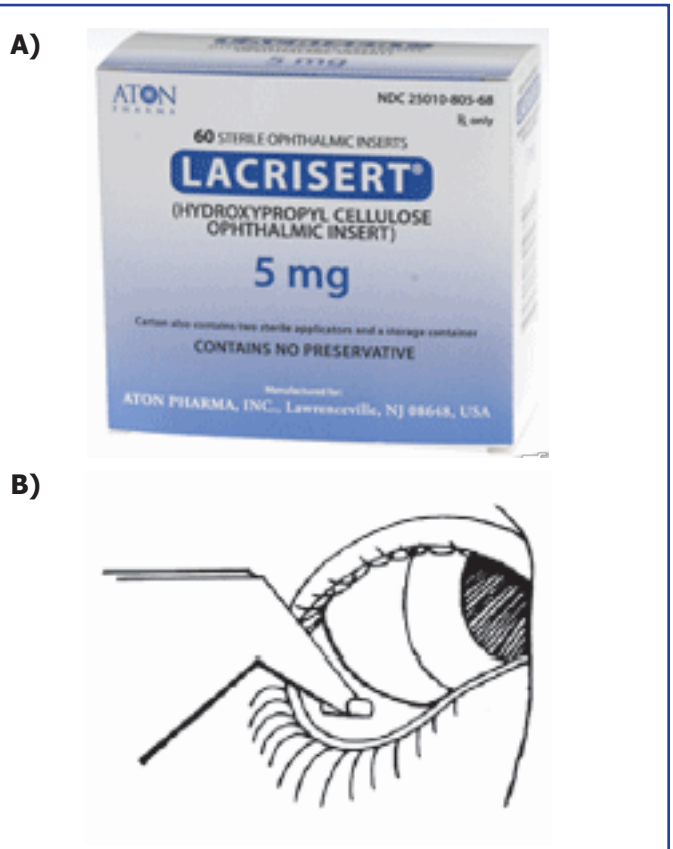
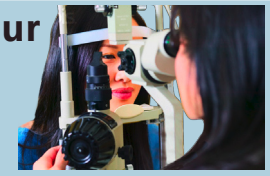


Figure 2. Lacrisert (A) is a small pellet of hydroxypropylcellulose that can be placed into inferior cul-de-sac (B) with a special holder that comes with the pack of pellets.

Look at epithelium in your refractive surgery patients considering LASIK enhancement



Estimated incidence of epithelial basement membrane dystrophy (EBMD) in a general population is 5%. Some patients who had LASIK may, therefore, develop signs and symptoms of EBMD at some point in their life. This may occur as soon as a few months after LASIK to as long as 10+ years. The signs of EBMD may include such findings as map, dot, and/or fingerprint changes on slit lamp biomicroscopy. They may also include a shift in refractive error. The shift in refractive error may be due solely to the thickened and/or irregular epithelium. Removal of the epithelium alone with or without concomitant phototherapeutic keratectomy (PTK) may be sufficient to eliminate the refractive error and bring these patients back to emmetropia. Stromal ablation can, in fact, result in over-correction and may need to be avoided in patients with post-LASIK refractive error associated with EBMD.

In the upcoming August issue of *Journal of Refractive Surgery,* Pacific Vision Institute research team published the results of PTK on refractive error in LASIK patients who developed signs and symptoms of EBMD (Figure 3). In these eyes, PTK alone resulted in decreased refractive error in both myopes and hyperopes, bringing these patients to emmetropia without the need for lifting the flap and doing excimer laser ablation on stromal bed. Patients considering enhancement after LASIK should be carefully examined for presence of EBMD changes prior to doing enhancement to avoid over-correction and insure accurate outcomes.

Calculating IOL power in patients after corneal refractive surgery requires multi-formula analysis

Accustomed to good vision after their corneal refractive surgery, these patients typically want predictable outcome and good vision after their cataract or lens replacement surgery. Cataract surgery success depends on accurate calculation of IOL power that takes into account the intricacies of the reshaped cornea. Traditional methods for measuring corneal power, such as keratometry and corneal topography, assume that the anterior and posterior corneal surfaces are nearly parallel. While this is the case for post-RK corneas, the relationship between corneal curvatures after excimer laser surgery is changed – the anterior surface becomes flat-

ter after myopic LASIK/PRK and steeper after hyperopic LASIK/PRK in relationship to the posterior curvature. Traditional methods of corneal power calculation also assume that corneal power at a 3 mm radius surrounding the visual axis is similar to that in the center of the visual axis. After kerato-refractive surgery, the corneal power in the visual axis is different than in the surrounding 3 mm.

Using corneal power measurements derived from traditional techniques will not accurately reflect the corneal power in the center of the visual axis. Traditionally measured post-refractive surgery keratometry values tend to over-estimate the corneal power. When used in intraocular lens calculation formulas, these keratometry values may generate weaker lens power values. Clinically this can manifest in insufficient intraocular lens power and in post-operative hyperopia to varying amounts.

In order to determine the correct IOL power, surgeons have developed various nomograms to adjust for the change in the corneal power. Currently the most reliable of the formulas relies on obtaining the patient's pre-refractive surgery measurements in order to determine the change in the corneal shape. It is, therefore, essential for the patient to maintain relationship with their primary eye doctor who can provide the cataract surgeon with pre-refractive surgery data for the most accurate IOL calculation.

If the historical data is unavailable, other formulas may also be used. More than 15 different IOL calculations formulas have been published to help surgeons choose the correct lens after cataract surgery (Figure 4). Dr. Victor Chin, Director of Cataract and Lens Surgery at Pacific Vision Institute, analyzes the results of all these calculations in selecting IOL power for the patients to achieve optimal results for their lens procedure.

CASE EXAMPLE

Recently, Dr. Chin performed surgery on a 58 year old sales manager who had undergone myopic LASIK in Nebraska approximately 13 years prior to being seen in the office. He reported that he used to have a very large spectacle correction but this improved greatly after LASIK. Over the past several years, he began to notice glare at night and recurrence of myopia (Figure 5).

Rather than advocate additional laser enhancement, Dr. Chin discussed the definitive correction with refractive lens exchange and implantation of a Crystalens. In addition to clearing early media opacity and reducing refractive error, a refractive lens exchange with this lens would treat presbyopia.

The patient's history of prior refractive surgery required very special consideration and careful analysis. After an exhaustive search, the patient's old LASIK records were obtained, and a new set of detailed measurements was performed. All available corrected keratometry formulas were used to obtain a range of possible corneal power readings, which were then used to predict an optimal intraocular lens power. The patient proceeded to have an uncomplicated cataract extraction procedure and post-operatively enjoyed excel-

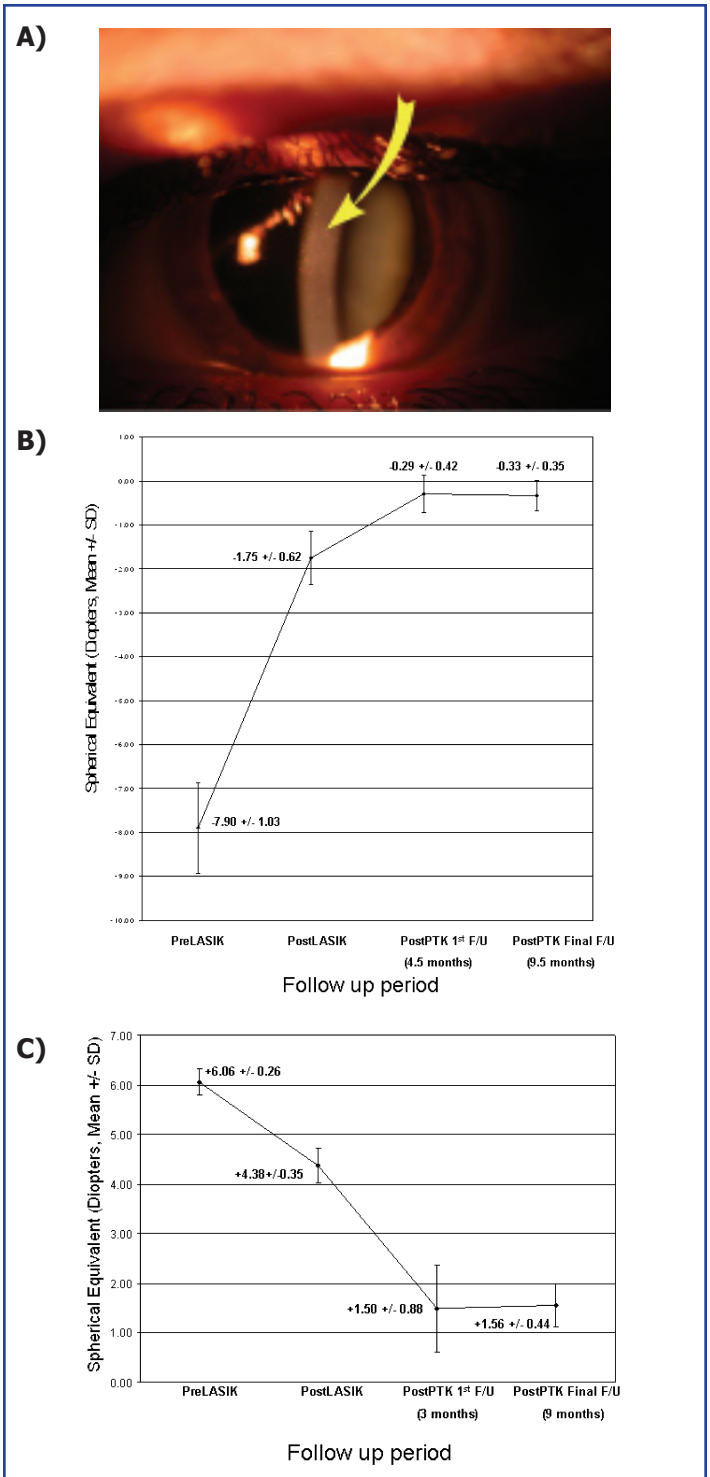


Figure 3. Map line (A). Myopic refractive error after myopic LASIK in patients with EBMD can be reduced with PTK (B). Hyperopic refractive error after hyperopic LASIK in patients with EBMD can be reduced with PTK (C). Traditional enhancement would have resulted in over-correction.

	OD	OS
MRx	-2.50 +0.75 @ 145 (20/25 BSCVA)	-1.75 +1.00 @ 14 (20/25 BSCVA)
CORNEA	Faint LASIK flap edge	Faint LASIK flap edge
LENS	1+ hazy	1+ hazy NS and vacuoles

Figure 5. Preoperative examination in a patient undergoing refractive lens exchange.

lent 20/25 uncorrected distance vision as well reading vision to the J3 level. The careful lens calculation adjustments predicted an intraocular lens which was over 3 diopters stronger than the lens which would have been selected with standard formulas. Without the extra analysis, the patient could have wound up with more than 3 diopters of unintended hyperopia. As the post-refractive surgery patients age, these cases will become more and more common. Thoughtful planning and consideration will be crucial to achieving the excellent refractive results that patients demand.

In addition, we are now advocating lens surgery rather than corneal surgery as primary vision correction option in these two types of patients:

- Presbyopic patients - refractive lens exchange is the best vision correction option for these patients. Accurate outcomes, life-long result, and presbyopia reversal can be obtained.

- High ametropes - phakic IOL (ICL) is the best vision correction option for these patients. When the need for cataract surgery arises as they age, ICL can be removed and IOL power can be calculated accurately since the cornea has not been operated on. ■

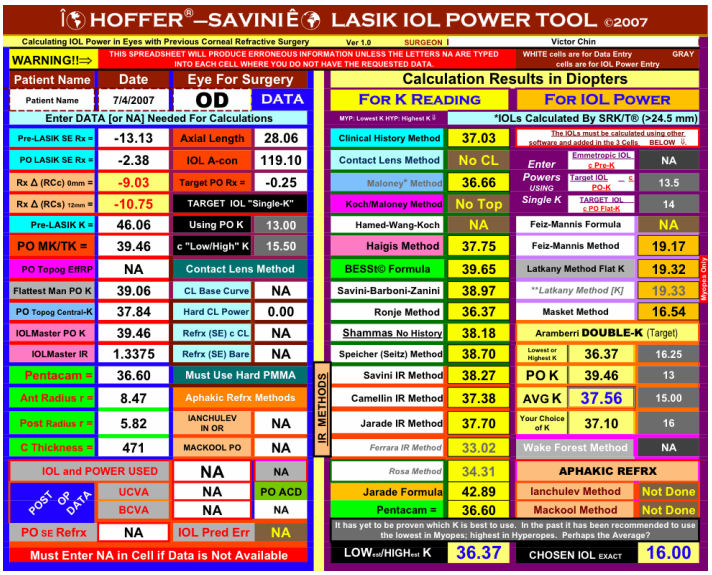
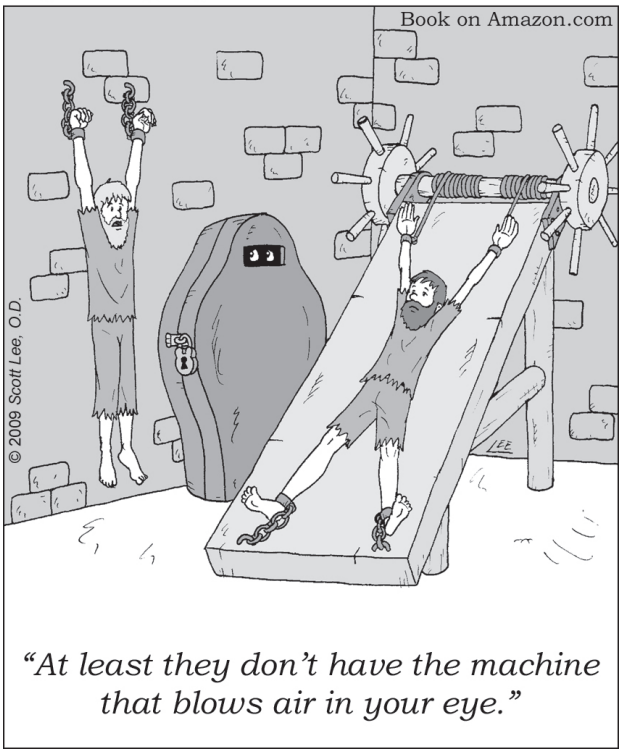


Figure 4. Complex set of formulas is required for IOL power calculation in patients with previous kerato-refractive surgery.

Pacific Vision Institute Optometric CE Program

10/23/09	PVI Grand Rounds Antibiotics and anti-inflammatory medications
12/10/09	PVI Holiday Dinner
01/29/10	San Francisco Optometric Continuing Education Symposium – Winter Session (5 hours of CE, 5 hours of TPA credit)
04/23/10	San Francisco Optometric Continuing Education Symposium – Spring Session (5 hours of CE, 5 hours of TPA credit)

Sight Gags *by Scott Lee, O.D.*



"At least they don't have the machine that blows air in your eye."

Scott F. Lee, O.D., Editor-in-Chief, eFocus.
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