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eFocus

Excellence in Co-Managed Care

PACIFIC VISION INSTITUTE • Life in Focus

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Anterior Segment Case Management

Tips on Cornea, External Diseases, Cataract and Lens patient management

Recent scientific meetings and publications brought a wealth of data that can be readily applied to help manage patients with cornea, external diseases, cataract, and lens considerations. In this month's *eFocus*, we share practical tips on the latest diagnostics and treatments. *eFocus* is a PVI publication for co-managing doctors. If you have a patient you want to discuss, please contact us and we'll be happy to help you. If you have a patient management story or dilemma you want to share with our Bay Area eye care community, please let us know and we'll include it in our next *eFocus*.

CORNEA

Excellent UV protection is essential to maintaining corneal clarity after PRK

A study performed in the US Military and presented at this year's meeting of the American Academy of Ophthalmology found that sunglasses with excellent UV protection are the most important factor in reducing corneal haze after PRK.[1] In this retrospective study, 25,313 eyes that underwent PRK were analyzed. The incidence of corneal haze was extremely low at 0.62%. There was no difference in age, gender, and preoperative refractive error between patients who developed haze and those who didn't. Risk factors such as smoking, exposure to windy/dusty environments, level of skin pigmentation, and the use of sunglasses were evaluated. The only risk factor that proved to be statistically significant was the use of sunglasses ($P<0.03$). Patients whose corneas were clear used sunglasses to protect their eyes from UV exposure.

Interestingly, in this study, intraoperative Mitomycin C was not used in any of the patients, including those with high corrections, and yet the incidence of corneal haze was very low. This could be due to the prolonged postoperative steroid course used in these patients. Topical steroids were used for four months postoperatively. At Pacific Vision Institute, we typically use intraoperative Mitomycin C in patients with myopic spherical equivalent of -5.0D or more, hyperopic spherical equivalent of +3.0D or more, patients who will have more than 50 microns of cornea ablated, and in patients with previous RK or significant corneal scars. Postoperatively, the patients are instructed to use Pred Forte QID for one week, followed by FML QID for one month, then BID for another month. We believe that a twelve second intraoperative application of Mitomycin C is preferable to many months of steroid use.

Regardless of intraoperative or postoperative medication regimen, all patients who have PRK should be encouraged to avoid ultraviolet light exposure. The use of sunglasses with excellent UV protection should be encouraged.

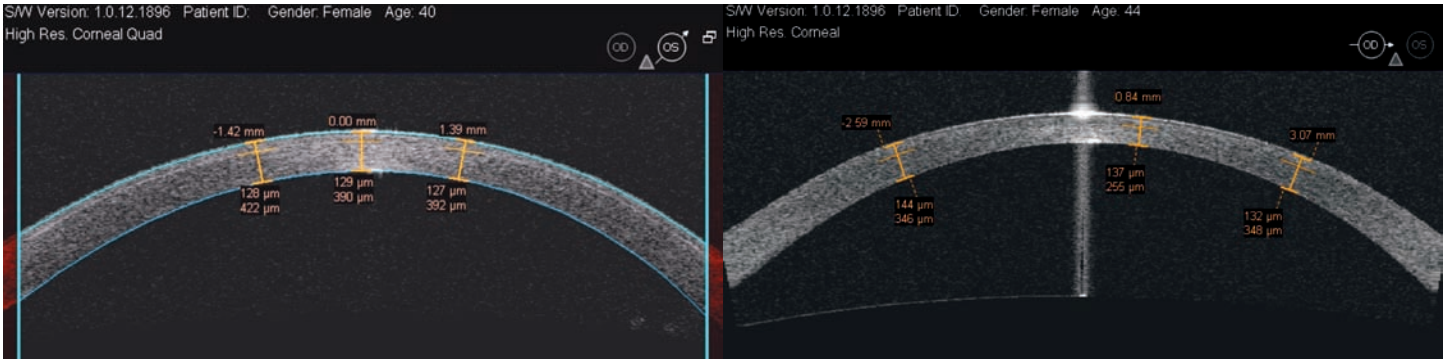

Figure 2. Anterior Segment OCT measurement of corneal flap and the central residual stromal bed after LASIK. In the image on the left, central residual stromal bed thickness is 390 microns – more than adequate for additional laser treatment. In the image on the right central residual stromal bed thickness is 255 microns. It is inadequate for additional laser treatment on the stromal bed. Laser enhancement in this patient needs to be done on the surface of the cornea as PRK.

Can these patients have Laser Vision Correction? What would you recommend - LASIK or PRK?

- Previous LASIK – any refractive error presenting after LASIK can typically be corrected by lifting the original corneal flap and doing laser on the stromal bed. The thickness of the stromal bed, however, needs to be adequate (at least 300 microns for patients considering enhancement) so that additional laser doesn't weaken the cornea. Stromal bed thickness can easily be determined using Anterior Segment OCT scan to measure the flap and the residual stromal bed thickness. Even if the residual stromal bed thickness is adequate for additional laser, patients who want an enhancement several years after their original LASIK are best corrected with PRK to avoid disturbing the corneal interface and risking epithelial ingrowth. Patients who had their original LASIK done with a mechanical microkeratome are more likely to have epithelial ingrowth if the flap is lifted than patients whose original LASIK was done with femtosecond laser. Therefore patients with a mechanical flap are better suited for PRK rather than LASIK enhancement.
- Previous PRK – these patients are easily enhanced with a PRK procedure.
- Previous RK – while LASIK can be performed in these patients, we have switched to doing PRK almost exclusively to preserve corneal integrity and avoid the risk of incision dehiscence during flap creation. PRK is typically performed with intraoperative Mitomycin C application to maintain corneal clarity. The results have been similar to primary PRK, although postoperative refraction may take longer to stabilize - up to six months. We recommend using FML longer in these patients – QID x two months, then BID x 1 month.
- Previous Phakic IOL –either LASIK or PRK can be done to correct residual refractive error in these patients. At Pacific Vision Institute, the results of LASIK and PRK in patients with phakic IOL are similar to those in primary LASIK and PRK cases. We wait at least three months after phakic IOL to perform LASIK or PRK if needed.
- Previous cataract surgery or refractive lens exchange (RLE) – we typically recommend PRK for these patients to correct residual refractive error. PRK rather than LASIK is recommended because these patients are generally older and may have either epithelial basement membrane dystrophy or another type of ocular surface disturbance that is best addressed with surface laser, such as PRK, rather than LASIK.
- Glaucoma suspect – either LASIK or PRK can be performed in these patients. If IOP is high, PRK may be the better option.
- Glaucoma – PRK is the best option for these patients
- Diabetes – either LASIK or PRK can be performed. Blood sugar and HbA1C need to be under control. Epithelial healing after PRK may take longer in patients with diabetes. Bandage contact lens may, therefore, need to be left on the eye for more than the typical four days after PRK. Some patients may require more than a week to re-epithelialize. Make sure to use topical antibiotic prophylaxis QID until epithelial defect is healed. We also use Pred Forte QID during that time, then switch to FML once the epithelial defect is healed.
- Keratoconus - Intacs are often helpful in spherosizing the cornea, reducing central corneal height, and/or moving the cone centrally. This helps improve vision in glasses and contacts, can often make contact lens wear more comfortable, and move the patient from RGPs into soft contact lenses. For patients who are interested in reducing their dependence on glasses and contacts, Intacs may not accomplish it. Since corneal laser is typically contra-indicated in patients with keratoconus, the safest refractive surgery is either phakic IOL for younger patients or RLE lens replacement for presbyopes. RLE with toric IOL works well for patients with mild to moderate amount of astigmatism.

At Pacific Vision Institute, we analyzed the results of PRK enhancement in patients with previous LASIK and found that the healing is typically faster than after primary PRK, with most patients achieving 20/15 vision by postoperative week 2.

Look carefully at the lens of every patient you are considering for laser enhancement! A change in refractive error after previous corneal refractive surgery may be caused by changes in the lens. Lens changes may be small – a few vacuoles, a mild PSC, "oil droplet" change in the nucleus – all may cause a change in refractive error. Best-corrected vision may remain 20/15 in these patients. Lens Replacement Surgery rather than LASIK or PRK is the best way to surgically treat the refractive error in most of these patients.

PATIENT J.U. 52 y.o. man underwent LASIK OU seven years ago to correct myopic astigmatism. Preop MRx was -5.00 – 3.00 x 011 OD (BSCVA 20/20) and -5.25 – 2.50 x 001 OS (BSCVA 20/20). Postoperatively, he had mild residual myopia – 0.50 – 0.25 x 001 OD (BSCVA 20/20) and plano – 0.50 x 058 OS (BSCVA 20/20). Five years ago he underwent wavefront-guided enhancement OU. He was very happy with his outcome until he presented several months ago with increasingly blurry vision in the right eye. On examination, he had recurrence of mild myopic astigmatism with MRx -0.50 – 0.75 x 109 (BSCVA 20/20-). All corneal maps were completely normal. Lens examination revealed two anterior cortical vacuoles in the visual axis. Vacuoles and their effect on the visual axis were confirmed by Pentacam

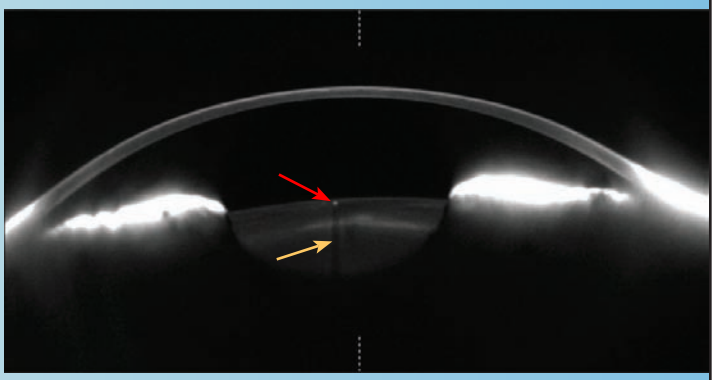

Figure 3. Lens vacuoles are easily visualized with Pentacam. They appear as white opacities (red arrow) that project a linear shadow (yellow arrow) posteriorly into the lens. Lens density can also be quantified.

	Type of enhancement surgery recommended			
	LASIK	**PRK**	**Lens Replacement**	**Phakic IOL**
Post LASIK				
Adequate stromal bed thickness, and less than 2 years after original LASIK, and no lens changes	**Y**			
Inadequate stromal bed thickness, or more than two years after original LASIK, and no lens changes		**Y**		
Lens changes present			**Y**	
Post PRK				
Lens changes absent		**Y**		
Lens changes present			**Y**	
Post RK				
Lens changes absent		**Y**		
Lens changes present			**Y**	
Post phakic IOL	**Y**	**Y**		
Post cataract / refractive lens exchange (RLE)		**Y**		
Glaucoma suspect	**Y**	**Y**		
Glaucoma		**Y**		
Diabetes	**Y**	**Y**		
Keratoconus			**Y**	**Y**

EXTERNAL DISEASES

Short-term therapy with Azasite provides lasting relief from Meibomian Gland Dysfunction (MGD) and improves TBUT

This summer, two prospective studies were published in *Cornea* on the efficacy of azithromycin 1% (Azasite) in treating MGD.[2,3] Twenty two patients were treated in one study[2] and twenty six patients in the other one. [3] In both studies, Azasite was administered BID on days 1 and 2, then QD on days 3 through 28. All patients experienced relief from their symptoms at four weeks of therapy. All signs of lid margin disease improved as well, including TBUT. The improvement in TBUT was statistically significant (P<0.001). Moreover, the relief lasted after therapy was discontinued. At four weeks after completion of treatment, patients continued to report improvement compared to baseline.

We use Azasite before and after refractive surgery in patients who have symptomatic MGD. We use it in both younger patients undergoing LASIK, PRK, or Phakic IOL procedures and in older patients undergoing cataract and RLE surgery. At first we prescribed it BID for one week then QD for two weeks, but have now switched to the regimen used in the two published studies.

Figure 4. Azasite is a viscous solution and patients may say they don't have enough in the bottle or that the drops don't come out easily. Recommend to them to store the bottle upside down so that the drops are dispensed easily.

CATARACT

Tips on managing refractive error after Crystalens IOL implantation

Patients who undergo cataract or refractive lens exchange surgery with special lenses - presbyopic or toric IOLs - typically want to optimize their uncorrected vision after surgery. If you manage these patients, attention to their postoperative refractive error is important. Some patients may not be bothered by postoperative refractive error and are happy to wear glasses. But many patients may not be satisfied with that solution especially if they invested into vision without glasses or contacts. Laser vision correction enhancement may be an excellent option for these patients. Patients with multifocal IOLs (such as ReSTOR and Technis) and toric IOLs can typically be enhanced with laser vision correction at three months postop.

Figure 5. Hyperopic astigmatism after Crystalens may be due to the small capsulorhexis and anterior capsular contraction. YAG anterior capsulotomy is the treatment of choice to reduce refractive error.

How about Crystalens patients? Crystalens is different from other IOLs – the hinges between optic and haptics are flexible. As the capsule contracts after surgery, the optic can move either anteriorly or posteriorly, or sometimes tilt. Meticulous surgery is critical to success. Capsulorhexis has to be the right size, all lens material needs to be meticulously removed during surgery, capsule needs to be polished. Surgical skill is critical to successful lens position. Nevertheless, healing forces can contract various parts of the capsule. If posterior capsule contracts, the optic shifts forward and the patient may present with myopia after surgery. If anterior capsule contracts, the optic shifts posteriorly and the patient may present with hyperopia postoperatively. If the lens tilts, both sphere and cylinder may be induced. It is, therefore, important to evaluate the lens capsule and the lens position in any patient considering enhancement of their refractive error after Crystalens.

U.S. Military results of ICL phakic IOL

An extensive study conducted at Fort Bragg with U.S. Army active duty personnel concluded that ICL is a safe and effective option for patients, even those exposed to the most adverse conditions, including eye trauma.[4] In the study, over 3,000 patients had ICL procedures. Average age was 28.3 years (range 19 to 51 y.o.). Mean preoperative spherical equivalent was -7.11D (range -2.87D to -13.87D). Mean preoperative cylinder was -1.56D (range 0.75D to -3.50D).

Postoperatively, 85% of patients saw 20/20 or better without glasses or contacts. 75% reported their quality of vision was better after ICL than with their preoperative vision with contact lenses, many stating this at their 1-day and 1-week visits. Myopes as young as 19 y.o. and as low at -2.87D were corrected with ICL. Doing surgery in young low myopes reflects the comfort in using this lens.

Figure 6. The demographics of ICL patients whose procedures were done at Fort Bragg involved more women and more patients of Asian descent than the military's typical laser vision correction program. The ICL patient demographics were more representative of civilian patients seeking refractive surgery.

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Pacific Vision Institute Optometric CE Program

01/20/11	iFS Femtosecond Laser Optometric Workshop. Pacific Vision Institute, San Francisco, CA
01/27/11	iFS Femtosecond Laser Optometric Workshop. Pacific Vision Institute, San Francisco, CA
02/03/11	iFS Femtosecond Laser Optometric Workshop. Pacific Vision Institute, San Francisco, CA
02/17/11	iFS Femtosecond Laser Optometric Workshop. Pacific Vision Institute, San Francisco, CA
04/29/11	10th Annual San Francisco Continuing Education Symposium Ritz Carlton Hotel, San Francisco, CA

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