

ASIA-PACIFIC EyeWorld

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Trendsetting in refractive surgery

*From applying new technologies to
modifying old techniques, refractive
surgeons are setting new standards and
changing the face of the practice*

Cover feature: Refractive Surgery

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Asia-Pacific Association of Cataract
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Letter from the Editor



Dear Friends

The theme of this issue of EyeWorld is changing trends in refractive surgery. The cover feature reports on refractive trends as reflected in a survey of members of the International Society of Refractive Surgery (ISRS). Although not identical we suggest that similar trends are likely to be occurring in the Asia-Pacific region.

Although LASIK is still the dominant refractive procedure performed, the number of surgeons performing surface ablation does appear to be increasing and is certainly used by most refractive surgeons in situations when LASIK may not be suitable. The reasons for the increased interest include newer techniques such as LASEK and epi-LASIK. It is interesting to note however the trend to discard the epithelial flap as reported in this issue. This appears to result in more rapid epithelial healing and visual rehabilitation. There is even discussion that cross-talk between a damaged epithelial layer and the stroma may increase haze formation, which is the opposite of the initial promise of the technique of preserving an epithelial flap. Even so, the creation of a well-circumscribed epithelial edge created by LASIK may be helpful in providing more rapid epithelial healing and may therefore be worthwhile as an alternative to traditional PRK.

Another topic in this issue is the prevention of postoperative pain with surface ablation. Some practitioners have developed relatively elaborate regimes including oral medication. In my experience the pain experienced undergoing surface ablation appears significantly less than I recall in my patients who underwent PRK in its early days in the early nineties. Less analgesia is required and despite counselling to expect severe pain, most often this does not occur. I suspect that one of the unsung innovations that has helped reduce pain is the development of improved bandage contact lenses. In this regard the silicone hydrogel contact lenses provide far superior oxygen transmission and therefore a tight lens syndrome with hypoxia is much less likely to occur.

The other emerging trend I noted in the survey of ISRS members is an increase in utilization of wavefront technology. It is difficult however to distinguish whether the improvements in results experienced with wavefront technology are in fact due to the reduction of higher order aberrations or other improvements which have been incorporated into the ablation profile. Measurements of higher order aberrations may vary depending on the tear film and ensuring that the aberration profile can be registered exactly at the micron level of accuracy required remains challenging. Experience with wavefront technology has demonstrated the importance of avoiding induced spherical aberration, which has led to the emerging trend of wavefront-optimised or aspheric ablation profiles.

Finally, the issue of safety and the prevention of late onset ectasia remains a concern. There is a general consensus that the gold standard of a residual stromal bed of 250 microns may not be sufficient in all cases as many surgeons prefer a residual bed closer to 300 microns. This has led to an interest in thinner flaps which can be created with the Intralase. It should be recognised that newer keratomes are equally capable of creating thin or sub-stromal flaps in the order of 100 microns with similar variability with the Femtosecond Laser.

The survey therefore reflects the important issues in refractive surgery and provides a useful platform to discuss some of the topical issues that face refractive surgeons in 2007. I hope you find the update on trends in refractive surgery as well as the other articles on cataract and glaucoma helpful.

Warmest regards

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Dear Friends

It is always a pleasure to pen down the editorial as the Managing Editor of the Indian Edition of EyeWorld.

The cover feature for this issue is: Refractive surgery.

While the building blocks of refractive surgery may have been laid down more than a century ago, and while the masters envisioned the techniques over the past five decades, the last decade has certainly seen explosive acceleration to the speed we are witnessing now. The field of refractive surgery is similar to a moving stream with constant improvements and innovations. The world of refractive surgery continues to evolve rapidly. It is incredible to realize that radial keratotomy (RK) was first performed less than 30 years ago. RK was the only real viable refractive surgery option until about 15-20 years ago when the excimer laser became widely available. In the past decade numerous improvements have been made in excimer laser system technology. Broad-beam lasers have evolved into much more versatile flying-spot lasers. Laser tracking systems effectively keep treatments well-centered. And now, iris registration may prevent cyclorotation from affecting the refractive outcomes. Femtosecond lasers to fashion laser-assisted in situ keratomileusis (LASIK) flaps are now more widely available, with potential advantages over mechanical microkeratomes. Just in the past few years custom ablations have become commonplace. Laser subepithelial keratomileusis (LASEK) has largely been replaced by epi-LASIK.

However, all laser techniques are limited in the amount of refractive error that can be corrected. If excessive amounts of tissue are removed, there is a risk of corneal ectasia. Also, because the cornea is the major refractive surface of the eye, changing its shape excessively degrades the image quality at the retina. Other options exist for patients with large refractive errors. The most popular of these is implantation of a lens within the eye, either with or without the removal of the natural lens. In younger patients (less than 50 years of age), who still have useful accommodation to permit reading vision, phakic IOLs are a good option. This eliminates the majority of the refractive error and preserves the accommodation. In older patients, refractive lens exchange or clear lens extraction are preferred. This latter technique is identical to the surgery routinely used to treat age-related cataract, although when performed for refractive reasons the lens that is removed is normal. Both procedures are able to correct very large amounts of short sight or long sight but have only a limited ability to correct astigmatism. In practice laser surgery is sometimes necessary as a secondary procedure to correct residual refractive error.

As a retina specialist, I would like to emphasize to all surgeons that a meticulous examination of these patients is required prior to refractive surgery. A substantial proportion of these patients are high myopes. A retina screening for them is as such mandatory. Incidence of retinal detachment in patients who have undergone LASIK has been documented to be between 0.06-0.25%. Though the association between LASIK and subsequent retinal detachment has not been conclusively established, a thorough examination of the periphery with I/O and indentation prior to LASIK is advisable. Treatment of any predisposing lesions such as lattice degeneration and retinal breaks if found may help in preventing retinal detachment in future. Retinal examination one month after LASIK is also recommended.

This issue covers emerging refractive technologies with a philosophical bent based on learnings from the past and looking forward to the future.

I hope you, the readers of this issue of EyeWorld, find it useful and applicable in your respective practices.

With warmest regards

Dr. S. Natarajan
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