

SURFACE ABLATION *continued from page 1*

laser vision correction, PRK was the only procedure available. Over time, I migrated to almost all LASIK, and now I find that I'm moving back to surface ablation for a substantial minority of my cases (Figure 1). The reasons for returning to surface ablation are familiar: improved outcomes, extended treatment range, and a better understanding of the limitations of LASIK (eg, potential for ectasia and flap complications). A healthy regard for the risks inherent in phakic intraocular lens implantation also inclines me toward surface ablation for many corrections above the LASIK range.

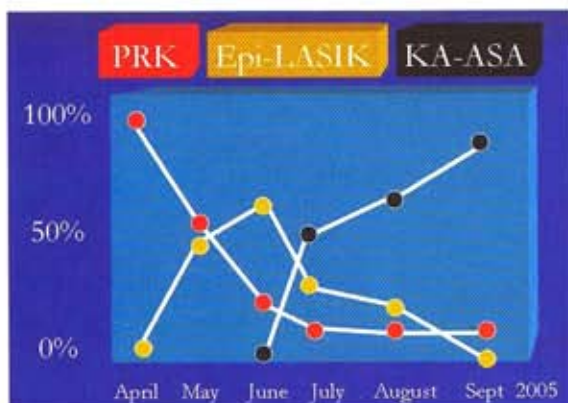


FIGURE 2 KA-ASA rapidly became the surface ablation procedure of choice in my practice.

Although I had tried LASEK, by last year I had shifted back to PRK as my procedure of choice for surface ablation (which I prefer to call "advanced surface ablation" because it is significantly different from—and better than—the PRK of the mid- and late 1990s).

I began performing epi-LASIK in April of last year, and by May half my advanced surface ablation cases were epi-LASIK. In June, the free cap happened, and by September I had almost fully converted my surface ablation cases from PRK or epi-LASIK to what I now call keratome-assisted advanced surface ablation or KA-ASA (Figure 2).

Experience Demonstrates Efficacy

In a 60-patient study we reported at the American Academy of Ophthalmology, KA-ASA was found to produce better visual outcomes than either PRK or epi-LASIK at 1 day and 1 week (Table I). By 1 month, however, the visual acuities are very close among all three procedures.

This is, I believe, a very meaningful result. One of LASIK's great advantages over surface ablation has been the very rapid return of vision that LASIK patients enjoy. Indeed, one of the things that allows us to attract young, working professionals to LASIK is the fact that they will be able to drive and to go back to work the day after surgery. With KA-ASA, we may at last have a viable alternative to LASIK.

In addition to faster visual recovery and superb

visual outcomes, KA-ASA patients experience less pain than epi-LASIK or PRK patients.

A Proposed Mechanism

Why should patients whose epithelium was removed with an epi-keratome (in a deliberate free cap procedure) enjoy significantly faster visual recovery than patients whose epithelium was removed with a hand-held blade, or a brush, or alcohol? There are several reasons:

- The epi-keratome leaves a beautifully smooth, shiny surface for ablation on Bowman's membrane.
- The epi-keratome technique is very quick, so there is little time for variable dehydration to affect the ablation results.
- The procedure leaves a smooth, clearly demarcated epithelial boundary (Figure 3). The cells at the edge of the separation are viable; there is no ring of crushed or alcohol-damaged cells to release mediators and impact healing.
- The clean epithelial borders promote rapid, uncomplicated healing with minimal pseudodendrite.
- Compared to epi-LASIK, there is no sheet of dying epithelium to release inflammatory mediators and impact healing.

KA-ASA

- ✓ **Advantages**
 - Rapid visual recovery
 - Excellent outcomes
 - Minimal discomfort
- ✓ **Theoretical basis**
 - Excellent surface for ablation
 - Fast—little time for corneal dehydration
 - Epithelial border made up of healthy, uninjured cells
 - Rapid epithelial regrowth without remodelling

TABLE I Results with different surface ablation technologies

| | Epi-LASIK (n=20) | KA-ASA (n=20) | PRK (n=20) |
|---------|------------------|---------------|------------|
| Pain | Low | Low | Low |
| UCVA | | | |
| 1 day | 20/40 | 20/25 | 20/40 |
| 1 week | 20/25 | 20/20 | 20/30 |
| 1 month | 20/20 | 20/20+ | 20/20- |

Results

Was our result with the first patient a statistical fluke? The answer is no. A subsequent prospective study in which patients were matched for prescription found that the average immediate postoperative vision was better among KA-ASA patients than either PRK or epi-LASIK patients (Figure 4). In fact, the results were somewhat better (and more tightly grouped around the mean) than in comparable LASIK patients.

As Table I demonstrates, the uncorrected visual acuities at 1 day and 1 week are also better than found with either standard epi-LASIK (with a flap) or PRK.