

Epi-LASIK

Successful in Eyes Prone to Haze, Keloids

Surgeon finds no increased risk of corneal haze following Epi-LASIK with MMC in an African population; flap retention or removal depends on amount of correction.

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February 2008

When I began performing laser surgery in Kenya, I consulted with many of my American and European colleagues about the best lasers, procedures and techniques. I was almost universally cautioned against performing surface ablation in African eyes.

We know that African eyes are prone to keloid formation. Sub-epithelial haze is caused by a keratocyte reaction similar to that which causes keloids, so African patients have always been considered to be at high risk for haze following PRK and other surface ablation procedures. And in a tropical city at 6,000 feet above sea level, ultraviolet radiation further contributes to the risk of haze.

However, the inability to perform surface procedures is a major problem in a country that also has high rates of keratoconus and dry eye. I decided to try Epi-LASIK, initially in very select cases.

Today, I perform Epi-LASIK with the Moria Epi-K™ in more than 35% of my laser refractive surgery cases, and I believe that number will only increase.

In a series of 410 myopic African eyes (SE from - 2.00 to -10.00 D) treated with Epi-LASIK, I obtained excellent results. 96% of patients were 20/40 on the first postoperative day.

No patient lost a single line of BCVA. There were no night driving complaints, and no patient lost ground on the Functional Acuity Contrast Sensitivity Test (FACS).

Most importantly, the incidence of sub-epithelial haze was very low. Only three eyes had significant sub-epithelial haze, which cleared after 16 weeks using topical steroids. All three cases occurred before I began using mitomycin C (MMC); since then, there has been no incidence of haze.

Epi-LASIK is now the procedure of choice in my practice for patients with thin corneas or any other risk factor for ectasia, including unusual topography, changing degree or amount of cylinder, or a family history of keratoconus. As a corneal surgeon who has performed nearly 1,000 corneal transplants for keratoconus, I am very conservative regarding the potential for ectasia.

I also prefer surface ablation for patients with large scotopic pupils or flat corneas, both of which can increase spherical

occupations (pilots, contact sports, etc.) also factor into the decision of whether to perform LASIK or Epi-LASIK.

It is essential that Bowman's membrane be intact for the Epi-K™ to function properly, so the procedure is contraindicated in anyone with prior refractive surgery, pterygium or other damage to Bowman's. I prefer the Ks to be from 39 D to 48 D; corneal diameter should be from 10.7 to 12.5 mm.

The procedure

Although many surgeons around the world have been concerned about pain levels after other surface procedures, I actually find that Epi-LASIK patients are remarkably comfortable. We see local patients from Kenya, as well as many others from around the world who travel to our center

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aberration post-LASIK. Additionally, many patients present for laser surgery in the first place because they have become contact lens intolerant due to ocular surface disease, meibomian gland dysfunction, severe blepharitis, or perimenopausal dryness. LASIK severs the corneal nerves, worsening dry eye and increasing the risk of DLK. And finally, patient choice and patient hobbies or

for treatment. In more than 700 Epi-LASIK cases I have not received a single after-hours call due to pain. I perform surgery on Fridays. We see the patients on Saturday for the first postoperative visit. Provided their visual acuity is at least 20/40, most patients are allowed to drive the following day (Sunday) and are able to return to work on Monday.

We use chilled anesthetic and BSS drops during surgery. Postoperatively, we give patients a topical NSAID (Acular) for the first day, then discontinue it after the first post-op day if there is no pain. Limiting the use of topical NSAIDs is a good idea because they can delay healing. We give patients one oral NSAID tablet (aceclofenac) and prescribe FML-T drops for the first week, followed by nine more weeks of FML. I also prescribe 1000 mg of Vitamin C daily for three months and liberal use of lubricating eyedrops (Refresh) for about three months. We do not prescribe topical anesthetic drops or

narcotic analgesics. I use Night & Day or Acuvue Oasys bandage contact lenses, which are removed after three to four days.

My current technique is to remove the epithelial sheet in low to moderate myopes, but retain it in higher myopes for haze prevention (Table 1).

I also use MMC 0.02% for 10 seconds for a 60- μm ablation; 15 seconds for a 70- μm ablation; and 20 seconds for an 80- μm ablation. We also instruct patients to wear good quality, 100% UV-A and UV-B

blocking sunglasses for nine months after surgery to reduce the risk of haze.

The Epi-K™ makes a nice large epithelial defect, so I find that I am able to successfully treat more hyperopes and astigmats because I have room for those larger custom ablations. In my practice, Epi-LASIK has been a wonderful alternative for patients in whom I would not have been comfortable cutting a lamellar flap, and I fully expect Epi-LASIK to continue to capture a greater share of refractive procedures.

Four Pearls to Success with Epi-LASIK

Cultivate a two-handed technique

Proper appplanation is a critical but often overlooked component of epithelial sheet dissection with the Moria Epi-K™. The surgeon must be able to apply smooth, even pressure when placing the suction ring on the eye, regardless of whether he is working with a left or right eye. Uneven pressure with a large suction ring such as that of the Epi-K™ will cause pain postoperatively. I constantly “train” my non-dominant hand by using it to write, play table tennis, and shave, or reverse knife and fork while eating. The payoff is that when I need to place the suction ring on a right eye with my left hand, I can do it smoothly and with minimal manipulation.

Use frozen anesthetic and BSS

Very cold drops are absolutely critical to patient comfort after surface ablation. Preoperatively, we put a few drops of frozen proparacaine in the eye, along with proparacaine-soaked strips in the upper and lower fornix. I put in the speculum but do not fully open it until after I irrigate, mark the cornea and test the Epi-K™ head. At the conclusion of the case, I apply frozen BSS, drop by drop, for 45 seconds. This makes the patient very comfortable immediately postop, but it also affects the lipids of Bowman’s membrane, to reduce pain sensation throughout the healing process. With this technique, my patients have not needed to use comfort drops or take an oral narcotic pain medication.

Discard the epithelial sheet, except in high myopes

When the epithelial sheet is removed, patients have better and more consistent postoperative visual recovery. However, in a contralateral eye study in a small series of -4.0 to -7.0D myopes, I found that haze was more likely in the eyes without the retained epithelium. Now, in eyes where the ablation is deeper than 70 μm or myopia is greater than -6.0 D, I retain the epithelial sheet.

Treat ocular surface disorders first

For patients to obtain an optimal visual result, as well as a comfortable postoperative experience, they must have a healthy ocular surface. If I see any lissamine green staining, I delay surgery until I have treated the underlying dry eye or lid disease. This may require several months and some combination of tears, punctal plugs, Omega 3 and 6 essential fatty acid supplements, lid scrubs and topical antibiotics, but I will not schedule surgery until I am satisfied that there is no staining and the dry eye is under control. Given that so many of our patients have some form of dry eye, Epi-LASIK is a wonderful alternative to LASIK because it preserves corneal innervation.

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Dr. Joshi has no financial interest in Moria and is not a paid consultant for the company.

