

Recurrent Epithelial Ingrowth and Regression

BY TAL RAVIV, MD, FACS; ELIZABETH A. DAVIS, MD, FACS; AND YUNHEE LEE, MD, MPH

CASE PRESENTATION

A 37-year-old female presented for an evaluation. She had undergone bilateral LASIK 33 months earlier. Although she saw well initially with both eyes, she has undergone flap lifting and/or enhancement surgery in

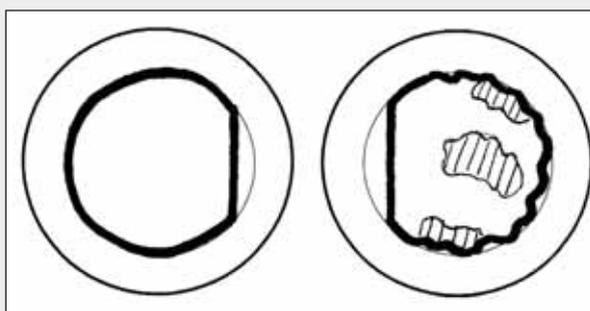


Figure 1. As seen in these slit-lamp drawings, the nasally hinged flap appears to be without striae or ingrowth in the patient's right eye, but her left eye shows significant scalloping of the temporal border as well as three dense areas of epithelial ingrowth.

her left eye 12 times during the subsequent 29 months for recurrent epithelial ingrowth and/or regression (no records are available). The last lifting of the flap occurred 5 months ago, and the patient again complains of poor vision in her left eye. She has tried rigid gas permeable contact lenses but has been unsuccessful due to a poor fit and discomfort.

The current ocular examination reveals a UCVA of 20/25 OD and count fingers at 4 feet in her left eye. Her near UCVA measures J1 OD and J14 OS. The keratometry readings are 40.6/43.3@94 OD and 35.4/41.2@124 OS. Figure 1 shows the view from the slit lamp. Her right eye is dominant. Pachymetry measures 468µm OD and 426µm OS (Figures 2 and 3). Her manifest refractions are +0.25 +0.50 X 135 = 20/20 OD and +2.00 +5.25 X 145 = 20/25-2 OS. She has an IOP of 15mmHg OD and 13mmHG OS.

The patient is interested in pursuing a permanent solution. How would you proceed with the visual rehabilitation of her left eye?

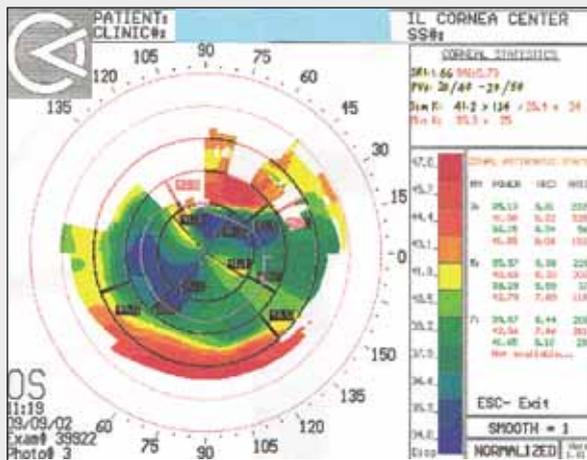


Figure 2. The corneal topography for the patient's left eye is shown.

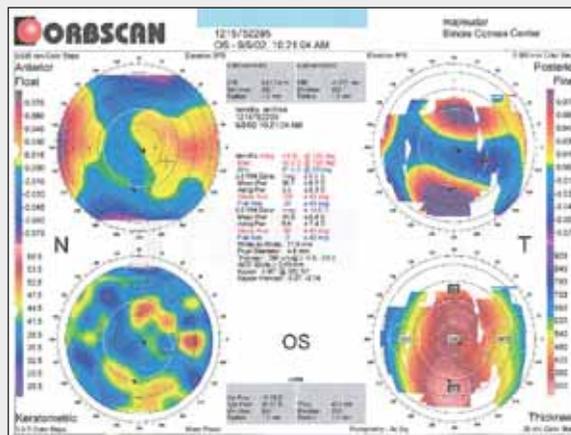


Figure 3. Measurements were taken of the patient's left eye with the Orbiscan topographer (Bausch & Lomb, Rochester, NY).

TAL RAVIV, MD, FACS

This is a case of recalcitrant, visually debilitating epithelial ingrowth. The irregular, high keratometric cylinder seen on both topographic maps is typical for this type of aggressive central ingrowth. The scalloping of the flap's edges and the hyperopic refraction may also reflect prior or ongoing flap necrosis and melt.

“The only way to improve the patient’s vision is to eliminate the epithelial ingrowth.”
—Elizabeth A. Davis, MD, FACS

There are two options for initial surgical intervention. The first involves one last effort to salvage the flap and remove the epithelial ingrowth, which occurs due to the presence of a fistula between the flap-stroma interface and the peripheral epithelium. The gold standard for permanently closing the fistula involves suturing the flap. The surgeon should lift the flap, scrape the epithelium from both the flap's undersurface and the stroma, and tightly suture the flap with circumferential, interrupted 10-0 nylon. I believe adjunctive epithelial destructive techniques such as the use of phototherapeutic keratectomy, alcohol, or proparacaine on the stroma accomplish little if the fistula is not sealed.

If the flap seems too thin, irregular, or necrotic or if the aforementioned suturing fails to resolve the ingrowth, then amputating the flap is the next option. After removing the flap, I would scrape off the nest of epithelial cells, lightly polish the stromal surface with a diamond burr, and then apply mitomycin C (MMC) 0.02% to the stromal bed for 12 seconds in an attempt to prevent the haze that frequently develops after a flap's removal.

I would wait months for the visual axis to clear and for the refraction to stabilize after either of the options just described. I would then evaluate any residual refractive error and deal with it either via a customized surface ablation with MMC or lens-based surgery, depending on the residual refractive error and/or pachymetry. If corneal visual clarity is not achieved, more invasive options such as lamellar or penetrating corneal surgery may be required.

ELIZABETH A. DAVIS, MD, FACS

In addition to intractable recurrent epithelial ingrowth in the patient's left eye, there is evidence of some flap melt, as indicated by the scalloped border of

the flap's edge. The topography of this eye shows significant irregular astigmatism. In addition, the sheet of epithelial cells in the interface may hinder the diffusion of nutrients to the flap above it. When combined with the potential for collagenases liberated from dying epithelial cells, future flap melt is possible. That problem could cause an additional loss of BCVA, particularly because some of the epithelial cells are centrally located.

The only way to improve the patient's vision is to eliminate the epithelial ingrowth. I might use one or both of the following approaches. If not already done, I would consider an additional removal of the epithelial ingrowth with the application of Tisseel glue (Baxter Healthcare Corporate, Glendale, CA) and/or sutures. There would still be the potential for recurrence, however, given the patient's history.

If this measure failed, then I would suggest removing the flap. To prevent haze, I would apply MMC 0.2mg/mL to the bed for 12 seconds after the flap's amputation and then irrigate the surface copiously with balanced salt solution. I would apply a bandage contact lens and have the patient frequently instill topical steroids postoperatively. My hope would be that re-epithelialization would make the corneal surface more regular. Later, an attempt could be made to fit the patient with glasses or contact lenses.

If these measures were unsuccessful and significant irregularity and loss of BCVA existed, a penetrating keratoplasty could be performed. I am hopeful, however, that one of the aforementioned approaches would work.

YUNHEE LEE, MD, MPH

After numerous attempts to address this patient's postoperative problems, her left eye has irregular hyperopic astigmatism with areas of surface elevation corresponding to the recurrent nests of epithelial ingrowth. Before trying again to correct her regression, one must remedy the epithelial ingrowth. One might attempt a final lifting of the flap with meticulous removal of all epithelial cells, a light application of alcohol on the back surface of the LASIK flap to devitalize any remaining epithelium, and complete sealing of the flap's edge to prevent reentry of the epithelial cells under the flap. Using Tisseel glue might work, but placing multiple corneal sutures at the flap's edge with careful attention to the 2- and 6-o'clock positions might be more successful.

If a heroic attempt at removing the epithelial ingrowth proved unsuccessful or if the flap demonstrated too much scarring and irregularity from stromal

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melting and thinning, amputating the flap might help. Once the surface has re-epithelialized, the eye's refractive status will probably be very different. After allowing adequate time for healing, remodeling, and stabilization of the surface and refraction, the surgeon could reassess the cornea for ectasia and consider performing either a minimal PRK with MMC or perhaps even implanting a phakic IOL. Alternatively, a repeat contact lens fitting might be more successful and comfortable for the patient at this point. ■

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