

Irregularly Recut Flap

BY STEPHEN COLEMAN, MD; ROY S. RUBINFELD, MD; WILLIAM B. TRATTLER, MD;
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CASE PRESENTATION

A female nurse undergoes bilateral myopic LASIK in 2006. After she experiences mild regression in her left eye, she responds to a Groupon advertisement for a discounted enhancement. The surgeon recuts the flap in the patient's left eye. During the microkeratome pass, suction breaks, and the entry through the visual axis is irregular.

One month later, the patient seeks a second opinion. Her UCVA is 20/60, and her manifest refraction is $-3.50 +3.25 \times 180$, with a BCVA of 20/30 OS (Figures 1 and 2). Her right eye has a UCVA of 20/30 with a refraction of -0.75 D sphere. Punctal plugs are placed in the patient's left eye, and she begins a course of topical steroids. The UCVA, BCVA, and manifest refraction, however, do not change.

The patient, now 32 years old, presents to your office for a corneal consultation. She expresses a desire for improved visual quality. What treatment options are available to her?

(All figures courtesy of William B. Trattler, MD.)

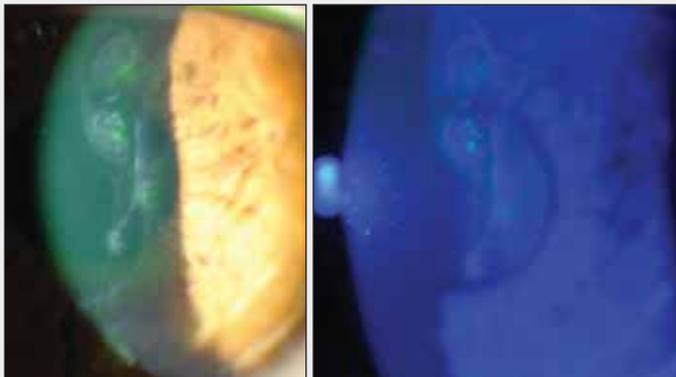


Figure 1. Clinical photography reveals an irregular corneal surface after a complication during the microkeratome's pass.

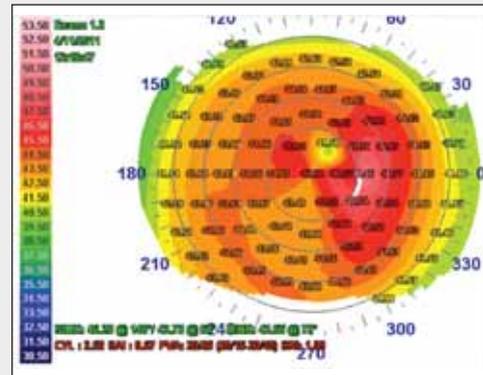


Figure 2. Topographic map of the patient's left eye.

STEPHEN COLEMAN, MD

A majority of surgeons today will agree most of the time on whether or not a patient is well suited for a primary LASIK procedure. The choice of laser and ablation profile certainly sparks discussion, but collectively, we surgeons have come a long way in terms of determining candidacy, which has improved LASIK's overall predictability and outcomes. Not so with enhancements. Our understanding of this aspect of LASIK continues to evolve. If medicine is a combination of art and science, performing a primary LASIK procedure is probably a little more science than art, and performing an enhancement is probably a little more art than science. With enhancements, we heatedly debate when, why, and how—particularly if the initial LASIK procedure took place 2 or more years ago.

In my practice, I evaluate patients desiring an enhancement similarly to how I assess those wanting a primary procedure with respect to visual acuity, topography, and pachymetry. The patients who do the best with an enhancement generally had myopic LASIK initially and present years later with a myopic regression. In these instances, I typically perform a surface procedure on the flap, which would have been my choice for re-treating this patient. As an alternative, I would have offered her a soft contact lens. I would not have lifted the flap, regardless of how it was initially created, due to the unacceptably high risk of epithelial ingrowth, which could lead to a long, complicated (but not visually threatening) postoperative course. Even with current state-of-the-art advanced imaging systems (eg, optical

coherence tomographers, WaveScan Wavefront System [Abbott Medical Optics Inc., Santa Ana, CA], etc.), I do not recut LASIK flaps because of the potential for visually significant complications that can be very difficult to manage. This is a case in point.

Although a rigid gas permeable lens is an option, it likely would not yield the patient's best vision. A planned two-step approach with a laser is the best course of action. The most reasonable approach would probably be first to perform a phototherapeutic keratectomy (PTK) to normalize the cornea and, it is to be hoped, improve her BCVA. Two to 3 months later, I would address the patient's residual refractive error with PRK. An alternative would be to perform a PRK using a transepithelial technique and the $-3.50 + 3.50 \times 180$ refraction, which theoretically would improve her visual acuity to 20/30. Provided the quality of her 20/30 vision is adequate, this surgical option might at least make the patient comfortable. I would use mitomycin C (MMC) with both approaches.

A third alternative would be to amputate the flap in its entirety, allow the cornea to heal similarly to after

PRK, and hope that the smoothing effect of the epithelium, in time, will work to the patient's advantage.

ROY S. RUBINFELD, MD

This case illustrates the dangers inherent in recutting any flap, whether with a mechanical microkeratome or a femtosecond laser. In 2003, my colleagues and I published a report on 12 eyes that experienced a significant loss of BCVA as a result of recut LASIK flaps.¹

In the current case, a break in suction was reported. Had it not occurred, there was still a significant risk of transecting the plane of the original flap with the recut, even if the second cut had been set deeper than the first. The three-dimensional nature and multiple factors that affect the geometry of LASIK flaps make recutting dangerous in nearly all circumstances.

Because of the irregularity shown on topography, I would recommend topography-guided PRK with MMC to treat this patient (procedure not approved in the United States). The Allegretto Wave excimer laser with T-CAT software (Alcon Laboratories, Inc., Fort Worth, TX) or the laser from iVis Technologies (Taranto, Italy)

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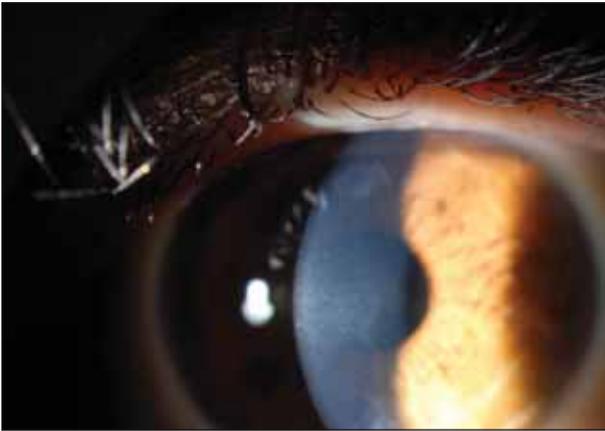


Figure 3. The appearance of the eye 2 months after undergoing transepithelial PTK.

might help this patient greatly (T-CAT software and iVis laser not available in the United States).

**WILLIAM B. TRATTLER, MD;
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The most important aspect of this case is that it reminds surgeons to avoid recutting LASIK flaps, a point Dr. Rubinfeld and his colleagues made years ago.¹ For the most part, surgeons have heeded this lesson and have used other techniques for enhancements. Dr. Trattler prefers PRK enhancements over flaps; this approach avoids epithelial ingrowth, but it does cause the patient some discomfort and delays visual recovery. Another option is to use a femtosecond laser to create a side cut of small diameter so that the flap can be lifted and replaced, possibly with a lower risk of epithelial ingrowth. Either technique avoids the serious complications that can occur when the surgeon recuts a cornea with a previous LASIK flap.

In this case, recutting produced a partial flap that extends through the visual axis. The slit-lamp examination reveals an irregular central corneal surface and a loss of BSCVA. When this patient presented to our clinic, Dr. Trattler recommended she undergo a PTK with MMC in an attempt to eliminate the irregular central corneal surface. The patient was advised to expect a hyperopic shift and the need for a second surface ablation procedure to address her residual refractive error. She was also informed that, if the PTK with MMC proved unsuccessful, a second option would be removal of the flap with the intraoperative application of MMC, and she was told that additional laser vision correction might be needed.

The patient elected to undergo PTK with MMC on May 26, 2011. Dr. Trattler performed the transepithelial PTK and then applied MMC 0.02% for 40 seconds. A bandage contact lens was placed, and the patient began

a regimen of Pred Forte (Allergan, Inc.) q.i.d., AzaSite (Merck & Co., Inc.) q.h.s., and Bromday (Ista Pharmaceuticals, Inc.) b.i.d. On June 7, 2011, her UCVA was 20/100, and her manifest refraction measured $-3.00 +3.25 \times 15 = 20/30$ OS. On July 19, 2011, approximately 2 months postoperatively, the patient's cornea was remarkably clear (Figure 3). Her UCVA was 20/50, however, and did not improve further with refraction. The patient said that she still noted some doubling of vision, with glare and halos. She will be observed, and a decision on further intervention will take place at the 6-month postoperative mark. ■

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1. Rubinfeld RS, Hardten DR, Donnenfeld ED, et al. To lift or recut: changing trends in LASIK enhancement. *J Cataract Refract Surg.* 2003;29:2306-2317.