

LASIK Retreatments: Create a New Flap, Lift the Old, or Perform Surface Ablation?

Surgeons share their preferences.

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Flap Lift Versus Recut for LASIK Enhancements



By Arthur B. Cummings, MB ChB, FCS(SA), MMed (Ophth), FRCS(Edin)

A small percentage of LASIK patients require enhancement following the primary procedure. These enhancements occur mostly within the first year, and there are no particular challenges with how to perform them. As long as there is enough corneal tissue, the surgeon simply lifts the flap, performs the laser ablation, and replaces the flap.

The challenge, however, occurs with late enhancements, in which regression occurs 3, 4, or more years after surgery. These flap lifts are known to lead to a higher incidence of epithelial cell ingrowth; I have seen this myself, and it is also reported in the literature.¹

Typically I discuss the surgical options with the patient: lift the flap and deal with the possibility of ingrowth or perform the enhancement as a surface procedure on the LASIK flap. The latter works well, but visual recovery is slower than for primary LASIK, the healing process is more uncomfortable for the patient for the first few days, and the eye can take longer to settle down visually. I do not like cutting a second flap if it can be avoided.

Other factors that affect the decision of flap lift versus surface ablation include whether the patient complained

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of dry eyes following the primary procedure and how thick the flap is. If the flap is thick, a large enhancement can be performed as a surface treatment without breaking through the flap. Of note, the surgeon must remember to subtract the epithelial thickness when doing the calculations. If the patient experienced dry eyes the first time around, I would lean toward surface laser.

Over the years, I have tended to sway between flap lift and surface ablation. When I first noted that more ingrowth was associated with late enhancements, I started performing more surface enhancement procedures. But when Jorge L. Alio, MD, PhD, of Spain, described the use of Nd:YAG laser to treat epithelial ingrowth,² I started performing more flap lifts, and even 10 or more years after the initial procedure I experienced no difficulty with lifting the flap. There were some cases of ingrowth, however, that did not respond to Nd:YAG laser treatment, and I then switched back to performing more surface enhancements than flap lifts. For a video demonstration of my current strategy, visit eyetube.net/?v=somew.

I recently used the OcuSeal Liquid Bandage CL (Beaver-Visitec International, Ltd.) for three tricky ingrowth cases, and all have done superbly. I am now leaning toward performing flap lifts again and using OcuSeal in high-risk cases, such as enhancements that are required 3 or more years after the initial treatment or those in which the flap lift results in untidy epithelial edges.

I used bandage contact lenses after flap-lift enhancements in the past, but I no longer do. I did not see any reduction in the ingrowth rate. Additionally, one study suggested that the bandage contact lens could, in fact, increase the rate of ingrowth.³ Therefore, use of bandage contact lenses has not been a custom of mine after LASIK enhancement surgery unless there was significant epithelial disturbance due to the surgical procedure.

For me, the ongoing saga of flap lift versus surface ablation for enhancement surgery is still evolving, and my practice changes as circumstances dictate and as we learn more.

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My Preferred Approach for LASIK Retreatments



By Andreas Frohn, MD, PhD

When performing a LASIK retreatment, I prefer to reopen the original flap. There is a certain amount of risk associated with recutting a new flap, including intersecting

the original flap cut. In many cases, it is impossible to know how the original flap was constructed, as the surgeon who performed the procedure years ago may not have provided this information. Additionally, the use of an old microkeratome model may have yielded poor accuracy, or the cut may have been performed without the use of online pachymetry. In these cases, insufficient data and the possibility of intersecting the original flap cut with the microkeratome are potential risk factors.

One detail to note: The patient should always be informed about the decision to lift the old flap or recut a new flap. A good (and successful) recut is comfortable for the patient. I therefore ask all of my patients undergoing enhancement surgery if they agree that I first try reopening the original flap to reduce the risk of complications. I inform them that this option could lead to abortion of the procedure if I fail to open the original flap, which means waiting 1 to 2 weeks for the next attempt. Some patients request that I recut a new flap instead.

One reason that I prefer reopening the original flap is that I have found an ideal instrument to use for the procedure: the phaco chopper by Engels (Geuder). To begin the flap-lift procedure, I drag the blunt tip of the chopper perpendicular to the corneal surface, from the limbus toward the old flap gutter. When the old gutter is reached, the blunt tip pops into it. The instrument is then swivelled so that the tip is positioned at a 45° angle to the cornea, thereby pushing the tip under the rim of the old flap. I then run the instrument around the rim of the original flap to open it approximately 1 mm.

During this step, the tip should be cleaned several times, wiping the epithelial cells from the instrument so that they do not adhere to the interface surface. For a video demonstration, visit eyetube.net/?v=memed.

After the ablation and before repositioning the flap, I use the Engels chopper to push the epithelium lying on the cornea from the rim of the wound to enlarge the gap between the flap and the corneal epithelium. When the flap is well repositioned, I put a bandage contact lens on the cornea (Acuvue; Johnson & Johnson) to exert a certain amount of pressure to prevent epithelial cell ingrowth under the flap.

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LASIK Retreatment: Lift or Cut?

By Michael A. Muller, MB ChB, MMed(Ophth)

Refractive surgeons are commonly confronted with patients who require retreatment after LASIK. Some of these LASIK procedures were performed in the 1990s, by surgeons who are no longer in practice or with mechanical microkeratomes that are no longer in use. Deciding how to manage these enhancements is sometimes difficult.

My preferred method is to lift the original flap. This is relatively uncomplicated when it is a retreatment of a case I initially performed, as I have records of the flap thickness and any complications.

The most important reason for my preference for flap relift rather than a new cut is that, in my experience, it avoids problems sometimes associated with a double interface. The resulting thin sliver of tissue is difficult to handle and, with a fold in the layer between the two interfaces, it can prove impossible. Epithelial ingrowth is also difficult to manage in these cases and can easily occur due to the concentric double flap edges.

In my experience, LASIK flaps can be lifted more than 10 years after the first surgery. It is important to mention that care must be taken not to stretch the flap edge. Stretching can lead to epithelial ingrowth because it leaves an entry point. Additionally, the spatula must engage the flap edge in the same plane as the flap interface.

When considering flap lift in a patient treated elsewhere, one must perform careful clinical examination. Lifting the flap should be avoided when:

- Biomicroscopy shows evidence of previous buttonholes, scarring of the flap edge, decentered or incomplete flap, or a severely striated flap;
- Topography indicates an incomplete ablation, suggesting an incomplete flap;
- There is doubt about adequate depth of the residual stromal bed (anterior segment optical coherence tomography can be valuable here); or
- There is even the slightest doubt about the presence of ectasia.

If a flap cannot be lifted, surface ablation is preferred. Alcohol 20% is used, and the epithelium is carefully removed from the center outward, taking care not to disturb the flap edge. A transepithelial approach is used in cases in which the masking effect of the epithelium is beneficial, for example in eyes with previous buttonholes. Surface ablation provides an easy alternative in these small treatments.

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LASIK Enhancement: Lifting the Flap

By Guy Sallet, MD, FEBOphth



Enhancements after a LASIK procedure can be performed any time from several weeks to years after the primary procedure. If there is enough residual tissue in the stromal bed to allow further laser ablation, I prefer to lift the flap rather than cut a new one. If the corneal epithelium is too severely damaged, I typically delay the enhancement procedure until a new LASIK flap can be cut. This article describes my



Figure 1. A spatula is used to indent the cornea at the rim of the existing LASIK flap.

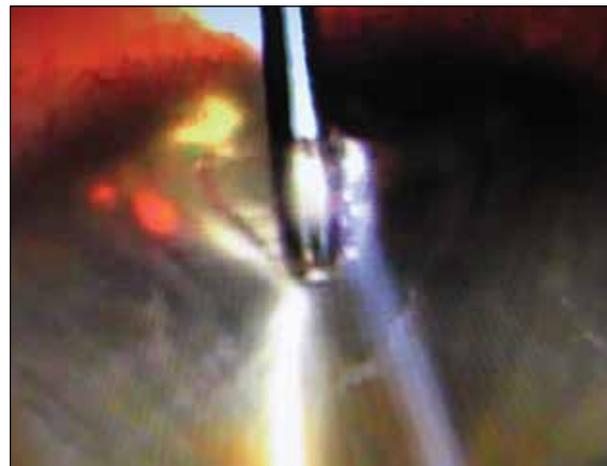


Figure 2. The sharp end of a spatula is used to create a small pocket in the stromal interface at the edge of the flap.

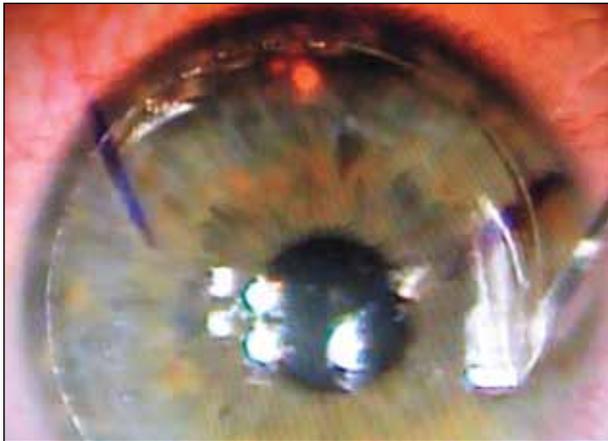


Figure 3. A flap elevator is used to lift the edges of the flap from the stromal bed.

technique for lifting an existing LASIK flap for purposes of performing an enhancement. For a video demonstration of my typical LASIK enhancement strategy, visit eyetube.net/?v=sosme.

Locating exactly the existing flap's edge may be difficult in some patients, especially if the line of the gutter is barely visible. Before initiating the procedure, I always perform a thorough examination at the slit lamp to locate the exact position of the flap edge. The cornea is marked with two radial ink marks so that the flap can be returned to its existing position at the end of the procedure; the cornea is then rinsed, and the fornices are dried with a sponge. Over the course of the enhancement procedure, the cornea is kept moist to prevent epithelial damage due to manipulation.

A narrow beam of the excimer laser's slit lamp is used to identify the edge of the flap. A sharp-ended spatula is introduced to indent the cornea just outside the flap rim; it is then moved toward the center of the cornea with downward force (Figure 1). It has been my experience that the

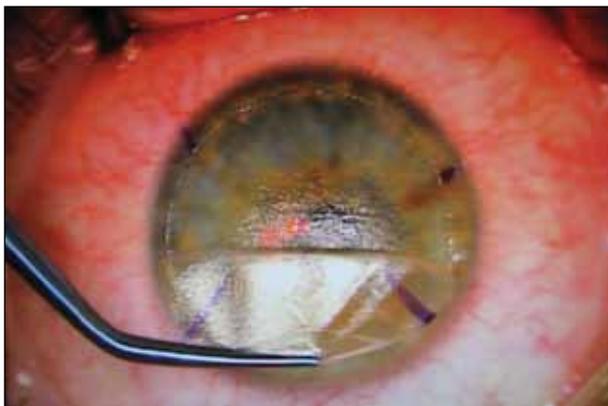


Figure 4. The existing flap is grasped with nontoothed forceps and folded back, allowing access to the ablation zone.

spatula will enter the epithelium at the flap edge and find the space between the stromal bed and the flap; this insertion can be repeated at multiple sites along the flap's rim until insertion is successful. Once the spatula is underneath the flap, it is used to create a small pocket (Figure 2), and the flap edges are lifted from the stromal bed with a flap elevator (Figure 3). The cornea and conjunctiva are then dried with sponges. Finally, the flap is grasped with nontoothed forceps and is carefully separated from the stromal bed (Figure 4). Surgeons performing this technique should be aware of the potential for adhesions, as they may tear and damage the flap, especially in eyes with thin flaps.

After pachymetry is performed on the stromal bed, the excimer laser is used for ablation, and the flap is restored to its original position. Using this approach, I have been able to lift flaps up to 15 years after the primary LASIK procedure. In my opinion, the risk of epithelial ingrowth using this method is low. In the future, strategies using a vertical cut made inside the old flap with a femtosecond laser might further facilitate the lifting of old flaps.

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Changes in My LASIK Technique

By Jerry Tan Tiang Hin, MBBS (S'pore), FRCS (Ed), FRCOphth, FAMS

When I first started performing LASIK enhancements 16 years ago, I relifted flaps that were less than 6 months old but recut flaps that were more than 6 months post-LASIK. Later, I relifted all flaps no matter how long ago the procedure was performed.

I failed in only one case, in which I performed LASIK in a patient who had previously undergone penetrating keratoplasty. The graft-host interface was vascularized, causing a strong healing response that made the flap adhere to the graft-host scar. My longest flap relift was in a case 14 years post-LASIK. There were no difficulties relifting this microkeratome-created flap.

However, problems can arise as a result of relifting a flap, including epithelial ingrowth, especially in old microkeratome-created flaps with sloping edges, as older-style mechanical microkeratomes had an acute blade angle from 0° to 25°; hinge tears in cases in which there is neovascularization in the superior cornea; strong flap edge adhesion if corneal vessels were cut; and irregular

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When performing a LASIK enhancement, my preference is to:

- Create a new flap
- Lift the old flap
- Perform surface ablation
- It depends on the status of the flap
- I do not perform enhancements

ablation caused by relifting a previously unrecognized buttonhole or partial buttonhole flap. (There must be a high index of suspicion of this last complication when treating irregular post-LASIK corneas.)

From recent experience, I find relifting a flap created with the IntraLase femtosecond laser (Abbott Medical Optics Inc.) more difficult than relifting microkeratome-created flaps, as there is stronger adhesion, especially in an inverted dovetail edge flap.

Recently, I am more in favor of surface ablation for enhancements for several reasons:

- Scar formation is minimal with the use of mitomycin C (40-second exposure);
- A double cut is impossible, as is loss of a sliver of corneal tissue;
- Surface ablation does not necessitate a flap, and therefore does not further weaken the cornea;
- There is no danger of epithelial ingrowth;
- There is no danger of a partial or ultrathin flap in corneas that are flat before enhancement (with keratometry reading below 36.00 D); and
- Surface ablation removes microwrinkles, especially when transepithelial PRK is performed. This will also result in better quality of vision. ■

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