

# Lasik enhancement; Lifting the flap vs. surface ablation

Mohamed Salem

Thumbay Hospital Fujairah, UAE

**Correspondence:** Mohamed Salem, Thumbay Hospital Fujairah, Fujairah, UAE, Email [msalem200@gmail.com](mailto:msalem200@gmail.com)

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## Introduction

Refractive errors re-treatment after primary Lasik treatment is known as Lasik enhancement, by exclusion of the causes of residual errors after Lasik treatment of refractive errors, residual errors may even be still a nightmare for not only the patient but also the surgeon. The factors that can cause imperfect refractive outcome after initial treatment by Lasik are variable and depend on the surgeon skills, selection and preparation of the case, and machine adjustment.

The surgeon skills improvement is not within the scope of this article as it needs special attention to many points like training, corneal map reading and finally the decision of doing or not. The case selection and preparation are not that far to the previous point but the tool is different as we need to analyze the patient data on the base of age, occupation, and the number of refractive errors.

Meticulous refractive test and evaluation of refractive status of the patient including manifest and cycloplegic refraction tests, best corrected visual acuity recording including pinhole test and recording the final visual outcome after treatment by Lasik, all are important considerations. Machine adjustment, calibration and regular maintenance are three important factors controlling the dose of laser delivered to the tissue therefore they control the outcome of the procedure.

## Indications of Lasik enhancement

Unless the patient will get a great benefit don't go for Lasik enhancement as the patient expectations may be out of the frame of the reality and increase the risk of complications.

Criteria for eye retreatment were residual refractive error with patient noting suboptimal uncorrected vision, a minimum of 1 line of improvement between uncorrected distance visual acuity (UDVA) and corrected distance visual acuity (CDVA), and a stable manifest refraction of no more than a 0.50 D change in either sphere or cylinder documented over a minimum of 3 months. Only patients with a follow-up of 3 months or more post enhancement were included in this study. Exclusion criteria were active ophthalmic diseases, abnormal corneal shape, concurrent medications or medical conditions that could impair healing, and calculated residual stromal bed of less than 250 mm.

## Lasik enhancement by flap lifting

Advantages including Accurate and predictable results, same plane of

ablation as in the primary procedure, Minimal discomfort and Quick visual rehabilitation pushed many surgeons towards this option in the residual errors retreatment after primary Lasik.

Performing Lasik enhancement by lifting the Lasik flap has a lot of drawbacks and Complications such as; Difficult flap lifting particularly when the primary procedure is by femtosecond assisted Lasik, Epithelial disruption, Epithelial ingrowth under the flap, Flap related complications, Diffuse lamellar keratitis, infectious keratitis, Flap folds and micro striae, Flap displacement, Flap edge necrosis, Interstitial fluid syndrome and Post Lasik ectasia.

## Enhancement by PRK on the Lasik flap

Advantages of the surface ablation on the flap include; easy surgical technique, suitable for thin corneas, decreased the risk of ectasia, suitable for patient who developed post Lasik dry eye, no flap complications and if there are post Lasik flap complications already occurred.

Photorefractive keratectomy reduces the flap related higher order aberrations and flap wrinkles, folds or micro striae therefore it avoids the flap complications.

Surface ablation on the previous Lasik flap has some disadvantages as well as adverse effects including; postoperative corneal haze due to activated keratocytes which may be controlled by Mitomycin C at the time of surgery or prolonged steroid use postoperatively.

Inadvertent flap lift or dislocations in addition to the postoperative pain after the PRK are considered against the preference of many surgeons to the procedure.

Postoperative visual acuity fluctuations add another adverse effect to the technique.

## Technique of PRK over the Lasik flap

Epithelial removal to expose the stroma is the corner stone of the procedure either using Ethanol 20% application for 20-30 seconds on the proposed area for the stromal exposure is the classic technique which is easier, well known to most of the surgeons and guarantees the whole epithelium removal and well exposure of the stroma but mechanical scraping may contribute to some undesired complications such as flap wrinkles, dislocation and button holing.

Another technique of epithelial removal to expose the stroma for ablation is the phototherapeutic keratectomy (PTK) which uses the excimer laser in removing the epithelium and bare the stroma for work.

## Discussion

Selection of the technique of retreatment of residual errors or regression after primary Lasik surgery is a big challenge and affects the outcome of the procedure; surgeons prefer the easy and predictable technique as advising the patient for a second procedure will not be comfortable and causes some worries.

PTK-PRK on the Lasik flap is an easy technique and suitable for small residual errors and regressions in which you will never mechanically touch the cornea so decrease the chance of flap dislocation, wrinkling or button holing.

Epithelium thickness is 50-60 microns in normal central corneas and

it is variable according to many factors so actual thickness of the treated corneas should be measured meticulously before PTK-PRK.

Complications such as dense haze and sometimes scarring particularly if injured the Bowman's layer of the cornea still the most challenging drawbacks of the technique.

## References

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