

# A prospective study of patients who underwent laser subepithelial keratomileusis (LASEK)

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## Abstract

**Objective:** To compare the preoperative and post-operative unaided visual acuity and assess the post operative complications in patients undergoing LASEK in 2017 and 2018.

**Methodology:** A prospective study was conducted on 30 eyes that underwent LASEK in 2017 and 2018. Patients were reviewed 6 month post operatively and the residual refractive error and uncorrected visual acuity were assessed. Pre procedure unaided visual acuity and post procedure unaided visual acuity were measured and the improvement of Snellen lines was assessed.

**Results:** There is no statistically significant difference between the target residual error (-0.50 D spherical equivalent) and the post-operatively achieved final residual error ( $p < 0.01$ ), the predictability was 100% (residual spherical equivalent is below -0.5D).

There is statistically significant difference between pre-operative BCVA and post-operative UCVA. ( $p < 0.01$ ). There is statistically significant difference between pre-operative best corrected visual acuity (BCVA) and post-operative BCVA. ( $p < 0.05$ )

## Introduction

LASEK is a kerato-refractive surgery which induce refractive changes by altering the corneal curvature. Corneal incision, tissue addition or subtraction, alloplastic material addition, collagen crosslinking and laser ablation are some methods to change the central corneal curvature.

LASEK is a variation of photo refractive keratectomy and a treatment option for myopia, hyperopia and astigmatism. In LASEK tissue removal done by excimer laser photoablation. Ablation depth depends on the degree of myopia to be corrected and the optical zone according to the "Munnerlyn formula"<sup>1</sup>.

In LASEK the goal is to preserve the epithelium. Initially cornea anaesthetized with topical anaesthetic agent. Then epithelium loosen from basement membrane with 20% alcohol. Then make an impression on epithelium with trephine and remove epithelial flap around 300° with micro hoe. Firing the laser on anterior stroma over 10-15 seconds after registration. Anterior stroma should be free of epithelial cells, debris, and excess fluid to ensure smooth ablation. finally apply Mitomycin 0.02% for 30-50 seconds and epithelium rolled back.

LASEK could avoid the haze and post operated pain and low visual recovery which associated with PRK and flap related complications of LASIK<sup>2</sup>.

## Methodology

A prospective study of high myopic patients ( $\geq -6D$ ) underwent LASEK in 2017 and up to 2018 June at Nawaloka Hospital, Colombo were enrolled. 30 eyes were selected and obtained data were pre-operative unaided visual acuity (UCVA), best corrected visual acuity (BCVA), post-operative unaided visual acuity, post-operative best corrected visual acuity after 1 year following LASEK. Data was analyzed using SPSS and t-test to compare the means.

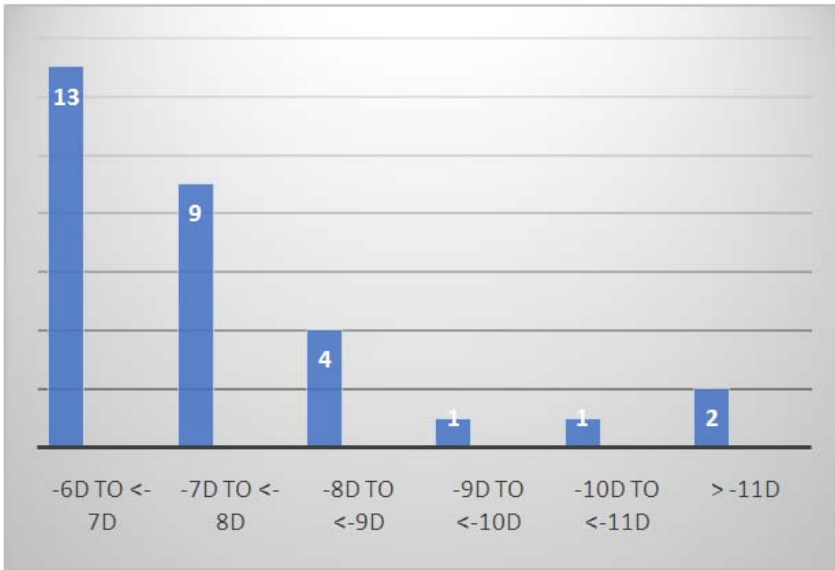
## Objectives

To assess the pre-operative best corrected visual acuity (BCVA) and post-operative unaided visual acuity (UCVA) after 1 year.

Assess the accuracy of the target correction of spherical error and the cylindrical error.

$$\checkmark \text{Ablation Depth} = \frac{\text{Degree of myopia (D)} \times (\text{optical zone diameter})^2}{3} \text{ mm}$$

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**Study group**

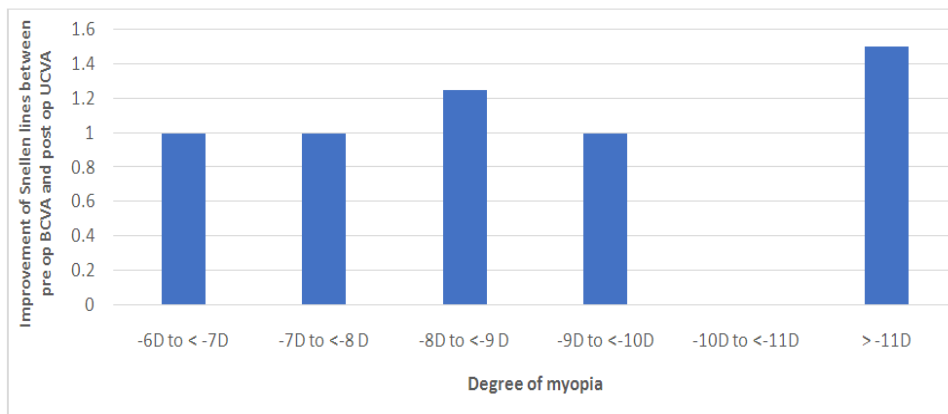
- ▣ -6D to <-7D = 13 eyes
- ▣ -7D to <-8D = 9 eyes
- ▣ -8D to <-9D = 4 eyes
- ▣ -9D to <-10D = 1eye
- ▣ -10D to< -11D = 1 eye
- ▣ -11D = 2 eyes

Out of 30 eyes, 25 had astigmatism; pre-operative mean of the spherical error is -7.45 D and its mode is -6 D while the median is -7 D and Pre-operative mean of the astigmatism is -1.55 D with mode of the astigmatism is -0.5 D. The median of preoperative astigmatism is -1.00 D.

**Results**

There is no statistically significant difference between the target residual error and the post-operative final residual error ( $p < 0.01$ ) and the predictability was 100% (residual spherical error is below -0.5D).

There is statistically significant difference between pre-operative BCVA and post-operative UCVA. ( $p < 0.01$ ). There is statistically significant difference between pre-operative best corrected visual acuity (BCVA) and post-operative BCVA ( $p < 0.05$ ).



**Comparison between pre op BCVA and post op BCVA**

Range	Improved Snellens lines
-6D to <-7 D	1.25
-7D to <-8 D	1.5
-8D to <-9 D	1.5
-9D to <-10 D	1
-10D to <-11 D	1
>-11 D	1

All patients had mild haziness at post op 1 month, while 10 had at 6 months and only 2 patients had at 1 year. Only 1 patient had regression without haziness at 1 year.

**Conclusion**

There is significant improvement of unaided visual acuity in post-operative group compare to pre op BCVA. There is a significant improvement of post op BCVA compared to the pre op BCVA. No statistically significant difference between target correction and ultimately achieved correction and predictability was 100% within 0.5 D.

Significant post-operative corneal haziness not detected. Type of the laser surgery should be based on the characteristics of patient such as corneal thickness, degree of refractive error, activities of the patient, lifestyle and requirement of visual rehabilitation<sup>2</sup>.

**References**

1. Ophthalmology AA of Refractive Surgery BCSC 2018. *American Academy of Ophthalmology* 2018.
2. Tobaigy FM, Ghanem RC, Sayegh RR, Hallak JA, Azar DT. A control matched comparison of laser epithelial keratomileusis for low to moderate myopia. *American Journal of Ophthalmology* 2006.