

LONG TERM OUTCOME OF LASER IN SITU KERATOMILEUSIS FOR THE TREATMENT OF POST-KERATOPLASTY REFRACTIVE ERRORS

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INTRODUCTION

The success of keratoplasty does not only depend on the success of the surgery, the clarity and the position of the graft, the location, direction and tightness of the sutures, but it also depends on the functional status of the graft and the amount of residual refractive error found after keratoplasty. The excessive residual spherocylindrical error has become the most challenging and common complication after keratoplasty.

Refractive surgeries originally used to treat naturally occurring spherocylindrical errors have shown great success and reliability in the recent era, to treat post-keratoplasty refractive errors.

LASIK is one of the refractive surgeries which showed great safety, predictability, and efficacy to manage post-keratoplasty refractive errors with the least complications. It replaces glasses for patients who cannot tolerate them because of the great difference in refractive errors between both eyes and anisometropia. It also replaces contact lenses which are not tolerable by the patients because of dry eye, corneal irregularity, or difficulty to apply them.

AIM OF THE WORK

The aim of this work was to study the long-term outcome of LASIK used to treat post-keratoplasty refractive errors.

PATIENTS AND METHODS

This is a retrospective clinical study in which the files of 20 patients who had undergone LASIK for the treatment of post-keratoplasty refractive errors at private centers in Alexandria will be reviewed.

All patients were intolerant of spectacle correction and contact lenses or refused to use them.

This study was conducted on 24 eyes on which the following was performed:

Pre-LASIK Assessment:

The following pre-LASIK data was collected:

- Ocular history.
- Examination of the cornea and the anterior segment of the eye using slit lamp.
- Fundus examination.
- Un-corrected visual acuity & Best-corrected visual acuity.
- Manifest refraction.
- Pre-LASIK Keratometry.
- Corneal topography or Pentacam when available.

All eyes were treated with the same LASIK platform: WaveLight EX500 Excimer Laser (Alcon).

Post-LASIK Assessment:

The following post-LASIK data was collected, one month after LASIK and also in a second visit with a minimum duration, two years after LASIK:

- Examination of the cornea and the anterior segment of the eye using slit lamp.
- Un-corrected visual acuity & Best-corrected visual acuity.
- Manifest refraction.
- Post-LASIK Keratometry.
- Corneal topography or Pentacam when available.
- Vector analysis of astigmatism using Alpins method.

RESULTS

Table 1: Distribution of the studied cases according to duration between LASIK and last follow up visit (n = 24).

Duration between last follow up and LASIK (months)	No.	%
≤36	7	29.2
>36	17	70.8
Min. – Max.	24.0 – 142.0	
Mean ± SD.	67.33 ± 36.50	
Median (IQR)	68.50 (34.0 - 89.50)	

Table 2: Comparison between preoperative and postoperative UCVA.

UCVA	Preoperative	Postoperative	Z	P
Min. – Max.	0.05 – 0.50	0.10 – 0.90	4.028*	<0.001*
Mean ± SD.	0.19 ± 0.14	0.48 ± 0.22		
Median (IQR)	0.13 (0.10 – 0.25)	0.45 (0.35 – 0.60)		

Table 3: Comparison between preoperative and postoperative BCVA.

BCVA	Preoperative	Postoperative	Z	P
Min. – Max.	0.20 - 0.90	0.16 – 1.0	2.871*	0.004*
Mean ± SD.	0.60 ± 0.20	0.70 ± 0.19		
Median (IQR)	0.60 (0.45 - 0.80)	0.70 (0.60 – 0.80)		

Table 4: Comparison between preoperative and postoperative spherical equivalent (n = 24).

	Preoperative data	Post-operative one month	Post-operative last follow-up visit
Sphere (D)			
Min – Max.	-7.50 – 6.00.	-1.00 – 4.00.	-4.00 – 6.00.
Mean ± SD.	-1.2 D ± 3.34.	0.40 ± 1.32.	0.18 ± 1.82.
Median (IQR).	-1.75 (-3.00 – 0.00).	0.00 (-0.38 – 0.50).	0.00 (-0.50 – 0.38).
Cylinder(D)			
Min – Max.	-8.00 - -1.00.	-5.00 – 0.00.	-5.00 – 0.00.
Mean ± SD.	-4.2 ± 2.14.	-1.83 ± 1.44.	-2.15 ±1.62.
Median (IQR).	-3.75 (-5.75 - -2.38).	-1.38 (-2.62 - -0.75).	-1.62 (-3.50 - -0.88).

CONCLUSION

LASIK for the treatment of post-keratoplasty refractive errors is a safe technique, and have the same risk of intraoperative and postoperative complications as LASIK performed in normal corneas.

Regarding the safety of LASIK following keratoplasty, 91.66% of the eyes had BCVA equals to or better than the preoperative BCVA. Regarding the efficacy of LASIK, the coefficient of efficacy of LASIK following keratoplasty was 80%.The predictability of LASIK for the treatment of post-keratoplasty refractive errors was acceptable. The spherical equivalent of 9 eyes (37.5%) was within ± 0.5 D, the spherical equivalent of 12 eyes (50%) was within ± 1.0 D, and the spherical equivalent of 19 eyes (79.2%) was within ± 2.0 D.