

INTRODUCTION

Corneal topography and Scheimpflug imaging are the most widely used methods for patient evaluation, detection of ectatic disorders, and preparation for refractive surgery. However, there are many reports of eyes with ectasia following refractive surgery having normal corneal topography and no other risk factor.⁽¹⁾ Corneal epithelial remodeling after refractive surgery differs according to the type of the procedure (PRK/LASIK / Femto-LASIK or Femto-SMILE), the type of refractive error corrected (Myopic or hyperopic), the optical zone diameter, and the ablation depth. In myopic correction, the central epithelium thickens, whereas, in the correction of a hypermetropic error, the central epithelium becomes thinner.⁽²⁾ Evaluation of corneal epithelial thickness mapping and remodeling after different refractive techniques is therefore important to distinguish between normal and abnormal changes and screen for early detection of complications.

AIM OF THE WORK

The aim of this work was to evaluate the changes in corneal epithelial mapping before and after Photorefractive keratectomy (PRK) and Femto-second laser-assisted small incision lenticule extraction (Femto-SMILE) for correction of myopia and myopic astigmatism.

PATIENTS AND METHODS

The study was a prospective comparative interventional study in which we enrolled patients who underwent refractive surgery for correction of myopia and myopic astigmatism. The steps of operation (PRK or Femto-SMILE) were explained to the patients along with possible complications and written informed consent was provided to all patients before enrolment in the study. The study included forty-eight eyes of twenty-four patients with myopia or myopic astigmatism who underwent refractive surgery. Half of the eyes were treated by PRK, while the other half was treated by Femto-SMILE. All surgeries were performed by the same experienced surgeon.

Before surgery, all patients were subjected to a detailed ocular and medical history, full ophthalmologic examination, corneal topography, and epithelial mapping using MS-39. All patients were examined at one week, one month, and three months postoperatively. The follow-up examination included: slit lamp examination, visual acuity testing, corneal Topography and epithelial mapping.

RESULTS

Table 1: Comparison between the two studied groups according to minimum and maximum of epithelial thickness.

	Epithelial map	Group A (n = 24)	Group B (n = 24)	p
Minimum	Preoperative			
	Min. – Max.	35.0 – 54.0	38.0 – 53.0	0.101
	Mean ± SD.	42.33 ± 4.25	44.25 ± 3.69	
	1 st post-operative follow-up (1 week)			
	Min. – Max.	26.0 – 79.0	45.0 – 54.0	0.004*
	Mean ± SD.	42.75 ± 13.06	48.21 ± 2.62	
	2 nd post-operative follow-up (1 month)			
	Min. – Max.	32.0 – 56.0	34.0 – 53.0	0.230
	Mean ± SD.	43.88 ± 6.53	45.58 ± 3.65	
	3 rd post-operative follow-up (3 Months)			
Maximum	Preoperative			
	Min. – Max.	48.0 – 60.0	48.0 – 59.0	0.983
	Mean ± SD.	54.46 ± 3.19	54.25 ± 3.12	
	1 st post-operative follow-up (1 week)			
	Min. – Max.	55.0 – 99.0	56.0 – 109.0	0.194
	Mean ± SD.	73.92 ± 12.39	71.04 ± 15.81	
	2 nd post-operative follow-up (1 month)			
	Min. – Max.	51.0 – 96.0	55.0 – 90.0	0.127
	Mean ± SD.	70.0 ± 14.72	62.13 ± 6.96	
	3 rd post-operative follow-up (3 Months)			
	Min. – Max.	56.0 – 81.0	54.0 – 80.0	0.717
	Mean ± SD.	62.96 ± 6.50	62.21 ± 6.27	

IQR: **Inter quartile range** SD: **Standard deviation** U: **Mann Whitney test**
p: p value for comparing between the two studied groups *: Statistically significant at p ≤ 0.05

Table 2: Comparison between the two studied groups according to spherical equivalent.

Spherical equivalent	Group A (n = 24)	Group B (n = 24)	U	p
Preoperative				
Min. – Max.	-1.38 – -4.0	-2.25 – -6.0	35.500*	<0.001*
Mean ± SD.	-2.75 ± 0.62	-4.24 ± 0.86		
2 nd post-operative follow-up (1 month)				
Min. – Max.	-0.50 – +0.50	-0.75 – +0.50	257.0	0.436
Mean ± SD.	0.0 ± 0.23	-0.06 ± 0.26		
3 rd post-operative follow-up (3 months)				
Min. – Max.	-0.50 – +0.50	-0.38 – +0.25	244.500	0.264
Mean ± SD.	0.03 ± 0.20	-0.02 ± 0.11		

SD: Standard deviation U: Mann Whitney test
p: p value for comparing between the two studied groups *: Statistically significant at p ≤ 0.05.

CONCLUSION

Epithelial thickness mapping is important for preoperative evaluation of candidates for refractive surgery, also important for assessing epithelial remodelling after keratore fractive surgery. The minimum epithelial thickness is significantly more after Femto-SMILE than after PRK. Thereafter, the epithelium retains its integrity and no significant difference between cases treated with PRK and Femto-SMILE regarding the minimum epithelial thickness.

REFERENCES

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