Color Light Emitting Diode Reflection Topography – Clinical Applications

Graciana Fuentes Páez, MD
Private clinical practice in Barcelona, Spain

PURPOSE

To evaluate whether LED reflection topography could accurately guide arcuate keratotomy (AK) in pseudophakic and post-refractive corneas.
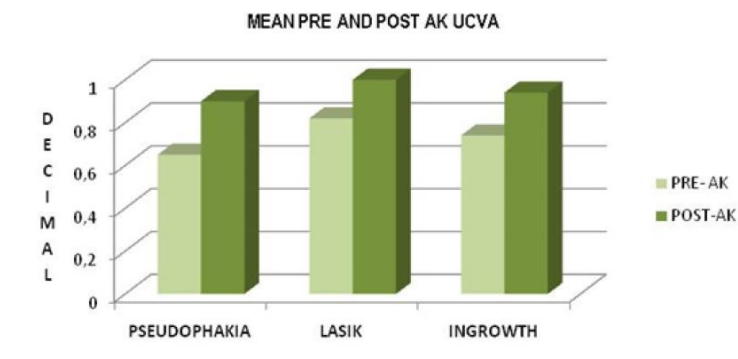
METHOD

Prospective, interventional study using LED topography anterior keratometric map for post-surgical AK. Pre and post-operative variables included uncorrected visual acuity (UCVA), best corrected visual acuity (BCVA), subjective sphere, astigmatism, LED and Orscan topography cylinder, SimK, and axis (steep). Data reported as mean and standard deviation, student t- test to assess statistical significance, Pearson correlation, and linear regression analysis were calculated. Bonferroni adjustment for p values.

RESULTS

AK performed on pseudophakic (45 eyes), LASIK (10 eyes), and ingrowth patients (5 eyes). Pre and post AK mean astigmatism results:

- For pseudophakia: subjective: 0.82 ± 0.4/0.2 ± 0.3D; p<0.001, LED 1.1 ± 0.5/0.8 ± 0.4D; p<0.0001, Orbscan 1.2 ± 0.7/0.7 ± 0.6D
- For LASIK: subjective: 0.75 ± 0.2/0.2 ± 0.3D; p<0.001, LED 0.8 ± 0.4D/0.61 ± 0.4D; p<0.05, Orbscan 0.78 ± 0.45/0.49 ± 0.2D; p>0.05
- For ingrowth: subjective: 1.2 ± 0.2/0.6 ± 0.4D; p>0.05, LED 2.1 ± 0.6/2.1 ± 0.4D; p<0.01, Orbscan 1.9 ± 0.9/1.1 ± 0.4D; p>0.05
- Pseudophakia LED vs. Orbscan astigmatism R2=0.60, p<0.0001 and SimK values R2=0.90, p<0.0001.

Comparative pre and post AK visual results for all group. Post AK mean UCVA increased in all groups, significantly for the pseudophakic (p ≤ 0.001) and LASIK (p ≤ 0.03) groups; ingrowth eyes (p≥0.01)

CONCLUSION

Cassini LED topography guided AK significantly improved UCVA in pseudophakic, LASIK, and ingrowth residual astigmatism. Strong correlation for astigmatism and SimK values between LED and Orbscan values in pseudophakic eyes.