WAVEFRONT-GUIDED ABLATION AFTER SPHERICAL PHAKIC IOL TO CORRECT ASTIGMATISM

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I have no financial interest.

- Moderate to high myopia with significant astigmatism is a challenge to Laser refractive surgery. Using toric phakic IOL is a safe and efficient solution. In some cases, misalignment of the cylinder axis can happen.
- Accuracy of registration of WF-guided ablation encouraged us to use it to correct astigmatism after spherical posterior chamber phakic IOL (BIOPTIC).
Also, in most of the cases, the astigmatism is on the corneal level which is better be corrected on the same plane.

Wavefront-Guided ablation has many advantages:

i) Wavefront measurements are 25 times more precise than a manifest refraction

ii) Objective measurement of the patient’s entire optical system.

iii) Help reduce or maintain higher order aberrations

iv) Iris Registration and pupil centroid shift (Star S4IR) which ensures accurate axial and torsional registration.
We did a study to evaluate the efficiency of wavefront-guided PRK after posterior chamber phakic IOL (spherical ICL-STAAR) to correct moderate to high myopia with astigmatism in cases beyond limits of LVC alone.

- Spherical ICL was implanted to correct spherical myopia. ICL power was chosen to leave eye with spherical error -0.5 to -1.0 D.
- 1-6 months later, wavefront-guided PRK was done to correct the remaining refractive error using Visx Star S4 with IR.

- Preoperative UCVA, BCVA, MR, contrast sensitivity.
- Pentacam was used for K readings, ACD, white to white corneal diameter.
- UCVA, BCVA, MR, contrast sensitivity, and HOA’s were measured after ICL implantation and after WF-guided PRK.
Means of sphere and cylinder at different stages.

Safety of ICL = 1.6
Safety of WF = 1.0
Contrast Sensitivity showed significant improvement postICL and no significant change postWF.

Comparison of PSF PostICL and postWF
Comparison of ocular HOA’s post ICL and post WF showed no significant change.

Corneal HOA’s showed no significant change after WF-guided ablation.

Post ICL corneal HOA’s  
Post WF corneal HOA’s
Conclusion

- Spherical posterior chamber phakic IOL (ICL) combined with wavefront-guided excimer laser ablation (BIOPTIC) is a safe and effective combination to correct moderate to high myopia with significant astigmatism in cases beyond limits of LVC.
- This technique significantly improved CS in the cases used to have their CS reduced after LVC to correct high myopia.
- There was no significant change either in ocular or corneal HOA's.

THANK YOU