

Effective ablation centration and achieved stromal ablation volume: A long-term contralateral comparison between two refractive correction platforms. ARVO 2016

Purpose:

The purpose of this study was to evaluate long-term (up 12 months) effective ablation zone (excimer laser) centration and volume ablated as a result of femto-second laser-assisted high-myopia LASIK correction employing two different combinations of femto-second (for flap creation) and excimer lasers (for refractive ablation).

Methods:

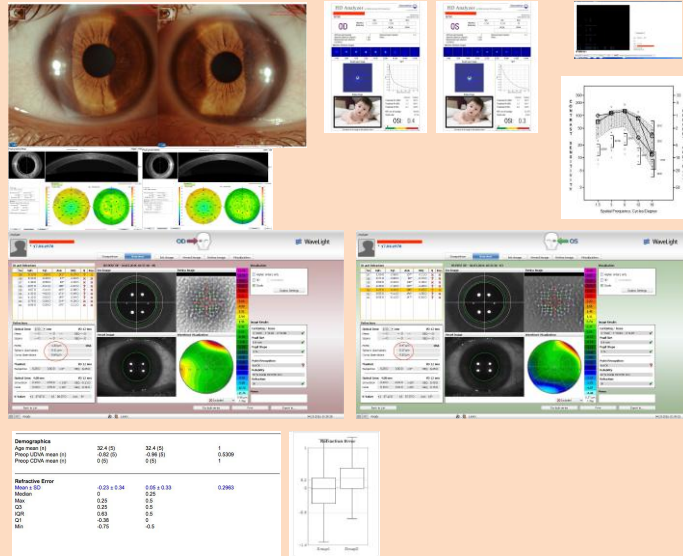
40 eyes were investigated in this contralateral study. One eye (Group-A) was treated with the Alcon Suite (femtosecond laser: FS200, excimer laser: EX500, WaveLight/Alcon Surgical, Ft. Worth, TX). The contralateral eye of each patient (Group-B) with the LDV femtosecond laser (Ziemer, Biel, Switzerland) and the Amaris 750 excimer laser (SCHWIND, Kleinostheim, Germany).

Primary endpoint was the evaluation of the effective ablation zone centration to the line-of-sight (radial displacement, in μm) and the correlation of the amount of tissue removed (ablated) compared to planned. To investigate these parameters, maximum achieved ablation thickness and optical zone diameter were digitally calculated by means of OCT & Scheimpflug imaging data.

Inclusion criteria: uncomplicated primary myopic LASIK up to -8.00 D of sphere and -3.00 D of astigmatism. **Exclusion criteria:** systemic or ocular diseases, eyes with history of corneal dystrophy or herpetic eye disease, topographic evidence of keratoconus or contact lens warpage, corneal scarring, glaucoma, severe dry eye.



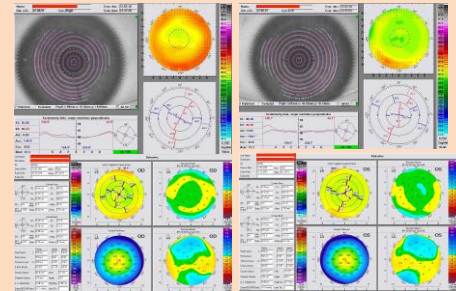
Case example OD: LDV+ Amaris / OS: FS200+ EX500



Group 1=EX500, Group B= Amaris

Results:

SEQ corrected in group-A (EX500): -4.5 ± 2.4 D and in group-B (Amaris 750): -4.7 ± 2.3 D. Average radial displacement in group-A (Alcon) was $120 \pm 95 \mu\text{m}$ (range 0 to $530 \mu\text{m}$), while in group-B (LDV/Schwind) $130 \pm 110 \mu\text{m}$ (range 0 to $580 \mu\text{m}$), not statistically different. Stromal reduction in group-A (Alcon) was $86.01 \pm 28.28 \mu\text{m}$, compared to the average programmed maximum ablation depth of $88.48 \pm 26.05 \mu\text{m}$. Stromal reduction in group-B (LDV/Schwind) was $89.56 \pm 37.55 \mu\text{m}$, compared to the average programmed maximum ablation depth of $95.38 \pm 32.51 \mu\text{m}$.



In this case OD was Amaris and OS was EX500

Conclusions Displacement of ablation pattern appeared well-centered in both platforms. The effective optical zones appeared larger in the FS200/EX500 group. This efficiency of centration indicates that newer generation excimer laser with faster eye tracking and active centration control appear to achieve a significantly more accurate centration of myopic ablation patterns. The LDV/Schwind platform appears to require more tissue as effective ablation depth compared to the FS200/EX500 platform.