COMPARATIVE STUDY BETWEEN TWO DIFFERENT REFRACTIVE EXCIMER LASER PLATFORMS IN TRANSEPITHELIAL PHOTOREFRACTIVE KERATECTOMY

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Introduction

Single step transepithelial photorefractive keratectomy (tPRK) achieves epithelial and stromal ablation in a single uninterrupted process, which consists of precise uniform epithelial removal. Theoretically, this one-step no-touch technique achieves a precise refractive result of corneal refractive surgery by reducing the risk of corneal dehydration, shortening the treatment duration and minimizing any mechanical manipulation of corneal tissue.(1)

Currently, single-step transepithelial PRK platforms are available on the Amaris 1050RS (Schwind), the Technolas Teneo, (Bausch+Lomb) and the recently introduced StreamLight. on the (WaveLight. EX500.).(2)

Aim of the work

The aim of this study was to compare the safety, predictability, efficacy, postoperative pain and haze in patients undergoing transepithelial PRK using Schwind AMARIS 1050RS (smart Pulse technology) Versus Wavelight EX500 (StreamLight).

Patients and Methods

In this prospective interventional study 40 eyes of 21 patients with mild to moderate myopia with or without mild astigmatism were included (myopia up to -5 D and astigmatism up to -3D) .Each group consisted of 20 eyes, the two groups underwent tPRK refractive surgery. In (group I) Schwind AMARIS 1050RS Eximer Laser was used and in (goup II) Wavelight EX500 (StreamLight) was used. Uncorrected, best corrected visual acuities , refractive status and corneal haze were assessed at 1week ,1 month and 3 months postoperatively.

Corneal haze was evaluated at each follow up using the slit lamp and evaluated by the Heitzmann corneal haze scale. (3) At first follow up visit, patients subjectively rated the maximum pain intensity within the first 3 days postoperatively using a numerical pain rating scale 0–4 (0= no pain, 4= sever pain).

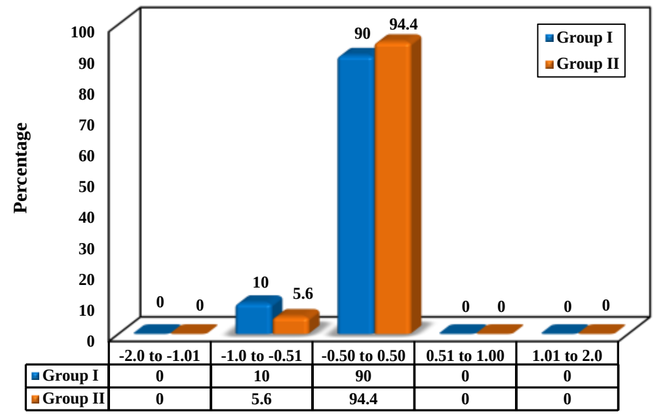
Safety Index is the mean CDVA after treatment divided by the mean CDVA before treatment (CDVA post/CDVA pre). (Cut-off value was set at 0.85)

Efficacy Index is defined as UCVA after treatment divided by CDVA before treatment (UCVA post/CDVA pre). (Cutoff value was set at 0.80)

Predictability Index is defined as the difference between the attempted and the achieved spherical equivalent (SE).

Results

- Mean pain score in group I was 2.35 ± 0.88 and in group II was 2.05 ± 1.47 and this difference was not statistically significant.
- In group I all patients had grade 0.5 haze, while in group II 33.3% of patients had grade 0 haze and 66.7% had grade 0.5 haze. Although this difference was statistically significant (p=0.003), both grades 0 and 0.5 are considered clear cornea in some literature. (4)
- All patients achieved a postoperative best corrected distance visual acuity equal to or better than their preoperative best corrected visual acuity with safety index higher than 0.85 suggesting safety of both platforms. Mean safety index in group I was (1.0 ± 0.0) and in group II was (1.05 ± 0.13).



	-2.0 to -1.01	-1.0 to -0.51	-0.50 to 0.50	0.51 to 1.00	1.01 to 2.0
Group I	0	10	90	0	0
Group II	0	5.6	94.4	0	0

Figure: Comparison between the two studied groups according to predictability at 3rd month.

- In terms of predictability, 90% of patients in group I and 94.4% of patients in group II achieved SE within ± 0.5D of the attempted refraction, respectively. All patients in both groups were within ± 1D of the attempted correction.
- At 3rd month, the mean efficacy index in group I was 1.0 ± 0.0 and in group II was 1.01 ± 0.04 and this difference was not statistically significant.
- Two eyes (one patient) had delayed epithelial healing in group II and was excluded from the analysis.

Conclusions

Both platform Schwind AMARIS 1050 and Streamlight Ex500 are safe, effective, and predictable. In the present study Streamlight group shows slightly superior results in postoperative haze over Schwind group. Both groups showed mild to moderate pain scores in the first 3 days postoperatively.

References

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