

## IN-VIVO CONFOCAL MICROSCOPY: KERATOCYTES CELL DENSITY (KCD) REGENERATION BETWEEN FEMTOSECOND LASIK (FS-LASIK) AND PHOTOREFRACTIVE KERATECTOMY (PRK)

**Noorshazana Mat Rejab**<sup>1\*</sup>, Mohd Radzi Hilmi<sup>2</sup>, Khairidzan Mohd Kamal<sup>3</sup>, Md Mustafa Md-Muziman-Syah<sup>2</sup>

<sup>1</sup>School of Optometry, Faculty of Medicine and Health Sciences, UCSI University, Kuala Lumpur, Malaysia.

<sup>2</sup>Department of Optometry and Visual Science, Kulliyyah of Allied Health Science, International Islamic University Malaysia, 25200 Kuantan, Pahang, Malaysia.

<sup>3</sup>Department of Ophthalmology, Kulliyyah of Medicine, International Islamic University Malaysia, 25200 Kuantan, Pahang, Malaysia.

\*Corresponding author's email: [shazanarejab@gmail.com](mailto:shazanarejab@gmail.com)

### ABSTRACT

**Aims:** To evaluate the regeneration of keratocyte cell density (KCD) in post 1- and 3-month following laser refractive surgery (FS-LASIK and PRK) using Heidelberg Retina Tomography III/Rostock Corneal Module confocal microscope (HRT III/RCM) and image analysis.

**Methodology:** Thirty-six patients who underwent FS-LASIK (n=18) and PRK (n=18) involved in this prospective non-randomized study. Inclusion criteria includes of having moderate to high myope. A flap was created and repositioned back after ablated in FS-LASIK, while in PRK the entire corneal epithelium was removed (flap-less) before ablated. Central corneas were scanned throughout their full thickness using HRTIII/RCM during both baseline and post-operative 1 and 3 month by single examiner. All surgeries were performed by one surgeon. Morphologic modifications of KCD were evaluated and expressed in cell/mm<sup>2</sup>. Two images with non-artefact were selected from each stromal layer for evaluation of KCD and the average mean was taken for analysis. KCD was manually calculated within a region of interest (ROI) set at 0.16mm<sup>2</sup> by modification of brightness and contrast. Cells in which are more illuminated were selected and analyzed using Mixed ANOVA and independent T-test.

#### Results:

There was a significant change across 1-M and 3-M prior to surgery,  $F(2,68)=326.79, p < 0.01$  and significant differences between groups,  $F(1,34)=100.471, p < 0.01$  in Keratocytes cell density. There was also a significant interaction between time and procedure,  $F(2,68) = 39.870, p < 0.01$ . Following up this interaction indicated that there was no significant different between groups in baseline data for both groups. However, the mean score of KCD abruptly decreased in PRK compared to FS-LASIK within 1m of post-surgery and remained low.

**Conclusion:** KCD decreases immediately after FS-LASIK and PRK but do not returns to its pre-operative state within 3 months follow up.

**Keywords:** keratocytes, confocal, refractive surgery