High Frequency Ultrasound (Artemis II), Cornea Tomography (Pentacam HD) And Cornea OCT Clinical Evaluation Of Cornea Stroma And Epithelium Topographic Thickness Post LASIK And PRK

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Purpose: To evaluate the intrinsic epithelial and stromal changes post-operative in LASIK and PRK. We have studied the principles of corneal epithelial thickness in normal and ectasia eyes, and attempted this study in order to elucidate the average epithelial thickness in treated corneas.

In an era when cornea OCTs will be able to perform easily epithelial maps, these findings may serve as a simple screening reference for stable or unstable corneas after laser refractive surgery.

Methods: 55 consecutive eyes were evaluated with the Artemis II HFU Artemis (Artemis Medical Technologies Inc. Vancouver, British Columbia, Canada), the Pentacam HD (Wavelight, Erlagen, Germany), and the Optovue RTVue anterior-segment OCT (Optovue Inc., Fremont, CA), for topographic cornea thickness with all 3 devices and cornea epithelial topography. In addition, age, UCVA, BSCVA, refraction, cylinder (C), tomography, and endothelial counts were reviewed.

Results: There were 28 LASIK cases (group A) and 27 PRK cases (group B) that were studied.

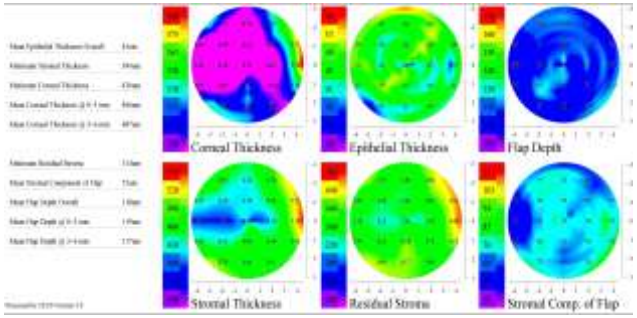
There were significant changes between the findings of group A versus group B. The LASIK eyes (group A) demonstrated significant epithelial thickness regularity in comparison to the post-PRK eyes (Group B) and were uniformly closer to normal than group B: 49um Vs. 58um.

Group B demonstrated a significant difference in tomographic cylinder (IHD: index of height decentration) when compared to group A.

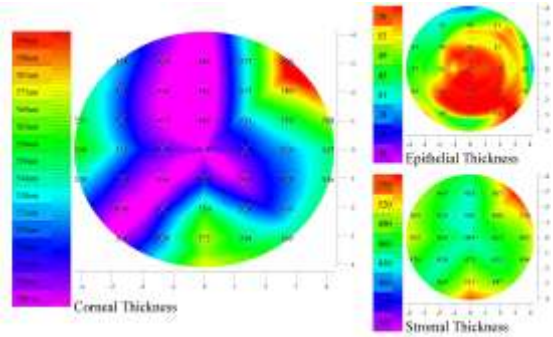
Conclusions/Discussion: Topographic cornea and epithelial thickness imaging shows significant differences when comparing outcomes of LASIK to PRK.

These data suggest that in an epithelial point of view, LASIK may be far more stable and not amenable to epithelial thickness variations that may affect stability and refraction regression.

We theorize that possible LASIK instability, as far as refractive error in the long term, may be more related to corneal biomechanical change, rather than epithelial hyper-or hypotrophy. PRK instability and regression may be amenable to the epithelial thickness variability and this factor may require to be factored-in relevant nomograms.



Above: This is a representative LASIK (Group A) example



Above: This is a representative PRK (Group B) example