POST-LASIK ECTASIA

Prospective study supports role of integrated optical coherence pachymetry

Cheryl Guttman Krader

The integrated optical coherence pachymetry (OCP) technology found on the Schwind Amaris 750S excimer laser (Schwind eye-tech solutions) is a valuable feature for obtaining intraoperative cornea and flap thickness measurements in patients undergoing LASIK, said Sharita R Siregar MD. In a study that she presented at the 26th Asia-Pacific Association of Cataract & Refractive Surgeons Meeting in Singapore, Dr Siregar used online OCP and a rotating Scheimpflug camera device (Schwind Sirius, Schwind eye-tech solutions) to measure cornea, flap and residual stromal bed thickness in 100 eyes of patients undergoing LASIK. The study population represented a wide range of spherical errors (-12.0 to +0.75 D) and cylinder (-6.0 to +2.0 D). All flaps were created with the Femto LDV femtosecond laser (Ziemer Ophthalmic Systems) with an intended thickness of 110 microns.

The results showed that the mean thickness values were consistently thinner using OCP compared with the Scheimpflug camera. The difference between technologies ranged from about three microns for mean corneal thickness (536.6 vs. 539.7 microns) to about 10 microns for mean flap thickness (99.7 vs. 110 microns). "The importance of accurately measuring corneal thickness preoperatively and of obtaining intraoperative determinations of flap and residual stromal bed thickness for preventing post-LASIK keratectasia is well-recognised. The results of this study show the integrated OCP technology offers a convenient tool for obtaining these data," said Dr Siregar, ophthalmologist, Jakarta Eye Centre, Indonesia.

"The findings are also consistent with previous data from Maria-Clara Arbelaez MD, who reported OCP measures thinner than a rotating Scheimpflug camera. Dr Arbelaez also found that the readings with both techniques were thinner than when using ultrasound pachymetry. Based on this information, I am able to create a nomogram for predicting true residual stromal bed thickness to avoid keratectasia."

Dr Siregar noted that the integrated OCP also has the capability to continuously measure corneal thickness intraoperatively. "Continuous monitoring provides another safeguard to ensure the residual stromal bed thickness is adequate to maintain biomechanical integrity of the cornea and limit the risk of keratectasia." The patient data were also analysed to determine the ablation depth and rate using the Amaris 750S laser. Mean spherical equivalent correction for the population was -4.74 D, mean maximum ablation depth was 89.16 microns, and mean treatment time was 25.83 seconds. The calculations showed that the laser cut an average of 16 microns per dioptre in an average of three seconds.

"Manufacturer data indicate mean ablation times of 1.5 seconds per dioptre of myopia and 2.7 seconds per dioptre of hyperopia using a 6.0mm optical zone. My average ablation time was longer because the treatments involved astigmatic corrections and also were performed with a larger optical zone, which averaged 6.76mm," Dr

Siregar said. “However, the Schwind Amaris 750S still has the advantage of a much shorter treatment time than other excimer lasers.”