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Predicting primary angle closure suspects using anterior segment OCT: A new approach

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Objective: To propose a novel non-invasive method for screening patients at risk of angle closure and thus the need for laser peripheral iridotomy using anterior segment OCT imaging.

Methods: Horizontal scans of the nasal and temporal anterior chamber angles in glaucoma suspect patients were performed at 870 nm wavelength Fourier-domain OCT (Spectralis-Heidelberg). Schwalbe's line (S) was identified on the images and using the integrated caliper tool, a line was drawn to the nearest point of the iris (S-I). A glaucoma specialist carried out gonioscopy and irido-corneal angles were graded according to a Shaffer grade. Anterior chamber depths as well as irido-corneal angle measurements were also carried out using Pentacam imaging. Spearman ρ analysis was performed to assess the correlation between S-I and Shaffer grades as well as between the different Pentacam measurements and Shaffer grades. Furthermore Tukey-Kramer HSD analysis was also carried out to evaluate the statistical differences between the means of S-I and each of the Pentacam measurements for each Shaffer grade.

Results: Thirty-four images from forty enrolled subjects were available for analysis. Schwalbe's line was identifiable in 94% of the total images. Correlation coefficients between S-I measurements and Shaffer grades were 0.81 and 0.77 for nasal and temporal quadrants respectively. The correlation was much lower with Pentacam-measured anterior chamber depth and irido-corneal angle (r=0.55 and 0.37 respectively). The means of S-I for gonioscopically occludable angles were statistically different than the means for gonioscopically wide-open angles. On the other hand the same statistical difference could not be achieved when comparing the means for Pentacam-measured anterior chamber depth and irido-corneal angle with gonioscopic Shaffer grade. The diagnostic cutoff value of S-I for occludable angles was established at 300 μm.

Conclusion: The measurement of S-I using anterior segment OCT imaging strongly correlates with gonioscopy and may be a suitable non-invasive alternative for evaluating the risk for angle closure.

Biography

Dan Samaha, optometrist (O.D.), obtained his Bachelor's degree in Physiology from McGill University before receiving his doctorate in optometry from the Universite de Montreal in 2011. He completed in 2012 an ocular health residency at the Institut de l'Oeil des Laurentides (IOL), during which has been participating in the education of optometry student, while working at the retina, glaucoma, emergency and cataract surgery evaluation clinics. Like all his colleagues at the EIL, Corrently, he is optometrist actively involved in strengthening the bonds of collaboration between optometrists and ophthalmologists in the Laurentians region, particularly at the IOL.

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