ASTIGMATISM MEASURE

Novel parameter quantifying total corneal astigmatism offers best match with refractive cylinder. *Cheryl Guttman Krader reports*

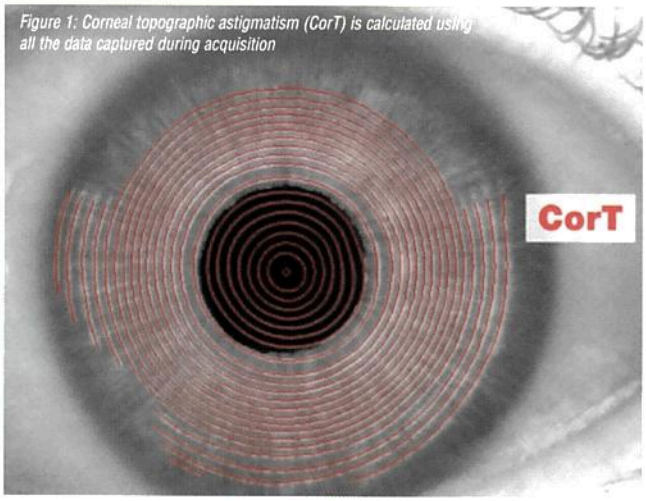

Figure 1: Corneal topographic astigmatism (CorT) is calculated using all the data captured during acquisition

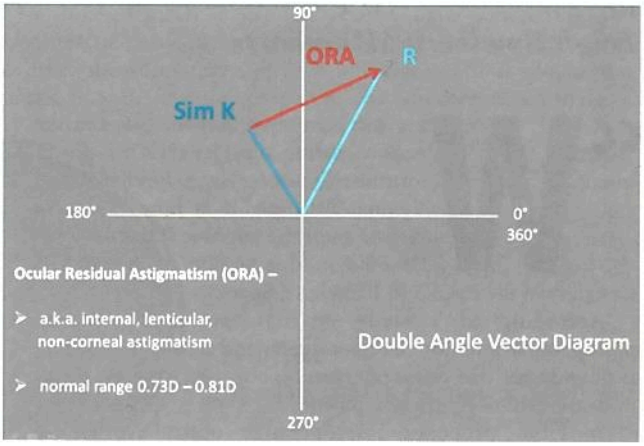

Figure 2: Ocular residual astigmatism (ORA) – the vectorial difference between corneal astigmatism and refractive cylinder (at the corneal plane) is expressed in dioptres

Courtesy of Noel Alpins MD, NewVision Clinics

Corneal topographic astigmatism based on total corneal power (CorT total) provides an accurate and consistent measure of astigmatism, said Noel Alpins MD at the XXXIII Congress of the ESCRS in Barcelona, Spain.

CorT total is derived using individual data for anterior and posterior corneal power measurements. In 2012, Dr Alpins and colleagues reported that CorT anterior, a corneal power measure based on anterior corneal power measurements only, corresponded better with manifest refractive cylinder in both magnitude and orientation than simulated keratometry, corneal wavefront, manual keratometry, and automated keratometry *(Alpins N et al. J Cataract Refract Surg. 2012;38(11):1978-88).*

Now, a study evaluating the performance of CorT total showed that it corresponded better with manifest refractive cylinder, both in variability and closeness, than CorT anterior and consequently the other measures also.

"Accuracy for the total astigmatic power of the cornea and its meridian is of utmost importance when correcting astigmatism, and CorT gives more accurate information than other parameters because it is derived from all measured data rather than from only a limited area of the cornea," said Dr Alpins, Medical Director, NewVision Clinics, Melbourne, Australia. (see Figure 1)

"Therefore, when planning toric intraocular lens selection and orientation, or the length and orientation of limbal relaxing incisions, we believe cataract surgeons should use the CorT parameter, total or anterior depending on whether their tomography/topography system measures the posterior and anterior cornea or just the anterior surface," he added.

The study comparing the performance of CorT total and CorT anterior has also been published *(Alpins N et al. J Refract Surg. 2015;31(3):182-6).* It included data from 526 surgically-naïve eyes of patients presenting for laser vision correction.

Corneal power measurements obtained with the Sirius tomographer (Costruzione Strumenti Oftalmici) were used to determine total and CorT anterior values for each eye. Correspondence of the CorT values with refractive cylinder was analysed based on calculations for ocular residual astigmatism (ORA) mean magnitude and standard deviation. ORA is the vectorial difference between the corneal astigmatism and the refractive cylinder at the corneal plane. (see Figure 2)

Compared with CorT anterior, CorT total had significantly lower values for both mean ORA magnitude (0.30 vs 0.32D) and ORA variability (SD 0.53 vs 0.64D), that is the CorT total was closer to the manifest refractive cylinder than CorT anterior. (see Figure 3)

"A lower mean ORA magnitude indicates closer correlation between refractive cylinder and corneal astigmatism, and a lower standard deviation indicates lower variability," Dr Alpins explained.

CorT total is now available on these tomography platforms that measure total corneal power – CSO Sirius, Pentacam (Oculus), and Galilei (Ziemer). Those three systems, as well as the Atlas (Carl Zeiss Meditec) and OPD-Scan III (Nidek), have the capability of providing CorT anterior. The iAssort software is required for calculation of the CorT parameter ***(www.assort.com).***

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Dr Alpins discusses the details of measuring CorT in an Eye Contact video interview at: www.eurotimes.org/eyecontact

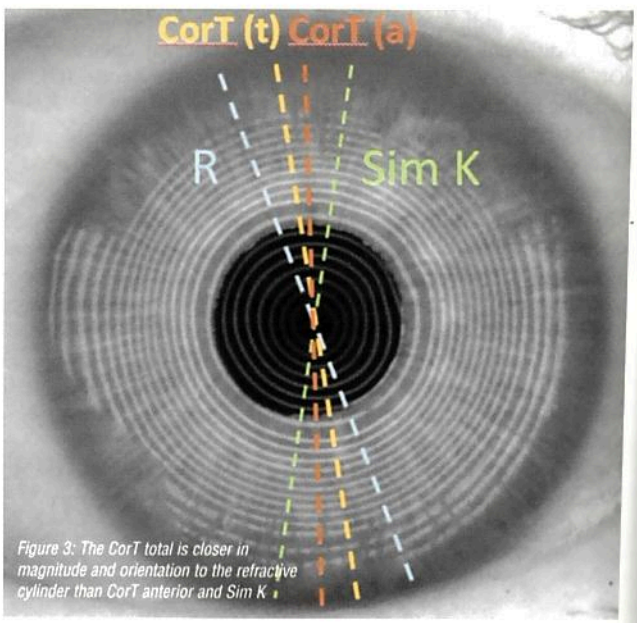

Figure 3: The CorT total is closer in magnitude and orientation to the refractive cylinder than CorT anterior and Sim K