Sponsored by Haag-Streit AG

Lens Thickness Matters

Improve your refractive outcomes with measured lens thickness.

Cataract patients are more active and have higher expectations for their postsurgical visual quality than at any time in the history of this surgery. As a result, cataract surgery is no longer just a cure for the disease but a refractive procedure. Modern laser-based cataract procedures and sophisticated IOL designs offer the opportunity for increased patient satisfaction and optimum surgical results, making the preoperative planning ever more important.

The accurate calculation of IOL power remains one of the biggest challenges in cataract surgery. Although standard IOL power calculation formulas like SKR/T, Hoffer Q, and Holladay 1 provide excellent results for the average patient, refractive surprises are still a major issue with short and long eyes. The reason for this is how these IOL calculation formulas predict the position of the lens after surgery. Only the axial length and the corneal curvature are used to derive the effective lens position (ELP) and IOL power. In cases where the anatomy of a patient differs from the average, the risk of missing the target refraction increases.

Advanced IOL power calculation formulas like Holladay 2 (Holladay IOL Consultant: www.hicsoap.com) or Olsen (PhacoOptics: www.phacooptics.com) overcome this issue by incorporating more preoperative data, including the anterior chamber depth and lens thickness. In 2006, Olsen published a landmark paper where he showed the importance of the lens thickness measurement for the accurate prediction of ELP.[1]

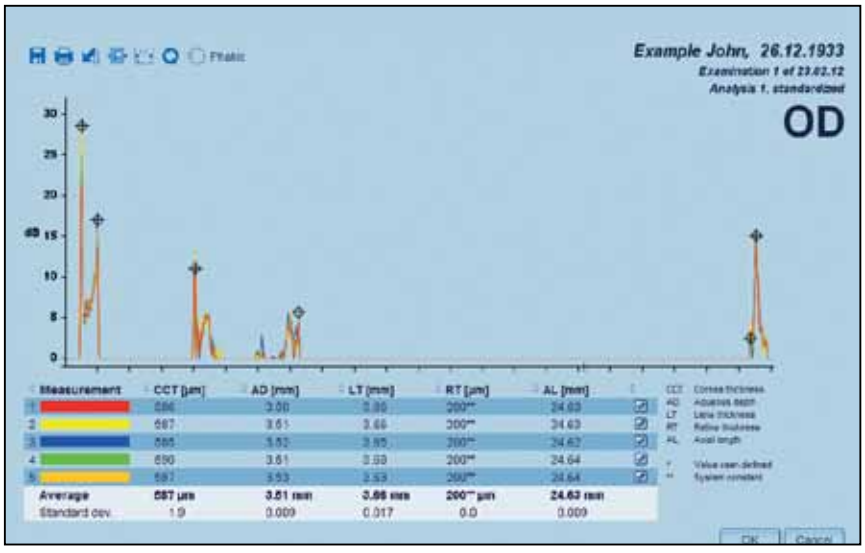
The Lenstar LS 900 optical biometer (Haag-Streit AG) is currently the only device that provides all measurement parameters to take full advantage of the latest-generation IOL power calculation formulas such as Holladay 2 and Olsen. All axial dimensions are measured with optical coherence biometry, enabling highly precise measurements of every eye's structure, from the cornea to the retina. Lens thickness can be measured in phakic and pseudophakic eyes. The Lenstar's capability to measure lens thickness in pseudophakic eyes may be useful for postoperative quality control and analyzing refractive surprises.

WEIGHING IN

"The Lenstar is a remarkably easy-to-use, all-in-one IOL power calculation tool that delivers exceptionally accurate axial length, anterior chamber depth, and lens thickness measurements by optical biometry. Its dual-zone autokeratometry feature is at the same time precise and uniformly consistent. The Lenstar is an excellent choice for surgeons migrating toward presbyopia-correcting and other premium-channel IOLs, where highly accurate outcomes are critical for success."

—Warren E. Hill, MD, FACS, Mesa, Arizona

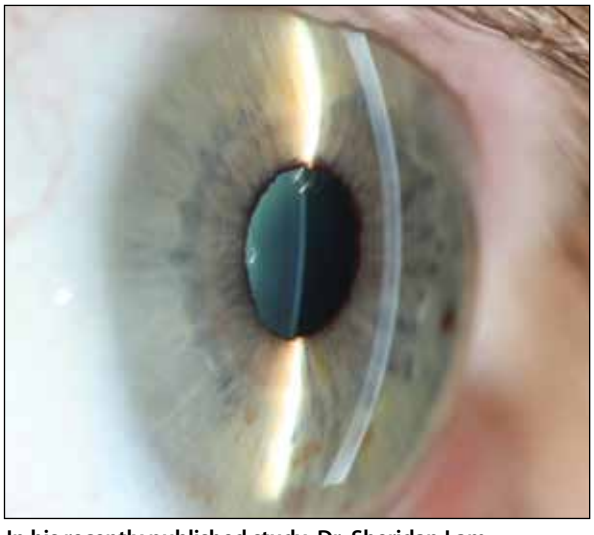
Lenstar is the only optical biometer available that measures lens thickness—one of the key parameters for improved refractive outcomes.



Lenstar provides the user with a full A-scan of the entire eye in a format similar to that of immersion ultrasound, facilitating easy user interpretation.

The Lenstar provides the user with a full A-scan of the entire eye, very similar to that of immersion ultrasound, for easy interpretation. Every measurement parameter can be reviewed and, if necessary, adjusted, allowing full transparency and confidence that the biometry is precise and correct.

In addition to measuring all the axial dimensions of the eye, the Lenstar also automatically captures highly accurate keratometry, white-to-white distance, and pupil diameter. When the operator incorporates established validation criteria, the unique dual-zone, keratometry-generated measurements of astigmatism and axis are equivalent to the gold-standard manual keratometers recommended by IOL manufacturers for use with toric IOLs.[2]



In his recently published study, Dr. Sheridan Lam demonstrated that in more than 30% of cases, measured lens thickness led to a different IOL choice.

CLINICAL EVIDENCE

In a recent study, Sheridan Lam, MD, analyzed the effect of measured lens thickness with the Lenstar as compared with age-based lens thickness estimation used with the Holladay 2 formula.[3] His study included 93 eyes. The average age was 73 years (range, 41–91 years), the average axial length was 23.8 mm (range, 21.6–28.7 mm), and the average spherical equivalent was 43.8 D (range, 40.9–48.1 D). These values represent a relatively average patient population.

The study results showed that the mean absolute refractive error with measured lens thickness was statistically significantly lower when compared with IOL power prediction based on an age-based estimation of this key parameter. In more than 30% of the cases, measured lens thickness led to a different IOL choice. The linear relationship commonly used to estimate lens thickness based on age is not appropriate. Not using measured lens thickness with the Holladay 2 puts the surgeon and the patient at a disadvantage. Lens thickness matters and should be measured.

NO MORE GUESSWORK

The Lenstar LS 900 optical biometer allows the surgeon to improve the precision and accuracy of the preoperative planning, providing all biometry measurements used in the latest IOL calculation formula in one single scan. It is the only optical biometer available that measures lens thickness, one of the key parameters for improved refractive outcomes in combination with the Holladay 2 or the Olsen formula. ■

1. Olsen T. Prediction of the effective postoperative (intraocular lens) anterior chamber depth. *J Cataract Refract Surg*. 2006;32(3):419-424.
2. Hill W, Osher R, Cooke D, et al. Simulation of toric intraocular lens results: manual keratometry versus dual-zone automated keratometry from an integrated biometer. *J Cataract Refract Surg*. 2011;37(12):2181-2187.
3. Lam S. Comparison of age-derived lens thickness to optically measured lens thickness in IOL power calculation: a clinical study. *J Refract Surg*. 2012;28(2):154-155.