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Abstract Title: **ACCOMMODATIVE IOL's OBJECTIVE EVALUATION USING A NOVEL DOUBLE-PASS BASED INSTRUMENT**

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Purpose: Double-pass based instruments provides information on both higher order aberrations and intraocular scattering. This type of systems can be also used to objectively measure the amplitude of accommodation by analyzing retinal images in real time. We used this system to determine actual accommodative range in eyes implanted with different types of accommodative and standard IOLs.

Methods: We recorded retinal images during accommodation of 30 pseudophakic eyes of 18 patients using a double-pass system (OQAS; Optical Quality Analysis System, Visiometrics SL). Measurements were performed with physiological pupil (no cycloplegic) between 4 to 6 weeks after an uncomplicated surgery. Mean spherical equivalent refraction was -0.75 ± 0.50 diopters (range -1.25 to $+0.50$ diopters). Ten eyes were implanted with an accommodative IOL (AT-45,C&C Vision), ten more with a ThinOptx IOL (Abingdon,VA) and ten more as control, five with an acrylic IOL from Corneal (Paris,France) and 5 from Alcon (Fort Worth,TX). Amplitude of accommodation in the OQAS instrument is defined as the range with image quality value 50% of the maximum (for best focus) or higher when analyzing the retinal image during the accommodation test target. This test is performed in both eyes separately.

Results: We observed a mean amplitude of accommodation of 1.3 ± 0.75 diopters (range 2.75 to 0.25 diopters) for the accommodative IOL (AT.45), 1.1 ± 0.75 diopters (range 1.75 to 0.50 diopters) for the ThinOptx IOL and 1.0 ± 0.50 diopters (range 1.25 to 0.50 diopters) for both Acrylic control IOL's. There were no statistically significant difference between all these IOL's using this objective measure of determining amplitude of accommodation. Although beyond the scope of this particular study, through our long term data, it seems that the range of accommodation achieved by the AT.45 does not change with time (6 to 12 months) as it happens with the other IOL styles.

Conclusions: The OQAS instrument provides a practical objective tool to evaluate the accommodative amplitude in eyes both before and after surgery. We demonstrated this capability in different types of IOLs.

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