Analysis of light-dark changes in iris convexity in eyes with occludable angles
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Purpose: To investigate light-dark changes in anterior bowing of the iris by means of anterior segment optical coherence tomography (AS-OCT) in eyes with occludable angles.

Methods: Sixty-five eyes of 65 Japanese patients with primary angle closure suspects, primary angle closure, or primary angle closure glaucoma were reviewed. We defined the iris convexity (IC) as the maximum distance from the posterior boundary of the iris to the iris plane passing through the pupillary margin of the iris and iris root. The IC was determined using AS-OCT in each quadrant (superior, inferior, temporal, and nasal) under light and dark conditions. We also measured pupil diameter (PD), anterior chamber depth (ACD), and crystalline lens rise (CLR) using AS-OCT.

Results: The mean age of all cases was 72.0 ± 8.2 years old. The IC, PD, ACD and CLR measured in the light condition were 0.287 ± 0.080 mm, 2.44 ± 0.86 mm, 1.94 ± 0.25 mm, and 1.10 ± 0.26 mm, respectively. The corresponding values measured in the dark condition were 0.326 ± 0.080 mm, 4.01 ± 1.09 mm, 1.94 ± 0.25 mm, and 1.09 ± 0.24 mm, respectively. The IC and PD in the dark were significantly greater than those in the light (p < 0.001). The IC varied significantly among the four quadrants (p < 0.001) under both the light and dark conditions. Significant negative correlations were found between the IC and the PD (r = -0.352, p = 0.004), and between the IC and the ACD (r = -0.360, p = 0.003) under the dark condition. Significant positive correlations were found between the IC and the CLR (r = 0.392, p = 0.001) under the dark condition.

Conclusion: A significant negative correlation was found between the iris convexity and the anterior chamber depth measured under both the light and dark conditions. This study quantitatively confirmed that increase in the iris convexity occurs promptly with physiologic pupil dilation and the association of relative pupillary block with shallow anterior chamber in eyes with primary angle closure.