Optical Coherence Tomography
Assessment of Angle Anatomy Changes After Cataract Surgery
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PURPOSE: To evaluate changes in anterior chamber (AC) morphology induced by cataract extraction using anterior segment optical coherence tomography (OCT).

DESIGN: Prospective comparative observational case series.

METHODS: Thirty-two eyes of 32 patients underwent OCT imaging of the angle before and after cataract surgery. Anterior chamber depth (ACD), angle opening distance at 500 μm (AOD500) and trabecular-iris space at 500 μm (TISA500) were measured pre- and postoperatively. Preoperative lens thickness (LT) and lens position (LP) were calculated.

RESULTS: ACD, AOD500 and TISA500 increased significantly after cataract extraction (P < .001). Preoperatively, ACD and LT highly correlated (P = .0083) as did ACD and TISA500 (P = .0001). TISA500 correlated with LP (P = .0001) but not with LT (P = .74).

CONCLUSIONS: Changes in angle morphology after cataract surgery can be imaged and objectively quantified by anterior segment OCT. Lens position may have a greater influence on angle width than LT. (Am J Ophthalmol 2007;144:464–465. © 2007 by Elsevier Inc. All rights reserved.)

Clinical experience has demonstrated that cataract extraction causes deepening of the central anterior chamber (AC) and widening of the angle. It is also a common clinical understanding that as lens thickness (LT) increases, there is an increase in angle crowding with predisposition to relative pupillary block. Thus, cataract extraction has been advocated in eyes with primary angle closure.1

Gonioscopy has traditionally been used for AC angle grading, but it is subjective and limited by interobserver bias. Ultrasound biomicroscopy is a more objective and reproducible method of angle assessment,1,2 but the immersion requirement is inconvenient and may cause artificial angle widening.3

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Optical coherence tomography (OCT) is an imaging modality that allows cross-sectional imaging of the eye.4 It requires no contact or immersion and produces images with higher spatial resolution. In this study, we used OCT to quantify changes in anterior segment morphology after cataract extraction and to evaluate the effect of LT and position on angle opening.

We studied 32 eyes of 32 patients undergoing cataract extraction and intraocular lens implantation. After obtaining informed consent, all eyes underwent preoperative measurements of anterior chamber depth (ACD), axial length (AL), LT, lens position (LP defined as ACD + ½ LT) and baseline OCT imaging (Figure). OCT scans and ACD measurements were repeated one month postoperatively.

We used an anterior segment OCT prototype provided by Carl Zeiss Meditec, Inc, (Dublin, California, USA), which uses a 1.3-μm wavelength light source to acquire 2,000 axial scans/second. Cross-sectional images were obtained in nasal and temporal quadrants. Images were analyzed using custom MATLAB software 7.0 (The MathWorks, Inc,
Our experiences have shown that OCT is a valuable tool for evaluating the effects of cataract surgery and peripheral iridotomy\textsuperscript{6,7} on the AC angle. This technology can be of use in evaluating patients with narrow angles and cataracts who are undergoing cataract extraction for the therapeutic purpose of widening the angle.

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REFERENCES


Common Forms of Childhood Strabismus in an Incidence Cohort

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PURPOSE: To report the prevalent forms of childhood strabismus.

DESIGN: Retrospective, population-based cohort study.

METHODS: The medical records of all Olmsted County, Minnesota, residents younger than 19 years diagnosed...