OCT useful for post-operative evaluation of capsule/IOL contact

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OPTICAL coherence tomography is a useful tool for assessing capsule closure after cataract surgery, report Austrian surgeons.

A new study presented at the Congress of the DGII (German-Speaking Society for Intraocular Lens Implantation and Refractive Surgery) found that optical coherence tomography (OCT) can be useful to visualise cross-sectional tomograms of capsule-intraocular lens contact during the early post-operative period following cataract surgery.

The development of posterior capsule opacification seems to be stunted by quick capsule fusion and early IOL-capsule contact. To determine the time required for capsule closure following cataract surgery, ophthalmic surgeons tested OCT as a new means to document and quantify pseudophakic capsule bend formation.

In a randomised, prospective trial, Stefan Sacu MD, Department of Ophthalmology, Meducal University of Vienna, Austria, studied 33 eyes of 33 patients with age-related cataract who were scheduled to undergo cataract surgery. Using OCT (OCT 1020, Zeiss Humphrey), he was able to evaluate the precise time at which the anterior and posterior lens capsules became directly apposed to the optic, as well as the moment at which capsule bend was created at the optic edge, following the implantation of three different sharp-edge IOLs.

All of the eyes underwent standard phacoemulsification surgery followed by the implantation of one of three different types of open-loop IOL with a sharp optic edge: one-piece acrylic IOL (SA60AT, Alcon), three-piece acrylic IOL (Acrysof MA60BM, Alcon), and three-piece silicone IOL (911A, AMO).

The patients were randomised into three groups of 11 eyes each. He performed slit-lamp examinations and used the OCT scan to evaluate the contact of the lens capsule with the IOL optic, and capsule bend formation, at one day, three days, one week, two, three weeks and one month after-surgery (average of three measurements at each time). He also determined on which postoperative day the capsule came into contact with the IOL optic and when capsule bend formation occurred.

One day postoperatively, the mean distance between the anterior capsule and the IOL was 161.0 microns for the three-piece acrylic IOL, 197.0 microns the one-piece acrylic IOL, and 220.0 microns for the three-piece silicone IOL. By day three, the distance was 64 microns, 88.0 microns, and 157 microns respectively. At one week, distances between the anterior capsule and the IOL diminished to 27 microns, 10 microns, and 60 microns. At two weeks post-operatively, both acrylic IOLs had contacted the IOL surface and the three piece silicone IOL was at a distance of 27 microns.

> "The short-term reproducibility of OCT was excellent."

The posterior capsule came into contact with the IOL on the same day or earlier than the anterior capsule in 85% of all patients.

"The short-term reproducibility of OCT was excellent. The three lens types we implanted in this study revealed a mean capsule fusion at approximately two weeks following cataract surgery. OCT was able to show that there was no significant difference regarding capsule bend formation time, however, it was noted earlier in eyes implanted with the one piece acrylic IOL than with three piece silicone IOL," Dr Sacu reported.

Dr Sacu noted that capsule bend formation occurred within approximately ten days for the one-piece acrylic IOL, 13 days for the three-piece acrylic IOL and 15 days for the three-piece silicone IOL.

The researchers implemented the OCT scan method in a standardised fashion. The scan duration lasted 1.0s; the scan length was 2.8 mm-3.2 mm; the scan meridian was 90° to the optic-haptic junction. Fixation was on the central green fixation point.

The average patient age in each group was 72 years for the one-piece acrylic IOL recipients, 71 for the three-piece acrylic IOL recipients and 75 for the three-piece silicone IOL recipients. The average dioptric power of the three types of IOL was 23.0 D, 22.0 D, and 21.0 D respectively.

The study excluded eyes with uveitis and pseudoexfoliation. The researchers used the ANOVA/T-Test for the statistical analysis of the results.

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