Minimal PCO with dual optic accommodating IOL

Cheryl Guttmann in New Orleans

THE unique design elements of the dual optic accommodating IOL (Synchrony, Visiogen) are effective in minimising the risk of anterior capsule and posterior capsule opacification, reported Ivan L Ossma, MD, MPH at the annual meeting of the American Academy of Ophthalmology.

Dr Ossma presented results of a long-term, prospective observational study comparing capsular opacification in a series of 31 eyes implanted with the dual optic accommodating IOL and in two control groups comprised of 62 eyes each that were implanted with one of two single-piece, square-edge, monofocal acrylic IOLs, the C-flex (Rayner) or SA60AT (Alcon).

Mean PCO scores increased in all three IOL groups between three and 24 months. Notably, however, there were no significant differences between IOL groups in mean scores at any time point. At 24 months, the mean PCO scores in all groups remained below the level considered to represent clinically significant PCO.

Photographic grading of anterior capsule opacification (ACO) was performed by a single masked observer. The results showed less ACO in eyes implanted with the dual optic accommodating IOL compared with the control groups at 12 months, although there was no significant difference between groups. “The dual optic accommodating IOL is a single-piece silicone lens designed to move anteriorly to generate an increase in total optical power that allows patients to see better at near. Any form of capsular opacification could interfere with the axial displacement of the IOL, and therefore with its mechanism of accommodation,” explained Dr Ossma, clinical professor of ophthalmology, Universidad Industrial de Santander, Colombia.

A previous study from researchers at the David J Apple MD Laboratories for Ophthalmic Devices Research showed ACO and PCO were significantly lower in animal eyes implanted with the dual optic accommodating IOL compared with controls receiving a single-piece, plate haptic silicone IOL, he noted.

“The present clinical study shows ACO and PCO rates after implantation of the dual optic accommodating IOL are comparable to those of currently available monofocal square edge acrylic IOLs and support the conclusion that the dual optic accommodating IOL has been well designed to minimise capsular opacification,”

Dr Ossma explained that the dual optic accommodating IOL both ensures expansion of the capsular bag and minimises contact between the anterior capsule and the IOL.

“First and foremost, the dual optic accommodating IOL is the first commercially available capsular filling implant. By completely filling and distending the capsular bag, it disallows the possibility of anterior capsule and posterior capsule opacification,” he said.

In addition, the IOL features anterior fluid channels that minimise the contact area between the lens and the anterior capsule to prevent sealing of the lens-capsule complex that can lead to fibrous metaplasia of residual cells and anterior capsule opacification.

All eyes in the study had at least 12 months of follow-up, and the PCO results at that visit showed the mean scores ranged from 1.3 in the SA60AT group to 1.78 in the C-Flex eyes. At 24 months, the mean PCO score was 1.98 in the dual optic accommodating IOL group and lower than the mean values in the C-Flex (2.32) and SA60AT groups (2.49), although the differences between groups were not statistically significant.

“While there are hurdles to overcome in PCO analysis, but the Open Access Systematic Capsule Assessment (OSCA) system, which is based on texture analysis, has been validated in previous testing and been shown to be reliable and generate results that correlate with visual acuity before and after Nd:YAG laser capsulotomy. In addition, prior studies with the OSCA system have shown that a score of 4 represents clinically significant PCO. In our study, there were patients in all groups with an OSCA score of 4 or higher by 12 months. However, the OSCA score for the average patient at that visit and at 24 months was well below the threshold for clinically significant PCO,” Dr Ossma said.

ACO ratings at 12 months showed ACO was judged as absent to mild in about three-fourths of eyes in both of the monofocal IOL groups and in more than 90 per cent of eyes in the dual optic accommodating IOL group. No eyes implanted with the dual optic accommodating IOL had severe ACO compared with eight eyes (5.1 per cent) in each of the monofocal IOL groups.

While the design of the dual optic accommodating IOL helps to minimise PCO development, Dr Ossma noted surgical technique also plays an important role. In addition to performing meticulous cortex removal, as would be done after all phacoemulsification procedures to minimise the risk of PCO, it is important to create a capsulorhexis that assures a 360-degree overlap of the IOL optic. Dr Ossma said he aims for a capsulorhexis diameter of 4.5 to 5.0mm.

ossma@mac.com