

POSTERIOR CAPSULAR OPACIFICATION: ONE FACTOR TO BE CONSIDERED FOR THE STUDY OF THE OPTIC NERVE

LA OPACIFICACIÓN CAPSULAR POSTERIOR: UN FACTOR A TENER EN CUENTA EN LA VALORACIÓN DEL NERVIÓ ÓPTICO

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It is known that pseudophakia is a very frequent condition in ophthalmology. The visual benefit obtained after a cataracts operation can diminish in time due to the progressive development of a posterior capsule opacification (PCO). Even though surgical techniques and the design and materials of intra-ocular lenses have been continuously modified, PCO continues to be the most frequent long-term post-surgical complication in cataracts surgery (1). The PCO rates vary from one study to another, but a meta-analysis published in 1998 reported that 25% of patients submitted to cataracts surgery developed PCO 5 years after the operation (2).

PCO is secondary to the proliferation and centripetal migration of epithelial lens cells from the equator and the anterior capsular sac which end up obstructing the visual axis. According to the growth patterns of these cells, the ensuing opacity assumes a fibrous or pearly appearance and, more frequently, a combination of both (3).

Said changes in the posterior capsule may involve visual acuity loss, alteration of contrast sensitivity, glare and monocular diplopia (4,5). Metaplasia of epithelial cells also causes indirect complications related to mechanical traction. Thus, epithelial cells can become fibroblasts containing contractile elements (miofibroblasts) which produce wrinkles

on the posterior capsule. These wrinkles or folds also cause visual distortions such as glare or similar to those caused by a Maddox rod (6).

All the above irregular combined formation of fibrosis, pearls and wrinkles of the posterior capsule alter reflection, refraction, diffraction and dispersion of light in the eye and may interfere not only with the patient's eyesight but also with the tests carried out for assessing the optic nerve.

In our daily practice it is not unusual to assess pseudo-phakic eyes with PCO which may have concomitant optic nerve pathologies such as glaucoma or a neuro-ophthalmic disease. In the light of specific clinical situations we pondered how PCO could influence the results of the tests made for evidencing the functional and morphological condition of the optic nerve and the peripapillary retinal nervous fiber layer (PRNFL). To this end we designed a number of studies, comparing results of different diagnostic tests (automated perimetry, laser polarimetry and Optical Coherence Tomography) before and after a capsulotomy in PCO patients.

In what concerns automated perimetry (AP) we observed that not only the mean deviation (indicating the degree of global field depression) but also the standard deviation from the mean value (indicating the degree of focal depression) improved

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after capsulotomy. This finding confirmed that PCO behaves as a heterogeneous opacification, i.e., it only depresses parts or areas of the visual field and not as homogeneously as cataracts do. The idea is compatible with daily clinical practice. When using the slit lamp, the reader has probably seen the capricious forms and textures PCOs adopt in patients. On the other hand, we also evidenced that prior to capsulotomy some fields exhibited defects simulating arched scotomae. After operating with the laser, said artifacts disappeared (7). For practical purposes, in some cases a campimetric defect produced by a PCO could be confused with a glaucomatous campimetric defect (false positive).

A study of laser polarimetry (LP) also produced interesting findings, among them that the PRNFL thickness calculation parameters obtained by GDx-VCC were significantly lower after capsulotomy, i.e., there is an over-estimation of thicknesses in PCO patients associated to an under-estimation of the Nerve Fiber Indicator (8,9). Therefore, the glaucoma diagnostic in PCO could be sidestepped on the basis of the PL results (false positives). On the other hand, we evidenced that the capsulotomy changed the bi-refringency of the anterior segment (BAS), requiring a new estimation of BAS for successive assessments with GDx-VCC after the capsulotomy (10,11).

In what concerns Optical Coherence Tomography (OCT), we obtained a significant increase of image quality (measured in terms of «signal strength») and of the number of valid tests after eliminating PCO. However, we did not find changes in the PRNFL thicknesses after capsulotomy (12). This difference in results between OCT and LP could be due to the different way of operating of these devices (13).

Considering the above, it seems recommendable to carry out in pseudo-phakic eyes a detailed examination of the anterior segment with slit lamp to determine a PCO when interpreting the various tests for assessing the optic nerve (AP, LO and OCT). If it is decided to perform a capsulotomy, we consider it necessary to repeat the tests after the laser because, after removing the artifacts produced by the PCO, the actual values will serve as a reference to make comparisons in the future and verify a progression of the pathology under assessment (14). If it is decided to postpone the capsulotomy, the most reliable diagnostic method for studying the optic nerve seems to be OCT.

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