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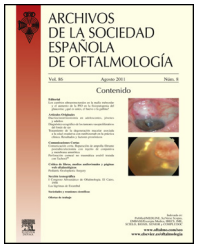

Original article

Effect of posterior neodymium:YAG capsulotomy. Safety evaluation of macular foveal thickness, intraocular pressure and endothelial cell loss in pseudophakic patients with posterior capsule opacification☆,☆☆

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ABSTRACT

Objective: To determine the effect of posterior capsulotomy on macular thickness, intraocular pressure and endothelial cell loss in pseudophakic patients with posterior capsule opacification using the other eye of every patient as a control.

Methods: An observational prospective study was conducted on 31 pseudophakic patients with posterior capsular opacification in one eye, using the other eye as a control. Patients did not suffer any other ocular pathology. All patients were treated by posterior capsular opacification with Nd:YAG capsulotomy, and followed up for a three-month period. The ocular examination included best corrected visual acuity (BCVA), intraocular pressure (IOP), macular optical coherence tomography (OCT), and endothelial cell assessment (including densitometry, cell size and coefficient of variation, hexagonal cell percentage and pachymetry), which were determined in both eyes before treatment, and one week, one month and 3 months after capsulotomy.

Results: Generalized estimating equations (GEE) were used to assess the capsulotomy effect adjusted by corresponding baseline measurements and time. No association was found between capsulotomy and IOP ($p = 0.597$), macular thickness ($p = 0.085$) or ECA densitometry ($p = 0.422$), average size of cells ($p = 0.299$), variation coefficient ($p = 0.495$), hexagonal cell percent ($p = 0.093$) and corneal pachymetry ($p = 0.423$). A significant increase of 0.15 Snellen units in BCVA was found during the 3-month follow-up period ($p < 0.001$).

Conclusion: This study shows that after Nd:YAG capsulotomy, BCVA improves significantly without any IOP, OCT or ECA changes during the three-month follow-up. Nd:YAG capsulotomy is a safe procedure in pseudophakic patients without any other ocular pathology.

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Efecto de la capsulotomía posterior con láser neodymium:YAG. Valoración de seguridad en el grosor foveal, la presión intraocular y el recuento de células endoteliales en pacientes pseudofáquicos con opacidad de cápsula posterior

Palabras clave:
Opacidad de cápsula posterior
Capsulotomía
Presión intraocular
Edema macular
Recuento endotelial

RESUMEN

Objetivos: Determinar el efecto de la capsulotomía posterior en el grosor macular, presión intraocular (PIO) y pérdida de células endoteliales en pacientes pseudofáquicos que presentaban opacidad de la cápsula posterior, utilizando el ojo adelfo de cada paciente como control.

Métodos: Se realizó un estudio prospectivo observacional en 31 pacientes pseudofáquicos con opacidad de la cápsula posterior en un ojo, utilizando el ojo adelfo como control durante un periodo de 3 meses. Se excluyó a los pacientes que presentaban otras enfermedades oculares o cirugías intraoculares aparte de la facoexéresis. A todos los pacientes se les realizó una capsulotomía posterior con láser Nd:YAG. El examen ocular, que se realizó previamente a la capsulotomía y en revisiones a la semana, al mes y a los 3 meses, incluía: agudeza visual mejor corregida (AVMC), PIO, tomografía de coherencia óptica macular (OCT) y recuento endotelial.

Resultados: Se utilizaron ecuaciones de estimación generalizadas para valorar el efecto de la capsulotomía ajustado en función de situación basal y tiempo de seguimiento. No se encontró asociación significativa entre la capsulotomía y la PIO ($p = 0{,}597$), el grosor macular ($p = 0{,}085$) o el recuento endotelial densitometría ($p = 0{,}422$), tamaño celular medio ($p = 0{,}299$), coeficiente de variación ($p = 0{,}495$), porcentaje de células hexagonales (0,093) y paquimetría ($p = 0{,}423$). Un incremento significativo de la AVMC se observó en la revisión a los 3 meses ($p < 0{,}001$).

Conclusiones: Este estudio indica que, tras la capsulotomía posterior, la AVMC mejora significativamente, sin observarse cambios significativos en PIO, grosor macular o recuento endotelial. La capsulotomía con Nd:YAG es un procedimiento seguro en pacientes que no presenten enfermedades oculares asociadas.

Introduction

Senile cataracts occur as a result of aging in 18% of the population between 65 and 74 years and in 46% between 75 and 85 years.[1] Cataract surgery improves vision and quality of life.[2,3] Posterior capsule opacity (PCO) is one of the most frequent complications of cataract surgery with intraocular lens (IOL) implant. It develops as a consequence of the proliferation of remaining epithelial cells and their migration to the space between the IOL and the posterior capsule.[4,5] Epithelial cells contract and produce wrinkles and opacity in the posterior capsule. This opacity diminishes visual acuity, contrast sensitivity, stereoscopic and color vision. It also can produce glare and monocular diplopia.[6–12] Opening the posterior capsule by means of capsulotomy with neodymium:YAG (Nd:YAG) laser restores the visual function when the PCO obstructs the visual axis. However, Nd:YAG capsulotomy can give rise to complications. Several studies have described damages in the IOL, increased intraocular pressure (IOP), glaucoma, retinal hemorrhage, iritis, vitreous prolapse, corneal injury, vitritis, pupil blockage, hyphema, cystoid macular edema, retina detachment, IOL dislocation or exacerbation of endophthalmitis.[13–17] This study utilizes the technology provided by confocal mirror microscope and spectral domain optic coherence tomography (SD-OCT) for measuring the loss of endothelial cells and macular thickness changes after capsulotomy respectively.

Patients and methods

Overall, the study prospectively evaluated 31 consecutive pseudophakic patients scheduled for laser Nd:YAG capsulotomy. The patients were selected in the Ramón y Cajal Hospital of Madrid between February and October 2010. The patients had to fulfill the following inclusion criteria: operation for cataracts with phacoemulsification without events and exhibiting visual deficit symptoms (blurred vision or glare) and clinically observable PCO in the slit lamp examination in only one of the 2 eyes, they should be capable of being evaluated for at least 3 months after the capsulotomy intervention and exhibit a centered IOL with complete overlap between the anterior capsules and IOL. Patients who had previous laser treatments, ocular trauma or surgery during the follow-up period, ocular surface, corneal or retinal disease, uveitis or glaucoma were excluded. The study was approved by the Ethics Committee of the Ramón y Cajal Hospital. The patients signed an informed consent.

The information obtained from both eyes prior to the capsulotomy procedure comprised age, sex, PCO type (fibrous, in pearls or combined), eye subjected to the procedure (left or