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Case Report

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Pigmentary Glaucoma After Cataract Surgery with Single-Piece Hydrophobic Intraocular Lens Implanted into the Ciliary Sulcus: Case Report

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Abstract

A 59 years old man presented with a history of phacoemulsification with an hydrophobic intraocular lens implant in his left eye 4 years ago. The biomicroscopy revealed pigments in the corneal endothelium (Krukenberg's spindle), peripheral transillumination of the iris and intraocular pressure of 52 mmHg in the left eye. Gonioscopy revealed hyperpigmentation of the posterior trabeculate. Posterior segment examination and visual field revealed a cup/disc 0.9 with significant field damage in strategy 10-2. Biomicroscopic ultrasonography showed asymmetric implantation of the IOL loops in the left eye (one loop in the ciliary sulcus and the other in the capsular bag). He underwent antiglaucomatous treatment with adequate control of intraocular pressure, with no need for surgical intervention.

Conclusion: *The single-piece hydrophobic intraocular lens implantation in the ciliary sulcus should be reconsidered due to the risk of pigmentary glaucoma.*

Keywords: Ciliary sulcus, Glaucoma, Intraocular lens, Intraocular pressure, Pigmentary glaucoma

Introduction

Pigmentary glaucoma (PG), one of the most common forms of secondary open-angle glaucoma, is caused by the deposition of iris pigments in the trabecular meshwork and obstruction of the flow of aqueous humor and, a consequent, increase in intraocular pressure [1-3]. The Pigment Dispersion Syndrome (PDS) is characterized by the release of granules from the pigment epithelium of the iris and, consequently, deposition in the anterior segment causing: a) Krukenberg spindle, b) Peripheral iris transillumination, c) Trabecular mesh hyperpigmentation, d) Deposits of pigments in the zonule, anterior surface of the iris and lens [1]. Currently, cases of PDS and PG have been reported in patients who underwent phacoemulsification using a single-piece hydrophobic intraocular lens (IOL), especially when implanted in the ciliary sulcus after, for example, rupture of the posterior capsule. The friction between the IOL loops positioned in the sulcus and the posterior region of the iris contribute to iris pigmentary dispersion, increased intraocular pressure (IOP) and secondary glaucomatous neuropathy [4-6]. This case report aims to describe a case of pigmentary glaucoma caused by the implantation of a hydrophobic IOL in the ciliary sulcus, as well as explaining its development and outcomes.

Case Report

A caucasian male patient, 59 years old, underwent phacoemulsification in the left eye (LE) on 04/2016 and implant of IOL Acrysof® SN60WF. On 10/2019, he presented visual acuity with correction in the right eye (RE) of 20/25 and in the LE of 20/20, biomicroscopy showed pseudophakia with decentralized IOL, but with no anterior chamber reaction, IOP RE 09 mmHg and LE 16 mmHg, pachymetry RE 575 µm and LE 550 µm. At Fundscopy: RE with 0.2 cup/disc and persistence of myelin fibers superiorly and in LE with 0.2 cup/disc.

On 03/2020, biomicroscopy in LE showed pigments in the corneal endothelium compatible with Krukenberg's spindle, IOP in RE 12 mmHg and in LE 52 mmHg, and at gonioscopy, it presented a concave iris with visibility to the ciliary body band in both eyes and with pigmentation of the posterior trabecular 2/4 in RE and 4/4 in LE. LE Fundscopy showed 0.9 sub-total excavation with rest of nasal rhyme. On that occasion Diamox® 250mg of 8/8 hours, Combigan® 12/12 hours and Xalatan® 1 time in LE were prescribed and ultrasound biomicroscopy (UBM) was requested.

The patient returned after 5 days with an IOP of 10 mmHg in LE. The UBM showed in LE asymmetric implant of the loops, one loop in the ciliary sulcus and the other in the capsular bag (Figure 1). In the following evaluations, the patient maintained controlled IOP, only with topical anti-glaucomatous medication, without indication, until that moment, of removing the intraocular lens or anti-glaucomatous surgery. Retinography (Figure 2), 24-2 computerized Sita-fast (Figure 3) and 10-2 in LE (Figure 4) were performed.

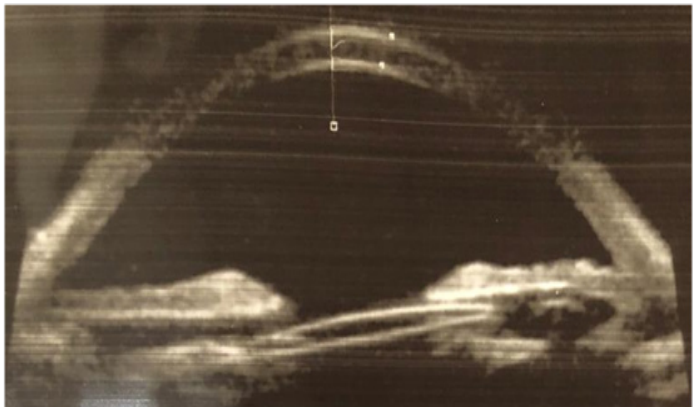

Figure 1: Left Eye UBM

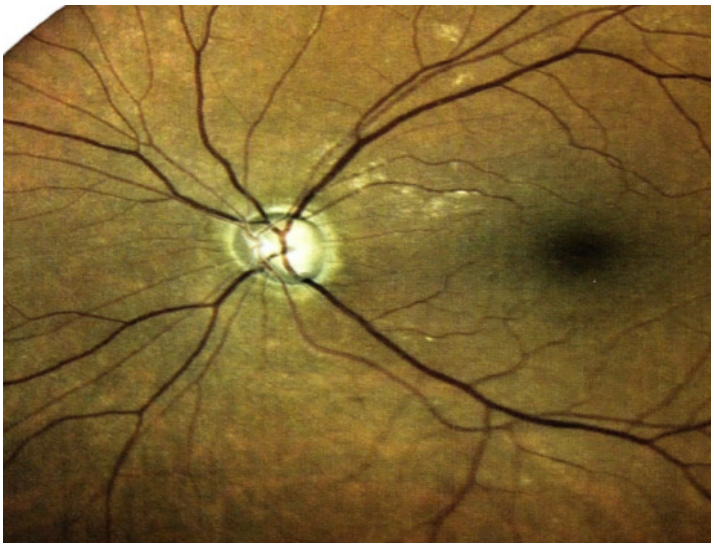

Figure 2: Left Eye Retinography

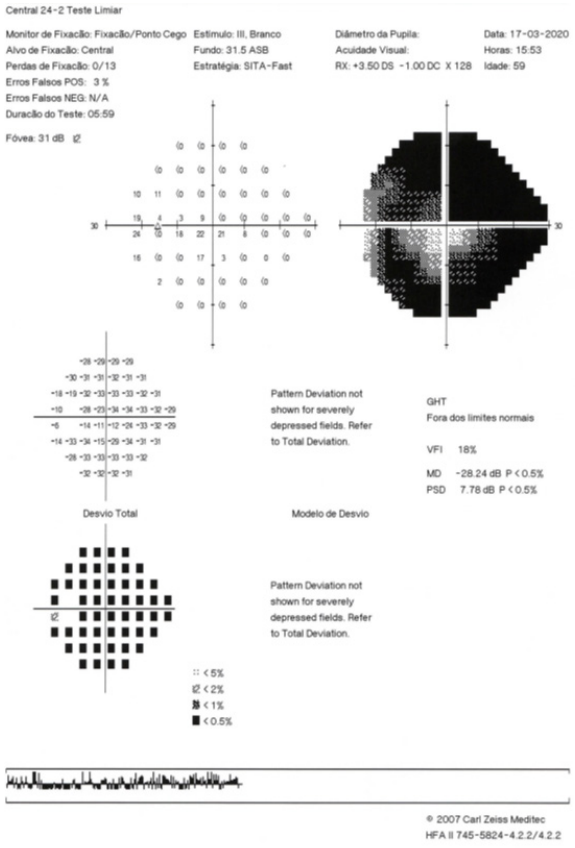

Figure 3: Left eye 24-2 campimetry

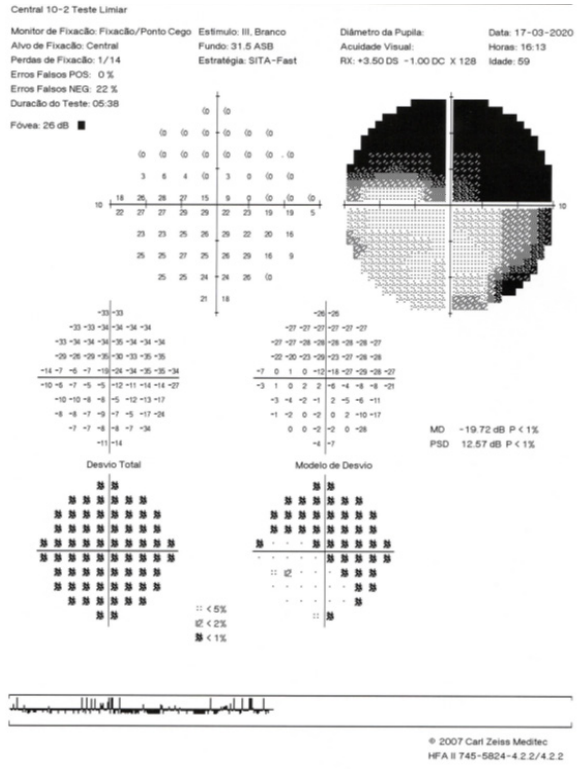

Figure 4: Left eye 10-2 campimetry

Discussion

A study carried out in 2008 showed that implantation of a single-piece IOL in the ciliary sulcus in the presence of adequate capsular support was possible for 40% of ophthalmologists [7]. However, some authors have demonstrated that hydrophobic single-piece IOL is not suitable for implantation in the sulcus, for presenting bulky haptics and square edges, generating friction against the iris stroma and the iris vasculature, pigment dispersion, hyphema and recurrent uveitis. This same lens lacks of larger diameters causing decentralization and, due to its flat configuration, does not allow a further more posterior positioning to the iris [8]. In addition, Chang, et al. identified in a histopathological study that patients with IOL in the ciliary sulcus had a high concentration of pigment granules on the anterior surface of the IOL [7].

In 2009, the Cataract Clinical Committee of the American Society of Cataract and Refractive Surgery evaluated 30 patients with single-piece IOL implantation in the ciliary sulcus with severe complications including: secondary pigmentary dispersion (83%), elevated IOP and secondary pigmentary glaucoma (33%), intraocular hemorrhage (23%) and iris transillumination (80%). Many of these patients (93%) required further surgical intervention, including IOL exchange (83%) [7].

Some studies have demonstrated the need for follow-up for a longer period of time with IOL patients in the ciliary sulcus, given the late possibility of elevating the IOP secondary to pigmentary dispersion. Chang, et al. identified that, in the first two postoperative weeks, only 20% of patients with IOL implantation in the ciliary sulcus had an acute increase in IOP, but in 80% there was a late increase in IOP (21.9 ± 17.1 months) [7]. Uy and Chan evaluated 20 patients with one-piece IOL in the capsular sulcus and 15% of these developed pigmentary glaucoma after 17.2 ± 9.4 months [9].

Some studies demonstrate the need for another additional surgical intervention after repositioning or replacing the IOL. Kristianslund, et al. found that in cases with IOP above 30 mmHg, 57% required surgical intervention to reduce IOP [10].

The case reported here had its evolution in late IOP increase due to pigmentary dispersion and pigment accumulation in the trabecular mesh caused by the iris friction on the IOL. Thus, the diagnosis of late secondary pigmentary glaucoma becomes compatible due to the implantation of a hydrophobic IOL in the ciliary sulcus.

Declaration of Conflicts

All Authors are nothing to disclose.

References

1. Okafor K, Vinod K, Gedde SJ (2017) Update on pigment dispersion syndrome and pigmentary glaucoma. Current Opinion in Ophthalmology 28: 154-160.
2. Scuderi G, Contestabile MT, Scuderi L, Librando A, Fenicia V, et al. (2018) Pigment dispersion syndrome and pigmentary glaucoma: a review and update. International Ophthalmology 39: 1651-1662.
3. Pinto LA, Stalmans I, Mierlo CV (2015) Surgical Management of Iatrogenic Pigment Dispersion Glaucoma. Journal of Current Glaucoma Practice 9: 28-32.
4. Hadid O, Megaw R, Owen R, Fraser S (2010) Secondary pigment dispersion syndrome with single-piece acrylic IOL. J Cataract Refract Surg 36: 1610-1611.
5. LeBoyer RM, Werner L, Snyder ME, Nick Mamalis, Christopher D Riemann, et al. (2005) Acute haptic-induced ciliary sulcus irritation associated with single-piece AcrySof intraocular lenses. J Cataract Refract Surg 31: 1421-1427.
6. Iwase T, Tanaka N (2005) Elevated intraocular pressure in secondary piggyback intraocular lens implantation. J Cataract Refract Surg 31: 1821-1823.
7. 7. Chang DF, Masket S, Miller KM, Rosa Braga-Mele, Brian C Little, et al. (2009) Complications of sulcus placement of single-piece acrylic intraocular lenses: recommendations for backup IOL implantation following posterior capsule rupture. J Cataract Refract Surg 35: 1445-1458.
8. Kawamorita T, Uozato H, Kamiya K, Shimizu K (2010) Relationship between ciliary sulcus diameter and anterior chamber diameter and corneal diameter. J Cataract Refract Surg 36: 617-624.
9. Uy HS, Chan PST (2006) Pigment release and secondary glaucoma after implantation of single-piece acrylic intraocular lenses in the ciliary sulcus. Am J Ophthalmol 142: 330-332.
10. Kristianslund O, Råen M, Østern AE, Drolsum L (2017) Glaucoma and intraocular pressure in patients operated for late in-the-bag intraocular lens dislocation: a randomized clinical trial. Am J Ophthalmol 176: 219-227.