

A Case Report of Pigmentary Glaucoma following Cataract Surgery with Sulcus Fixated Intraocular Lens Implantation

Dr. Deepak Choudhury¹, Dr. Jayashree Dora², Dr. Pramod Kumar Sharma³, Dr. Nisha Jha⁴

^{1,3,4}Department of Ophthalmology, Veer Surendra Sai Institute of Medical Science and Research, Burla, Sambalpur, Odisha, India

²Professor, Department of Ophthalmology, Veer Surendra Sai Institute of Medical Science and Research, Burla, Sambalpur, Odisha, India

Abstract: A 43 yr Hindu male presented with gradual diminution of vision of right eye (RE) for 3 months. He had history of cataract surgery with posterior chamber intraocular lens (PCIOL) implantation in RE 1 year back. O/E- VA- HM+ in RE. IOP – 40mm Hg in RE. On slit lamp examination Krukenberg spindle was found on corneal endothelium. Gonioscopy revealed heavily pigmented trabecular meshwork and wide open anterior chamber angle of RE. He had iris transillumination defects associated with the intraocular lens haptics. Posterior segment examination revealed obliteration of physiological cup and thinning of neuroretinal rim. OCT showed RNFL thinning in all quadrants. HFA showed grossly diminished visual field with sparing of a central island of vision (Tubular vision). Patient was treated medically with topical timolol e/d 0.5% twice daily and topical dorzolamide 2% twice daily. On follow up monthly for 4 months IOP reduced to 22mm Hg but VA didn't improve in RE. Laser peripheral iridotomy was done in RE. IOP remained consistently below 20 since then. **Conclusion:** Pigmentary glaucoma due to cataract surgery should be diagnosed and treated early to maintain useful vision.

Keywords: Pigmentary glaucoma, sulcus fixated IOL, Laser peripheral iridotomy, HFA, OCT.

1. Introduction

Pigmentary glaucoma is one of the most frequent forms of secondary open angle glaucoma. It is a consequence of an obstruction in the aqueous humor flow at the level of the trabecular meshwork, secondary to the dispersion of iris pigment in the anterior chamber. This dispersion of pigment accounts for the typical clinical findings of the pigment dispersion syndrome and pigmentary glaucoma such as the Krukenberg spindle, transillumination in the periphery of the iris, trabecular meshwork hyperpigmentation and pigment deposits in the zonule, anterior surface of the iris and lens¹. Secondary pigmentary glaucoma has been reported in patients who have undergone posterior chamber intraocular lens (IOL) implantation during cataract surgery, especially when the IOL was implanted in the ciliary sulcus following rupture of the posterior capsule^{2,3,4}. The main pigment dispersion mechanisms are contact between the iris and lens and the presence of IOL mobility in the posterior chamber due to instability. The pigment dispersion is more frequent when the implant is in the sulcus due to the smaller distance between the IOL and the iris pigmentary epithelium^{5,6}.

2. Case Report

A 43 year old Hindu male presented to our Out patient department (OPD) on 10th July 2015 with gradual diminution of vision in right eye for 3 months. It was painless and progressive. Patient had undergone cataract surgery with IOL implantation in the sulcus in the right eye one year back elsewhere. The visual acuity in the right eye was hand movement. The intraocular pressure (IOP) measured with Goldmann applanation tonometry was 40 mmHg. On slit lamp examination Krukenberg spindle was seen over the corneal endothelium (Fig 1).

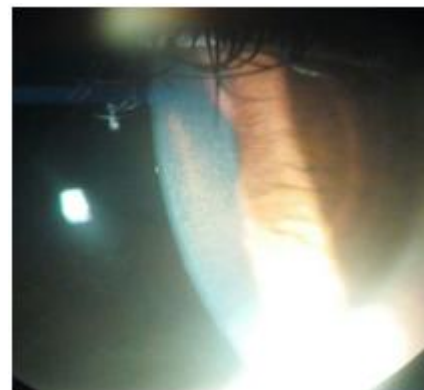


Figure 1: Krukenberg spindle

He had iris transillumination defects associated with the intraocular lens haptics. The PCIOL was seen in the sulcus with small slight displacement of the IOL towards the nasal quadrant and marked iridopseudophakodonesis. Gonioscopy with Zeiss 4 mirror gonioscope revealed heavily pigmented trabecular meshwork network and wide open angle. The fundus of right eye revealed obliteration of physiological cup with neuroretinal rim. Left eye biomicroscopic examination showed a posterior chamber IOL, no pigment dispersion, and an open angle without evident trabecular pigmentation.

Optical coherence tomography (OCT) showed thinning of neuroretinal rim in all quadrants (Fig 2). Field testing with Humphrey Field Analyser (HFA) showed grossly diminished visual field with sparing of a central island of vision i.e. tubular vision (Fig 3). Patient was treated medically with topical timolol eye drop 0.5% twice daily and topical dorzolamide 2% twice daily. On follow up monthly for 4 months IOP reduced to 22mmHg but visual acuity didn't improve in right eye. Laser peripheral

iridotomy was done in right eye. IOP remained consistently below 20 mmHg since then.

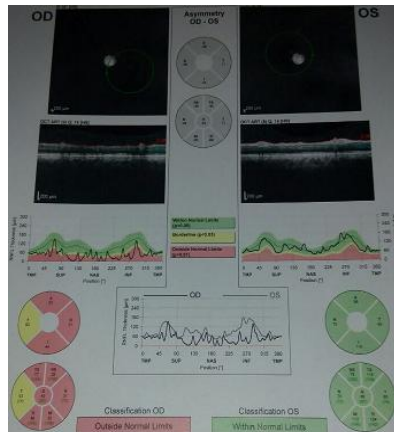


Figure 2: OCT shows NRR thinning in LE

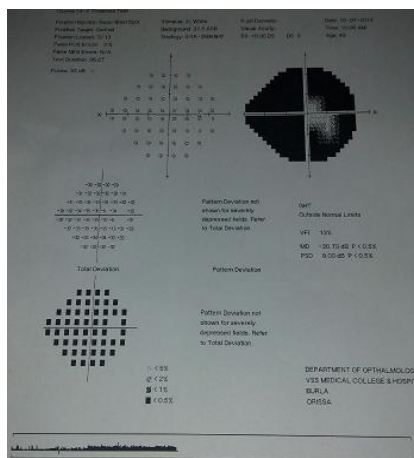


Figure 3: Grossly diminished visual field

3. Discussion

This patient had secondary pigmentary glaucoma accompanying the implantation of a foldable IOL in the ciliary sulcus with late-onset IOP elevation with glaucomatous optic nerve damage. Previous studies have shown early post surgical IOP elevation due to development of secondary pigmentary glaucoma after implantation of IOL in the ciliary sulcus^{7,8}. Richardson proposed that progression from pigmentary dispersion to pigmentary glaucoma occurred in two distinct stages^{9,10}. In the first, transient IOP elevations occur in response to acute obstruction of the trabecular meshwork by pigment granules. In this phase the damage is reversible, but over time the trabecular meshwork endothelial cells become permanently altered by the ongoing pigment phagocytosis and separate from the connective tissue lamellae of the trabecular meshwork. The trabecular beams are then left bare and eventually degenerate, leading to increased outflow obstruction and the irreversible phase of pigmentary glaucoma. Late IOP elevation in the patients with sulcal foldable IOL implantation may be resulted from chronic iridocyclitis and pigment dispersion. Iris chafing by the IOL can arise because of the closer contact between the IOL and the iris that results from the sulcal placement of the IOL.

Micheli et al reported pigmentary glaucoma following in-the-bag implantation of an AcrySof® SA60AT single-piece intraocular lens (Alcon) in the right eye in a 49-year-old man. The patient presented Twenty-seven days postoperatively with ocular pain, intraocular pressure of 48 mm Hg, 360 degrees of hyperpigmentation of the trabecular meshwork, and iris pigment epithelial atrophy in the region of the upper temporal haptic, which had dislocated into the sulcus. The patient made an excellent recovery following IOL removal and exchange¹¹. But in our case laser peripheral iridotomy was sufficient to control IOP. Chang et al used ultrasound Biomicroscopy (UBM) to establish the IOL position in the sulcus and to identify any possible contact between the IOL and the iris. He performed Gonioscopy to document both the status and the pigmentation of the angle. Visual field testing was performed to document visual field defects after the onset of glaucoma. As we don't have UBM or Anterior segment - OCT, position of the IOL was determined by careful slitlamp examination. OCT was done to examine the thickness of retinal nerve fibres and HFA was used to detect visual field loss¹².

4. Conclusion

Sulcus placement of IOL should be reconsidered in all patients undergoing cataract surgery. Prompt treatment may prevent progression of IOL related pigmentary glaucoma.

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