A case report on cataract surgery in eyes with bilateral inferior iridoschisis

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Abstract

Purpose – The purpose of the paper is to report a case of bilateral inferior iridoschisis who underwent cataract surgery with intraocular lens implantation successfully with the help of iris hooks or pupillary expanders.

Design/methodology/approach – A 71-year-old male presented with inferior iridoschisis in both eyes, history of angle closure glaucoma (ACG), cataract and shallow anterior chamber (AC) angles inferiorly. A localized area of iris stroma is cleaved in two with anterior atrophic portion disintegrating into fibrils from the posterior stroma, and muscle layer is termed as iridoschisis. Iridoschisis is a rare condition associated with fibrillary iris degeneration, narrow drainage angles and cataract.

Findings – Preoperative and postoperative ocular examination, including visual acuity, intraocular pressure and degrees of iris damage, was evaluated. Cataract surgery was performed under topical anesthesia with flexible iris hooks. There were no intraoperative complications whereas marked corneal edema was shown at immediate postoperative period but subsided completely in two weeks' time. Visual acuity improved from 20/60 to 20/25.

Practical implications – This case report demonstrates that while iridoschisis care during cataract surgery has been reported to be difficult, cataract extraction was managed using iris hooks.

Originality/value – This paper reports the successful management of cataract in a patient with bilateral inferior iridoschisis.

Keywords Iridoschisis, Cataract, Peripheral iridotomy, Angle closure glaucoma, Iris hooks

Paper type Case study

Introduction

Iridoschisis is defined as the separation of the anterior iris stroma from the posterior stroma and muscle fibers. Clinically, iridoschisis manifests as a bilateral, symmetric iris stromal cleft with free iris fibril ends floating in the aqueous humor. This is typically visible in the inferior half of the iris, with the superior half generally appearing normal. Iris stromal strands from the anterior layer float freely in the anterior chamber (AC). With normal sphincter and dilator muscle function, angle closure glaucoma (ACG) and cataract are frequently found in conjunction with it in the sixth to seventh decades of life (Pieklarz *et al.*, 2020). The condition was first described by Schmitt in 1922 when he reported a case with anterior iris layer detachment (Schmitt, 1922). Loewenstein and Foster (1945) first

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introduced the term "iridoschisis", a condition where an inferior localized cleavage of iris into two layers, with the anterior fibrils of the iris waving in the AC was seen in a case of end-stage glaucoma. Most of the cases are bilateral and sectoral affecting the inferior quadrant of iris tissue. The underlying mechanism in pathogenesis of iridoschisis is unknown; however, age-related atrophy, trauma, glaucoma, syphilis, cataract and ischemia were suspected to be predisposing factors. In 50% of the reported cases, iridoschisis is associated with ACG (Seth, Kaushik, & Panday, 2018; Chen, Qian, & Lu, 2017).

Case report

A 71-year-old-male presented with painless diminution of vision in both eyes for past one year. Laser PI was done in both eyes two years back due to the previous history of angle closure attack. Antiglaucoma medication (AGM) was started in OU twice a day after PI. On evaluation, best corrected visual acuity (BCVA) was 20/50 in the right eye (OD) and 20/60 in the left eye (OS), respectively. Intraocular pressure (IOP) as measured by Goldman Applanation Tonometry was 19- and 14-mm Hg in OD and OS, respectively. Slit lamp examination (Plate 1a and b) and anterior segment optical coherence tomography (Figure 1a and b) of anterior segment showed multiple thin disintegrated iris fibrils were floating in the AC, iris stromal separation with iris elevation in the inferior half and forward bowing of the iris in OU, narrow angles with patent PI in the OS and nonpatent PI in the OD. The lens showed nuclear sclerotic cataract in the OU. The posterior segment examination revealed flat retina with normal cup disc ratios. Specular microscopy was

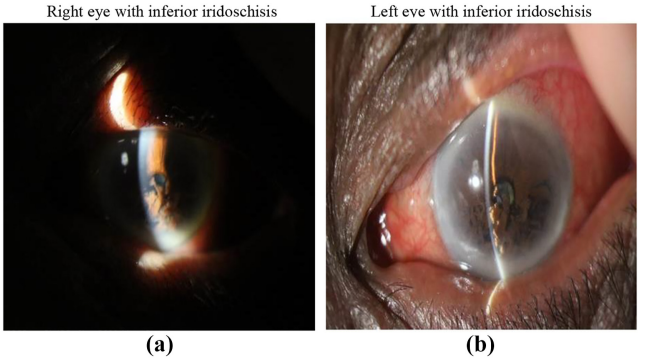

Plate 1.
(a and b) Slit lamp photograph of (a) right eye, (b) left eye showing multiple thin disintegrated iris fibrils floating in the anterior chamber inferiorly from 4 to 8 o'clock

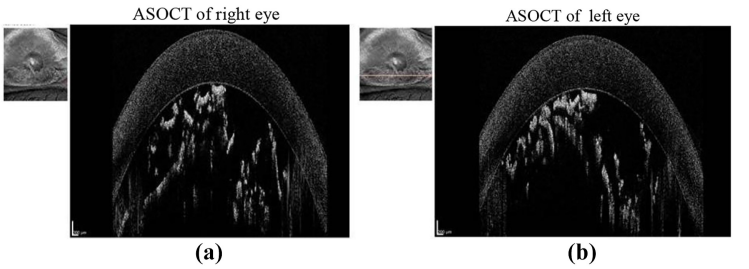

Figure 1.
(a and b): The anterior segment optical coherence tomography (ASOCT) of the right eye (a) and the left eye (b) multiple hyperreflective echoes in the anterior chamber suggestive of disintegrated and floating iris fibrils suggestive of iridoschisis

done showed normal endothelial count in both eyes. So, in the first visit, the patient was advised for PI in the OD. He was diagnosed as a case of bilateral iridoschisis, nuclear sclerosis with a previous attack of angle closure and status post PI. Laser PI was done in the OD.

Outcome and follow-up

On the sixth month follow-up visit, the BCVA was 20/60 and 20/80 in the OD and OS, respectively. The patient had an IOP of 8 and 9 mmHg in the OD and OS, respectively. Cataract in the OD was denser than the OS which hindered the visualization and evaluation of optic disc alterations. The preoperative corneal endothelial cell density was within normal limits. Phacoemulsification was first performed on the OD and was then conducted on the OS one month later. To safely proceed with phacoemulsification and posterior chamber intraocular lens (PCIOL) implantation in an eye with already disintegrated iris stroma inferiorly, we used six flexible nylon iris hooks to trap the degenerated fibrillary iris stroma for tucking them and to protect the disorganized iris from further damage during the surgical procedure. A foldable PCIOL was safely implanted in the capsular bag. Postoperative examinations were conducted at first, seventh and 30 days following the phacoemulsification with lens implant surgery.

On the first day of postoperative review, the uncorrected visual acuity (UCVA) of the OD was 20/400 and the IOP was 34 mmHg. A slit lamp examination showed corneal edema 2+ was noted with pain in the operated OD. PC IOL was in situ, and AC depth was normal. Hence, the patient was started on AGM (Tablet. Acetazolamide and Dorzolamide and Timolol eyedrops). After one week of surgery, the UCVA was 20/50+, and the IOP was 15 mmHg. The corneal edema was mild and improving. UCVA reached 20/40 with IOP of 14 mmHg, and no corneal edema was noted one month after surgery.

One month after the surgery on the OD, phacoemulsification with lens implant surgery was performed on the OS. UCVA in OS one day after surgery was 20/40, and the IOP was 12 mmHg. After a week and month of surgery, the visual acuity and IOP remained stable with UCVA was 20/40+ and IOP 10 mmHg. The postoperative corneal endothelial cell density remained normal in the OU. The postphacoemulsification with PCIOL implantation of OD and OS are shown in Plate 2a and b. The suture was used to tighten the iris during phacoemulsification surgery to prevent iris prolapse. The suture was removed 10 days after surgery. Two months after phacoemulsification with lens implant surgery, the UCVA was 20/40+ and the IOP was 10 mmHg in the OU. His postoperative retinoscopy was OD: +0.25ds/−1.25dc*90; OS: Plano/−0.75dc*75. The subjective refraction showed OD: Plano/−1.00dc*90 (20/25); OS: +0.25/−1.00*100 (20/20); addition OU: +2.50 Ds (0.8) @ 30-35 centimeters. Patient preferred new correction for distance and near; therefore, new glasses was given as per the subjective refraction. PCIOL was in place. Dilated fundus examination showed normal optic

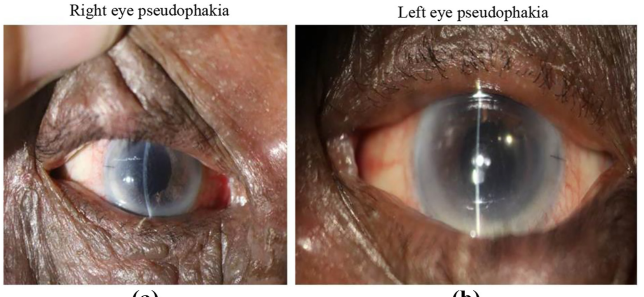

Plate 2.
(a and b) Slit lamp photograph of (a) right eye, (b) left eye showing PCIOL in place after phacoemulsification procedure

disc parameters with focal vitreo-macular traction, which was confirmed with macular optical coherence tomography (Figure 2a and b). No intervention was suggested, and review was given after four months.

Discussion

Our case presented at an age of 71 years with the clinical signs of bilateral, symmetric, inferior sectorial damage of iris tissue, narrow AC angle and cataract. The diagnosis of iridoschisis was made based on the clinical appearance, age of onset, laterality and whether the condition is progressive or with co-existent ACG. Similar to this, studies have revealed that the sixth to seventh decades of life are when iridoschisis typically manifests (Pieklarz *et al.*, 2020; Schmitt, 1922; Loewenstein & Foster, 1945; Seth *et al.*, 2018; Chen *et al.*, 2017; Gogaki, Tsolaki, Tiganita, Skatharoudi, & Balatsoukas, 2011) although Pegu, Jain, and Dubey (2020) observed that the average age of presentation was 49 years or the fifth decade (Pegu *et al.*, 2020).

Iridoschisis' etiology is unknown, but studies have suggested that cleavage of the iris in the inferior plane may be caused by lytic substances in the aqueous due to glaucoma, an increase in the sclerosis of the anterior iris stromal blood vessels, tearing of the tissues between the anterior and posterior sections of the iris during constriction and dilatation, a posttraumatic peak in IOP, shearing along the dilator fibers and/or attributed to senile changes (Gomez Goyeneche, Osorio, & Martinez Malo, 2018).

Our case presented with complains of a previous incident of ACG, for which the patient underwent PI three years ago. The connection between glaucoma and iridoschisis has been theorized by Mills to be unique to primary ACG (Mark, Leon, & Mangahas, 2011). Iridoschisis and shallow AC, with or without glaucomatous alterations, have a substantial correlation according to studies by Gogaki *et al.* (2011). Agard *et al.* (2013) proposed a link between iridoschisis and a shallow AC and that iridoschisis may have developed as a result of ACG and therefore appropriate screening must be carried out at the time of diagnosis and on follow-up visits (Agard *et al.*, 2013).

Several studies (Pieklarz *et al.*, 2020; Schmitt, 1922; Loewenstein & Foster, 1945; Gogaki *et al.*, 2011; Pegu *et al.*, 2020; Gomez Goyeneche *et al.*, 2018; Mark *et al.*, 2011) have shown

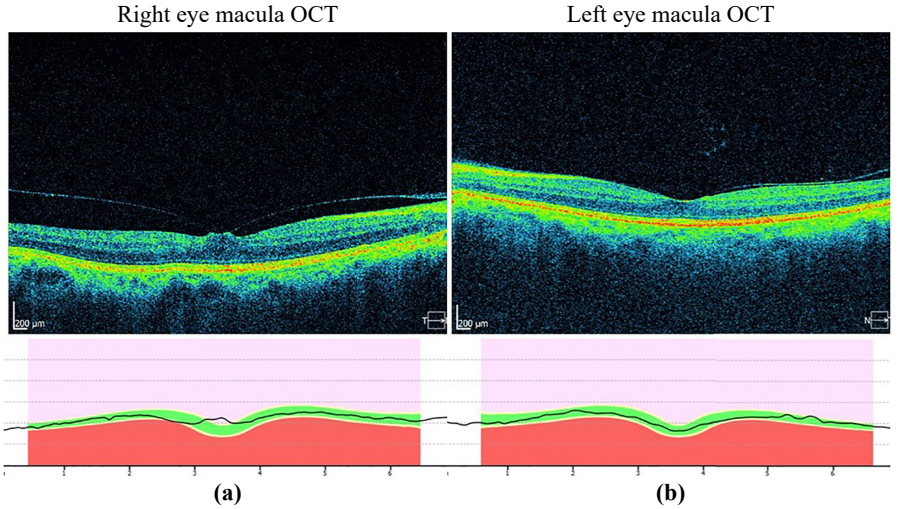

Figure 2.
(a and b): The macular OCT scans (a) right eye shows the vitreomacular traction and the normal shape of the fovea is distorted, (b) left eye shows healthy macula with normal foveal dip visible with incomplete shallow posterior vitreous detachment

that this distinctive inferior quadrants iridoschisis is found in combination with ACG or as an apparently idiopathic atrophy of old age. Although studies have demonstrated that inferior quadrant iris involvement, as found in our case, few investigations have shown superior quadrant iris involvement. Iridoschisis patients undergoing cataract surgery need to take extra precautions. The risk of iris fibers aspiration and iris prolapse might be prevented by inserting flexible iris hooks, super-cohesive ocular viscosurgical devices, avoidance of iris stretching, preoperative tropical atropine administration and intracameral epinephrine (Hashemi, Latifi, Moghimi, & Mohammadi, 2012). With the help of flexible nylon iris hooks, we successfully performed cataract surgery on the OU. Every six months starting in 2019, the patient was monitored and checked for changes in the IOP and glaucomatous disc changes.

Conclusion

Iridoschisis is most likely a challenging condition that necessitates skilled ophthalmological care, including screening patients for glaucoma, corneal and lens abnormalities. Two-thirds of individuals with iridoschisis have glaucoma; hence, it is important for the ophthalmologist to rule out any link with glaucoma when the patient reports having iridoschisis. Poor pupil dilation, the potential for iris fibrils to be aspirated by the irrigation-aspiration probe and injury to sphincter muscles make managing iridoschisis during cataract surgery difficult. An informed consent form that outlines any additional potential consequences should be signed by every patient. During the patient's follow-up visits, the routine glaucoma tests should be performed, including assessments of the patient's visual acuity, visual field, IOP, AC angles and optic nerve head. Iris hooks are proven to be superior in preventing free fibers from moving and firmly trapping them during cataract extraction in patients with iridoschisis.

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