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Case Report

Iris Chafing Syndrome Secondary to Iridociliary Adhesions in a Patient with a Single-Piece Acrylic Intraocular Lens: Case Report

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Keywords

UGH syndrome · Iridociliary adhesions · Viscoelastic retention · Sulcus gap closure · Case report

Abstract

Introduction: We present a unique case of iris chafing syndrome in a patient with a complex ophthalmologic history after successful placement of a single-piece in-the-bag intraocular lens (IOL) in an eye with healthy zonular support. ***Case Presentation:*** A patient with a previous history of multiple retinal surgeries presented with pain and elevated intraocular pressure (IOP) secondary to retained viscoelastic material in the anterior chamber. Following removal of the viscoelastic material in clinic, the patient underwent a combined cataract and glaucoma surgery. Subsequently, the patient developed signs and symptoms of iris chafing syndrome. Anterior segment imaging revealed the cause to be iridociliary adhesion causing an elimination of the sulcus space. Iris chafing syndrome was suspected when the patient presented post-operatively with changes in vision and anterior chamber inflammation. New iris transillumination defects present at the edge of the optic and haptic of the 1-piece lens helped confirm the diagnosis of UGH. Upon further investigation with gonioscopy, ultrasound biomicroscopy and anterior segment optical coherence tomography, it was determined that the patient had iridociliary adhesions. These adhesions eliminated the sulcus space, which resulted in iris chafing. The patient opted for conservative medical management. Best-corrected distance visual acuity remained stable at 20/100 and IOP remained well controlled. ***Conclusion:*** A complex ocular history of multiple retinal surgeries and retained viscoelastic material in the anterior chamber resulted in adhesions of the ciliary processes to the iris, leading to UGH syndrome in a patient with an otherwise unremarkable placement of a single-piece in-the-bag IOL.

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Introduction

Uveitis-glaucoma-hyphema (UGH) syndrome, commonly caused by intraocular lens (IOL) chafing of the iris, is an uncommon complication following cataract surgery reported to occur in 0.4–1.2% of cases [1]. UGH syndrome results from a variety of mechanisms [1–6], where the defining feature is mechanical irritation of the uveal structures by the IOL, which can result in iris transillumination defects, hyphema, intraocular pressure (IOP) elevation, and cystoid macular edema. This syndrome is uniquely rare following successful placement of a modern 1-piece IOL within an intact capsular bag supported by healthy zonules [3–6]. We present a case of UGH syndrome secondary to iridociliary adhesions in which the lens and haptics are well placed but adhesive scarring of uveal structures from prior surgeries resulted in elimination of the sulcus space. We believe an understanding of this small but notable difference in mechanism may contribute to future prevention when structural changes in the eye that may cause UGH syndrome can be identified in the pre- or perioperative period.

Case Report

A 72-year-old woman presented to the clinic with ocular pain and decreased vision in the left eye. The patient had a complex ocular history in the left eye prior to presentation. Specifically, the patient underwent a pars plana vitrectomy approximately 1 year prior to presentation for a visually significant floater. The patient subsequently developed endophthalmitis and underwent a vitreous biopsy with injection of intravitreal antibiotics. Ten days following this, the patient developed a macula-off rhegmatogenous retinal detachment requiring endolaser retinopexy and placement of silicone oil. The patient underwent removal of silicone oil 2 weeks prior to presentation to her local emergency department for eye pain. In the emergency department, the patient was noted to have an IOP of 45 mm Hg and was started on topical timolol and brimonidine twice a day and dorzolamide 3 times a day.

The patient presented to our clinic 4 days later with a visual acuity of count fingers at 3 feet and an IOP of 23 mm Hg. On slit lamp examination, the pupil was dilated, the anterior chamber was hyper-deep with suspended cell present. Gonioscopy revealed a posteriorly displaced iris with an open angle. It was determined that the patient had retained viscoelastic material in the anterior chamber, present for the 2 weeks since her removal of the silicone oil in that eye. An anterior chamber tap was performed through a prior paracentesis, with obvious evacuation of viscoelastic material. The patient was seen 1 week later with an IOP of 16 on brimonidine and timolol twice a day and vision remaining at count fingers. Four months later, the patient underwent uneventful cataract surgery with iris expansion and insertion of a 1-piece in-the-bag IOL followed by a goniotomy. Of note, no zonulopathy was noted during her procedure. A single-piece SN60WF 11.5 diopter lens (Alcon, Fort Worth, TX, USA) was placed in the bag without complication. A planned endocyclophotocoagulation laser was aborted during the procedure secondary to the inability to enter the peripheral sulcus space and to visualize the ciliary processes. On post-operative day one, visual acuity was 20/400 and IOP was 6 mm Hg. At post-operative week 4, best-corrected visual acuity was 20/100 and IOP was 12 mm Hg on 2 classes of glaucoma medications.

Approximately 6 months later, the patient presented with mild discomfort, injection, and photophobia of her left eye. Vision was 20/200 and IOP was 20 mm Hg. Slit-lamp examination showed 1+ injection, faint corneal endopigment, 1+ cell and flare in the anterior chamber, and peripheral and mid-peripheral iris transillumination defects as seen in Figure 1. Optical coherence tomography of the left macula showed mild cystoid macular edema. Repeat gonioscopy seen in Figure 2 showed a deep angle with a focal, 360-degree elevation of the iris at

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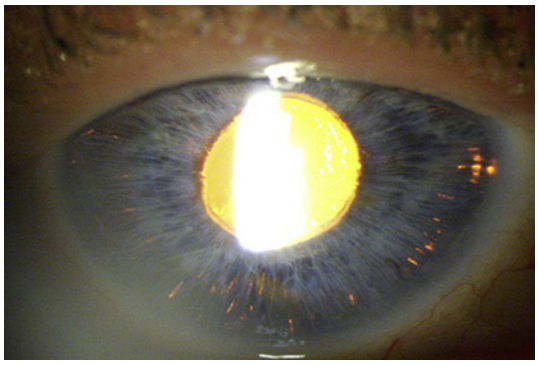

Fig. 1. Mid-peripheral and peripheral iris transillumination defects caused by mechanical irritation of the lens against the iris.

the level of the ciliary processes. Ultrasound biomicroscopy confirmed that the posterior iris was adhered to the ciliary body as seen in Figure 3. Elimination of the sulcus space secondary to these adhesions, which is demonstrated in Figures 3a, b, explained the nature of this unique case of UGH. Anterior segment optical coherence tomography revealed the contact and close proximity between the single-piece IOL and the posterior iris in different regions (Fig. 4a–c).

The patient was offered surgical options of an IOL exchange with a 3-piece IOL placed in the bag or removal of the IOL with a secondary lens but opted for continued medical management. Her macular edema and anterior chamber inflammation improved with topical prednisolone over the following 3 months. She has remained on prednisolone twice a day and at 1.5 years post-operatively maintained a best-corrected vision of 20/100 and IOP of 13 on 2 classes of topical glaucoma medications. The CARE Checklist has been completed by the authors for this report and can be accessed as online supplementary material (for all online suppl. material, see https://doi.org/10.1159/000535167).

Discussion

UGH syndrome is a rare but vision-threatening complication of IOL placement in cataract surgery. Since it was first described in 1978 by Ellingson [7], the incidence of UGH syndrome has decreased as surgical techniques and lens technology have both improved. It was historically attributed to poorly sized anterior chamber IOLs, sulcus IOLs, or displaced in-the-bag IOLs [1, 2]. Patients may present weeks, months, or years after placement of the lens as the underlying forces, which result in UGH syndrome inherently, result in cumulative damage [8]. UGH syndrome caused by an in-the-bag IOL has been reported in a few cases due to varying circumstances. When UGH syndrome results from an in-the-bag IOL, it is most often because of abnormalities of the capsular bag complex or the lens. Badakere et al. [2] reported UGH syndrome after rupture of the capsular bag. Zhang et al. [6] described UGH syndrome caused by pseudophacodonesis from weakened zonules. Others report UGH syndrome secondary to displacement of the haptics by a Soemmering ring [3], or by simple displacement of the lens within the bag [4, 5].

Our patient presented with a complex ophthalmic history consisting of multiple retinal surgeries, endophthalmitis, a macula-off rhegmatogenous retinal detachment status-post silicone oil placement and removal and retained viscoelastic material in the anterior chamber causing IOP elevation with a hyper-deep anterior chamber. Retained anterior chamber viscoelastic material is often considered a transient cause of IOP elevation following cataract surgery. Anterior chamber instability during the patient's most recent retinal surgery prior to presentation was discovered to be the reason for leaving viscoelastic material in the anterior chamber, but inability of the viscoelastic material to dissolve and be eliminated from the

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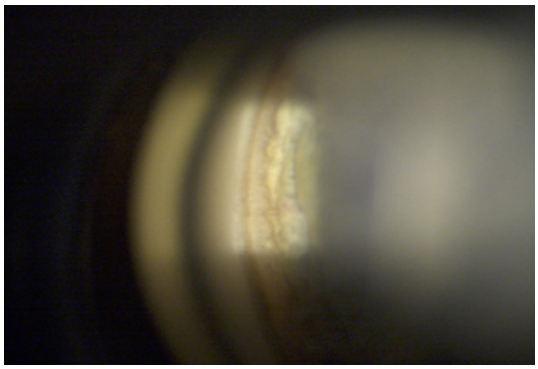

Fig. 2. Gonioscopy revealing an open angle with focal iris elevations at the level of the ciliary processes. Similar findings are found 360° along the peripheral iris.

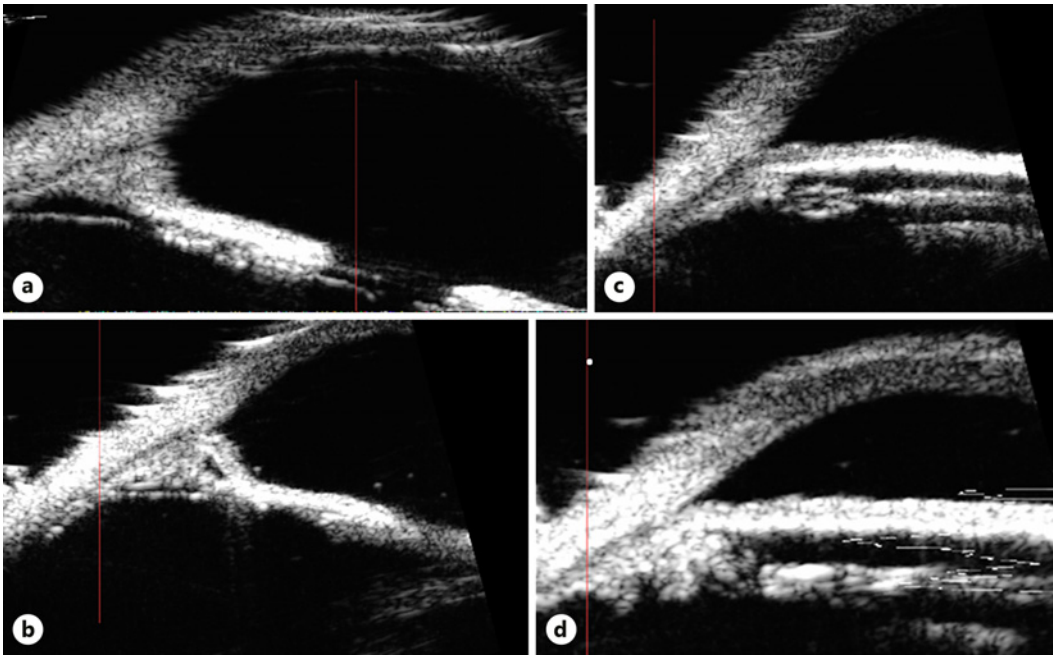

Fig. 3. Ultrasound biomicroscopy of the angles of the involved left eye (**a**, **b**) and healthy right eye (**c**, **d**) for comparison. Both eyes are pseudophakic. The adherence of the ciliary body and its processes to the iris can be seen in (**a**, **b**) with elimination of the sulcus space and the apposition of the lens to the posterior iris.

anterior chamber is unknown. Likely, a component of ciliary body shutdown with reduced aqueous production was present in the immediate post-operative period following removal of the silicone oil. Nonetheless, we hypothesize that the patient's adhesion complication arose from a combination of post-operative inflammation and an extended period (approximately 2 weeks) of retained viscoelastic material in the anterior chamber, placing the posterior iris in contact with the ciliary body. This led to scarring of the ciliary processes to the posterior iris and elimination of the sulcus space prior to cataract surgery.

Most modern 1-piece IOLs have optics with squared edges, such that when the lens is displaced, the sharper edges may worsen uveal damage with contact. Rounded optic edges and haptics found commonly in 3-piece IOLs can help alleviate this issue [4]. In addition, the patient may have benefited from the posterior vaulting of the 3-piece IOL, positioning the IOL further posterior into the capsular bag. The option of exchanging the patient's current 1-piece

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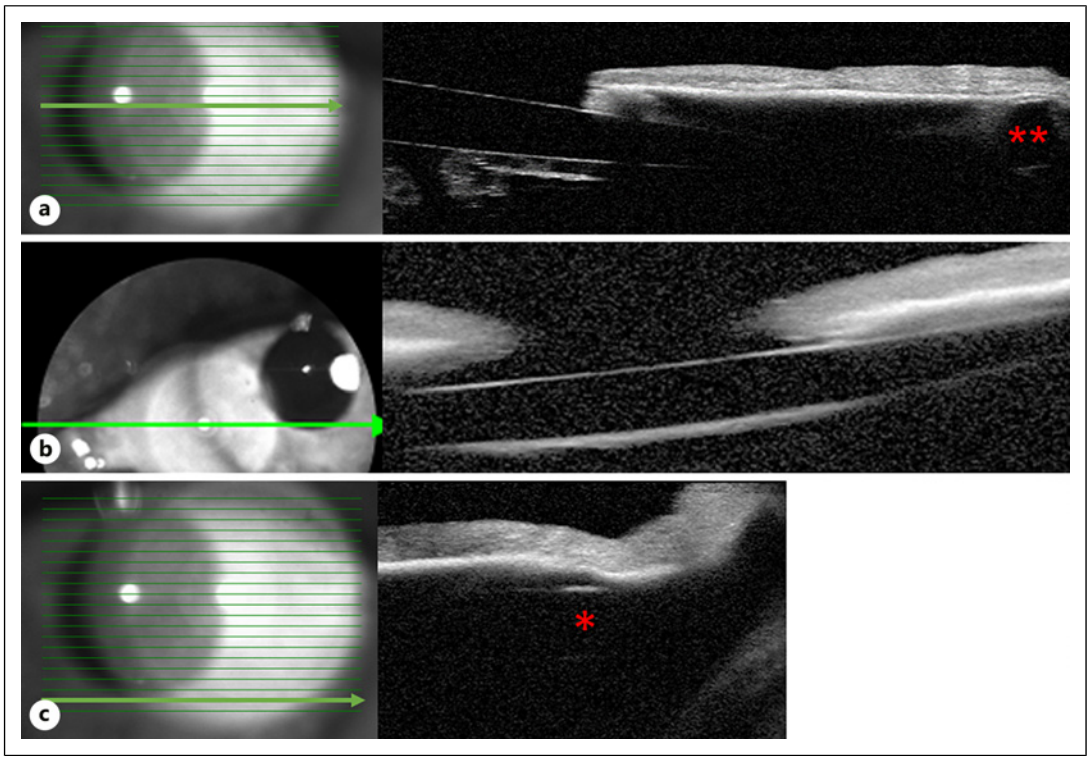

Fig. 4. Anterior segment OCT of the involved left eye. **a** The contact between the lens haptic (**) and posterior iris in the involved eye. The close proximity of the lens optic (*) to the posterior iris is seen in (**b**, **c**).

IOL for an in-the-bag 3-piece IOL or removing the IOL with placement of a secondary scleral attached IOL was discussed. Given the multiple surgeries, poor visual potential, and relative control of her symptoms with medical treatment, the patient elected to continue medical management.

We present a case demonstrating a novel mechanism for the development of UGH syndrome from elimination of the sulcus space. Although such complex cases may be relatively rare encounters for ophthalmic surgeons, patients with such an extensive history of eye disease and prior surgery may have abnormal tissue architecture that places them at an increased risk for UGH syndrome, even if the lens is well placed in a bag with healthy zonules. If viscoelastic material is retained in the anterior chamber, it should be monitored closely to ensure its dissipation. Furthermore, if the mechanism of this patient's pathology was understood pre-operatively or peri-operatively, placement of a 3-piece IOL may have reduced the degree of iris chafing.

Statement of Ethics

The retrospective review of patient data did not require ethical approval in accordance with local/national guidelines and the West Virginia University office of human research protections. We obtained written and informed consent from the patient for publication of their medical case details and any accompanying images in this report. All data and images were collected and presented in compliance with the Health Insurance Portability and Accountability Act.

Conflict of Interest Statement

The authors have no conflict of interests to declare.

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Author Contributions

Jacob King contributed to drafting of the manuscript and selection and interpretation of images. Joel Palko, Stephen Chen, and Austin Goncz contributed to drafting and revision of the manuscript, including final approval.

Data Availability Statement

All data generated or analyzed during this study are included in this article. Further inquiries can be directed to the corresponding author.

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