Case Report

Posterior Wall Collapse in High Myopia following Cataract Surgery

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Abstract

Purpose: We report a case of posterior globe collapse of an eye after initial recovery from uncomplicated cataract surgery in a patient with high myopia and discuss the course of management involving recognition and emergent air injection with globe reformation. **Case Report:** A 64-year-old functionally monocular male with a history of high myopia presented for follow-up after uncomplicated cataract surgery. Uncorrected distance visual acuity (UCDVA) at postoperative day 1 was 20/150 with an intraocular pressure (IOP) of 19 mm Hg. At the week 1 visit, UCDVA had decreased to 20/200 with an IOP at 9 mm Hg. After preliminary exam, the keratome site suture was removed, after which the patient reported vision changes. A dilated fundus exam was performed revealing posterior scleral wall collapse. A clinical diagnosis of hypotony was made and a pars plana injection of 1 mL air was performed. This resulted in immediate subjective improvement of vision. Exam the next day revealed UCDVA 20/50 with pinhole improvement to 20/30 and IOP 15 mm Hg. **Conclusion:** This case demonstrates postoperative hypotony in a patient with pathologic myopia, following cataract surgery. Pathologically myopic eyes may have greater propensity to collapse in the setting of reduced IOP.

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Introduction

Hypotony is typically associated with complications following glaucoma surgery and perforating eye injuries [1], but can occur as a consequence of any pathology causing a reduction in production, or increase in outflow, of aqueous humor. Hypotony has statistical and clinical definitions. Statistically, hypotony is an intraocular pressure (IOP) less than 6.5 mm Hg, which corresponds to more than three standard deviations below mean IOP. Clinically, hypotony is an IOP which is low enough to cause visual loss [2].

The most widely reported postoperative complications following cataract extraction with intraocular lens placement are: posterior capsular opacification, elevated IOP, corneal decompensation, cystoid macular edema, refractive surprise, and endophthalmitis [3]. While rare, postoperative hypotony after cataract extraction also can occur, and is most likely to occur in the context of a nonhealing, or leaking, cataract wound [4].

Case Report

A 64-year-old male was referred for surgical cataract treatment of the left eye. Ophthalmic history was complex and significant in the right eye for trauma (boxing and baseball injuries as youth) resulting in secondary traumatic glaucoma, cataract, and traumatic optic neuropathy. Numerous surgical treatments were performed 17 years prior to presentation, including 2 trabeculectomy surgeries, cataract extraction with intraocular lens implantation, and Nd:YAG laser for posterior capsular opacification (4 years prior to presentation). The right eye additionally had a history of endophthalmitis complicated by hypotony and subretinal fibrosis (7 years prior to presentation) and had a small central island of vision remaining from numerous pathologies. The left eye history was significant for high myopia optically corrected with a soft contact lens. By history, the patient used his left eye for essentially all tasks due to the constricted visual field and quality of vision of the right eye.

Best corrected visual acuity was 20/30 and 20/60 in the right and left eye, respectively. Refractive correction in diopters (dpt) was +3.00 dpt + 1.00 × 082 with spectacles for the right eye and −13.75 + 4.75 × 085 with a soft contact lens. A polycarbonate plano spectacle lens was used as protective eye wear for the left eye. A 4+ relative afferent pupillary defect for the right side was noted. Tonometry of the right eye was 7 and 18 mm Hg for the left eye. Slit-lamp exam revealed a functioning superior bleb for the right eye, a posterior chamber intraocular lens (PCIOL) and surgical iridectomy site superiorly. Posterior exam of the right eye revealed significant glaucomatous cupping of the optic nerve and subretinal fibrosis. Left eye exam was significant for combined cataract with nuclear, cortical, and posterior subcapsular changes as well as myopic fundus changes. The left eye also appeared to be buphthalmic in association with its high axial length. After counseling of risks and benefits, consent for left eye cataract treatment was obtained and biometric measurements were taken after 2 weeks of a contact lens holiday. A refractive target of −0.5 dpt was set for the patient.

Uncomplicated cataract surgery and intraocular lens implantation for the left eye was performed with topical anesthesia. Of note was very poor dilation of the left pupil at about 4.5 mm. Due to the functionally monocular status, a 10-0 nylon suture was used to close the keratome wound for additional wound closure during recovery. At the 1-day postoperative visit, the patient's uncorrected distance visual acuity (UCDVA) was 20/150 with pinhole-assisted acuity of 20/60. Tonometry was 19 mm Hg for the left eye. Anterior segment exam was significant for a tight-appearing 10-0 nylon suture at the keratome site, which was

Seidel negative, 1+ cell and flare in the anterior chamber, and an appropriately centered PCIOL. The patient was prescribed a regimen of postoperative topical anti-inflammatory and antibiotic eye drops with follow-up recommended for 1 week. At the following 1-week visit, the patient reported no issues, but minimal improvement of vision. UCDVA was 20/200 improving to 20/150 with pinhole assistance. Inflammation had reduced to trace cell and flare with a deep anterior segment and centered PCIOL. IOP was measured at 9 mm Hg by tonometry. Clinical judgement was made to remove the 10-0 nylon suture, after which the patient reported vision changes. A dilated fundus exam was performed revealing posterior scleral wall collapse (Fig. 1) in the context of clinical hypotony. Urgent measures were put in place and 1 mL of filtered air was injected at the pars plana in the inferior temporal quadrant for volumetric replacement in the eye. The patient reported an immediate subjective improvement in vision and resolution of the globe collapse with indirect ophthalmoscopy. Postinjection pressure was measured at 10 mm Hg. Topical antibiotics and a bandage contact lens were utilized in addition to the topical anti-inflammatory eye drops. The next day exam revealed uncorrected visual acuity of 20/50 with improvement to 20/30 with pinhole. The IOP was measured at 15 mm Hg over the contact lens. Anterior exam revealed a formed chamber with a centered PCIOL and posterior exam revealed a 50% remnant air bubble, flat retina, and formed globe. Examination at 1 week postinjection revealed complete resorption of the air bubble and stable eye exam findings with UCDVA stabilized at 20/40 uncorrected and IOP of 18 mm Hg over the bandage contact lens (Fig. 2).

Discussion

As a pathologic myope (spherical equivalent >6.00 dpt or axial length >26.5 mm) the patient presented in this case report is part of a population known to have unique risks following cataract surgery. Most notably, eyes with a high degree of myopia may be more likely to develop retinal detachment and residual refractive error in the postoperative period following cataract extraction with intraocular lens replacement [5]. Though there are no recognized large associations between pathologic myopia and postoperative hypotony following cataract surgery, it has been thought that the thinner, less rigid sclera of a myopic eye may be more likely to collapse in the setting of reduced IOP [6].

The mechanism of posterior wall collapse in the absence of a shallow anterior chamber presents a mechanistic challenge. There may be regional susceptibility of the posterior globe to collapse in certain pathologies, but how that related to manipulation of the anterior segment remains unknown in this case. Hypotony and globe collapse have been reported post retinal surgery; however, it is less likely an anticipated entity after cataract surgery [7]. It is possible that posterior globe collapse existed prior to suture removal attempts given the 10-point differential on IOP from the 1-day and 1-week applanation. Either scenario likely warrants a dilated exam given the subpar vision at 1 week and considerations that suture removal could induce clinical hypotony in specific clinical settings.

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Statement of Ethics

Patient consent was obtained. No personally identifiable information is otherwise included in this case report.

Disclosure Statement

The authors have no conflicts of interest or proprietary interest in any of the topics or products presented in this case report.

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Fig. 1. Fundus photo after removal of corneal suture prior to injection of air.

Fig. 2. Fundus photo 1 week after air injection and resorption of air bubble.