An 80-year-old mildly hypertensive patient was scheduled for topical clear corneal phacoemulsification cataract surgery in his right eye. The patient had moderately dense bilateral cataracts and a long-standing exotropia. The rest of the ophthalmic examination was normal. During the initial 1.1 mm paracentesis, the patient reported pain, the anterior chamber became shallow, and the iris prolapsed toward the paracentesis. Intraocular lidocaine was instilled, and the iris prolapsed through the paracentesis accompanied by significant anterior chamber shallowing. The eye was firm to palpation. On indirect ophthalmoscopy, a choroidal effusion but no choroidal hemorrhage was identified. The iris was reposited and the paracentesis closed. The elevated intraocular pressure (IOP) was treated, and the choroidal effusion resolved over a few weeks without permanent damage. This report suggests that even minimal surgical manipulation that lowers the IOP can trigger a choroidal effusion in certain patients.

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Intraoperative choroidal effusions and suprachoroidal hemorrhages are among the cataract surgeon’s worst nightmares. One retrospective study found that the rate of acute suprachoroidal hemorrhage was 0.03% with phacoemulsification and 0.13% with extracapsular cataract extraction (ECCE).1 Intraoperative choroidal effusions are different from postoperative and glaucoma-related choroidal effusions in that the former contain very little protein (18% of plasma concentration) whereas the latter contain large amounts of protein (67% of plasma concentration).2 One theory is that a decrease in intraocular pressure (IOP) leads to increased leakage of fluid into the suprachoroidal space (choroidal effusion); if enough fluid leaks into this space, it stretches and ruptures the blood vessels, leading to a suprachoroidal hemorrhage. One question remains: How much IOP change is required to initiate the onset of a choroidal effusion?

CASE REPORT

An 80-year-old non-obese black man with a medical history significant for hypertension presented for cataract evaluation. The patient’s only medication was nifedipine ER 90 mg/day, and his only drug allergy was angiotensin-converting enzyme inhibitors. Examination findings are shown in Table 1. The preoperative eyedrop regimen consisted of nonsteroidal and fluoroquinolone ophthalmic drops starting 2 days before surgery.

Cataract surgery in the right eye was scheduled for topical temporal clear corneal phacoemulsification. Preoperatively, the patient received oral alprazolam (0.25 mg) and topical lidocaine slurry (neosynephrine 10%, cyclopentolate 1%, gatifloxacin, and diclofenac). A Honan cuff was applied to the eye. The preoperative blood pressure was 153/82. The patient was prepped and draped in the usual manner. The initial paracentesis (1.1 mm) was made at the inferior temporal location (left-handed surgeon). At the conclusion of the paracentesis, the patient reported mild pain and the iris prolapsed toward the paracentesis, with the anterior chamber appearing to shallow slightly. Intraocular lidocaine was instilled, and the iris prolapsed through the paracentesis and out of the eye; a small amount of dispersive ophthalmic viscosurgical device (OVD) was used to push the iris back into the paracentesis. The procedure was temporarily stopped. The eye was palpated and found to be hard, and the inferior portion of the anterior chamber had shallowed substantially. Indirect ophthalmoscopy showed a choroidal effusion but no choroidal hemorrhage.

A small superior paracentesis was made to gently release enough pressure (the superior anterior chamber was still fairly deep) to allow the iris to be reposited into the eye from the inferior paracentesis. A suture was placed in the inferior paracentesis site. The procedure was terminated. The
Table 1. Ophthalmic exam findings.

| Exam Finding                        | Right Eye | Left Eye |
|-------------------------------------|-----------|----------|
| Corrected distance visual acuity (Snellen) | 20/100    | 20/100   |
| Refraction                          | −1.00 sph | −0.50 +0.75 × 45 |
| Intraocular pressure (mm Hg)        | 10        | 14       |
| Cataract                            | 2.5+NS, 2+CS, 1.5+PSC | 2.5+NS, 2+CS, 1.5+PSC |
| Slitlamp                            | Normal    | Normal   |
| Alignment                           | Moderate exotropia | Moderate exotropia |
| Cup-to-disc ratio                   | 0.4       | 0.4      |
| Retina exam                         | Normal    | Normal   |
| Axial length by PCI (mm)            | 22.91     | 22.88    |
| Blood pressure                      | 118/63    | —        |

CS = cortical spokes; NS = nuclear sclerosis; PCI = partial coherence interferometry; PSC = posterior subcapsular cataract

postoperative regimen included prednisolone, nonsteroidal, and fluoroquinolone ophthalmic eyedrops. One drop of timolol 0.5% and brimonidine along with a methazolamide (Neptazane) 50 mg tablet were given for the elevated IOP.

In the postoperative recovery area, the patient had counting fingers (CF) barely to hand motion acuity and an IOP of 56 mm Hg, which decreased to 39 mm Hg after 30 minutes. The retina consultant (via telephone) recommended maintaining the IOP in the 20 to 30 mm Hg range and administering an atropine eyedrop. Same-day office evaluation found that the acuity had improved to CF at 6 inches and the IOP to 18 mm Hg. A large choroidal effusion was confirmed by ophthalmoscopy. At the 1-day visit, the acuity had improved to 20/200 and the IOP to 15 mm Hg; the IOP eyedrops were discontinued. At 6 days, the patient was examined by the retina specialist, who confirmed that the choroidal effusion was resolving. Over the next few weeks, the remaining eyedrops were tapered and the effusion resolved completely.

**DISCUSSION**

This case was unique because of the early onset of the choroidal effusion. The choroidal effusion began with the slight drop in IOP that occurred during creation of the 1.1 mm paracentesis at the start of cataract surgery. The temporal clear corneal incision had not yet been performed. One study found that the most common times for suprachoroidal hemorrhages were following nucleus removal and during irrigation/aspiration (I/A) of cortical material. A This same study found only 1 or 2 cases in which the suprachoroidal hemorrhage occurred when the eye was entered, although it was unclear whether it was the main incision or the paracentesis and whether it occurred with phacoemulsification or ECCE.

We do not know why this particular patient developed a choroidal effusion at the onset of the case, but advanced age and systemic hypertension are often cited as risk factors and might have contributed to the development of the choroidal effusion.

The patient has not returned for cataract surgery. The plan to reduce the risk for a choroidal effusion during the second cataract surgery attempt will be to tightly manage the patient’s blood pressure, giving additional antihypertensive medication if needed to maintain the pressure at the patient’s normal baseline. Additionally, a dose of alprazolam will be given to the patient before his arrival at the surgical facility, with additional supplementation intravenously by the anesthesia provider to reduce anxiety-related blood pressure spikes and help the patient remain relaxed during the procedure. From the surgical standpoint, aggressive anterior chamber maintenance with an OVD will be performed while instruments such as the phaco handpiece and the I/A handpiece are switched. The initial paracentesis will be made slightly smaller than normal, and intraocular lidocaine and then OVD will be instilled into the eye before the paracentesis is enlarged to 1.1 mm and the 2.5 mm temporal clear corneal incision is made. Of note, at the time of the first surgery, the patient was not taking any medications that increased the risk for choroidal effusion.

In conclusion, this case demonstrates that surgeons should be attentive to any changes associated with increased posterior pressure that might indicate development of a choroidal effusion and should be aware that these changes can occur with minimal change in IOP and minimal surgical manipulation. Ophthalmologists performing in-office anterior chamber taps should be aware that a fragile patient has the potential, however small, to develop a choroidal effusion during the procedure.

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