CASE REPORT

Possible acute bilateral fluid misdirection syndrome and unilateral suprachoroidal hemorrhage during delayed sequential bilateral cataract surgery

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ABSTRACT

Fluid misdirection syndrome (FMS) and suprachoroidal hemorrhage (SCH) are rare complications occurring during phacoemulsification surgery. A 62-year-old female patient developed acute FMS during delayed sequential bilateral cataract surgery in both eyes. A localized and limited SCH also occurred in the first eye. Both surgeries were successfully completed after treating the condition via vitreous needle tap. Intraoperative FMS may occur in both eyes consecutively. SCH can accompany this rare complication.

Keywords: Cataract surgery, Bilateral, Fluid misdirection syndrome, Suprachoroidal hemorrhage.

INTRODUCTION

Most patients with cataract have this common disease in both eyes and undergo cataract surgery on separate days or weeks, known as delayed sequential bilateral cataract surgery. Performing these surgeries within an interval allows surgeons to check the results in the first eye before they decide to operate the second eye.

Fluid misdirection syndrome (FMS) is a rare condition which may occur during phacoemulsification surgery in hyperopic eyes. It is the accumulation of fluid in the vitreous cavity resulting in increased intraocular pressure (IOP) and shallow anterior chamber (AC). Suprachoroidal hemorrhage (SCH) is a devastating complication of cataract surgery due to rapid accumulation of blood in the suprachoroidal space. Both conditions have similar presentations, but the management of each is markedly different.[1,2]

Here, we report a case of bilateral FMS and unilateral SCH occurring during delayed sequential bilateral cataract surgery.

Case Report

A 62-year-old female patient was admitted with bilateral decreased vision. She had hyperopic refraction of 1.50 diopters in both eyes. Ocular examination revealed bilateral nuclear cataracts. Ocular biometric parameters are listed in Table 1.

Both cataract surgeries were performed under local anesthesia (topical proparacaine 0.5% eye drops combined with intracameral lidocaine 0.5% injection) by the same surgeon (KÖ). In the first (left) eye, the nucleus was emulsified by quick chop technique in 2 minutes. Immediately following the removal of phaco handpiece, the patient began complaining of ocular pain and the eye developed marked posterior pressure with shallowing of the AC. The red reflex was normal. There was no posterior capsular rupture and iris prolapsus.

It was presumed to be a FMS and we decided to go on with a vitreous needle tap. After aspiration of 0.5 ml. of retrolenticular fluid, AC deepened and the IOP was normalized. The red reflex did not change and pain relieved. Thereafter, systemic blood pressure (140/90 mmHg) was lowered by intravenous 150 cc mannitol and

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the patient was placed in a reverse Trendelenburg position. The rest of the operation proceeded without complication. At first postoperative day, the IOP and anterior segment were normal, but a superiorly located choroidal mass with subretinal hemorrhage was found. B-scan confirmed the choroidal detachment on this eye. **(Figure-1a, b)** At first week, choroidal detachment began to resolve and visual acuity improved.

Two weeks later, the patient received cataract surgery in the fellow eye. Unfortunately, the same symptom and signs (ocular pain, increased IOP, shallow AC) repeated just after the removal of phaco handpiece in this eye. The red reflex was normal and posterior capsule was intact. We proceeded again with a vitreous needle tap and completed the surgery without any further complications. At first postoperative day, IOP was normal (17/17 mmHg), anterior and posterior segments did not reveal any abnormalities. At first week, best corrected visual acuities were 0.9 on both sides.

DISCUSSION

Cataract surgery with phacoemulsification includes well-defined risks. Although very rare, unexpected complications and adverse outcomes may occur during delayed sequential bilateral cataract surgery. One of them is intraoperative acute posterior pressure rise. There are two most common causes of this very rare complication; FMS and SCH. Though both conditions have similarities, the management of each is markedly different. Therefore, it is very important to identify SCH when a shallow AC occurs in the presence of elevated IOP during cataract surgery.

Fluid misdirection syndrome is a rare condition characterized by a very shallow AC and a marked increase in IOP with the absence of suprachoroidal hemorrhage or effusion. Currently, it is assumed to be related to an abnormal relationship between the ciliary processes, the lens and anterior vitreous face, leading to the misdirection of intraocular fluid posteriorly. When faced FMS during the cataract surgery, decompression of the eye is essential in order to complete the surgery.[1] Axial hyperopia and previous angle closure with peripheral anterior synechiae are risk factors that predispose a patient to FMS. It was found to be more common in females. Furthermore, FMS can rarely develop in eyes without any known risk factors.[3,4]

Suprachoroidal hemorrhage presents with severe ocular pain, decreased visual acuity, shallow AC and severe increase in IOP. It is thought to be a result of acute hypotony or atherosclerotic vasculature. It has been suggested that increased IOP fluctuations may result in rupture of the choroidal vessels, with subsequent SCH. Risk factors for SCH include advanced age, uncontrolled hypertension, atherosclerotic disease, hypotony, high myopia, aphakia and prolonged surgical time.[2]

For this patient, risk factors for SCH can be advanced age, atherosclerosis of choroidal vessels and development of sudden intraoperative hypotonia after vitreous tap. Predisposing factors for FMS were female gender, hyperopia and ocular biometrics (short axial length). Despite similar introperative symptoms and signs, like shallow AC, increased IOP and normal red reflex in both eyes, ocular pain was more severe in the first eye with SCH and FMS (reported by the patient during the surgery). Therefore, we presumed the case as bilateral FMS with unilateral SCH. Vitreous tap immediately deepened the anterior chamber, relieved the ocular pain and was effective in both eyes.

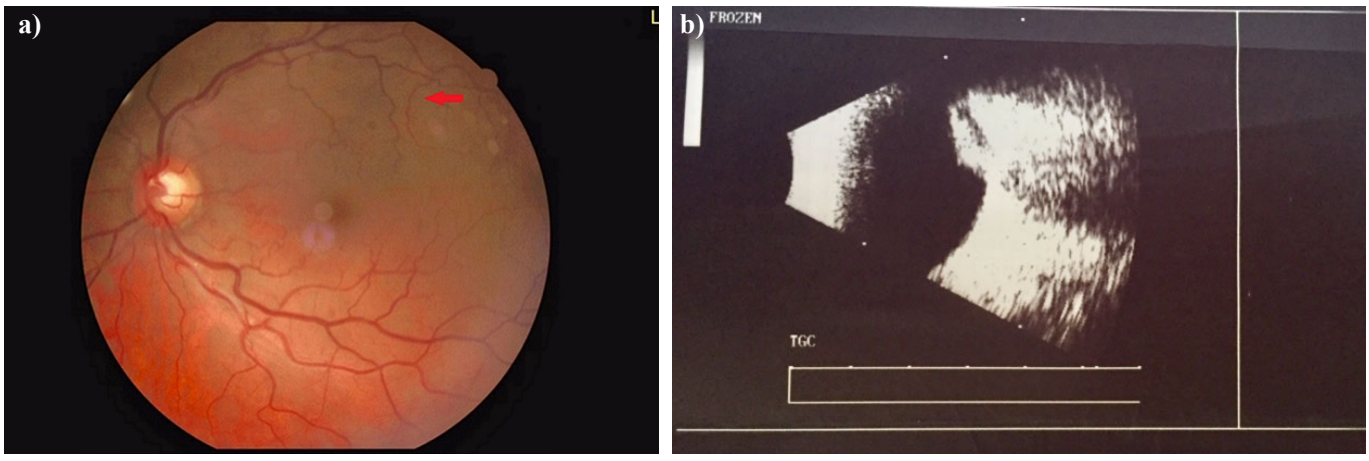

Figure 1: a) *Hemorrhagic choroidal detachment (arrow) in the left eye superior to the macula.* **b)** *B-scan ultrasonography showing the choroidal detachment.*

Several methods have been described to overcome increased IOP with shallow AC. Chung et al.[5] reported bilateral sequential aqueous misdirection in a glaucoma patient with narrow angle. They treated the first eye with YAG laser anterior hyaloidotomy and second eye with iridozonulohyaloidectomy. Lau et al.[6] evaluated the efficacy of pars plana needle aspiration in patients with acute intraoperative rock-hard eye syndrome and found satisfactory outcomes. Kang et al.[7] reported the only case with serous choroidal detachment and rock-hard eye syndrome treated with vitreous tap and intracameral carbachol.

As the underlying mechanisms of FMS have not been fully understood, there are no guidelines for primary prevention. However, if there is an increased risk of FMS in the second eye, prophylactic iridotomy can be performed or preoperative cycloplegic drugs can be started. Other options are intentional rupture of the anterior hyaloidal surface and prophylactic pars plana vitrectomy in high risk fellow eyes during the surgery.[8]

To conclude, we presented a unique case of a possible FMS with unilateral SCH during bilateral sequential cataract surgery. Although loss of red reflex is an important sign associated with SCH, it may not always be observed due to a localized and limited SCH. Even so, the fundus should be examined to rule out hemorrhage. Fluid misdirection syndrome can be resolved with prompt diagnosis and treatment. Additionally, steps can be taken to prevent it from recurring in the second eye.

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