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Aqueous misdirection syndrome after uneventful phacoemulsification

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Abstract:
Malignant glaucoma or aqueous misdirection syndrome usually occurs in hyperopic eyes, characterized by an acute rise in intraocular pressure (IOP) with shallow anterior chamber in presence of patent peripheral iridotomy. The aim of the article is to report a case of malignant glaucoma which developed after an uneventful phacoemulsification surgery in an emmetropic eye on post operative day one.
Key Word*: Malignant Glaucoma, Aqueous Misdirection, Ciliolenticular Block*

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I. Introduction

Malignant glaucoma is defined as a rare condition in which there is acute rise in intraocular pressure (IOP) with a very shallow anterior chamber in presence of a patent peripheral iridotomy.[1] It usually develops after glaucoma drainage surgery; however, it can also occur after any anterior segment surgery including phacoemulsification in hyperopic eyes. [2],[3] Though, the mechanism leading to malignant glaucoma is not clearly understood, the most accepted theory suggests that in an anatomically predisposed eye, the anterior rotation of the ciliary body induces misdirection of aqueous flow into or behind the vitreous body, increasing vitreous volume, resulting in anterior displacement of the iris–lens diaphragm, axial and peripheral anterior chamber flattening, and secondary angle closure.[4],[5]

The aim of this article is to describe a case of malignant glaucoma after uneventful phacoemulsification surgery in immediate post operative period in an emmetropic eye and its management.

II. Case Report

A 70-year-old female came to Eye Department with chief complaint of gradual, painless and progressive decreased vision in her left eye since last 5 years. There was no h/o redness or discharge from the eye, no h/o ocular injury, no h/o any systemic diseases or any long-term intake of any medication. General and systemic examination was normal. On ocular examination, the corrected distant visual acuity was 6/9in right eye and counting fingers at 3mtrs in left eye. On slit lamp examination, the right eye was pseudophakic and rest examination was within normal limits, and left eye had senile immature cataract and remaining details within normal limits

Fundus examination of both eyes was unremarkable. Diagnosis of left eye senile immature cataract was made and patient was posted for left eye phacoemulsification surgery with intraocular lens (IOL) implantation. On biometry, axial length was 22.70mm and IOL power calculated was 21.50 diopters. Surgery was uneventful and IOL was placed in the bag. Post op day 1 visual acuity was recorded as 6/60 and slit lamp examination revealed the presence of microcystic edema and a very shallow anterior chamber (Fig. 1) and Goldman tonometry was 55 mmHg in the left eye. The diagnosis of acute angle closure glaucoma was made and the patient was treated with two cycles of intravenous 20%mannitol, topical 0.5% timolol, and topical brimonidine. After four hours, IOP remained higher than 50 mmHg. Oral acetazolamide and topical prednisolone were added and a laser peripheral Nd-YAG iridotomy was done. On the following day, despite the presence of a patent iridotomy, IOP was 45 mmHg with flat anterior chamber. B-scan showed attached retina with no evidence of suprachoroidal hemorrhage. A diagnosis of aqueous misdirection syndrome was made and pars plana vitrectomy was done. Post vitrectomy, patient vision was 6/9and IOP came down to 16mm Hg and anterior chamber was well formed. Patient was reviewed after 2 weeks – patient vision recorded was 6/9 and IOP recorded was 15mm Hg.

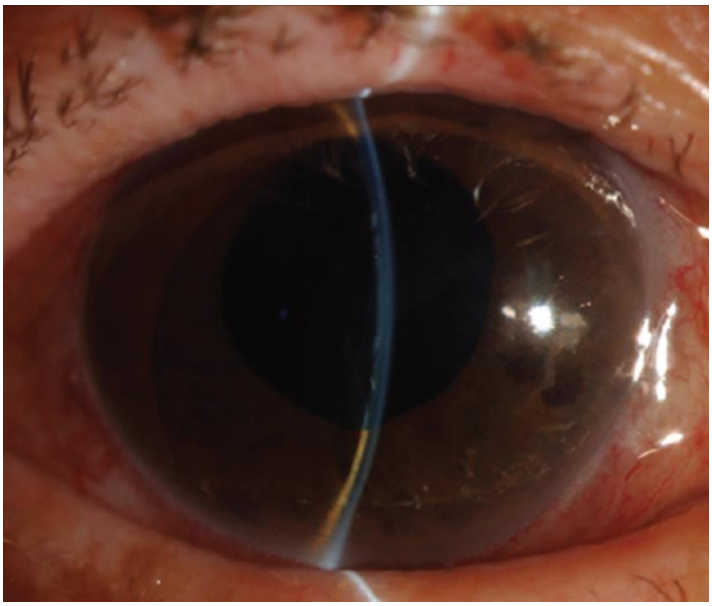

Figure 1: Post-op day 1-shallow anterior chamber and anteriorly displaced IOL-iris complex

III. Discussion

Malignant glaucoma is a challenging ophthalmologic problem. The incidence of malignant glaucoma after glaucoma surgery is reported to be as high as 2%.[3] Although malignant glaucoma after uneventful phacoemulsification with in-the-bag IOL placement is rare, it does occur. The shallowing of anterior chamber after uneventful phacoemulsification with IOL implantation can be due to incision leakage, pupillary block, capsular block syndrome, plateau iris, choroidal effusion or hemorrhage, and malignant glaucoma.[6] Diagnosis of malignant glaucoma should be made after ruling out other possibilities by thorough anterior and posterior segment examination.

The exact mechanism by which aqueous misdirection occurs is still poorly understood. However, the historical belief is that an abnormal anatomic relationship exists between the ciliary bodies, lens, and anterior hyaloid causing diversion of fluid into the posterior chamber.[7] Aqueous fluid builds within the vitreous body and raises IOP, and thereby, exerts a force on the anterior hyaloid that causes a forward displacement of the lens–iris diaphragm.[8] Ultrasound biomicroscopy studies also provide evidence by illustrating that these eyes display supraciliary fluid accumulation that pushes anteriorly rotated ciliary processes against the lens equator.[9] Whether this anatomical configuration of ciliary processes lead to diversion of fluid or is itself an outcome of volume expansion is unclear.

In this case, pre-operative ocular examination was within normal limit and phacoemulsification surgery was uneventful. Still, patient had increased IOP and shallow anterior chamber on post-operative Day 1 The probable cause of malignant glaucoma in this case could be zonular laxity. Even after doing medical management and peripheral iridotomy, IOP was high. Although some cases can be controlled with medical treatment, malignant glaucoma usually requires surgical procedures. In such cases, a stepwise treatment approach starting with medical therapy including cycloplegics and aqueous suppressants and followed by laser iridozonulohyaloidotomy should be followed. The aim of this type of treatment is to disrupt misdirection andto restore normal aqueous flow. The classical intervention, described by Chandler in the sixties, was the aspiration of vitreous with an 18-gauge needle through an incision in the parsplana. Since then, capsulotomy, laser iridotomy and hyaloidotomy, vitrectomy and transscleral cyclophotocoagulation have been reported to be useful in the treatment of this condition.[3],[4] Core Vitrectomy should be done with surgical disruption of the anterior hyaloid and zonule to break the primary mechanism of aqueous misdirection. Core vitrectomy is the most effective intervention in malignant glaucoma, secondary to filtration and non-filtration surgery [10]

IV. Conclusion

Malignant glaucoma can occur even in an emmetropic eye after uneventful phacoemulsification surgery. Thorough examination of anterior and posterior segment must be done to rule out other possibilities of increased IOP and shallow anterior chamber post cataract surgery. Management must be done in a step wise approach once the diagnosis of malignant glaucoma is confirmed.

References

[1]. von Graefe A. Beitrage zur Pathologie und Therapie des € Glaucoms. Albrecht von Graefes Arch Ophthalmol 1869; 15(3):108–252
[2]. Ruben S, Tsai J, Hitchings RA. Malignant glaucoma and its management [perspective]. Br J Ophthalmol 1997; 81:163–167. Available at: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC 1722113/pdf/v081p00163.pdf. Accessed August 5, 2014
[3]. Debrouwere V, Stalmans P, Van Calster J, Spileers W, Zeyen T,Stalmans I. Outcomes of different management options for malignant glaucoma: a retrospective study. Graefes Arch Clin Exp Ophthalmol 2012;250(1):131–41.
[4]. Dave P, Senthil S, Rao HL, Garudadri CS. Treatment outcomes inmalignant glaucoma. Ophthalmology 2013;120(5):984–90.
[5]. Shahid H, Salmon JF. Malignant glaucoma: a review of the modernliterature. J Ophthalmol 2012;2012: 852659
[6]. Ahmed IIK, Gagne S. August consultation #3. In: Menapace RM,ed, Cataract Surgical Problem. J Cataract Refract Surg 2009;35:1475–1477
[7]. Byrnes GA, Leen MM, Wong TP, Benson WE. Vitrectomy for ciliary block (malignant) glaucoma. Ophthalmology. 1995;102(9):1308–1311.
[8]. Epstein DL. Pseudophakic malignant glaucoma – is it really pseudomalignant? Am J Ophthalmol. 1987;103(2):231–233.
[9]. Tello C, Chi T, Shepps G, Liebmann J, Ritch R. Ultrasound biomicroscopy in pseudophakic malignant glaucoma. Ophthalmology. 1993; 100(9):1330–1334. 8. Fatt I. Hydraulic flow conductivity of the vi
[10]. Matlach J, Slobodda J, Grehn F, Klink T. Pars plana vitrectomy for malignant glaucoma in nonglaucomatous and in filtered glaucomatous eyes. Clin Ophthalmol 2012;6:1959–66

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