Case Report

Waterfall Cataract: A Rare Presentation of Lens Induced Glaucoma

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Abstract

Lens induced glaucoma (LIG) with pseudoexfoliation (PXF) is not a very uncommon entity. A 75 year old woman presented with LIG in left eye but with lens matter outflowing into the anterior chamber. Systemic examination was unremarkable. After lowering of the intraocular pressure, cataract extraction was performed following which patient had pain relief and got satisfactory vision. Correct diagnosis and administration of intraocular pressure lowering agents followed by lens extraction is crucial for a desirable outcome.

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Introduction

Phacolytic glaucoma is a type of inflammatory glaucoma. As the lens ages its protein composition becomes altered with an increased concentration of liquefied high-molecular-weight lens protein. These denatured proteins leak through intact but semi-permeable microscopic openings in the lens capsule. An immune response is not elicited; rather macrophages ingest these lens proteins. The trabecular meshwork becomes clogged with both the lens proteins and the engorged macrophages precipitating secondary glaucoma. The usual clinical presentation of phacolytic glaucoma consists of an elderly patient with a history of poor vision who has sudden onset of pain, conjunctival hyperemia and worsening vision in a cataractous eye. The cornea may be edematous and significant flare and cellular reaction may occur in the anterior chamber. The lack of keratitic precipitates helps distinguish phacolytic glaucoma from phacoantigenic glaucoma. White flocculent material appears in the anterior chamber and often adheres to the lens capsule or pseudohypopyon may be present. Intraocular pressure (IOP) is markedly elevated and the anterior chamber angle remains open. Initial treatment of phacolytic glaucoma consists of controlling the IOP with ocular hypotensive medications and managing the inflammation with topical corticosteroids. Surgical removal of the lens is the definitive treatment.[1]

Case Report

A 75 year old female presented in our outpatient department with complains of pain, redness and diminution of vision in left eye since 20 days. Her vision in left eye was perception of light only. Slit lamp examination of anterior segment revealed conjunctival and circumciliary congestion along with grade 2 atrophic nasal pterygium (Figure 1). Cornea was steamy hazy with peripheral senile degeneration. Anterior chamber was shallow in depth with lens matter deposits inferiorly. Lens matter was adherent with the anterior capsule in pupillary area. It was giving appearance as if lens matter oozed and flowed out of bag into anterior chamber, resembling a waterfall. Pupil was round, sluggishly reacting to light and refused to respond to mydriatrics.

Figure 1: *Left Eye at the time of presentation*

Psuedoexfoliation was noted over pupillary margin as well as over anterior lens capsule. Anterior capsule appeareintact and calcified. Lens examination revealed hypermature senile cataract. IOP measurement with Goldman applanation tonometer (GAT) was 50 mmhg. There was no history of trauma in Left eye. Her right eye was found to be pseudophakic with grossly normal anterior segment. IOP in right eye was 14 mmhg with GAT. Dilated posterior segment examination of right eye revealed vitreous cavity full of asteroid hyalosis. B-scan Ultrasonography of both the eyes showed multiple dots and clump like echoes of moderate reflectivity in anterior and mid vitreous cavity suggestive of asteroid hyalosis (Figure 2a,2b). Diagnosis of phacolytic glaucoma with pseudoexfoliation and asteroid hyalosis in left eye was made and patient was advised for cataract extraction under guarded visual prognosis under local anaesthesia. Following the diagnosis, anti-glaucoma medication (AGM) was started to lower the IOP. Injection mannitol 5ml/kg body weight was given fast intravenously along with oral acetazolamide and topical brimonidine and timolol combination stat. Post-AGM, IOP in the left eye lowered down to 26 mmhg on GAT.

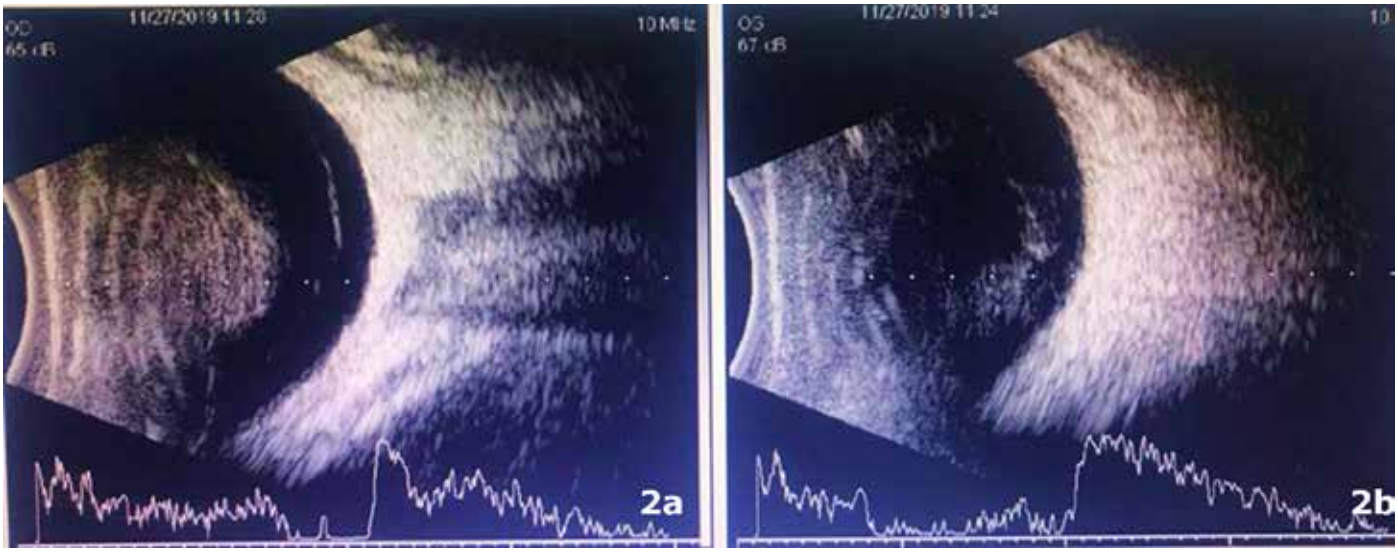

Figure 2: *(2a) B scan image of Right eye (2b) B scan image of left eye*

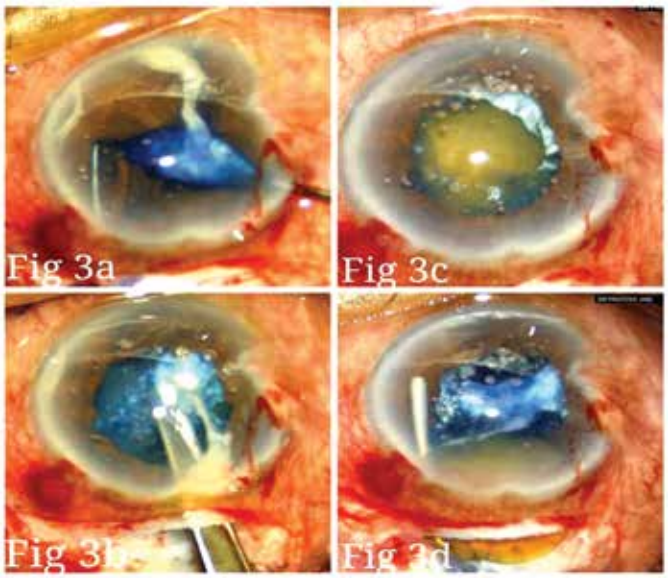

Figure 3: *Intraoperative images;* ***Figure (3a):*** *Stretch pupilloplasty being performed;* ***Figure (3b):*** *Lens tag excision with vannas scissor*
Figure (3c): *Image following capsulorrhexis*
Figure (3d): *Visco assisted nucleus delivery being done revealing calcified posterior capsule and asteroid hyalosis.*

Considering the fact that patient was from a poor socioeconomic background and challenges in surgery like non-dilating pupil, calcified anterior capsule, leaking lens matter, pseudoexfoliation and hypermature cataract; Manual Small Incision Cataract Surgery (MSICS) with implantation of single piece PMMA intra ocular lens was planned. Iris claw lens and capsular tension ring were kept on standby. Patient was taken into OT. After anterior chamber entry through superiorly placed scleral tunnel, stretch pupilloplasty was performed in view of non-dilating pupil (Figure 3a). As a result pupil achieved only 5 mm dilatation. Hence it was decided to do sphincterectomy at 3, 6 and 9 o'clock position and this achieved further 8 mm dilated pupil. Following which tag of dense lens matter attached to anterior capsule was cut with vannas scissor (Figur 3b). The lens matter from anterior chamber was removed with help of dispersive viscoelastic HPMC. A circular capsulorhexis of 5 mm was achieved on a calcified anterior capsule having gross zonulopathy with help of cystitome and utrata's rhexis forceps (Figure 3c). Nucleus was prolapsed into anterior chamber after coating endothelium with HPMC followed by visco assisted nucleus delivery (Figure 3d). Cortical fibres were cleaned with 23 G simcoe I A cannula. No zonular dialysis was noted hence single piece PMMA IOL was implanted in the bag. Anterior chamber lavage was done with balanced salt solution to remove HPMC. Side ports were hydrated, conjunctiva was reposited back and thence, the case was concluded. On Post-operative day 1 (POD 1), striate keratopathy was observed with well-formed anterior chamber. Moderate cellular reaction noted in anterior chamber. Intra Ocular Lens was well placed (Figure 4). Fundus examination revealed asteroid hyalosis

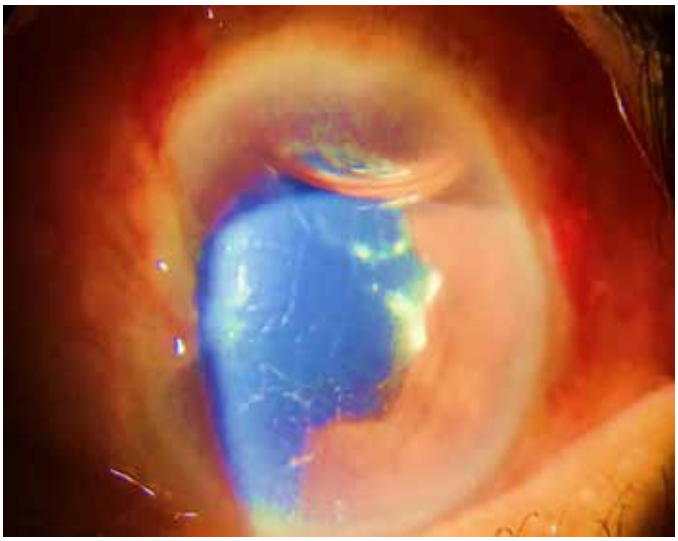

Figure 4: *Slit lamp image of left eye on post-operative day 1*

with features suggestive of glaucomatous optic atrophy. Patient was put on AGM and was advised to visit glaucoma clinic for glaucoma work-up. She is maintaining satisfactory vision (UCVA: 20/200) in this eye.

Discussion

Around one and a half century has elapsed since Gifford first described glaucoma due to hypermature cataract and urged its prevention by cataract extraction.[2] The pathogenesis of phacolytic glaucoma is an obstruction of the TM by lens proteins and/or protein-laden macrophages, a process that has been shown to be reversible by lens extraction alone.[3] Epstein has experimentally demonstrated that leakage of soluble lens proteins can cause a severe obstruction to the aqueous outflow pathway.[4] Phacolytic glaucoma occurs mainly in the age group of 50-70 years with a female preponderance.[5] In a study conducted in Nepal to assess the major reasons for late presentation it was found that two third of patients didn't present on time because of no escort or lack of money. Both the factors were noted in our patient which led to complication of cataract.[6] Primary care of phacolytic glaucoma consists of medical management involving use of hyperosmotic agents, aqueous suppressants, anti-inflammatory drugs and cycloplegics to control IOP and inflammation but the definitive treatment is removal of the lens with or without an IOL implantation. Some ophthalmologists defer placement of an IOL until after the inflammation subsides; however, there is no significant difference in final visual acuity between those patients who did receive an IOL immediately during surgery and those who received in a later sitting.[7] Manual small incision cataract surgery with trypan blue staining of the anterior capsule is a safe and effective method of cataract extraction for patients with phacolytic glaucoma.[8] Potential complications of phacolytic glaucoma include permanent loss of vision from uncontrolled glaucoma and/or persistent corneal oedema. Surgical complications like suprachoroidal haemorrhage, rupture of posterior capsule, injury to cornea and vitreous prolapse have been observed.[9]

Conclusion

75 year old female presented with phacolytic glaucoma in left eye with leakage of lens matter into anterior chamber. Following normalization of IOP, cataractous lens extraction was done and IOL was implanted. The patient was discharged with satisfactory vision in operated eye and was put on topical anti-glaucoma agents. Long term monitoring of patient for glaucoma management is important in such cases. Further studies can be done in such atypical presentations of phacolytic glaucoma with regards to pre-operative optimum medical management, adequate duration for preoperative IOP stabilization to minimise adverse intra-operative events and best method to extract the lens to minimise collateral damage to an already compromised eye.

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