

## Angle Closure with Patent Laser Peripheral Iridotomy - An Unusual Complication

### Abstract

A 41-year-old female presented with diminished vision in both eyes with recurrent episodes of pain, redness, and watering. With a provisional diagnosis of primary angle-closure glaucoma in the left eye and primary angle closure in the right eye, anti-glaucoma medications were started in the left eye and laser peripheral iridotomy was done in both eyes. Follow-up showed patent iridotomy in both eyes and dilated funduscopy revealed total cupping in the left eye. Next day, the patient had angle closure in the right eye. On medical management, symptoms subsided but intraocular pressure (IOP) was still raised. Right eye trabeculectomy with cataract surgery was done. Vision was restored to 6/9 with IOP of 12 mmHg after 2 weeks. The event was considered to be precipitated because of plateau iris configuration which is an anatomical variant of angle in angle-closure patients. This proves patent laser iridotomy is not always a ticket to dilatation and one should be aware of all possible complications.

**Keywords:** Angle closure, laser peripheral iridotomy, plateau iris

### Introduction

Angle-closure glaucoma takes the major share among glaucoma patients in the Asian population.<sup>[1]</sup> Plateau iris which is defined as a flat iris with relatively deep anterior chamber and occludable angle on gonioscopy is one of the nonpupillary block mechanisms in angle-closure glaucoma. Studies report about 30% of primary angle-closure glaucoma patients present with plateau iris in the Indian population.<sup>[2]</sup> Careful gonioscopy and investigations like ultrasound biomicroscopy (UBM) can help rule out plateau iris and plan the management accordingly.

### Case Report

A 41-year-old female presented with diminished vision and recurrent episodes of pain, redness, and watering for 3 months in the left eye (OS). Her right eye (OD) had a best-corrected visual acuity (BCVA) 6/24, shallow anterior chamber (AC) and sluggishly reacting pupil with cataract nuclear sclerosis grade two, and the left eye (OS) had perception of light but the inaccurate projection of rays (PL + PR inaccurate), hazy cornea,

conjunctival congestion, shallow AC, and fixed dilated pupil with nuclear sclerosis grade three [Figure 1]. Intraocular pressure (IOP) was 14 and 56mm Hg in OD and OS, respectively. Angles were closed in both eyes (OU) with peripheral anterior synechiae in the left eye (OS). With a provisional diagnosis of Primary angle-closure glaucoma (PACG) in OS and primary angle-closure suspect (PACS) in OD, latanoprost (0.005%), fixed-dose combination of brimonidine and timolol maleate eye drops twice a day along with oral acetazolamide (250 mg) tablets four times a day were started in OS and laser peripheral iridotomy (LPI) was done in OU the next day when IOP was 12 and 30mm Hg in OD and OS, respectively. On follow-up after a week, IOP was 12 and 24 mm Hg in OD and OS, respectively. LPI was patent in OU. Hence the patient was dilated. Funduscopy revealed total cupping in OS with loss of rim all throughout and pallor suggesting glaucomatous optic atrophy and a shallow cup with sloping of cup margins in right eye. No notching was noted in OS. The same medical management was continued. To our dismay, the patient presented with sudden pain, redness, and watering with the edematous cornea, mid-dilated pupil in OD next day

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with an IOP of 32 mmHg. Pilocarpine drop was prescribed along with brimonidine and timolol combination in OD with status quo in OS. The symptoms subsided but IOP was still 24 mm Hg in OD. On subsequent follow-ups even with maximum medication IOP was not controlled and the patient had deterioration in vision. UBM examination of both eyes suggested plateau iris configuration [Figure 2]. The patient was taken up for the right eye trabeculectomy with cataract surgery. Axial length was found to be 22.04 mm in the right eye and 22.23 mm in the left eye before surgery. Also, we had an index myopia of around -3.00 dioptres sphere in right eye which was mostly due to cataract. Hence high hypermetropia was excluded from the study. The surgery was uneventful and no choroidals noted or hypotony occurred. BCVA was restored to 6/9 with IOP of 12 mmHg in OD and PL + PR inaccurate with 20mm Hg in the OS after 2 weeks [Figure 3]. The last follow-up after 5 months after surgery, the patient was doing well without any complaints.

## Discussion

Plateau iris configuration is a preoperative diagnosis where the iris is displaced anteriorly thus compromising the iridocorneal angle and leading to angle closure.<sup>[3]</sup> It is usually treated with laser iridotomy. Plateau iris syndrome on the other hand is said to be present in an eye which has angle closure with a plateau iris configuration and a patent LPI where pupillary block mechanism is already excluded from the study.<sup>[4]</sup> Careful gonioscopy in these cases reveals a double hump sign. Investigations like UBM reveal anatomical changes such as flat iris surface, anteriorly situated ciliary processes, absence of ciliary sulcus, anterior angulation of the peripheral iris in its insertion, steep, short or thick iris root, iridotrabecular contact, and a normal central depth of the AC in cases with plateau iris configuration. A study in Singapore has found about one-third of eyes having plateau iris after LPI in PACS patients.<sup>[5]</sup> Plateau iris syndrome can again be complete or incomplete. In complete form level of the iris is such that both anterior and posterior trabecular meshwork are blocked resulting in blockage of aqueous drainage and subsequent rise in IOP. The incomplete form on other hand has some drainage due to incomplete blockage of the trabecular meshwork.<sup>[6, 7]</sup> In this particular case, angle closure was considered to be precipitated because of plateau iris configuration postdilatation. In our case, where the plateau iris configuration was complete and dilatation post-LPI resulted in acute angle closure due to appositional closure which perhaps the patent LPI was not able to overcome.<sup>[8]</sup> Hence, it is important to recognize plateau iris as one of the important etiological entities of angle closure. Thorough knowledge of angle anatomy and gonioscopy procedure and recognizing the mechanisms responsible for angle closure rather than following protocol-based solely on identification of angle closure will help prevent

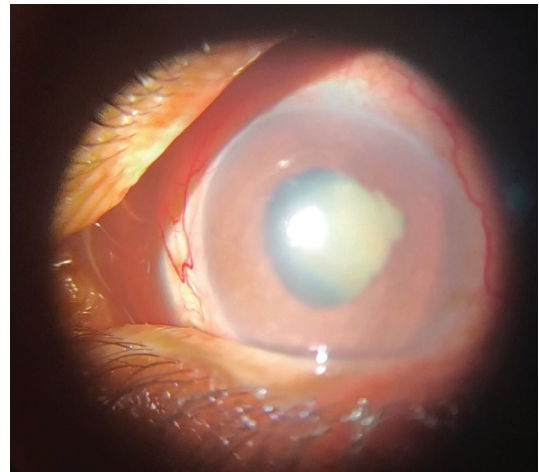


Figure 1: Anterior segment of the left eye showing mid dilated fixed pupil and posterior synechiae

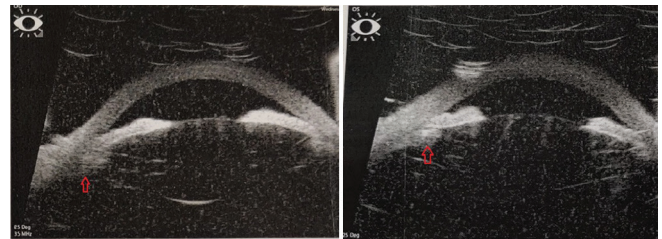


Figure 2: Ultrasound biomicroscopy of the right and left eyes showing anteriorly positioned ciliary body

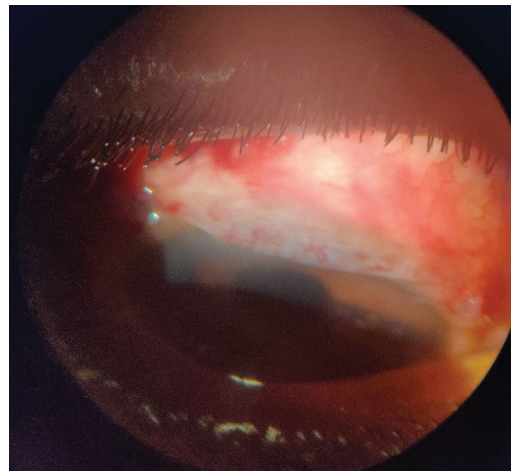


Figure 3: Postoperative picture of the right eye showing well-formed bleb and anterior chamber

accidents like in our case. In addition, the use of ancillary testing modalities such as UBM showing anteriorly directed ciliary processes with a steep rise of iris from its point of insertion and iridotrabecular contact in the same quadrant also helps. Other presentations of angle closure such as ciliary body edema, malignant glaucoma, and iris or ciliary body cysts presenting as pseudo plateau iris should be kept in mind as differential diagnosis. Careful clinical examination and appropriate investigations will help diagnose and manage the cases. Few similar cases

have been reported in the literature and careful observation of such cases helps inculcate appropriate treatment protocol which can avoid this nightmare both for the patient and the treating doctor.<sup>[9,10]</sup>

### Conclusion

Plateau iris is most likely overlooked in our day-to-day practice. IOP is the only modifiable factor in glaucoma cases. Once LPI is patent and medications take care of the IOP, we expect the disease process to be somewhat controlled. Furthermore, suspicion usually arises in cases where IOP does not get controlled and the management is planned per the etiology. However, cases like ours where the IOP was normal to start with but anatomy is atypical, one needs to be more careful. Our experience shows, all the etiologies of angle closure and their respective management should be kept in mind while dealing with these cases. To conclude, patent LPI is not a ticket to dilatation in angle-closure cases and patients need to be carefully monitored post-LPI.

### Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given her consent for her images and other clinical information to be reported in the journal. The patient understands that their name and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Nil.

### Conflicts of interest

There are no conflicts of interest.

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