

Treating Plateau Iris

Pearls for managing a patient with glaucoma and a plateau iris configuration.

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This article shares pearls on the clinical spectrum of presentations and treatment options for patients with plateau iris syndrome. This form of primary angle-closure glaucoma is caused by an anteriorly positioned ciliary body, which displaces the peripheral iris forward.^{1,2} The plateau narrows the angle and can lead to mechanical obstruction of the trabecular meshwork, although the anterior chamber will appear deep. Patients with plateau iris syndrome tend to be slightly younger than those with primary pupillary block glaucoma.^{3,4} Although an element of pupillary block is usually present, in eyes with plateau iris syndrome, the angle remains occludable even in the presence of a patent iridotomy.⁵

EPIDEMIOLOGY

Patients with plateau iris tend to be hyperopic, female, and younger than age 50. In a US-based chart review of patients under the age of 60, Stieger et al found the prevalence of plateau iris with recurrent angle-closure symptoms to be 54%, despite initial iridotomy or iridectomy.⁴ In a study from Singapore, Kumar et al used ultrasound biomicroscopy (UBM) to show that approximately one-third of patients over the age of 50 with primary angle closure had a plateau iris after laser iridotomy.⁵ There is also evidence to suggest that this anatomical predisposition may be familial with an autosomal dominant inheritance pattern.⁶

DIAGNOSIS

The diagnosis of plateau iris configuration can be confirmed with indentation gonioscopy. (For an excellent lesson on indentation gonioscopy from Wallace

“The diagnosis of plateau iris configuration can be confirmed with indentation gonioscopy.”



Figure 1. Gonioscopy demonstrates the double hump sign in an eye with plateau iris.

Alward, MD, visit www.gonioscopy.org/indentation.html.) On gonioscopy, the angle is narrow, and there is a drop-off of the peripheral iris. In a study conducted in Japan, the investigators found that the double hump

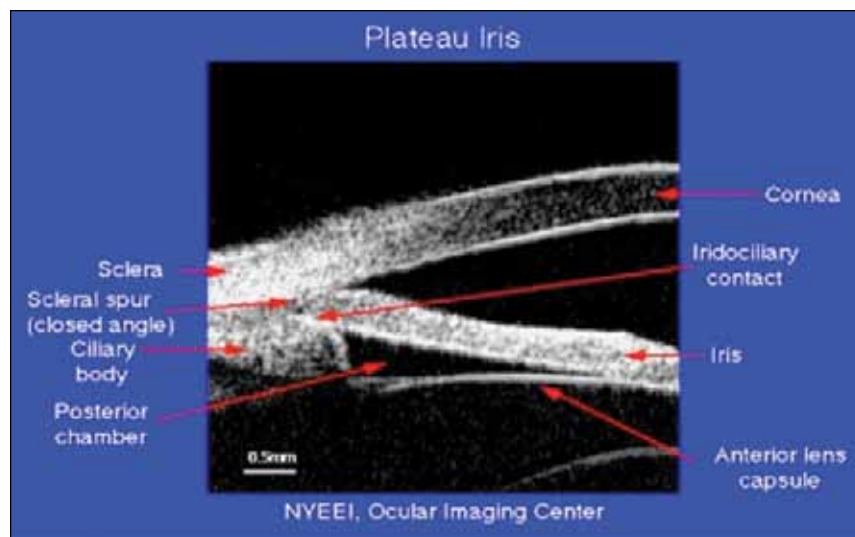


Figure 2. UBM of an anteriorly positioned ciliary body in plateau iris.

sign detected by indentation gonioscopy can indicate the presence of a plateau iris configuration regardless of a patent iridotomy. They hypothesized that compression by the gonioscopic lens pushes the aqueous humor behind the iris, causing the double hump sign (Figure 1) even prior to laser treatment.⁷ Performing tonometry both before and after pupillary dilation after iridotomy can help clinicians detect elevated IOP due to residual angle closure from plateau iris.

The term *plateau iris syndrome* refers to the clinical picture of angle closure despite a patent iridectomy. UBM is useful for the evaluation of plateau iris (Figure 2). Kumar et al defined the presence of plateau iris on UBM by the following criteria:

- the presence of an anteriorly directed ciliary body
- an absent ciliary sulcus
- a steep iris root from its point of insertion followed by a downward angulation from the corneoscleral wall
- the presence of a centrally flat iris plane
- iridoangle contact³

In addition to UBM, optical coherence tomography (OCT) can be used to help detect plateau iris. In a study that evaluated the role of anterior segment OCT, Liu correlated the risk of iridotrabecular contact with the height of the iris plane relative to the trabecular meshwork and the degree of physiologic pupillary dilation.⁸

The differential diagnosis includes a tumor that causes the anterior displacement of the ciliary processes and iris cysts.⁹ If available, further imaging such as anterior segment OCT or UBM can be performed to document the diagnosis of plateau iris.

TREATMENT

Laser Iridotomy

Patients with narrow angles and iridotrabecular apposition that can be opened with indentation gonioscopy should undergo a laser iridotomy. Afterward, clinicians should re-examine the angle using gonioscopy. If it is still narrow, plateau iris is a likely cause. At this point, gonioscopy should be performed to confirm the plateau finding and to evaluate for the double hump sign.

Argon Laser Peripheral Iridoplasty

The treatment of plateau iris involves performing argon laser peripheral iridoplasty (ALPI). The burns should be made in the peripheral iris, causing the iris to shrink and pull away from the angle. A spot size of 200 to 500 μm , a duration of 0.2 to 0.6 seconds, and a power of 150 to 300 mW can be used to perform this procedure. In a study by Ritch et al, ALPI proved to be an effective method of maintaining an open angle, with only a small percentage of patients requiring retreatment.^{10,11} (To watch an excellent video showing the clinical performance of ALPI by Robert Ritch, MD, visit www.youtube.com/watch?v=l2NYixE_0xQ.) Urrets-Zavalía syndrome, which is characterized by prolonged mydriasis unresponsive to pilocarpine, is an uncommon complication of ALPI that typically resolves spontaneously within 1 year.¹²

Drug Therapy

Miotic agents are an option for patients who do not consent to laser treatment. These drugs cause the pupillary sphincter to contract, mechanically pulling the iris away from the trabecular meshwork and opening the anterior chamber angle.¹³ These agents also lower the IOP by stimulating contraction of the ciliary muscle, thereby increasing the trabecular outflow of aqueous humor. Induced myopia, pupillary constriction, brow ache, and retinal detachment are potential adverse effects of this therapy. Low doses of miotics every 6 hours can be tried to pull the peripheral iris from the trabecular meshwork to prevent the formation of anterior synechiae. Treatment will require compliance on the patient's part, however, which studies show can be difficult to maintain, thus continuing the risk of iridotrabecular contact.

"Cataract surgery or a lensectomy may be required to remove any component of pupillary block that is associated with the plateau iris configuration."

Surgical Intervention

Surgical intervention is required for glaucoma patients who present with advanced plateau iris, compromised trabecular meshwork function, and severe synechial angle closure involving more than 180° of the trabecular meshwork. Initially, physicians should attempt to control the IOP pharmacologically. Pupillary dilation should be avoided or performed minimally with a short-acting compound such as tropicamide (Mydracil; Alcon Laboratories, Inc.) that can be readily reversed.

Goniosynchiolysis can be performed in the OR under the operating microscope.¹⁴ After anesthetizing the eye and filling the anterior chamber with viscoelastic, the surgeon uses a Utrata forceps to grasp the peripheral iris at each clock hour and gently pulls the tissue toward the pupil, breaking the synechiae from the trabecular meshwork. Caution is required to prevent iridodialysis.

Cataract surgery or a lensectomy may be required to remove any component of pupillary block that is associated with the plateau iris configuration.^{15,16} The procedure has also been combined with endocyclophotocoagulation of the ciliary processes to deepen the anterior chamber angle. The IOP should be reassessed at 3-month intervals, and gonioscopy should be performed at 6-month intervals to ensure that trabecular meshwork outflow is not compromised by the plateau iris configuration in patients with glaucoma.

If the patient's IOP is uncontrolled by medication, and he or she has advanced glaucomatous damage requiring a low IOP, then goniosynechiolysis must be combined with trabeculectomy. At the time of trabeculectomy, after the iridectomy is complete, the surgeon will often see iris processes appear and protrude anteriorly into the scleral ostium. Caution may be used to carefully contract the ciliary processes without burning the scleral tissue. This technique will prevent the ciliary processes from obstructing the ostium, which can cause the trabeculectomy to fail. During the postoperative period, the ophthalmologist will need to reassess the plateau configuration of the iris gonioscopically to

ascertain if there is a continued risk of iridotrabecular meshwork apposition. If so, a repeat ALPI may be needed.

CONCLUSION

This article shares pearls for the diagnosis and treatment of glaucoma patients who have plateau iris and plateau iris syndrome. Several treatment modalities, both medical and surgical, are available. A thorough clinical evaluation, monitoring, and appropriate intervention can preserve patients' vision. ■

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