

# Yag Laser Iridotomy Revisited

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## Indications for laser iridotomy

### Firm indications

*Acute angle-closure glaucoma*

*Chronic angle-closure glaucoma*

Intermittent angle-closure

Narrow-angle eye with acute angle-closure glaucoma in the fellow eye

Aphakic or pseudophakic pupillary block or silicon after vitrectomy

Incomplete surgical iridectomy

Luxated or subluxated crystalline lens ,AC IOL

Nanophthalmos

## Relative indications

Critically narrow angles in asymptomatic patients

Younger patients, especially those who live some distance from medical care or who travel frequently

Narrow angles with positive provocative test

Iris–trabecular contact demonstrated by compression gonioscopy

## Contraindications

Conditions causing **poor visualization** of the iris include the following:

- Corneal edema
- Corneal opacity
- Flat anterior chamber

Conditions causing **synechial closure** of the anterior chamber angle include the following:

- Neovascular glaucoma
- Iridocorneal endothelial (ICE) syndrome

Patients who are **unable to cooperate** include the following:

- Patients who cannot sit comfortably at the laser table
- Patients who cannot keep the head still

## Technique

Full Ophthalmic Examination

Informed consent

Gonioscopy is used to assess the AC angle.

**IOP** and intraocular inflammation are controlled.

The patient is asked to **sit** comfortably at the laser table.

The plane of the **CL** must always be oriented parallel to the iris plane and the laser spot centered within the button.

The laser beam should always be in sharp **focus**.

## Technique

The eye should be pretreated with :

Topical anaesthesia (proparacaine),

Apraclonidine (0.5% or 1%) or brimonidine (0.1%, 0.15%)

Pilocarpine 1%?????

Higher concentrations of pilocarpine are not recommended, because they can cause paradoxical angle closure Also it may induce PVD

## Contact Lens (CL)



CL makes the procedure easier:

The laser **energy** is concentrated at the level of the iris.

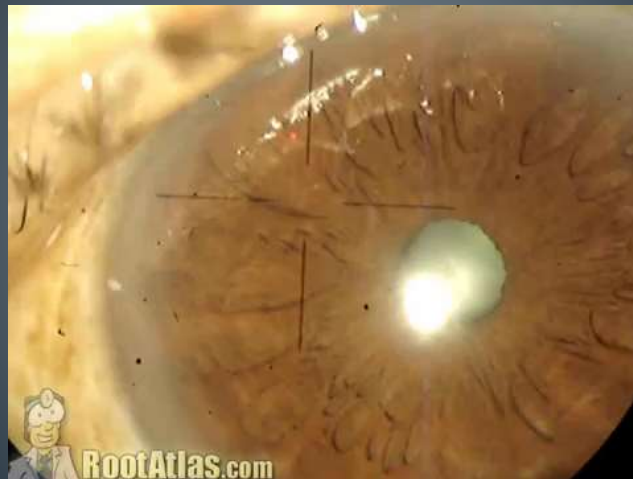
The lens acts as a heat sink.

The target structure is **magnified** with less loss of depth of field

The lens acts as a **speculum**; keeping the eye open & minimizes fine eye movements.

If **hyphema** occurs applying pressure for 20-30 seconds with the lens will help to stop bleeding

## Technique



## Application of laser

- Different laser settings are employed, depending on the device used, the clinical situation, and the physician's preference.
- In patients with blue or green/light brown irides, LPI can be performed with a (Nd:YAG) laser, using the following settings:
  - Power - 4-8 mJ
  - Pulses/burst - 1-3
  - Spot size – Fixed
- In dark irides more energy is used & pre treatment with Argon laser may be useful

## Technique

- The LPI should be placed in the **periphery** of the iris.
- This reduces lens injury and possible subsequent sealing of the iridotomy by posterior synechiae to the lens.
- Furthermore, peripheral placement also reduces the likelihood of later ghost images through the iridotomy.



## **A Case for Nasal or Temporal Iridotomies**

Linear photopsias are most common in partially covered iridotomies but can develop with superior iridotomies even with complete lid coverage in primary position.

light passing through a fully exposed iridotomy hits the retina unfocused and is usually ignored

Alternatively, light passing through a partially exposed iridotomy is bent by the prismatic effect of the tear film and hits the retina as a focused image.

Either a nasal or temporal location will decrease the incidence of linear photopsias

It may be more painful

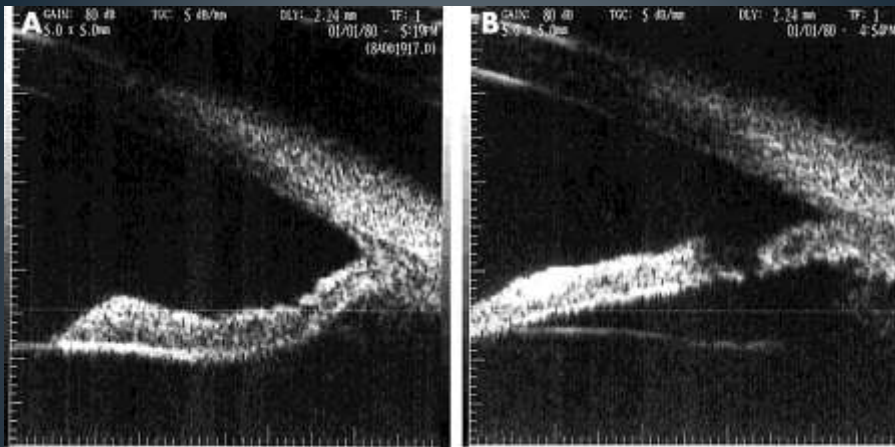
## **Nd:YAG laser iridotomy in pigment dispersion syndrome(PDS)**

In eyes with PDS there is posterior iris bowing either in baseline conditions or during accommodation.

YAG laser iridotomy restores a normal iris configuration

may prevent the development of ocular hypertension.  
these eyes.

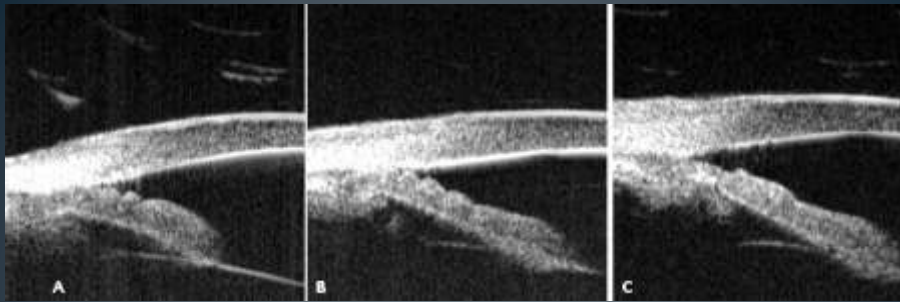
Br J Ophthalmol 1998;82:150-153 doi:10.1136/bjo.82.2.150



(A) UBM image showing the iris concavity before iridotomy. (B) UBM image showing flattening of the iris configuration following iridotomy in the same eye.

## Plateau Iris Syndrome

- Plateau iris is common angle-closure glaucomas presenting in younger patients.
- This condition is characterized by closing of the anterior chamber angle secondary to a large or anteriorly positioned ciliary body that mechanically alters the position of the peripheral iris in relation to the trabecular meshwork.



- **Ultrasound biomicroscopy, plateau iris syndrome.**

(A) Appositional anterior chamber angle in dark condition prior to LPI

(B) After laser iridotomy, the angle remains occludable.

(C) After peripheral laser iridoplasty, the peripheral iris is thinned, opening the angle and significantly reducing the risk of closure.

## Complications of Procedure

### Visual symptoms:

Transient blurred vision may occur in the immediate postlaser period. Possible causes include pigment dispersion, inflammation,

Optical aberrations (eg, shadows, ghost images, lines, haloes, spots, glare, diplopia,) were reported, in eyes with partially covered iridotomies, those with fully exposed iridotomies & even in eyes with completely covered iridotomies.

Horizontal position of PI may decrease visual symptoms



## Iridocyclitis

Mild iritis as a reaction to YAG laser insult may occur  
This can easily be managed by giving steroid drops for  
5-7 days.

However, rarely severe iridocyclitis, cystoid  
macular edema and even endophthalmitis have been  
reported.

## Transient Rise of IOP

The rise of IOP occurs due to decrease in aqueous outflow facility,  
it could be because of release of inflammatory mediators into  
the aqueous, which occurs due to breakdown in the blood aqueous  
barrier.

The blood plasma and fibrin are also released, which may also  
block the iridotomy site or angle leading to IOP rise.

For preventing this rise 1 percent apraclonidine eye drops should  
be instilled one hour prior to laser iridotomy and also  
immediately after the procedure.

## Hyphema

If the laser beam hits iris capillaries, the blood may be seen leaking from them. This bleeding can be easily managed by applying pressure with the help of contact lens.

If previous to the YAG laser, Argon laser is utilized the chances of bleeding are reduced as it coagulates the capillaries.



## Endothelial Cell Loss

One study documented a higher rate of endothelial cell loss after argon laser PI than after YAG PI

## Posterior Synechia

Another potential complication of laser peripheral iridotomy is the development of posterior synechiae following laser iridotomy.

This synechia may cause PI closure

Posterior synechiae can both limit vision in dim environments and cause cataract formation & makes cataract surgery more challenging

## Failure of Iridotomy

There is a relation between the extent of angle closure by PAS and failure of iridotomy to control IOP and progression of glaucoma.

Iridectomy or iridotomy is less effective in eyes with glaucomatous visual field loss and further surgical or medical treatment is often required to control IOP.

## Cataract Formation

The incidence of cataract formation is much less with YAG laser than with argon laser PI.

They are non-progressive.

LPI disrupts the natural flow of aqueous in the eye and results in significant increase in lens-iris contact.

This may predispose to a more rapid development of cataract since less aqueous is in contact with the lens epithelium.

**Cataract surgery is the definitive Rx for angle closure**

## Complications of Procedure

The following complications are **rare** but have been reported in the literature:

- Aqueous misdirection
- Recurrent herpetic keratouveitis
- Retinal and subhyaloid hemorrhage or retinal burns
- Choroidal and retinal detachment after argon LPI
- Stage I macular hole

**Thank you  
for your  
attention**