Chapter 40
Laser Peripheral Iridotomy

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Abstract Laser iridotomy functions to relieve pupillary block by allowing an equalization of pressure between the anterior and posterior chambers. Patients should have had nonindentation gonioscopy that demonstrated contact between the iris and the trabecular meshwork typically for greater than 180° of the angle, although clinician discretion may be employed on a case-by-case basis. Other indications include aphakic or pseudophakic pupillary block, plateau iris, or phacomorphic angle closure with a component of pupillary block and some cases of pigment dispersion syndrome. The procedure may be performed with an argon laser, Nd:YAG laser, or a combination of the two. This author prefers Nd:YAG for hazel or blue irides and combination argon/YAG for darker irides. Simply put, all patients should be informed of at least a 2 % risk of a linear dysphotopsia from the laser. Recent literature shows that a temporal iridotomy is less likely to result in linear dysphotopsia as compared to a superior iridotomy, although a temporal iridotomy may be more painful, and again clinician discretion may be indicated.

Keywords Anatomical narrow angle • Pupillary block • Angle closure • Argon laser • Nd:YAG laser • Glaucoma • Iridotomy • Occludable angle • Plateau iris

Indications

Primary angle closure and primary angle closure glaucoma, anatomical narrow angle, aphakic or pseudophakic pupillary block, plateau iris or phacomorphic angle closure with a component of pupillary block, and pigment dispersion syndrome with reverse pupillary block

Essential Steps

1. Consideration of pretreatment with pilocarpine 1 h before laser to induce pupil miosis and iris stromal thinning, although not always necessary.
2. Consideration of pretreatment with α_2-agonists like brimonidine or apraclonidine 1 h before laser to help blunt IOP spikes.

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3. Administration of topical anesthetic.
4. Ensure comfort of patient and surgeon with patient head positioning against the headrest.
5. Consideration of the use of the *Abraham iridotomy* lens, although not always necessary.
6. Laser strategy: Nd:YAG laser can typically be used alone to perform the iridotomy, especially in lightly pigmented irides (pretreatment with argon laser should be considered in patients on anticoagulation to prevent significant intraocular bleeding and in those with very thick irides).
7. Laser settings:
   - Argon iridotomy: time, 0.02 s; power, 400–1500 mW; spot size, 50 μm
   - YAG iridotomy: power, 1.2 mJ and up
8. Identification of iris crypt or region of thinned iris (e.g., crypt at 12:00 may be a reason to laser superiorly instead of temporally).
9. Application of a single YAG pulse of 2 mJ aimed temporally in far periphery of iris; more laser energy may be required in dark irides.
10. Penetration is marked by a gush of fluid and pigment into the AC (not always present).
11. A few additional laser pulses may be applied if complete iridotomy is not initially achieved.
12. If penetration is not achieved after ~15 laser pulses at 2 mJ, consider using focusing lens or treating with argon laser.
13. Application of argon laser burns in an overlapping configuration at increasing power as tolerated by patient, keeping in mind that a more pigmented iris will absorb more laser energy and will be more painful per mW of energy.
14. Application of one or two more pulses of YAG laser may be needed to complete a patent iridotomy after argon pretreatment.
15. Check IOP 30–60 min later.
16. Postoperative topical steroid QID × 1 week.
17. Reassess in 2 weeks and perform gonioscopy to ensure angle is open (it will not be in a third of patients and in those a diagnosis of plateau iris is usually made).

Complications

- Linear dysphotopsia/diplopia
- Temporary or persistent iritis
- Corneal burn/scar with argon/YAG laser
- Focal anterior subcapsular lens opacities and cataract progression
- Closure of a patent laser iridotomy
- Hyphema
- Posterior synechiae
- Retinal burns (very rare due to defocusing of light)
- Transient IOP increase

Template Operative Dictation

Preoperative diagnosis: Anatomical narrow angle (*OD/OS/OU*)

Procedure: Laser iridotomy (*OD/OS*)

Postoperative diagnosis: *Same*

Indication: This____-year old (*male/female*) was found to have anatomical narrow angle*(s)* (*OD/OS/OU*) with ≥180° of iridotrabecular apposition identified on (*non-indentation gonioscopy/anterior segment optical coherence tomography/ultrasound biomicroscopy*). After a detailed review of risks and benefits, the patient elected to undergo the procedure.

Description of the procedure: Informed consent was obtained from the patient at which time the risks, benefits, and alternatives were discussed and all questions were addressed. The patient was identified and the (*right/left)* eye was marked. One drop of pilocarpine 2 % and one drop of brimonidine 0.1 % were instilled into the eye.

*_60_* minutes later, the patient was brought into the procedure room and a proper time-out was performed. Proparacaine was instilled into the eye. Patient was comfortably seated at the laser with forehead touching the guide bar. An *Abraham iridotomy* lens was placed on to the eye with goniosol solution.

[Choose one]:

If pretreating with argon laser*—Pretreatment with argon laser was used with a duration of _0.02_ s and spot size of _50_ μm and was aimed at the (3/9) o'clock position in the far periphery of the iris. The initial power was set at _300_ mW and was then titrated up as quickly as tolerated by the patient, to a maximum of ____ mW. Burns were applied in an overlapping configuration until contraction of the iris stroma was seen. The patient was then transferred to the Nd:YAG laser and comfort of patient and surgeon were ensured. Pulse(s) of ____mJ was/were applied in the center of the crater to achieve patency.*

If only Nd:YAG laser used*—The Nd:YAG laser was set at a power of _2_ mJ and aimed at the (3/9) o'clock position in the far periphery of the iris. ___ pulse(s) of ____ mJ was/were applied to achieve patency.*

If Nd:YAG laser used followed by argon laser*—The Nd:YAG laser was set at a power of _2_ mJ and aimed at the (3/9) o'clock position in the far periphery of the iris. ___ pulse(s) of ____ mJ was/were applied without achieving patency. The patient was then transferred to the argon laser and comfort of patient and surgeon were ensured. Argon laser was applied at a duration of _0.02_ s and spot size of _50_ μm and was aimed at the same area in an overlapping configuration. The initial power was set at _300_ mW and was then titrated up as quickly as tolerated by the patient, to a maximum of ___ mW. (If further YAG laser treatment was needed, the patient was then transferred to the Nd:YAG laser for a final ____ pulse(s) of ____ mJ to complete the iridotomy.*)

Patency was confirmed by visualization of streams of pigment clumps and aqueous humor into the anterior chamber. The patient was monitored in the waiting room for ___ minutes. IOP at ___ minutes following treatment was ____ mmHg. The patient tolerated the procedure well without any IOP spikes observed. The patient was instructed to use topical steroid therapy *1* gtt *QID* (*OD/OS*) for *1* week and to return in _*2*_ weeks at which time gonioscopy will be performed to assess the effect of the iridotomy on angle configuration.