

SPONTANEOUS RESOLUTION OF IATROGENIC TONIC PUPIL FOLLOWING ARGON LASER IRIDOPLASTY

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We introduced a 19-year-old female patient who presented with photophobia and decreased vision following Argon laser iridoplasty in the left eye. Examination revealed anisocoria, with a dilated left pupil that was poorly responded to light, while the right pupil remained normal. Diluted pilocarpine 0.0625% test was positive, confirming iatrogenic tonic pupil. After 8 months, her anisocoria was found to naturally recover with restoration of best-corrected visual acuity and resolution of photophobia. This case highlighted the potential for Adie-like tonic pupil as a rare complication of laser procedures for ocular conditions. Therefore, awareness of this possibility is important for preoperative counseling and postoperative management to prevent patient distress and visual discomfort.

Keywords: Iatrogenic, tonic pupil, iridoplasty argon laser.

I. INTRODUCTION

Tonic pupil is an abnormal condition in which parasympathetic denervation of the dilated pupil leads to a poor light but better and tonic near constriction.¹ This clinical entity has been documented in the literature as a complication associated with ophthalmic lasers. Herein, we report a patient with iatrogenic pseudo-Adie tonic pupil following iridoplasty argon laser. A written informed consent was obtained.

II. CASE PRESENTATION

A 19-year-old female presented with photophobia and slight visual decrease after an anterior segment laser. She reported a history of myopia and juvenile onset open angle glaucoma with prior bilateral selective laser trabeculoplasty. More recently, her

ophthalmologist performed an iridoplasty argon laser for her left eye. No previous record was found, so the laser setting could not be retrieved. About 1 week post treatment, she experienced photophobia and blurry vision in her left eye but received no treatment. She was kept on a combined glaucoma drop (alpha agonist and beta blocker) BD until she was seen at [redacted for review] University Hospital.

On examination, we found normal intraocular pressure (IOP) (20mmHg OD, 18mmHg OS) on a combined IOP lowering drop. Her best corrected visual acuity was 20/20 (-6.50/-0.75 x 10) in the right eye and 20/30 (-6.00/-0.75 x 15) in the left eye; her near vision was N8 bilaterally at 40cm. Anisocoria was detected; her left pupil was dilated and poorly responded to light while the near reaction was intact (light-near dissociation) without vermiform movement. Her right pupil was about 3.5mm, and reacted normally (Figure 1A). Her angle was wide open 360 degree with some iris processes on gonioscopy in both eyes. The

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anterior segments of both eyes appeared to be normal with healthy neuro-retinal rim and some mild myopic changes in the retinas. No ptosis

or ocular movement restriction was found. Deep tendon reflexes were preserved. She was healthy and her blood test was negative.



Figure 1. Anisocoria: A. Before Pilocarpine 0.0625%; B. After Pilocarpine 0.0625%; C. Spontaneous resolution after 8 months

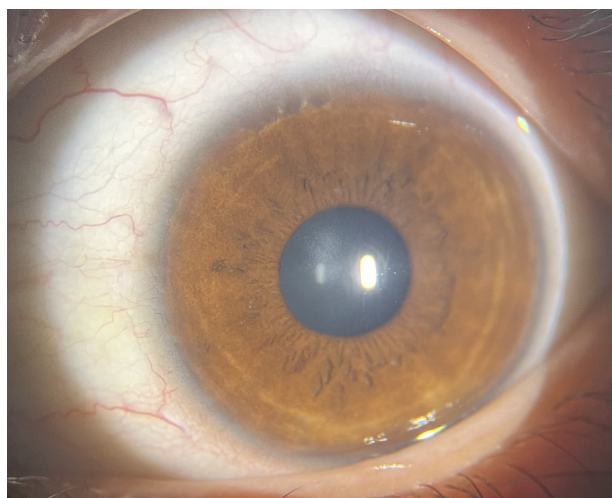


Figure 2. Iris stroma shrinkage in the left side after 8 months

Pilocarpine 0.0625% was instilled into both eyes, and 45 minutes later, (Figure 1B) her left pupil constricted and her vision with the same correction increased to 20/25. She was diagnosed with an iatrogenic tonic pupil following laser iridoplasty. She was monitored

on a basis of 3 months with regular drop for glaucoma management. Surprisingly, her anisocoria improved (Figure 1C) with normal best corrected visual acuity, no photophobia and some residual laser burn spots of the iris stroma (Figure 2) after 8 months.

III. DISCUSSION

Adie tonic pupil, known as Adie syndrome or Holmes-Adie syndrome, is a neurologic disorder induced by any damage to ciliary ganglion and its parasympathetic postganglionic fibers, leading to a poor light but better and tonic near constriction. Sometimes, deep tendon reflexes are disturbed without generalized peripheral or autonomic nervous system dysfunction. It has been found to be associated with infectious diseases, especially syphilis, immune diseases and paraneoplastic processes.² Pseudo Adie tonic pupil was detected in cerebral proliferative angiopathy.³ However, iridoplasty argon laser-related tonic pupil has never been documented prior.

Dilated pupil and loss of accommodation was previously reported in retinal photocoagulation. Patients in these studies responded to Pilocarpine 0.1 or 0.125%.^{4,5} Urrets-Zavalia syndrome was also found in a case series with argon laser peripheral iridoplasty and insignificant pupil response to Pilocarpine up to 4%.⁶ In our report, the patient demonstrated parasympathetic denervation hypersensitivity, confirmed with the use of 0.0625% pilocarpine.⁷ This concentration was shown to be better than 0.125% for detecting denervation hypersensitivity in Adie tonic pupil.⁸ Thermal damage to the ciliary ganglion or nerves induced by ocular laser therapies might lead to Adie-like tonic pupil. In this case, the angle was wide open, and the IOP was normal; therefore, an angle closure induced by tonic pupil could be ruled out.⁹

Patients with tonic pupil usually suffer from photophobia or blurry vision. Dilute Pilocarpine 0.1% to relieve symptoms, sunglasses reducing light sensitivity or reading glasses aiding near vision might be helpful.¹⁰ Underlying systemic problems must be addressed. Fortunately,

our patient was completely stable, and her Adie-like pupil naturally recovered. We have not found any similar report in the literature. To prevent this potential complication, argon laser should be reasonably indicated and set at 500-micron spot size, with 0.5 second duration, and a starting energy around 50 to 200mW. The energy level will increase until stromal shrinkage is observed.¹¹ The spot should not be too peripheral to avoid damaging the ciliary ganglion.

IV. CONCLUSION

Glaucoma is among top causes of blindness globally; therefore, ocular laser treatments are popular. Adie-like tonic pupil should be taken into consideration when preparing the setting and performing the procedure to avert potential visual problems caused by pupil dilation and loss of constriction.

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