

Bilateral Loss of Light Reflex and Accommodation Following 360° Peripheral Retinal Laser Therapy

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ABSTRACT

We report a case of bilateral loss of pupillary light reflex and accommodation following 360° peripheral retinal laser therapy. A 24 years old male underwent prophylactic laser barrage for peripheral retinal lattice degenerations. Soon after the procedure, he developed bilateral loss of pupillary light reflex and accommodation. The patient faced difficulty while doing near work. On instillation of 0.125% pilocarpine, both pupils demonstrated the phenomenon of denervation supersensitivity. Damage to the short ciliary nerves was the most likely mechanism responsible for this adverse outcome.

Key words: Accommodation. Laser therapy. Light reflex. Denervation.

INTRODUCTION

Constrictor pupillae and ciliary muscles get parasympathetic supply by the short ciliary nerves. Tonic pupil is unresponsive to light stimuli and shows decreased constriction response to accommodation. It manifests denervation supersensitivity to dilute cholinergic agents.¹ Most tonic pupil cases are idiopathic, but among all known causes, trauma is the most frequent.²

Here we report a case of loss of pupillary light reflex and accommodation power following double frequency Nd: YAG LASER peripheral retinal barrage.

CASE REPORT

A 24 years old male student presented to the outpatient department for the routine checkup and change of glasses if required. He was using glasses for the last 15 years. The patient was otherwise healthy and had no other complaint regarding the eyes. He had no history of systemic illnesses. His family history suggested use of glasses for distance in his siblings. He was a non-smoker. He had no addiction to any drug. Patient belonged to the middle class. His uncorrected visual acuity was counting fingers at 3 meters in his both eyes. His best corrected visual acuity was 6/6 right eye with -6.50 diopters sphere and 6/6 left eye with -5.50 diopters sphere and -0.50 diopters cylinder at 170°. With distance correction in place the patient could read N6 with either eye. His external eye examination and anterior segment examination was normal bilaterally.

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He showed signs of liquefaction of vitreous. There was thinning of the retina with unmasking of the choroidal vasculature. Both the retina showed areas of peripheral degeneration. There were areas of white without pressure and lattice degeneration with small atrophic flat holes.

After counselling 360° prophylactic retinal laser barrage of both eyes was performed. After the procedure the patient was started on diclofenac 0.1% eye drops twice a day and he was planned to present in OPD after 6 weeks. But the patient returned after 2 weeks with complaints of difficulty in reading. The problem started soon after the laser procedure. He also had photophobia and blurred distance vision. The patient was regularly using post-laser eye drops. Patient gave no history of trauma or any ocular or systemic illness during these 2 weeks. On examination his distance vision with glasses was 6/12 in either eye. He improved to 6/6 in either eye when a pinhole was placed in front of his glasses. His near vision was N14 in either eye while distance correction was in place. On further examination we found both pupils were dilated. There was hardly any reaction to light. On accommodation, pupils reacted slowly and to a small extent. While looking at a non-accommodating target, right pupil diameter was 7.00 mm and that of the left pupil was 6.9 mm. The diameter was same in both the bright and dim light. When the patient was looking at accommodating target, held 14 inches away from him, his right and left pupil diameter was 6.1 mm. Patient's convergence was intact. The retina showed laser's marks. The rest of the examination was the same as it was before.

The clinical diagnosis was laser induced loss of parasympathetic supply to the pupil and ciliary muscles. The possibility of accidental/un-intentional instillation of cycloplegic/mydriatic eye drops was ruled out by history. The laser procedure was done 2 weeks ago and

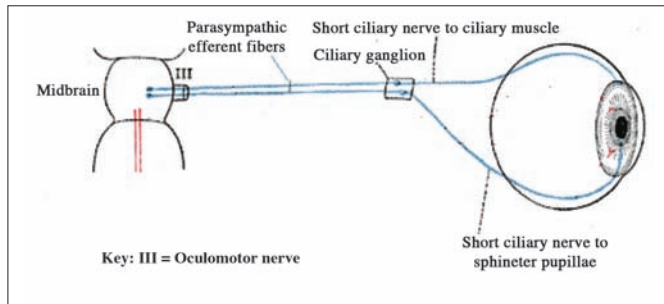


Figure 1: Parasympathetic nerve supply to the sphincter pupillae and ciliary muscle.

no dilating drop was instilled after that time. To confirm the diagnosis, one drop of 0.125% pilocarpine was instilled in either eye. After 45 minutes, the patient was re-examined. That time his pupil diameter was 2.5 mm in either eye. There was no light or accommodation reflex. Patient could read upto N6 with either eye. Patient's distance vision blurred. There was aggravation of myopia and patient's refraction was -8.00 diopters sphere for right eye and -7.25 diopters sphere with -0.50 diopters cylinder at 170° for left eye.

Pilocarpine 1% four times in a day was advised for symptomatic relief. On the next follow-up visit 2 weeks later the patient told us that he could do his near work but he had developed congestion of conjunctival and headache. Patient's counselling was done and he was advised to use the drops less frequently on as needed bases. Follow-up to monitor the side effects of pilocarpine and recovery of internal ophthalmoplegia has been planned.

DISCUSSION

Pupil and accommodation defects have been described after retinal laser treatment.³ Parasympathetic fibers supply the ciliary body for accommodation and the sphincter muscles in iris to constrict the pupil. The nerves synapse in the ciliary ganglion and continue as the short ciliary nerves, which penetrate the sclera around the optic nerve and run forward in the suprachoroidal space to the ciliary body and iris.⁴ Direct thermal damage to the short posterior nerves may be responsible for mydriasis and loss of accommodation.^{5,6}

Lifshitz and Yassur suggested another mechanism. Their assumption was that besides the direct damage to the ciliary muscle fibers, laser application to the area adjacent to the ora serrata might have led to fixation of ora serrata, preventing contraction of ciliary muscle in the meridian portion.⁷ Isolated internal ophthalmoplegia is a rare complication of retinal laser photocoagulation. It has been reported to be a transient phenomenon⁸ or permanent.³

The site of the lesion in our patient is postganglionic, that is in the short ciliary nerves. The lesion produced is similar to a tonic Adie's pupil with pupil dilatation, poor reaction to light, loss of accommodation and positive denervation supersensitivity to 0.125% pilocarpine.

All patients who are planned for peripheral laser barrage may be made aware of this troublesome rare complication before treatment.

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