



A 16-Year-Old Male with Blurry Vision

Yicheng Chen, MD; Matthew A. Thomas, MD



Introduction:

A 16 year old male with a history of ADHD presents with blurry vision in his left eye. He initially reported blurry vision of a few weeks duration. He denied any history of trauma.

Exam:

His vision was 20/20 in the right eye and 20/200 in the left eye. There was no relative afferent papillary defect. Confrontational visual fields were full. The anterior segment exam was normal with a clear lens in each eye. On dilated fundus examination, the vitreous was clear. The optic nerves were pink and sharp with a cup to disc ratio of 0.25 and 0.3. The macula was normal in the right eye. In the left eye, there was a full thickness macular hole with inner retinal striae. The vessels and periphery were normal in both eyes.

The optical coherence tomography (OCT) showed a full thickness macular hole with RPE atrophy and an excrescence at the level of the RPE that corresponds to the yellow dot in the macular hole in the fundus photo.

Upon further questioning, the patient reports that 8 months ago he was playing with a "military-style" laser that his friend had purchased on the internet and accidentally shined the laser in his left eye. He reported a momentary pain and blurry vision immediately afterwards.

Discussion:

The recent popularity and growing availability of laser pointers have resulted in increased reports of laser eye injury in the literature. The FDA has issued a public safety communication that lasers with power greater than 5mW can cause skin and eye injuries. A study in

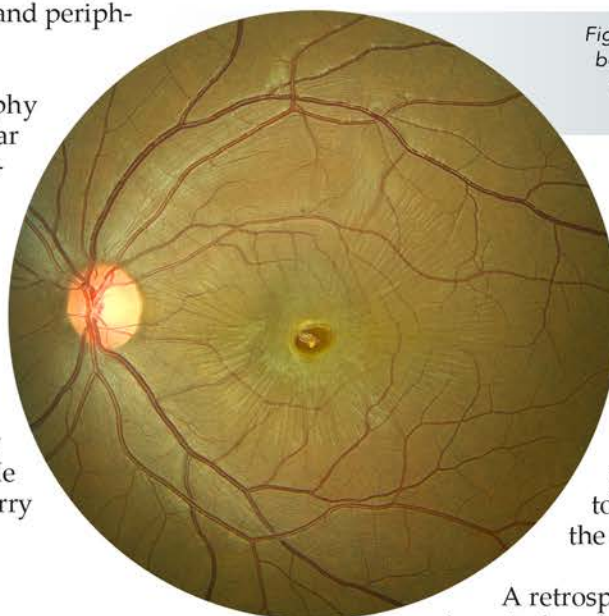
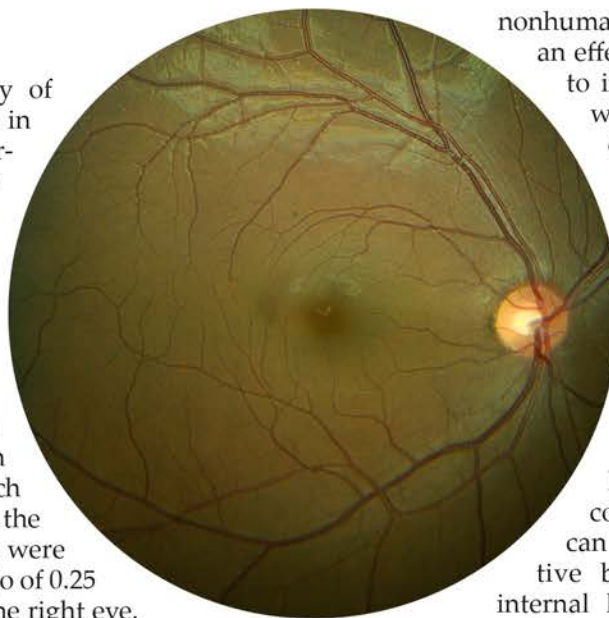
nonhuman primates found the median effective dose (ED50) necessary to induce visible retinal lesions with a 650nm diode laser at an exposure of 0.25s was 21.2 mW¹. Despite safety warnings, lasers with power far greater than 5mW can readily be purchased over the internet.

Findings on fundus examination include gray or yellow spots in the fovea and changes at the level of the RPE. Optical coherence tomography (OCT) can reveal vertical hyper-reflective bands, ellipsoid zone and internal limiting membrane disruption and hyporeflective cavities².

Figure 1a and 1b: Fundus photo of both eyes, there is a full thickness macular hole in the left eye with central RPE changes.

More severe injury can result in choroidal neovascularization, subhyaloid or submacular hemorrhage as well as macular hole and epimacular membrane formation³. Self-inflicted lesions may exhibit outer retinal streak lesions while accidents and peer-afflicted injuries tend to exhibit more focal lesions of the outer retina⁴.

A retrospective series of 17 eyes with laser-induced macular holes found that the mean age was 18 years old⁵. The best corrected visual acuity (BCVA) ranged from 20/30 to 20/200. 8 eyes were initially observed, but only one eye had spontaneous closure of the macular hole. 14 eyes eventually underwent pars plana vitrectomy with internal limiting



membrane peeling. 11/14 of the operated eyes (78.6%) had closure of the macular hole at the final follow-up visit. The mean final vision was 20/43 in the 11 cases of successful closure, and 20/62 in all 17 of the cases.

Summary:

Our patient is a young male who presented with a macular hole and a history of exposure to a high-powered laser. In the absence of other history to suggest a mechanism for macular hole formation, it is likely that this patient has a case of laser-induced macular hole. Data on the treatment of such holes is limited, but spontaneous closure appears to be rare. Surgery can help close these macular holes and may improve final visual acuity.

References:

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An internet search for "high-powered lasers" provides hundreds of products available for purchase.

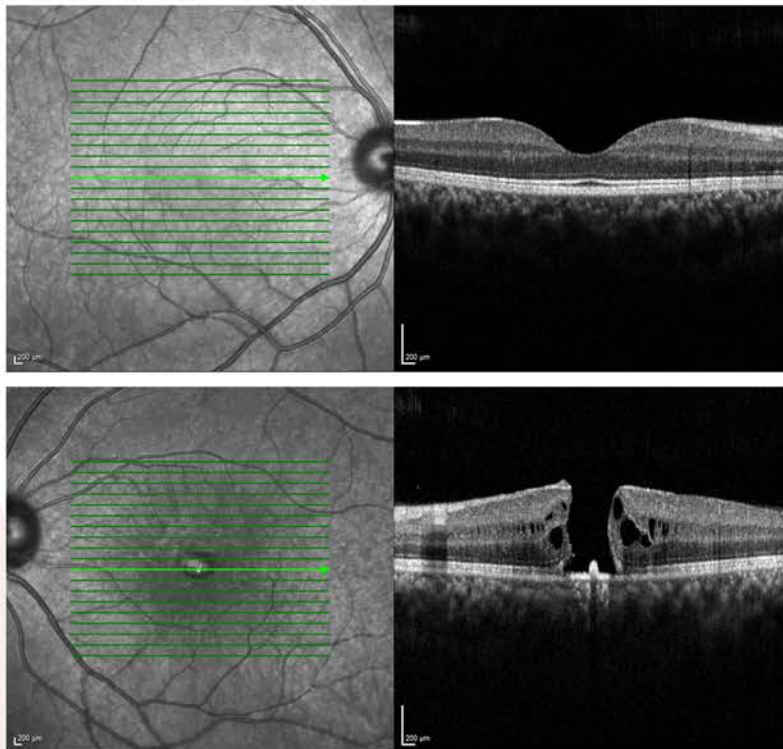


Figure 2a and 2b: Optical Coherence Tomography (OCT) of both eyes.

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