

Case Series of Retinal Damage Caused by Laser Pointer



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Abstract

Introduction: Laser pointers are commonly used in various settings, including presentations, lectures, entertainment events, and toy applications. Although they have become increasingly popular, the misuse or accidental exposure to high-powered laser pointers can cause serious ocular injuries, including retinal damage.

Methods: In this case series, we present many cases of retinal damage caused by laser pointers in patients who visited our clinic over the past year (from January 2024 to January 2025).

Results: We discuss the clinical presentation, diagnostic findings, management, and outcomes of 32 patients with laser-induced retinal damage. Our findings highlight variable recovery patterns depending on injury severity, ranging from spontaneous resolution in some patients to complications requiring intervention in others.

Conclusion: This study explored the potential visual damage caused by laser pointers and provided recommendations for safe usage.

Keywords: Retina; LASER; Laser pointer; Retinal damage; Ocular injury; Maculopathy; Vision loss.

Introduction

Light is accountable for facilitating vision within a limited and visible portion of the electromagnetic spectrum. In contrast, Light Amplification by Stimulated Emission of Radiation (laser) operates as a polarized and monochromatic beam that possesses a distinct frequency and minimal deviation from the aforementioned spectrum.¹ Everyday life has embraced the laser since its introduction in 1960. Furthermore, laser devices have been extensively used in several domains throughout the last several decades, including education, medicine, the military, cosmetics, and, on rare occasions, children's playthings.² Recent epidemiological data suggest a rising trend in laser-related ocular injuries, particularly among children and adolescents, due to increased accessibility of high-powered laser devices.³⁻⁵ Our finding that over 40% of the patients were under 18 years old supports global trends reviewed by Wong et al., highlighting youth as a high-risk group for laser pointer misuse.⁶ According to the American Academy of Ophthalmology, over 70% of reported laser injuries occur in children under 18, often involving devices purchased online without safety warnings.⁷ While previous reports have described isolated cases of CNV following laser injury, our series presents one of the largest cohorts documenting its development and response to anti-VEGF therapy.⁸⁻⁹ Recent studies indicate that while many laser-induced retinal injuries resolve

spontaneously, up to 15% progress to complications such as macular holes or choroidal neovascularization requiring intervention.⁹⁻¹⁰ The most recent revisions to the International Electrotechnical Commission's classification system for laser devices use maximum output power to divide them into four groups; portable laser pointers are typically labelled as 2M or occasionally 3R, as we see in Table 1. This categorization states that 2M lasers are safe to use since they have a low output power and a very divergent light beam, and the blink reflex protects the eye from laser light by reducing the amount of time the light is exposed to its internal structures.¹¹ Class 3R potential eye damage is questionable, but in two situations the probability can increase, when using optical aids (like binoculars, telescopes, or magnifiers), as well as with prolonged exposure or intentional direct observation, and previous research has shown that both groups are at risk for serious eye injury.^{2, 6-7, 10} Two factors make the retina the most frequently injured eye structure by a laser. The eye's transparency and its ability to focus light on the retina make it an ideal medium for this type of study. Retinal radiation has an energy that is over 105 times that of the cornea and can approach a million times with the optical tools indicated before.¹²⁻¹³ The interaction between lasers and ocular tissues, as well as the wavelength, exposure duration, and refraction characteristics of the eye, determines the extent to which lasers do harm to the

Table 1. Laser pointers are coded by output power and wavelength. Based on the latest updates, the International Electrotechnical Commission has classified laser devices into 4 classes based on maximum output power, as described in this table.

Class	Output power	Potential ocular injuries	Example
1	Low output power (<0.4 mW)	Nil (no possibility of retinal damage even after hours of exposure).	Laser printers, CD and DVD players.
1M	Low output power (<0.4 mW)	Highly divergent beam; therefore, only a small part can enter the eye. Potentially dangerous if viewed with optical instruments*.	
2	<1 mW	Wavelength 400–700 nm. Safe by blinking reflex if accidentally shone at the eye, but may be dangerous if repeated deliberate exposure or viewed with optical instruments*.	Barcode scanners.
2M	<1 mW	Highly divergent beam with wavelengths 400–700 nm. Potentially dangerous if viewed with optical instruments*.	Lasers with visible light, including most of the laser pointers, are included in this group.
3R	1-5 mW	The possible damages are controversial (may be dangerous if it exceeds the maximum permissible exposure for accidental viewing). The risk of injury increases when viewed with optical instruments*.	Laser pointers for presentation and recreational use, and some alignment products.
3B	5-500 mW	Capable of causing permanent retinal injury with short duration of exposures (1/100sec) if viewed directly or via reflection.	Used in research and physiotherapy treatments, as well as the majority of industrial, military, and medical lasers.
4	>500 mW	All the lasers in this category can cause severe, permanent damage to the eye or skin, even by a short exposure, as well as a fire hazard.	Used for laser displays, surgery and cutting metals.

Safety of laser products - Part 1: Equipment classification and requirements (2nd edn). International Electrotechnical Commission 2007)

* Optical instrument, including magnifiers, binoculars, or telescopes.

eyes. In particular, damage to the ellipsoid and myoid zones of the photoreceptors is a hallmark of laser-induced retinal injury, indicating the disruption of mitochondrial function and outer segment integrity. Outer retinal disruption refers to structural compromise involving the photoreceptor layer and the outer nuclear layer.^{5,14}

Typically, there are three ways in which lasers interact with ocular tissues.¹² In the first thermal (photothermal) process, pigments absorb laser light, which raises the local temperature, which in turn causes tissue proteins to coagulate, leading to cell death and scar formation. In the second mechanical (photochemical) process, tissue chemical reactions are triggered by laser light without a significant rise in temperature, resulting in the evaporation of liquid and the creation of a mechanical wave. According to this view, thermal damage is the primary cause of laser damage, which is especially common with green lasers and other short-wavelength lasers. Retinal pigments mediate laser phototoxicity in various types of damage.⁶

The symptoms of retinal damage from a laser pointer injury may include blurred vision, blind spots, and sensitivity to light. In severe cases, permanent vision loss can occur. Retinal bleeding, retinal holes, photoreceptor damage, choroidal neovascularization (CNV), and many other adverse effects of lasers on the retina have been documented in numerous papers.^{2, 8-10, 15} Treatment options for retinal damage caused by a laser pointer injury may include medications, surgery, or other interventions, depending on the extent of the damage.

The widespread use of laser pointers for both recreational and advertising purposes, along with their ease of availability and low cost, has made retinal damage a serious concern in recent years. This is especially true for children and young adults, who are often active members of society and who may suffer from a lifelong visual impairment as a result.¹⁶

Methods

This study collected all cases of laser-induced ocular injuries between January 2024 and January 2025, which included 32 cases (Table 2). Of these, 24 were male and 8 were female, with ages ranging from 5 to 59 years. The majority of patients were under 20 years of age, and the left eye was affected slightly more frequently than the right. The cases were diagnosed based on a combination of clinical history of laser exposure, fundoscopic findings, and OCT imaging. The diagnosis of complications such as choroidal neovascularization (CNV), macular hole (MH), or subretinal hemorrhage was confirmed using multimodal imaging, including fluorescein angiography when available. All patients presenting with a history of direct exposure to laser beams and evidence of posterior segment injury on fundus examination or OCT were included. Patients with an unclear exposure history or pre-existing retinal disease were excluded. The study was approved by the Ethics Committee of Kermanshah University of Medical Sciences. Informed consent was obtained from all participants or their legal guardians.

Patients

Ellipsoid and Myoid Zone Disruption

Case#1: A 16-year-old male presented to our clinic with complaints of sudden vision loss in his right eye after accidentally looking directly into a toy green laser pointer. On examination, he had a best corrected visual acuity (BCVA) of 20/200 in the affected eye with central scotoma on Amsler grid testing. Fundus examination revealed a yellowish-white lesion at the fovea consistent with laser-induced retinal injury. Optical coherence tomography (OCT) confirmed disruption of the Ellipsoid and Myoid layers in the foveola (Figure 1). Sunglasses were prescribed, and the patient underwent monthly follow-up and experienced an improvement in vision up

Table 2. Demographic information, characteristics of the laser-induced posterior segment injuries, subsequent complications, and clinical course in patients referred to the clinic from January 2024 to January 2025.

No	Gender (M/F)	Age (years)	Affected Eye (OD/OS)	BCVA	Type of Laser Device	Clinical Manifestation	Initial Ocular Injury	Initial Treatment	Clinical Course/Delayed Complication	Secondary Treatment for Complication
1	M	16	OD	1/10	Toy green laser pointer	↓ VA	Elipsoid & Myoid zone disruption	Secondary preventive measures	Vision improvement up to 8/10 with repair of the Elipsoid and Myoid zone (4-month follow-up)	---
2	M	15	OD	5/10	Toy red laser pointer	↓ VA, Central scotoma	Elipsoid & Myoid zone disruption	Secondary preventive measures	Vision decreased to 3/10 with progress in Elipsoid & Myoid zone disruption (1-month follow-up)	---
3	F	12	OS	5/10	Toy green laser pointer	↓ VA, Central scotoma	Elipsoid & Myoid zone disruption	Secondary preventive measures	Stable clinical course (over 6-month follow-up)	---
4	M	8	OS	7/10	Toy green laser pointer	↓ VA, Floater	Elipsoid & Myoid zone disruption	Secondary preventive measures	Vision improvement up to 9/10 with repair of the Elipsoid and Myoid zone (3-month follow-up)	---
5	M	43	OS	8/10	Laser beam during a party	Floater	Elipsoid & Myoid zone disruption	Secondary preventive measures	Vision improved to 10/10 with repair of the Elipsoid and Myoid zone (4-month follow-up)	---
6	M	11	OD	2/10	Toy green laser pointer	↓ VA	Elipsoid & Myoid zone disruption	Secondary preventive measures	Vision decreased to 1/10 with Sub-Retinal Hx and progressed to CNV (2-month follow-up)	Intravitreal injection of Aflibercept (Eylea)
7	M	6	OS	5/10	Toy green laser pointer	↓ VA	Elipsoid & Myoid zone disruption	Secondary preventive measures	Stable clinical course (over 4-month follow-up)	---
8	F	11	OS	8/10	Green laser pointer in the classroom	↓ VA, Floater	Outer retinal disruption	Secondary preventive measures	Vision improvement up to 10/10 with repair of the outer retina (2-month follow-up)	---
9	M	5	OS	Not cooperate	Toy green laser pointer	↓ VA	Outer retinal disruption	Secondary preventive measures	Stable clinical course (over 3-month follow-up)	---
10	M	12	OD	5/10	Toy green laser pointer	↓ VA, Central scotoma	Outer retinal disruption	Secondary preventive measures	Stable clinical course (over 6-month follow-up)	---
11	M	21	OS	7/10	Laser beam during a party	↓ VA, Floater	Outer retinal disruption	Secondary preventive measures	Vision improvement up to 8/10 with repair of the outer retina (5-month follow-up)	---
12	F	30	OD	2/10	Laser beam during a party	↓ VA, Central scotoma	Outer retinal disruption	Secondary preventive measures	Vision decreased to 1/10 with pigmentary changes and progressed to CNV (1-month follow-up)	Intra-Vitreous injection of Bevacizumab
13	F	13	OS	1/10	Toy red laser pointer	↓ VA	Outer retinal disruption	Secondary preventive measures	Vision decreased to 6mFC with progress in Elipsoid & Myoid zone disruption (3-month follow-up)	---
14	M	28	OD	1/10	Green laser pointer in the classroom	↓ VA, Central scotoma	Outer retinal disruption	Secondary preventive measures	Vision decreased to 5mFC with Sub-Retinal Hx and progressed to CNV (1-month follow-up)	Intra-Vitreous injection of Bevacizumab
15	F	10	OD	3/10	Toy green laser pointer	↓ VA	Outer retinal disruption	Secondary preventive measures	Stable clinical course (over 6-month follow-up)	---
16	M	14	OS	5/10	Toy green laser pointer	↓ VA	Outer retinal disruption	Secondary preventive measures	Stable clinical course (over 6-month follow-up)	---
17	M	23	OS	8/10	Advertising green laser light	Floater	Outer retinal disruption	Secondary preventive measures	Vision improvement up to 9/10 with repair of the outer retina (2-month follow-up)	---
18	F	49	OD	9/10	During laser treatment of facial hair	Floater	Outer retinal disruption	Secondary preventive measures	Stable clinical course and floater resolved	---
19	M	9	OD	7/10	Toy green laser pointer	↓ VA, Central scotoma	Outer retinal disruption	Secondary preventive measures	Vision improvement up to 9/10 with repair of the outer retina (3-month follow-up)	---
20	M	14	OD	5/10	Green laser pointer in the classroom	↓ VA, Floater	Outer retinal disruption	Secondary preventive measures	Stable clinical course (over 5-month follow-up)	---

Table 2. Continued.

No	Gender (M/F)	Age (years)	Affected Eye (OD/OS)	BCVA	Type of Laser Device	Clinical Manifestation	Initial Ocular Injury	Initial Treatment	Clinical Course/Delayed Complication	Secondary Treatment for Complication
21	M	7	OD	6mFC	Toy green laser pointer	↓ VA	Outer retinal disruption	Secondary preventive measures	Stable clinical course (over 4-month follow-up)	---
22	M	9	OS	HM	Toy green laser pointer	↓ VA	Sub-ILM Hx, Sub-Hyaloid Hx	Secondary preventive measures	Loss to Follow up	---
23	F	45	OD	2mFC	Advertising green laser light	↓ VA	Sub-ILM Hx	YAG-laser posterior hyaloidotomy	Vision improvement up to 9/10 with resolving Hx (2-week follow-up)	---
24	F	21	OS	2mFC	Laser beam during a party	↓ VA, Central scotoma	Sub-Hyaloid HX	YAG-laser posterior hyaloidotomy	Vision improvement up to 10/10 with resolving Hx (1-month follow-up)	---
25	M	15	OD	HM	Toy green laser pointer	↓ VA	Sub-Hyaloid Hx	YAG-laser posterior hyaloidotomy	Vision improvement up to 8/10 with resolving Hx (2-week follow-up)	---
26	M	6	OD	Not cooperate	Toy green laser pointer	↓ VA	N/A	None	Sub-Retinal Hx	Intravitreal injection of aflibercept (Eylea)
27	F	12	OS	6mFC	Toy green laser pointer	↓ VA, Metamorphopsia	Sub-Retinal Hx		Loss to Follow up	---
28	M	17	OS	1/10	Toy red laser pointer	↓ VA, Metamorphopsia	Sub-Retinal Hx	1-Month Follow up	Vision decreased to 6mFC with the spread of Sub-Retinal Hx (2-month follow-up)	Intravitreal injection of aflibercept (Eylea)
29	F	33	OD	2/10	During laser treatment of facial hair	↓ VA, Metamorphopsia	Traumatic MH (Stage 1B)	1-Month Follow up	Vision improvement up to 8/10 and MH spontaneously resolved (3-month follow-up)	---
30	M	16	OS	3/10	Toy green laser pointer	↓ VA, Metamorphopsia	Traumatic MH (Stage 1B)	1-Month Follow up	Vision improvement up to 7/10 and MH spontaneously resolved (3-month follow-up)	---
31	F	59	OD	3mFC	During laser treatment of facial hair	↓ VA	Traumatic FTMH	1-Month Follow up	Traumatic FTMH (1-month follow-up)	PPV + inverted ILM Flap
32	F	46	OS	HM	Laser therapy operator with several accidental exposures to laser beam light	↓ VA	N/A	None	Chorioretinal Atrophy	Tertiary preventive measures

(Abbreviations: VA=Visual Acuity; OD=Right Eye; OS=Left Eye; BCVA=Best Corrected Visual Acuity; CNV=Choroidal Neovascularization; MH=Macular Hole; FTMH=Full Thickness Macular Hole; Hx=Hemorrhage; PPV=Pars Plana Vitrectomy; ILM=Internal Limiting Membrane; HM=Hand Motion; FC= Finger Counting; mFC=Meters Finger Counting)

to 8/10 after 4 months. In the serial OCT, the repair of the Ellipsoid and Myoid zone of the retina was visible in the foveal area.

Case#2: Another case was a 15-year-old male presenting with decreased vision and central scotoma in the right eye after accidentally looking directly into a toy red laser pointer. A disruption in the ellipsoid and myoid zone was observed in OCT at the first visit. Progressively decreased vision and ellipsoid and myoid zone disruption were observed at the follow-up visit after one month (Figure s1).

Case#5: Also, a 43-year-old male presented with a floater in the left eye after accidentally looking directly into a laser beam during a party. BCVA was 8/10 in the affected eye and OCT imaging demonstrated a disruption in the ellipsoid and myoid zone. The patient underwent follow-up and secondary preventive measures. In one-month follow-up, vision improved to 10/10 and ellipsoid

and myoid zone disruption was resolved (Figure s2).

Outer Retinal Disruption

Case#8: An 11-year-old female presented with complaints of low vision and a floater in her left eye from one month ago after being exposed to a laser pointer during the classroom presentation. Fundus examination revealed loss of the foveal reflex. OCT demonstrated the disruption of the photoreceptor layer and outer nuclear layer. The patient was followed up with explanations to prevent re-trauma. Despite no repeat visit, telephone follow-up noted a significant improvement in vision and resolution of the floater.

Choroidal Neovascularization (CNV)

Case#12: A 30-year-old female presented with complaints of blurry vision and central scotoma in her right eye after being exposed to a laser beam during a party. She had a

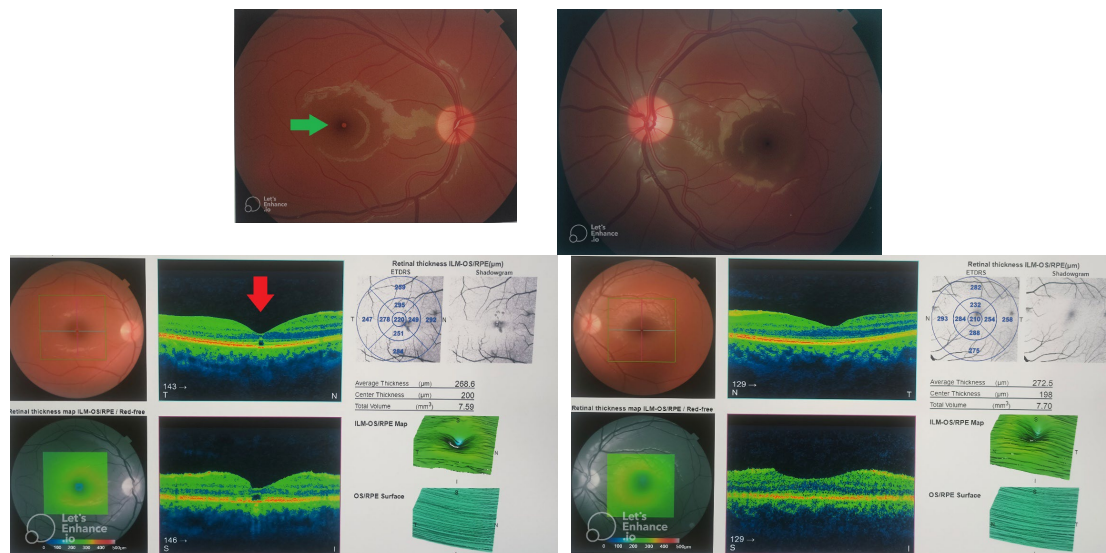


Figure 1. A 16-year-old male presented with complaints of sudden vision loss in his right eye after accidentally exposure to a toy green laser pointer. Fundus examination (top row) revealed a yellowish-white lesion at the right eye fovea consistent with laser-induced retinal injury (green arrow). OCT B-Scan confirmed disruption of the Ellipsoid & Myoid layers in foveola (red arrow). (OCT: Optical Coherence Tomography)

40/200 BCVA, and fundus examination revealed a well-defined circular lesion at the macula with surrounding hemorrhages. OCT demonstrated the disruption of the photoreceptor layer and outer nuclear layer (Figure 2). In one-month follow-up, BCVA decreased to 20/200, and fundus examination revealed pigmentary changes and fluorescein angiography (FA) showed hyperfluorescence corresponding to the lesion site. The patient was treated with intravitreal anti-vascular endothelial growth factor injections for choroidal neovascularization (CNV) secondary to laser-induced retinal injury.

Sub-Hyaloid Hemorrhage

Case#22: A 9-year-old boy presented with acute vision loss in his left eye after intentionally shining a green laser pointer into his eye while playing. Visual acuity was hand motion in the affected eye. Fundus examination revealed a large area of sub-hyaloid and sub-ILM hemorrhage at the macula, consistent with severe laser-induced retinal damage. Due to low vision and poor cooperation, OCT images were accompanied by artifacts (Figure 3).

Sub-ILM Hemorrhage

Case#23: A 45-year-old woman was referred to our clinic for vision loss in her right eye after being exposed to advertising laser light while walking on the street. On initial examination, the BCVA of the right eye was finger counting at 2 meters, and sub-ILM hemorrhage was evident on funduscopy. OCT imaging also confirmed the localization of hemorrhage in the sub-ILM. The patient underwent YAG-laser posterior hyaloidotomy, and hematoma evacuation was evident during treatment. At follow-up two weeks later, BCVA increased to 9/10, and no damage to the outer layers of the retina was reported

on repeat OCT (Figure 4).

Sub-Retinal Hemorrhage

Case#26: The next case is a 6-year-old boy who developed vision loss in his right eye 2 months ago after looking at a toy laser pointer and was followed up by a general ophthalmologist. He was referred to a retina specialist due to the progression of vision loss. Examinations revealed an elevated lesion on the central macula with subretinal hemorrhage, and OCT imaging showed hyperreflective subretinal prominence consistent with subretinal fibrovascular tissue (Figure S3). Based on the diagnosis of CNV, the patient was treated with intravitreal injection of aflibercept (Eylea). In addition to preventive recommendations, regular follow-up was scheduled, but as of the time of writing this article, they still have not returned after a month.

Macular Hole (MH)

Case#30: A 16-year-old boy presented with acute vision loss in his left eye after intentionally shining a red laser pointer into his eye while playing. Visual acuity was 3/10 in the left eye. Fundus examination revealed loss of the foveal reflex with a yellow ring in the central macula, and OCT demonstrated partially thickness central foveal separation consist with stage-1B macular hole (MH) (Figure S4). The patient underwent follow-up with secondary preventive measures. MH spontaneously resolved without intervention in one-month follow-up, and the patient's vision improved to 10/10. The spontaneous resolution seen in this patient is consistent with Petrou et al., who reported bilateral macular hole closure without surgical intervention following laser pointer exposure (9).

Case#31: A 59-year-old female patient developed



Figure 2. A 30-year-old female presented with complaints of blurry vision and central scotoma in her right eye after being exposed to a laser beam during a party. OCT demonstrated disruption of the photoreceptor layer and outer nuclear layer (green arrow). In one month follow up vision decreased and fundus examination revealed a pigmentary changes and follow-up OCT showed CNV secondary to laser-induced retinal injury (red arrow). (OCT: Optical Coherence Tomography, CNV: Choroidal Neovascularization)

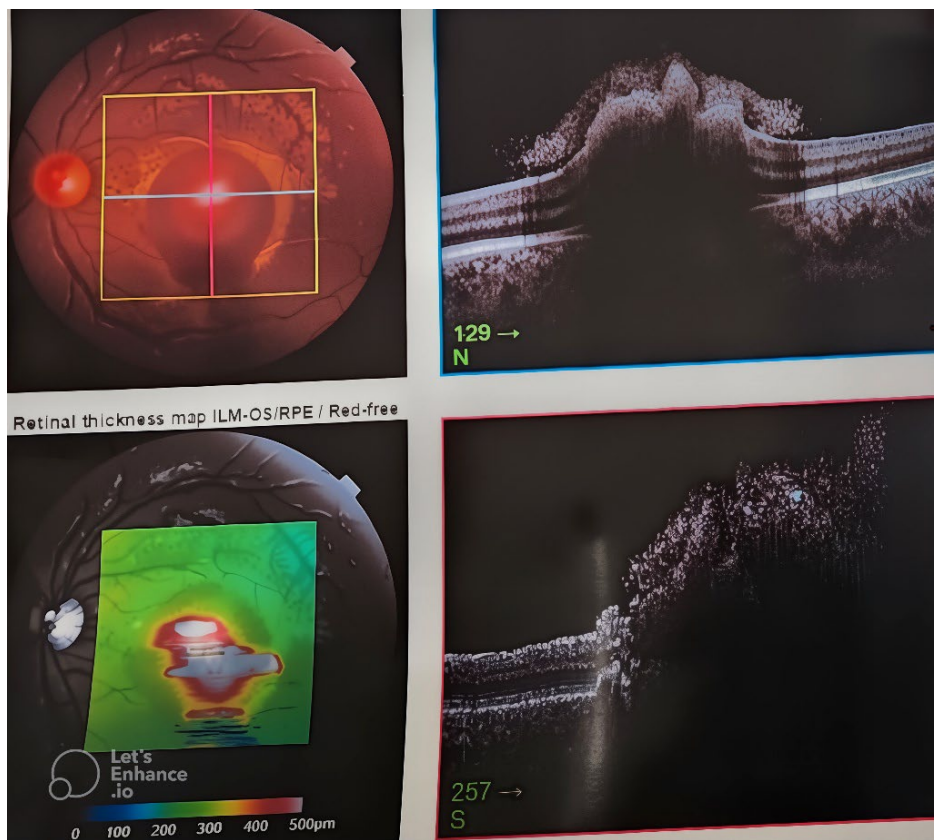


Figure 3. A 9-year-old boy presented with acute vision loss in his left eye after intentionally shining a green laser pointer into his eye while playing. Fundus examination revealed a large area of sub-hyaloid and sub-ILM hemorrhage at the macula consistent with severe laser-induced retinal damage. Due to low vision and poor cooperation, OCT images were accompanied by artifacts. (OCT: Optical Coherence Tomography)

vision loss in her right eye following accidental exposure to laser light during laser treatment of facial hair. On examination, she had BCVA of finger counting at 3 meters, and a macular hole (MH) was evident on fundus examination. OCT imaging also confirmed the full-thickness macular hole (FTMH). With the possibility of

spontaneous closure of the traumatic FTMH, the patient underwent a one-month follow-up, but no improvement was achieved and the patient was considered a candidate for pars plana vitrectomy with an ILM inverted flap. Following surgery, the patient's vision improved to 3/10 with successful closure of the MH.

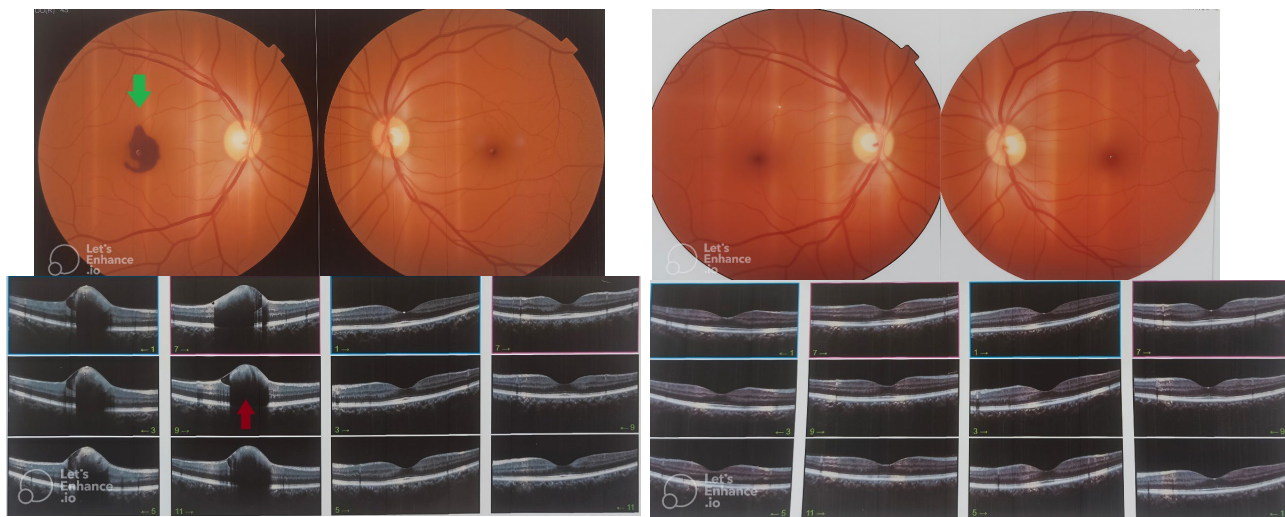


Figure 4. A 45-year-old woman referred for vision loss in her right eye after being exposed to advertising laser light. On initial examination, a sub-ILM hemorrhage was evident on fundoscopy (green arrow). OCT imaging also confirmed the localization of hemorrhage in the sub-ILM (red arrow). The patient underwent YAG-laser posterior hyaloidotomy, and at 2 weeks follow-up, vision improved, and no damage to the outer layers of the retina was reported on repeat OCT (images on the right). (OCT: Optical Coherence Tomography, ILM: Internal Limiting Membrane, YAG-laser: Yttrium Aluminum Garnet-laser)

Chorioretinal Atrophy (CRA)

Case#32: The next case was a 46-year-old female laser therapy operator who had a history of several accidental exposures to laser beam light in previous years in her left eye (patient's previous documents are not available). Fundus examination revealed a large area of chorioretinal atrophy with pigmentary changes at the macula, consistent with severe laser-induced retinal damage. Visual acuity was hand motion only in the affected eye. The patient was consulted on the irreversible nature of his condition and was referred for low-vision rehabilitation. Also, he was counseled on the importance of protective eyewear when handling lasers.

Discussion

Due to the photothermal laser damage localized in retinal pigment epithelium (RPE), the most common tissue involved is the retina, and the most common anatomical area involved is the outer retina.² Also, other light toxicities frequently affect the outer retina and RPE, and Chromophores are theorized to mediate this damage to the retina.¹⁷ According to a qualitative survey in this study, the prognosis of patients is dependent on the initial visual acuity, and patients with better vision had a higher chance of recovery. Optical coherence tomography played a crucial role in both diagnosis and follow-up, allowing the visualization of structural repair patterns such as restoration of the ellipsoid and myoid zones, which correlated with functional improvement.¹⁸⁻¹⁹

Interestingly, our series highlights several cases of spontaneous resolution of macular holes and ellipsoid zone disruptions, suggesting that conservative management may be viable in the selected cases, particularly when vision remains relatively preserved at presentation. As shown in this study, the majority of patients are young and deaf,

which, due to permanent visual complications, can cause functional impairment in the future and place a significant burden on the health system. Among the 32 cases, 14 presented with ellipsoid and myoid zone disruption, 8 developed outer retinal disruption, 5 experienced subretinal or sub-ILM hemorrhage, and 3 progressed to complications such as choroidal neovascularization or macular holes requiring intervention. These findings align with previous reports showing that children and adolescents are disproportionately affected, likely due to limited awareness and inadequate supervision during laser exposure. It is important to note that this study has several limitations, including its retrospective nature, reliance on patient-reported exposure events, and lack of standardized follow-up intervals across all cases. One strength of this study is its consecutive collection of real-world cases over a one-year period, capturing a diverse spectrum of laser-induced retinal injuries and their outcomes in both pediatric and adult populations. On the other hand, we estimate that due to the high prevalence of trauma in children who may not be able to articulate vision problems, the incidence of these traumas is likely to be much higher and we may be dealing with an iceberg.

This study showed that, in addition to the increasing prevalence of laser injuries resulting from the widespread use of laser toys, traumas caused by laser equipment used for advertising, educational purposes, and light dance parties are on the rise.

These patients are candidates for secondary preventive measures, including avoiding re-trauma and preventing further photic injuries by prescribing protective glasses (with the assumption that first, these patients are more sensitive to these traumas and second, re-trauma can worsen the condition). It is recommended that the injurious device be removed for the sake of others, with

the assumption that standard precautions are likely not included in these devices. Also, we recommend increasing public awareness about the harmful effects of using laser pointers in different ways, including the use of social media. Also, some policies should be designed to ban the use of these tools at the community level, especially in toy stores. In addition, the need for public awareness and especially parental education is of great importance.

Conclusion

Retinal damage caused by laser pointers can result in irreversible visual impairment and significant impacts on the quality of life. Healthcare providers should educate patients on the potential risks associated with laser pointer use and emphasize the importance of proper safety measures to prevent ocular injuries. In addition, regulatory authorities should consider stricter controls on the sale and marketing of high-powered laser devices, especially those labeled as toys or recreational items. Further research is needed to establish guidelines for the safe use of laser pointers and improve outcomes for patients with laser-induced retinal damage.

Finally, education and awareness about the potential risks of laser pointer injuries are key in preventing ocular damage. Moreover, regulatory frameworks must be strengthened to ensure proper labeling, restrict access to high-powered devices, and mandate protective eyewear in occupational settings where laser exposure is routine. However, necessary arrangements and policies to ban the use of these tools at the community level, especially in toy stores, should be made. Given the rising trend of laser pointer misuse and its potentially irreversible consequences, coordinated efforts among clinicians, policymakers, and educators are essential to prevent vision loss.

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Conceptualization: Masood Bagheri.

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Competing Interests

The authors have no conflicts of interest to declare.

Ethical Approval

The current study was approved by the local Ethical Committee of the Kermanshah University of Medical Sciences (code: IR.KUMS.REC.1404.185) and complied with the tenets of the Declaration of Helsinki. Informed consent was obtained from the all patients.

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Patient's Consent

Written informed consent was obtained from each patient.

Supplementary Files

Supplementary file 1 contains Figure S1-S4.

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