

## Laser Pointer Retinopathy

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### Abstract

**Purpose:** Clinical description of laser pointer retinopathy.

**Methods:** Retinal burns leading to acute visual loss were documented by fundus photos and angiography in three eyes of two patients.

**Case Reports:** A student competing with his friends to stare longer at a laser pointer (?power) resulted in bilateral retinal burns (final VA 20/100 and 20/40). Another student developed a foveal burn in his right eye (final VA was 20/40). This was a result of staring at a 5mW laser pointer.

**Conclusion:** Laser pointers can result in serious retinal damage and choroidal neovascularization, especially long exposure to powerful ones [1]. However, the scientific literature showed that laser eye injuries are uncommon due to the use of nonindustrial lasers [2].

### Introduction

Laser pointers are useful presentation aids. Recently laser pointers have been misused to distract people and drivers [3]. The beam of a powerful laser pointer can be a hundred times more powerful than the brightest sunlight [3]. The classification of lasers differs in Europe and in the USA [4,5]. Under European standards a 5mW laser key chain is classed 3B where it is considered in the USA as class 3A. It is known that class 3B can deliver power up to 500mW [4,5]. Laser pointers are considered safe and cause dazzling if viewed momentarily [6].

Nevertheless retinal photocoagulation can occur with exposure to class 3A laser for more than 10 seconds [7-12]. Although vision may improve spontaneously, most cases require intervention [8]. Malingers may present with visual problems after exposure to a laser pointer, a problem that has been encountered worldwide [6-10]. Unregulated access to commercially available high-power handheld laser devices is dangerous and public awareness should be encouraged [8]. We report 3 eyes with photocoagulation from misuse of laser pointers.

### Case Reports

#### Case 1

A fifteen year old male student presented the complaint of poor quality of vision in both eyes for 2 months. There was no history of sun or eclipse gazing, no history of trauma. He was generally healthy. Three months ago, he was competing with his friends to stare at the beam of a laser pointer for the longest period. His best corrected VA was 20/100 in the right eye and 20/40 in the left eye.

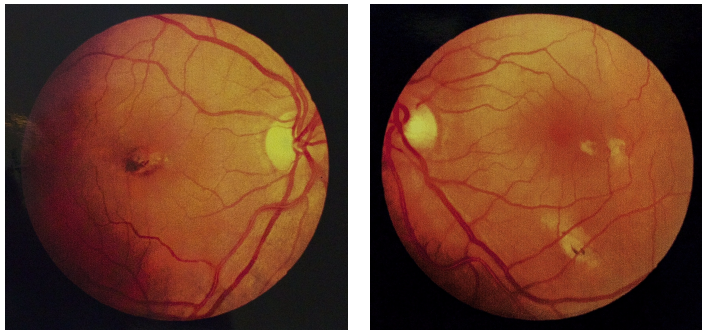
Intraocular pressure was normal both eyes. Slit lamp examination was within normal limits.

Dilated fundus exam showed a large foveal photocoagulation scar in the right eye (Figure 1). The left fundus had multiple parafoveal scars (Figure 2). He recalls dazzling of vision in the right eye when he first gazed at the laser pointer for a period of approximately 10-15 seconds. On another occasions he looked at the pointer for shorter periods but did not fixate directly on the beam. On both occasions he held the laser pointer himself in front of the involved eye. Fluorescein angiography showed typical photocoagulation scars in both eyes (Figures 3 and 4). The exact class and power of the device was not available. Two of his friends were evaluated and had no retinal changes to report. However, they clearly stated that they were afraid to look at the laser beam for more than a second or two. VA was 20/20 in both students. Three students of the same group refused to be examined and retinal damage could not be ruled out.

#### Case 2

An eight year old male student had an acute decrease in vision after gazing with his right eye at a 5 mW laser pointer. The exact exposure duration was not known, due to dazzling of vision with continuous exposure. He was a known myope with documented corrected VA of 20/20 in both eyes six months prior to presentation. Three hours later, his VA was only CF at 7 feet as noted by his referring physician who started him on 30mg of prednisone oral once a day. One week later, his VA became 20/200 in the affected eye. The prednisone was tapered over three weeks. Three weeks

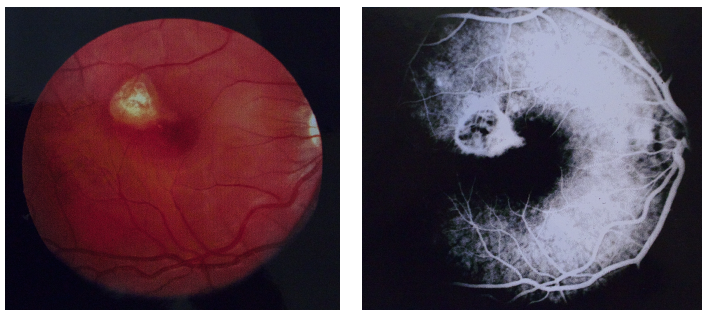
later the eye was quiet with normal intraocular pressures and slit lamp exam. The VA was 20/40 with best correction in the affected eye. The fundus exam showed a parafoveal large photocoagulation scar (Figures 5 and 6).



**Figures 1 and 2: Case no 1-** A large foveal burn in the right eye. **Case no. 1-** multiple parafoveal scars in the left eye.



**Figures 3 and 4: Case no 1-** Angiography showing bilateral scars typical of photocoagulation.



**Figures 5 and 6: Case no 2-** large parafoveal scar with resolving retinal edema 3 weeks post laser pointer exposure, and angiography of the same lesion.

## Discussion

Laser pointers though regarded as safe devices, they still carry the risk of potential damage to the eyes. The long exposure to class 3 lasers can come with photocoagulation of the retina [5]. In adults, pupil, blink and aversion responses are protective from laser pointer exposure in less than 0.25 seconds [6-10].

It is clearly illustrated from these two patients that serious retinal damage can develop from misusing powerful laser pointers. Although the final scar in the second patient was large, the effect and role of systemic prednisone needs further investigation. From these two patients, the following recommendations are to be

considered [6-11].

- Use of class 3 laser pointers in public should be controlled.
- Instructions, warnings and laser output should be well-labeled in all types of laser pointers.
- All imported laser devices should pass authority check for power output and therefore its safety for public use.
- Laser hazards and safety should be well outlined to the public.
- The sale of these devices should be limited to professions and should be kept away from children.

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