International Journal of Science and Research (IJSR)
ISSN: 2319-7064
SJIF (2019): 7.583

Laser Device Induced Retinopathy: An Uncommon and Under-reported Public Health Issue

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Abstract: ***Laser devices and gadgets are readily and cheaply available in today's day and age in online marketplaces. These devices are popular among children and young adults alike. There is an alarming lack of knowledge among the general population in general and this demographic in particular about the risk of eye injury potential of these lasers. The number of laser induced retinopathy cases are on the rise and yet remain under-reported and under-diagnosed. We describe a case of a 30 year old male who presented with central scotomas 3 days after having directly viewed laser emanating from a handheld playing gadget. We aim to highlight the importance of educating the general public about the potential harmful nature of handheld lasers and helping eye care professionals identify such cases as they can mimic retinal dystrophies if the patient is not forthcoming with history of laser exposure.***

Keywords: Laser Induced Retinopathy, Handheld Lasers, Retinal Dystrophy, Central Scotoma, Optical Coherence Tomography

1. Case

A 30 year old male presented to the outpatient department with complaints of black spots in the visual field since 3 days. He reported the symptoms started after having directly seen the laser coming out of a handheld playing gadget. His Best Corrected Visual Acuity was 6/36 in both eyes. On dilated fundus examination, large areas of macular scarring was noted in both eyes (fig 1a and b). Fundus autofluorescence images revealed hypoautofluorescent areas corresponding to the macular scars in fundus photography suggesting Retinal pigment epithelium loss (fig 2a and b). Optical coherence tomography images of both eyes revealed hyperreflective signal in the outer retinal layers with Ellipsoid zone loss and External limiting membrane discontinuity (Fig 3a and b). The patient was started on oral prednisolone acetate 1mg/kg body weight and asked to review in a week but was lost to follow up.

Fundus photography of a 30 year old male with laser induced retinopathy

Fig 1a and b show macular scarring in right and left eye respectively at the time of presentation

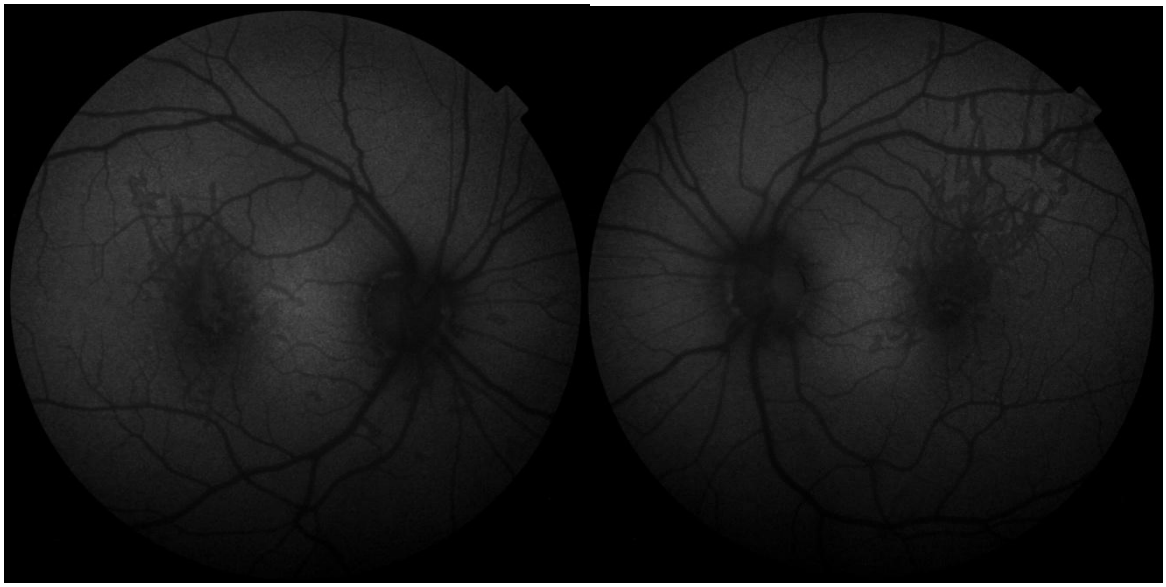

Figure 2 (a) & 2 (b): Fundus autofluorescence images show hypoautofluorescent areas corresponding to the scarring in fundus photographs

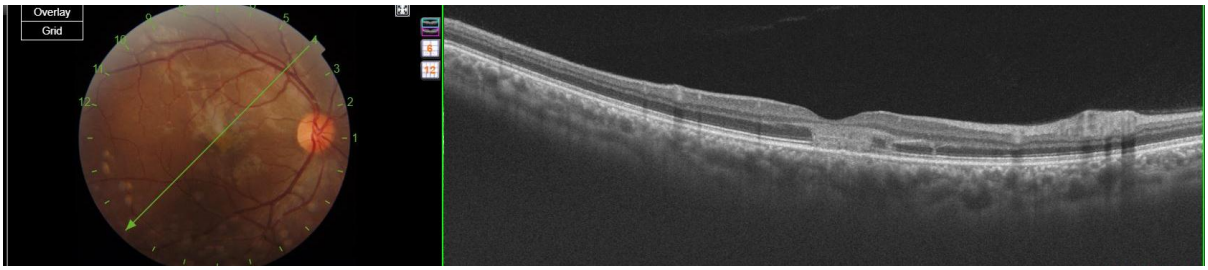

Figure 3 (a): OCT image of right eye showing hyperreflective signal at the outer retinal layers with ellipsoid zone and external limiting membrane loss

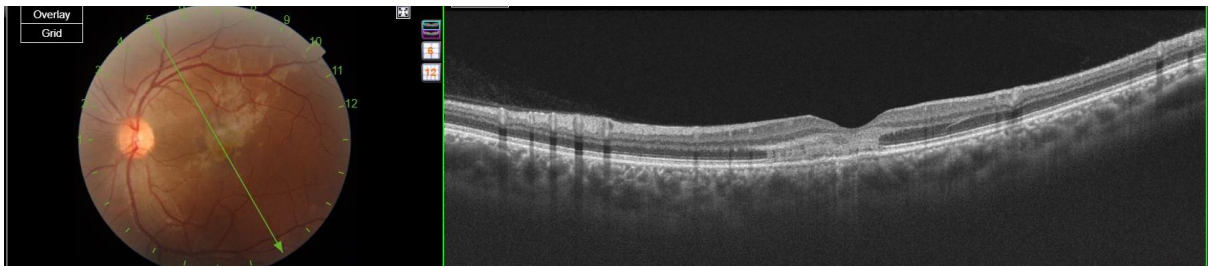

Figure 3(b): OCT image of left eye showing hyperreflective signal at the outer retinal layers with ellipsoid zone and external limiting membrane loss

2. Discussion

Laser induced retinopathy is an under diagnosed and under-reported public health problem with numbers that will only increase with the increasing ease of availability of handheld laser gadgets and devices. The knowledge of the risks involved with such devices however is minimal even among the otherwise educated. The mechanism of retinal injury due to laser is by photocoagulation, photodisruption and photochemical reactions [1]. Some laser pointers also emit infrared energy [2]. The degree of damage depends on the focus, duration, power and wavelength [1]. The resulting damage and its sequelae may range from no clinical damage to severe reduction in visual acuity [3]

Laser induced retinopathy unfortunately has no recognised treatment, although a variety of different approaches have been reported with some success. These include oral corticosteroids[4], oral lutein[5] and pars plana vitrectomy with internal limiting membrane peeling[6] for laser induced macular holes. Further studies are needed to ascertain the proper timing and dosage of pharmaceutical intervention especially corticosteroids in laser induced retinopathy cases.

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