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Case Report

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Macular burn due to diode laser

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Abstract

In this study, it was aimed to present a 26-year-old female patient with a macular burn due to a direct laser beam to the eye during laser epilation cleaning without turning off the device. The patient was a technician performing laser epilation.The patient's vision was found to be 2/10 on the Snellen chart. Anterior segment findings were found to be normal.Fundus examination revealed a hemorrhagic hypopigmented burn in the macula due to laser, hemorrhage in the vitreous, and color fundus photograph was taken in both eyes. Optical coherence tomography (OCT) showed a burn in the macular area.The patient was given oral steroids, topical steroids, and topical nonsteroid anti-inflammatory drugs (NSAIDs) and was called for examination on the 15th and 30th days.

Keywords: macular burn, diode laser, intravitreal hemorrhage

1. Introduction

The laser concept was developed by Albert Einstein in 1917 as part of quantum theory. The laser method was initially used for military or industrial purposes. Laser systems were produced much later for medical applications. The principle of laser hair removal, which is one of the medical applications, is to ensure that the color substance called melanin, which is located in the hair follicle, is captured by laser light and converted into heat, and then destroys the hair follicle with this heat energy. Diode laser is a laser type frequently used in hair removal and has a wavelength of 810 nm and a power of 0.4 Mw (1). It is frequently used in beauty salons to burn hair follicles on the skin. In this study, it was aimed to present a 26-year-old female patient with a macular burn due to a direct laser beam to the eye during laser epilation cleaning without turning off the device. The patient was a technician performing laser epilation.

2. Case Report

The left eye of a 26-year-old female patient was exposed to a diode laser beam for a few seconds (Fig. 1a). The patient presented to our clinic immediately after the exposure, noticing that the central visual field was blurred and irregular. On examination, the patient's vision was found to be 2/10 on the Snellen chart. Anterior segment findings were found to be normal. Fundus examination revealed a hemorrhagic hypopigmented burn in the macula due to laser, hemorrhage in the vitreous, and color fundus photograph was taken in both eyes (Fig. 1b). Optical coherence tomography (OCT) showed a burn in the macular area (Fig. 1c). The patient was given oral steroids, topical steroids, and topical nonsteroid anti-inflammatory drugs (NSAIDs) and was called for examination on the 15th and 30th days. The patient was followed up with a color fundus photograph and OCT in controls. After 30 days, the patient's vision was 5/10 on Snellen's scale the vitreous hemorrhage disappeared and a macular scar was observed on OCT.

3. Discussion

Lasers are divided into four different hazard classes within the framework of IEC 825 and ANSI Z136.1 norms. These standards take into account the potential hazard to the eye when classifying lasers. ANSI standards include diode laser class 1 (1,2,3,4). The lens focuses laser beams of wavelength 750–1400 nm onto the retina, and damage may occur. Semiconductor diode lasers appear harmless, but a 15 mW, 870 nm semiconductor diode laser has more than enough power to damage the retina permanently. Almost all therapeutic lasers used in medicine pose an eye hazard. Most lasers used in medicine and materials processing produce wavelengths of light that are invisible to the human eye. The invisibility of the laser and the fact that it can reflect from different surfaces in relation to its wavelength increase the danger (5). Retinal damage in people exposed to laser radiation is directly proportional to factors such as laser power, wavelength, contact time, and pupil size. Laser exposure may cause damage

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to the retinal pigment epithelium by photomechanical, thermal, and photochemical events (6).

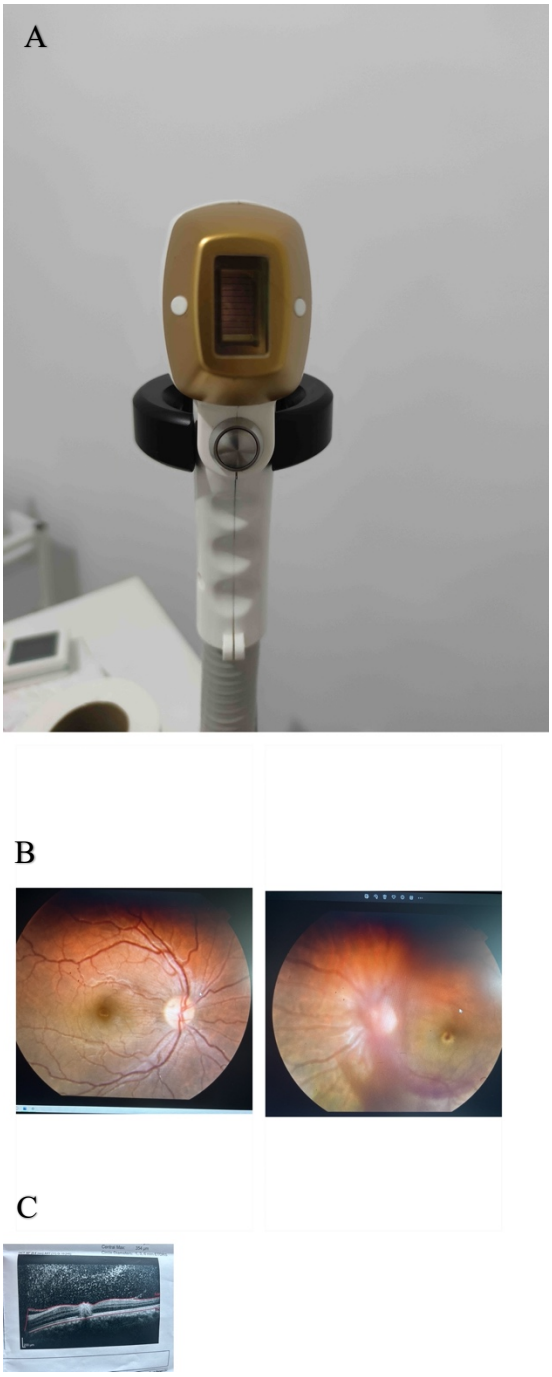

Fig. 1. Diode laser beam (A), photograph of both eyes (B), OCT (C).

There is reporting of unilateral anterior uveitis and a macular defect following inadvertent laser exposure, leading to photophobia, pain, and decreased visual acuity (7). Retinal pigment epithelium appears white after acute photocoagulation injury. Symptoms are taken into consideration in the evaluation of patients (8). In order to prevent the damage that a laser beam can cause to the eye, it is necessary to pay more attention and control the measures taken.

It is of great importance to be aware of the potential hazards that exist when working with laser devices and to take some precautions in advance against the negative situations that people working in this environment may encounter. It may not be possible to return the eye damage encountered. It is of great importance to provide sufficient information about this technological product widely used in our country and to take the necessary precautions for people who will work in this environment.

Conflict of interest

The authors have no conflict of interest to declare.

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Informed consent from the patient has been obtained.

Authors' contributions

Concept: B.D.K, B.U., Design: B.D.K, B.U., Data Collection or Processing: B.D.K, B.U., Analysis or Interpretation: B.D.K, B.U., Literature Search: B.D.K, B.U., Writing: B.D.K, B.U.,

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