

Case Report

Low Vision in a Patient Due to Retinal Dystrophy upon Refractive Surgery

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Abstract

A 26-year-old lady with a severe visual fall was referred to the Basir eye clinic for electroretinography (ERG). She claimed that three years ago she had undergone refractive surgery for her visual acuity fall, and since then she was experiencing gradual visual decay. Herein, the ERG recording showed that she was suffering from retinal dystrophy. Thus, in certain cases, before performing refractive surgery, an ERG-mediated retinal examination is suggested for achieving the desired outcome.

Keywords: Retinal Dystrophy; Refractive Surgery; Electroretinography.

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Introduction

Low vision is a vision loss that cannot be corrected with glasses, contacts, or surgery. It can be caused by visual pathways or retinal disturbances, whereas these two sections of the visual system can be screened by certain electrophysiology tests. Visual evoked potential (VEP), electrooculography (EOG), and electroretinography (ERG) are among these techniques. These tests can be used in different physiological and pathological conditions of the visual system.

Accordingly, Shushtarian SM et al (1999) measured VEP during the physiological menstrual cycle of a female subject with a normal visual system. They observed the delay in VEP, P 100 peak during this period which was due to hormonal changes¹. VEP is an electrophysiology test that is primarily used for diagnosing demyelinating diseases like multiple sclerosis^{2,3}.

Tajik F et al (2018), on the other hand, worked on the toxic effects of amiodarone on the retina of patients with heart failure. The results showed the toxicity of the medication which can be diagnosed by the Arden Index (AI) of the EOG test⁴.

Using ERG, Shushtarian SM et al (2018) studied the effect of occupational vibration on the human retina. To this end, they selected 50 workers from a textile factory who worked with the machinery producing heavy vibration. The authors observed that occupational vibration had an adverse effect on the retina, which was diagnosed by the b wave of ERG⁵. ERG test is mainly applied to detect retinal dystrophy diseases like retinitis pigmentosa (RP). In this regard, Naser M et al (2020) investigated the pathological changes of the retina in RP patients and concluded that the amplitude and latency of ERG a and b waves could be helpful to reveal the extent of retinal degeneration in

RP patients⁶.

Besides the mentioned reports, there are multiple other studies around the application of VEP, EOG, and ERG tests⁷⁻¹⁹. Here, the ERG test was examined on a lady with visual disturbances despite undergoing refractive surgery.

Case report

A 26-year-old female subject with severe visual disturbances was referred to the Basir eye clinic for an ERG examination. Three years before, she had been admitted to refractive surgery, but since then her vision was not improved. Noteworthy, her fundus was normal. The patient was also tested for demyelinating diseases, and the result was negative. Then, she was examined with the ERG test, which showed a reduction in the amplitude of ERG, b wave peak in both eyes; 18.5 μv and 25.3 μv for the right and left eye, respectively (the normal value for the amplitude of ERG b wave should be above 100 μv in our laboratory). It is a well-known fact that ERG is originating from retinal layers. The test's result along with other necessary tests was in favor of retinal dystrophy.

Discussion

Refractive surgery is a safe technique unless the patient has a certain silent underlying disease or visual disturbance which is missed to notice before surgery. A 26-year-old lady with a clear fundus had undergone refractive surgery for her visual acuity fall, however, she still complained of visual disturbances. The ophthalmologist checked the patient and everything was correct as far as the surgery was concerned. Finally, the ophthalmologist referred her for the ERG test and the result showed severe retinal dystrophy, which was

previously missed by the consulting doctor.

In this regard, the following case reports may be taken into consideration. Shushtarian SM et al (2020) reported a case who complained of diplopia and blurry vision on his second refractive surgery attempt. It was assumed that this condition was due to side effects of surgery, however screening the visual system using VEP, magnetic resonance imaging (MRI), and other necessary techniques showed that the patient was suffering from visual pathway disorder, and the symptom was not due to the surgery²⁰.

Naser M et al (2017) also reported a case who claimed to see colored rings around the lights after refractive surgery. The ophthalmologist was quite certain regarding the surgery. So, the patient was undergone VEP, ERG, and EOG tests, and all test results were abnormal. Thereafter, the patient was asked about any pathological problem that can affect the visual system, and he disclosed that he had a heart problem and was thereby under amiodarone treatment²¹. Like the previous case, the symptom was not caused by the surgery, but by the amiodarone.

Conclusion

Altogether, it is concluded that in the case of patients undergoing refractive surgery, a full screening of the visual system should be performed mainly by VEP, ERG, and EOG to avoid any possible visual disorders upon the surgery.

Article Notes:

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Footnotes and Financial Disclosures

Conflict of interest:

The authors have no conflict of interest with the subject matter of the present manuscript.