Choroidal neovascularization due to endogenous candida endophthalmitis in a COVID-19 patient

Senol Sabanci[1], Muhammet Kazim Erol[2], Fulya Duman[2]

ABSTRACT

Endogenous endophthalmitis is a serious condition that threatens vision and globe integrity with complications such as choroidal neovascularization membrane (CNVM), retinal scarring, and phthisis bulbi. Immunosuppressive conditions, endocarditis, and the long-term use of broad-spectrum antibiotics can be counted among the causes of endogenous endophthalmitis. In recent years, there has been a noticeable increase in opportunistic infections due to the increase in the number of people admitted to intensive care units with the COVID-19 pandemic and the immunosuppression seen as a result of long-term antibiotic and corticosteroid treatments. Iatrogenic opportunistic infections can occur in many different parts of the body. In this report, we present a case of CNVM caused by endogenous Candida endophthalmitis in a 60-year-old male patient who received intensive care for a long time due to COVID-19.

Keywords: Endogenous endophthalmitis,choroidal neovascularization membrane, optical coherence tomography angiography.

INTRODUCTION

Endogenous Candida endophthalmitis is the most common cause of endogenous endophthalmitis and begins as focal or multifocal chorioretinitis. Risk factors include drug abuse, broad-spectrum use, immunosuppression, debilitating chronic diseases, and intravenous drug addiction. Endophthalmitis caused by Candida albicans can lead to retinal scarring, choroidal neovascular membrane (CNVM), and phthisis bulbi. Evisceration or enucleation may be required in some cases.

In this case report, we present the optical coherence tomography (OCT) angiography findings of a case of CNVM associated with endogenous endophthalmitis caused by C. albicans in a patient with a history of prolonged intensive care due to COVID-19.

CASE REPORT

A 60-year-old male patient who stayed in the intensive care unit for 40 days due to COVID-19 was referred to our ophthalmology clinic due to the decrease in his vision in the right eye that had started 13 days after leaving the intensive care unit. The initial examination of the patient revealed 3+ cells in the anterior chamber, vitritis, a yellowish chorioretinitis focus, vitreous opacities, and epiretinal membrane (Figure 1a-1b). While waiting for the laboratory results required for a diagnosis, a further decrease in vision in the right eye (finger counting from 20 centimeters), an increase in anterior chamber reaction, a 1-mm hypopyon, and a dense vitreous reaction were detected. Blood and urine culture samples were taken, and the patient underwent pars plana vitrectomy (PPV). For culture analysis, vitreous tap samples were taken at the beginning of the operation. At the end of the operation, intravitreal vancomycin, ceftazidime, and amphotericin B were administered. While there was no growth in the blood culture, C. albicans grew in the urine and vitreous tap samples. Thereupon, oral fluconazole 300 mg/day treatment was started and continued for 20 days.

1- MD, Ophthalmology Department, Antalya Training and Research Hospital, Antalya, Türkiye

2- Assoc. Prof., Ophthalmology Department, Antalya Training and Research Hospital, Antalya, Türkiye

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Correspondence author:
Senol Sabanci
Email: sbncsenol@yahoo.com

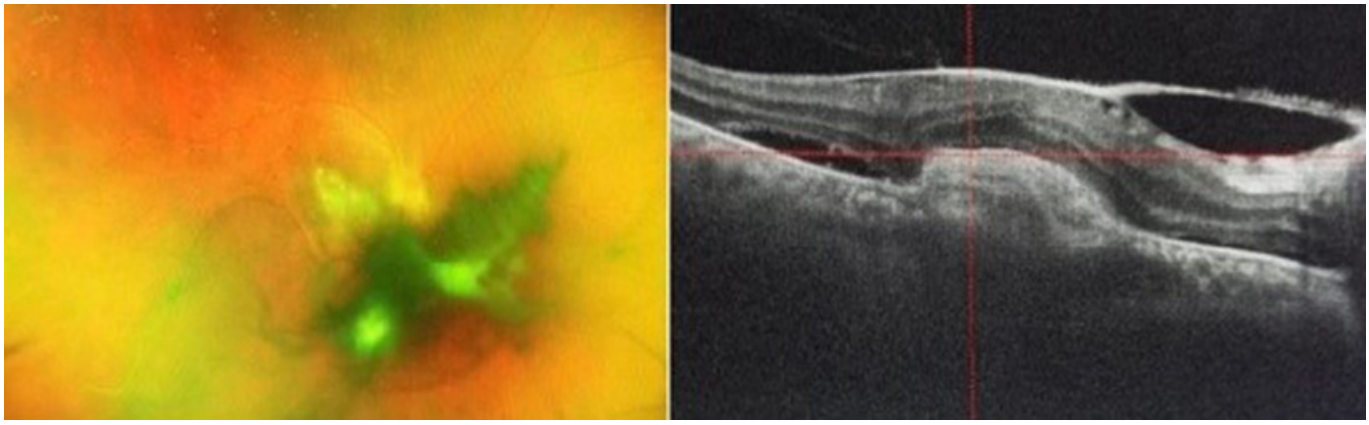

Figure 1: *Initial optical coherence tomography angiography images of the patient: a) a yellowish chorioretinitis focus in the fovea and vitreous opacities in the vitreous cavity, b) epiretinal membrane and choroidal neovascular membrane.*

2 days after PPV, he was able to count fingers from 3 meters on the right, the anterior chamber was quiet, and pigment deposits were detected on the lens. The retina was reattached, and a yellowish focus of chorioretinitis was seen in the fovea. A subretinal hyperreflective mass and a small amount of subretinal fluid were observed on the OCT images. OCT angiography showed CNVM (Figure 2a, 2b). Thereupon, the patient was treated with intravitreal bevacizumab once a month for a total of 4 doses. 4 months later, at the patient's examination, the visual acuity level was determined as 0.05 on the Snellen chart. In the OCT examination, it was determined that the subretinal fluid was resorbed and subretinal scar developed. At the patient's last examination, 2 years after PPV, his vision level was 0.05 on the Snellen chart, and there was a subretinal scar in the fovea on OCT.

DISCUSSION

Endogenous endophthalmitis is a very serious, vision-threatening condition that develops following the hematogenous access of an infectious agent to the eye in cases without a history of surgery or trauma. Although endogenous endophthalmitis can occur due to fungal and bacterial agents, the most common cause is fungal agents, mostly C. albicans. In studies on experimental endophthalmitis in the literature, it has been reported that chorioretinitis and endophthalmitis are seen generally within three to 14 days in cases with fungemia, and chorioretinitis or endophthalmitis is detected in 9-45% of cases with candidemia, although at varying rates.[1] Immunosuppression, long-term steroid therapy, intravenous substance abuse, endocarditis, major surgery, diabetes mellitus, and childbirth are among the most common

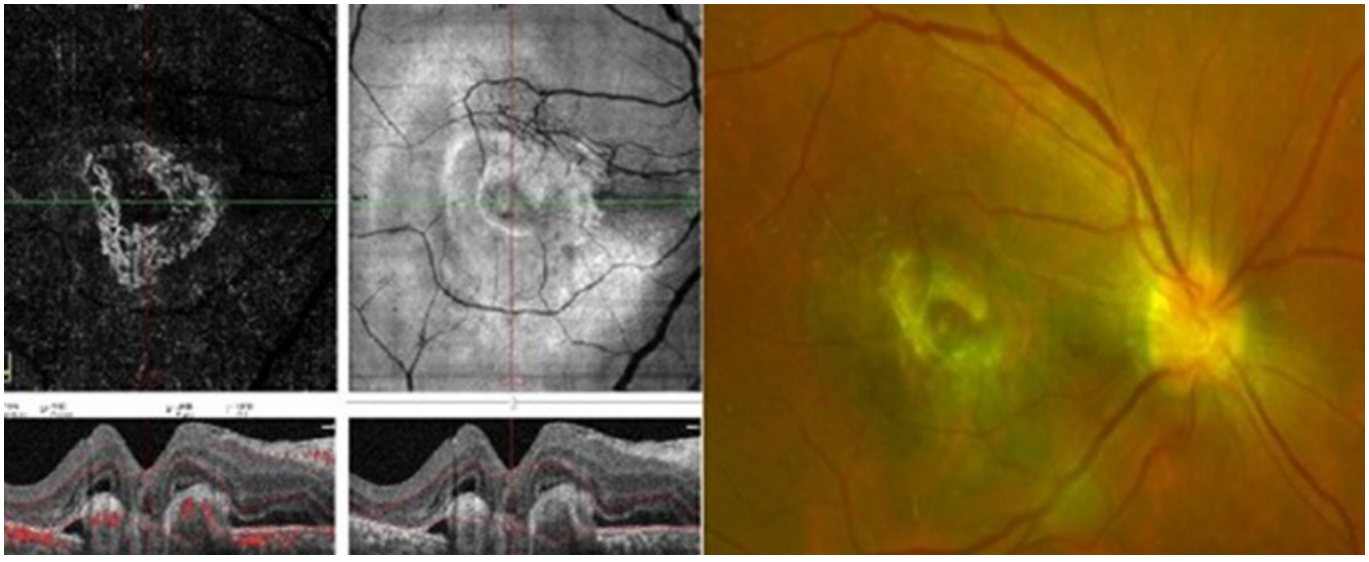

Figure 2: *Optical coherence tomography angiography images of the patient taken after pars plana vitrectomy: a) dark, ring-shaped choroidal neovascularization in the center, b) image of the fundus.*

systemic causes of endogenous fungal endophthalmitis. A few cases have also been reported in immunocompetent individuals who do not have these risk factors.[2]

The slow and insidious course of endogenous endophthalmitis can mimic many uveitis cases, causing a delayed diagnosis. In a previous study, it was stated that the average time between the diagnosis of COVID-19 and the onset of ocular symptoms was 3.2 weeks (3-5 weeks) in patients who developed fungal endophthalmitis following COVID-19 infection.[2] The current case was referred to our clinic due to his complaint of decreased vision 53 days after being admitted to the intensive care unit. We confirmed his diagnosis based on the growth of C. albicans in the anterior chamber and vitreous tap samples taken at the beginning of PPV, which we performed due to the further decrease in vision, hypopyon development, and increased vitreous reaction while waiting for the laboratory test results for the preliminary diagnosis of uveitis. C. albicans grew in the patient's urine, but there was no growth in his blood culture. This may be related to candidemia being mostly transient.[3]

Recently, an increasing number of endogenous endophthalmitis cases have been reported in the literature. Most of these cases were admitted to the intensive care unit due to COVID-19, received long-term immunosuppressive treatment (corticosteroid, tocilizumab, etc.) and broad-spectrum antibiotics, and presented with complaints of low vision and floating bodies during the recovery period or after discharge.[2] In the current case, the length of hospital stay was 65 days, including 40 days in the intensive care unit due to COVID-19, and the use of corticosteroids and broad-spectrum antibiotics during this period was determined to be a predisposing factor for the development of endogenous Candida endophthalmitis.

It has been reported that CNVM associated with endophthalmitis caused by C. albicans can emerge in the chorioretinitis scar area within two weeks to two years.[4]

In the literature, increased vascular endothelial growth factor (VEGF) levels have been reported in COVID-19 patients.[5] It has been shown that increased VEGF levels trigger not only angiogenesis but also inflammation.[6] In the current case, elevated VEGF levels due to COVID-19 may have contributed to CNVM secondary to C. albicans endophthalmitis. Although fundus fluorescein angiography is a very common method for demonstrating CNVM, some cases are open to interpretation, and diagnosis can be difficult because leakage cannot be easily demonstrated. In the literature, we did not find any case in which CNVM due to Candida endophthalmitis was demonstrated by OCT angiography. In our patient, we diagnosed CNVM due to Candida endophthalmitis using OCT angiography findings, and we consider that this imaging modality may be superior to fundus fluorescein angiography in demonstrating CNVM in selected cases.

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