

Endogenous *Candida albicans* infection causing subretinal abscess

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Abstract *Purpose* We report a case of *Candida albicans* endophthalmitis with subretinal abscess formation in a patient who underwent liver transplantation. *Methods* Case report. *Results* A 51-year-old Japanese woman complained of deep pain and ciliary injection in her right eye. Three months prior, the patient had undergone liver transplantation for cirrhosis caused by hepatitis C. A slit-lamp examination revealed intense anterior chamber inflammation with hypopyon and funduscopy showed a yellowish-white subretinal mass lesion in the inferior peripheral fundus. Systemic and topical antibiotics did not prevent further progression of the infection. The patient underwent pars plana vitrectomy treatment three times and a histopathological study of a vitreous specimen revealed *C. albicans* to be the causative

organism. *Conclusion* A subretinal abscess, previously reported in *Nocardia*, *Pseudomonas*, *Staphylococcus*, and *Aspergillus* infection cases, can also occur in patients infected with *Candida*. Therefore, *Candida* infection should be considered as a potential cause of subretinal abscess in organ transplant recipients.

Keywords *Candida albicans* · Endogenous endophthalmitis · Subretinal abscess · Liver transplantation · Vitrectomy

Introduction

A subretinal abscess (or choroidal abscess) is a rare but catastrophic condition that occurs in immunocompromised individuals, with visual prognosis being poor in most cases. Most of the cases reported were caused by endogenous infections by bacteria, predominantly *Klebsiella pneumoniae* [1] and *Nocardia* spp. [2], and occasionally *Pseudomonas aeruginosa* [3], *Streptococcus aureus* [4], and *Streptococcus viridans* [5]. In comparison, a fungal subretinal abscess is a considerably more uncommon condition, with only six cases caused by *Aspergillus* spp. [6, 7], one case caused by *Scedosporium apiospermum* [8], and one case caused by *Zygomycetes* [9] reported thus far. Herein, we present a case of subretinal abscess and endophthalmitis due to *Candida albicans* infection in a liver transplantation recipient.

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Case study

A 51-year-old woman, who had undergone liver transplantation for cirrhosis caused by hepatitis C 3 months prior and then received 0.1 mg/kg/day of tacrolimus hydrate, complained of deep pain and ciliary injection in her right eye. Visual acuity was 20/20 in both eyes. Moderate cells and flare were present in the anterior chamber of the right eye. A fundoscopic examination of her right eye revealed the presence of a well-demarcated yellowish-white subretinal lesion in the inferior peripheral fundus (Fig. 1). There were no particular abnormalities in the left eye. The results of hematological and biochemical investigations were mostly normal, except that her liver function was moderately impaired. On the basis of clinical manifestations, we suspected ocular toxoplasmosis, ocular tuberculosis, or a bacterial subretinal abscess.

Laboratory data demonstrated that the serum titer of anti-toxoplasma IgG was positive (146 IU/ml), while a tuberculin skin test was negative (5×5 mm) and a chest computed tomography (CT) examination indicated no signs of pulmonary tuberculosis. Thus, we suspected ocular toxoplasmosis or a bacterial subretinal abscess, and empirically administered oral acetylspiramycin (800 mg/day) and levofloxacin (600 mg/day). However, the eye condition deteriorated, leading to enlargement of the abscess and increased vitreous opacity. One month later, vitreous

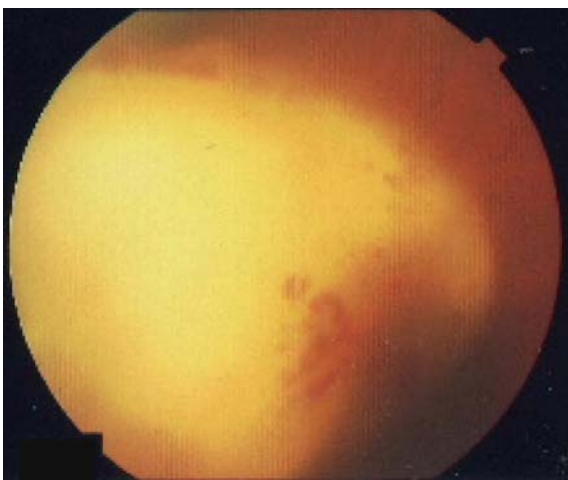


Fig. 1 Photograph of the fundus of the right eye (inferior field). A yellowish-white, elevated subretinal lesion with retinal hemorrhage can be seen in the inferior field

opacity suddenly increased and vision in the right eye was reduced to the detection of hand motion.

Since the medical modalities adopted failed to arrest the pathological progression of the condition, we performed a complete vitrectomy with cataract extraction. During the vitrectomy, an iatrogenic retinal hole was unintentionally opened in a necrotic retinal lesion in the subretinal abscess; thus, we decided to perform drainage of the abscess contents using an irrigation fluid containing 0.01 mg/ml fluconazole and 0.001 mg/ml imipenem. We also added an antifungal agent and antibiotics, due to the possibility of both fungal and bacterial abscesses. In consideration of the extent of tissue damage and the possible occurrence of retinal detachment, silicone oil was injected at the end of the operation. However, a culture of the vitreous tissue revealed no growth.

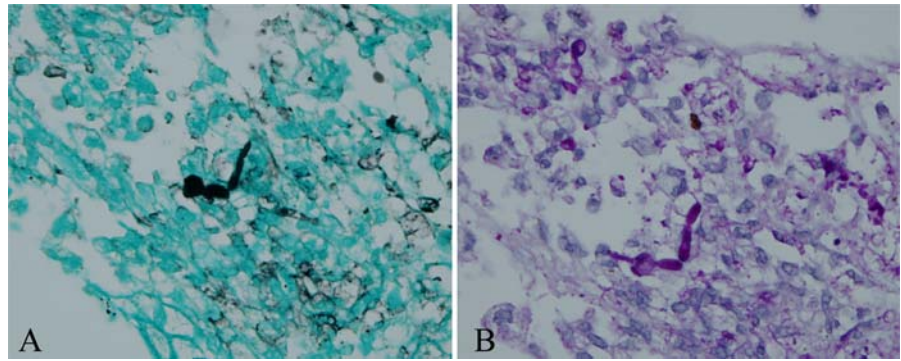
One week after the first surgery, the silicone oil was removed, as the anterior chamber had become shallow and intraocular pressure was increased. The fundus gradually became invisible due to the development of a dense vitreous haze, despite daily intravenous infusions of fluconazole at 200 mg and imipenem at 1 g. Two weeks later, B-mode ultrasonography revealed total retinal detachment.

Finally, one month after the first surgery, the patient underwent a third operation for proliferative vitreoretinopathy, during which epiretinal proliferative tissue was removed using irrigation fluid containing 0.01 mg/ml amphotericin B, and scleral encircling and a silicone oil tamponade were performed. A histopathological investigation and culture of the epiretinal proliferative tissue revealed *C. albicans* infection (Fig. 2). Three days after the third surgery, an intravitreal injection of 0.01 mg/0.1 ml of amphotericin B was administered and a 200-mg intravenous infusion of fluconazole was also performed daily for 2 weeks. Although the intraocular inflammation gradually subsided, the regrowth of proliferative tissue was seen in the macula and visual acuity remained at hand motion.

Discussion

A subretinal abscess is a rare condition associated with endogenous endophthalmitis and is caused by metastatic infection by microorganisms. In previous reports, a range of 30–50% of cases of endogenous

Fig. 2 Histopathological study of epiretinal proliferative tissue revealed *Candida* yeast. **a** Grocott–Gomori staining 400×. **b** Periodic acid Schiff (PAS) staining 400×



endophthalmitis were caused by *Candida* infection, while a predominance of gram-positive bacteria was also reported [10, 11]. *Candida* is the most prominent fungal organism in endogenous fungal endophthalmitis, whereas isolates of *Aspergillus* species are rarely found [12, 13]. However, to the best of our knowledge, no report of a case of *Candida* endophthalmitis infection with severe subretinal abscess formation has been presented thus far, whereas six cases of those conditions caused by *Aspergillus* spp. have been reported [6, 7]. This rarity might be explained by the results of a histopathological study of enucleated eyes with endogenous mycotic endophthalmitis, which revealed that the vitreous was the primary focus of infection for *Candida*, whereas subretinal pigment epithelium infection and growth in the subretinal space were noted in eyes infected with *Aspergillo*sis [14].

In the present case, we treated a female patient with a history of liver transplantation who developed sudden loss of vision due to endogenous endophthalmitis with a subretinal abscess in her right eye. We could not detect the causative microorganism in vitreous fluid obtained at the first vitrectomy, which led to a delay before the use of intravitreal amphotericin B and poor visual prognosis. Ness and Serr recommended that collected vitrectomy fluid should first be centrifuged and then immediately cultured to achieve a high detection rate in cases of fungal endophthalmitis [15]. In addition, Ferry and Abedi found that a histopathological examination was more sensitive for the diagnosis of mucor infection and the related group of fungi as compared to culturing [16]. In our case, *Candida* was detected with a histopathological method and culturing of the epiretinal proliferative tissue, which agrees with their suggestion. Therefore, if possible, the rapid performance of a diagnostic vitrectomy for obtaining not only a

vitreous specimen, but also epiretinal membrane and proliferative tissue samples, may be necessary for better visual prognosis. In addition, microbial DNA amplification using a polymerase chain reaction assay and intraocular antibody measurements have been shown able to detect the presence of infection by organisms that are difficult to culture [17]. The present findings suggest that *Candida* infection should be considered as a potential, albeit rare, cause of a subretinal abscess in organ transplant recipients.

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