An ocular diploid fungus: a case of an overlook systemic mycosis

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ABSTRACT

Fungal infection of the eye can be vision-threatening, especially when it is associated with fungaemia. Early recognition and prompt treatment of fungaemia could prevent this vision-threatening complication. We report a case of a 64-year-old diabetic female patient who was admitted with recurrent urosepsis. She was noted to have fungaemia during her initial presentation but did not receive any therapy. Subsequent presentation, she underwent an ophthalmological examination and demonstrated a fungal endophthalmitis. Then, a combination of intra-vitreal and intravenous antifungal therapies was administered and her visual symptom and acuity improved significantly upon discharge.

Keywords: Fungal eyeball infection, fungaemia, intravitreal antifungal, endophthalmitis

INTRODUCTION

Fungal bloodstream infection could be broadly divided into candidaemia and non-candidaemia. Fungaemia involving candida species has been gaining its popularity worldwide, especially of *albicans* type. The prevalence of as high as 6.14% was reported in Thailand [1], though Asian studies were limited. Such candidaemia could invade multiple organs including brain, renal, heart, abdomen, or eyes as in our case. On the other hand, *Cryptococcus*, *Aspergillus*, and *Fusarium* are among the species identified to cause non-candidaemia in groups of susceptible patients such as immune-compromised patients, diabetics, elderly, and patients receiving retroviral agent or chemotherapy. We illustrate a rare case of ocular manifestation of such disseminated yeast disease and further highlight on the importance of early recognition of this complication.

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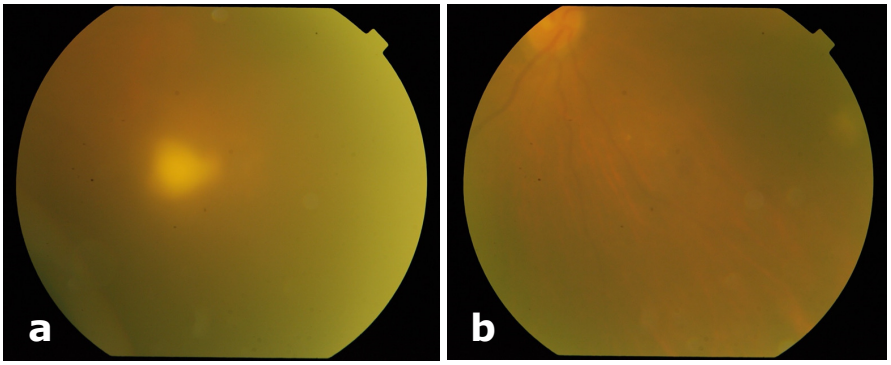
CASE REPORT

A 63-year-old woman with a background history of long-standing diabetes presented with a two-day history of fever and right loin-to-groin pain. There were no associated respiratory tract or urinary tract symptoms reported. She had history of bilateral ureteric calculi a month ago complicated with urosepsis. Ureteric stenting was employed during that admission and patient was discharged after five



Figs. 1: a) Left ocular fundus depicting the presence of vitreous fungal ball (pre-treatment), and b) Resolving left eye fundal endophthalmitis with disappearance of fungal ball (post-treatment).

days of intravenous antibiotic (imipenem), with oral ciprofloxacin one week upon discharge. Blood culture revealed *Candida albicans* on the day of discharge but antifungal therapy was not instituted. Subsequently, the patient was re-admitted with pain, redness and blurring of vision affecting her left eye, high grade fever, tachycardia, and hypotensive which required an inotropic support. A routine blood investigation demonstrated an evidence of leukocytosis with neutrophil predominant and lymphocyte count was 3.4 x 10^9/L. Serum inflammatory markers, C-reactive protein and procalcitonin were elevated at 19.42 mg/dL and15.77 ng/ml respectively. There was also an evidence of acute kidney injury and renal ultrasound demonstrated a blocked ureteric stent with mild right hydronephrosis. An ophthalmological examination was performed and had demonstrated a fungal ball in the vitreous of the left eye (Figure 1a) with no evidence of choroiditis, retinitis and vasculitis.

Subsequently she was treated with intravenous fluconazole 400 mg once a day for a period of two weeks, followed by an oral fluconazole 400 mg once daily for six weeks duration. A vitreal tapping of the left eye was performed on two occasions: an intra-vitreal antibiotics were injected at the inferonasal limbus during first tapping (amphotericin B 5µg/0.1ml, ceftazidime 2mg/0.1ml, vancomycin 1mg/0.1ml), while intravitreal voriconazole 100µg/0.1ml was given during second tapping. The patient also received a topical antibiotic eye drops, ceftazidime (5%), gentamicin (0.3%) and also topical voriconazole (1%) along with topical dexamethasone.

Following the above therapy, an ophthalmological examination was repeated and it had demonstrated a remarkable improvement in the vitreous with a complete resolution of the fungal ball (Figure 1b) along with great recovery of her left eye visual acuity.

DISCUSSION

Systemic mycoses involving eyes often manifest itself as rather nonspecific findings such as cotton-wool spots, retinal haemorrhages, or Roth spots which could occur as part of diabetic retinopathy as well. The aforementioned fungal ball lesion in the vitreous is rather rare but specific. Such rare occurrence could be observed in the case of delay in diagnosis and therapy initiation. [2] As in this case, positive bloodstream mycosis was only treated a

month later. This could even lead to devastating complication of retinal detachment and blindness. Apart from that, mortality of as high as 70% has been reported with candidaemia. [3]

The commonest causative agent in fungaemia leading to endophthalmitis is ascribed to chiefly *Candida* and *Aspergillus* species. [4] Longstanding history of diabetes, history of recent hospitalisation with preceding broad-spectrum antibiotic use (i.e imipenem) as well as indwelling stenting did predispose this lady to such haematogenous candidal infection.

Therapy advocated for such candidaemia is mainly via initial intravenous and/or intravitreal amphotericin B with or without oral flucytosine, based on the guidelines from European Society of Clinical Microbiology and Infectious Diseases and Infectious Diseases Society of America. Optimal total duration of treatment has not yet been established but a total of four to six weeks is suggested by most guidelines. An intra-vitreal administration of voriconazole is also an option recommended in the guidelines, though no strong evidence as yet. Voriconazole exerts its fungicidal activity via inhibiting cytochrome P-450-mediated 14- alpha-demethylation, leading to destruction of the cell wall and cell lysis. [5, 6] The intra-vitreal injection is given slowly 3.5 mm (in aphakic or pseudophakic eyes) to 4 mm (in phakic eyes) from the limbus [7] at the inferotemporal portion of the eye to avoid Bell's reflex and visual axis. [8, 9] Volume of injection is generally 0.1 mls and the risk of endophthalmitis including pseudoendophthalmitis was reported up to 0.3%. [7]

In conclusion, our case highlight a case of fungal infection of the eye in the setting of fungaemia and a combination of an intravenous and intra-vitreal anti-fungal therapies have successfully treated this condition to prevent a deleterious visual impact.

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