

## CASE REPORT

## A rare case of bilateral aspergillus endophthalmitis

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Aspergillus endophthalmitis is a devastating inflammatory condition of the intraocular cavities that may result in irreparable loss of vision and rapid destruction of the eye. Almost all cases in the literature have shown an identified source causing aspergillus endophthalmitis as a result of direct extension of disease. We present a rare case of bilateral aspergillus endophthalmitis. A 72-year-old woman with a history of diabetes mellitus, congenital Hirschsprung disease, and recent culture-positive candida pyelonephritis with hydronephrosis status post-surgical stent placement presented with difficulty opening her eyes. She complained of decreased vision (20/200) with pain and redness in both eyes – right worse than left. Examination demonstrated multiple white fungal balls in both retinas consistent with bilateral fungal endophthalmitis. Bilateral vitreous taps for cultures and staining were performed. Patient was given intravitreal injections of amphotericin B, vancomycin, ceftazidime, and started on oral fluconazole. Patient was scheduled for vitrectomy to decrease organism burden and to remove loculated areas of infection that would not respond to systemic antifungal agents. Four weeks after initial presentation, the fungal cultures revealed mold growth consistent with aspergillus. Patient was subsequently started on voriconazole and fluconazole was discontinued due to poor efficacy against aspergillus. Further workup was conducted to evaluate for the source of infection and seeding. Transthoracic cardiogram was unremarkable for any vegetation or valvular abnormalities. MRI of the orbits and sinuses did not reveal any mass lesions or bony destruction. CT of the chest was unremarkable for infection. Aspergillus endophthalmitis may occur because of one of these several mechanisms: hematogenous dissemination, direct inoculation by trauma, and contamination during surgery. Our patient's cause of bilateral endophthalmitis was through an unknown iatrogenic seed.

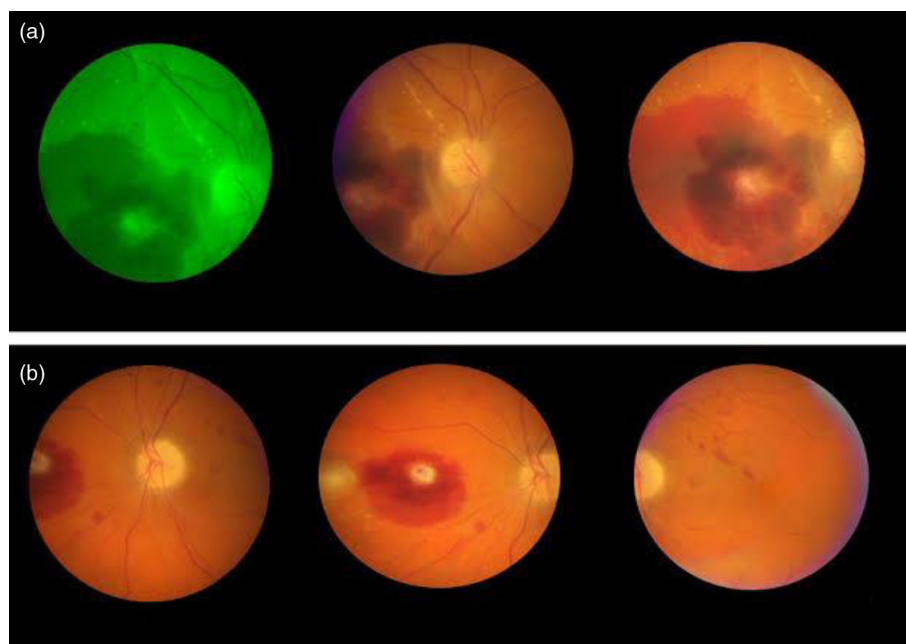
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A 72-year-old woman with a history of insulin-dependent, poorly controlled diabetes mellitus, congenital Hirschsprung disease status post diverting ileostomy, no history of intravenous drug abuse (IVDA), and recent culture-positive candida pyelonephritis with hydronephrosis status post-surgical stent placement presented with sudden bilateral difficulty opening her eyes which worsened at home, with symptoms of keratitis. Patient did not have a history of eye surgery or eye trauma. She complained of decreased vision (20/200) with pain and redness in both eyes – right worse than left. Examination was consistent with multiple white fungal balls seen in both retinas (Fig. 1), initially believed to be because of hematogenous spread of recent candida urosepsis. The diagnosis of bilateral fungal endophthalmitis was made. Bilateral vitreous taps for cultures and staining were performed. Patient was given intravitreal injections of amphotericin B,

vancomycin, and ceftazidime and started on intravenous voriconazole to treat for suspected candida endophthalmitis. Patient lost intravenous access peripherally but no central line was placed. She was transitioned to oral medications. The patient soon developed acute kidney injury and rash, which was thought to be secondary to voriconazole. Therefore, she was then transitioned to fluconazole. At this time, no culture results were available. Patient was scheduled for repeat vitrectomy after being medically stable to decrease organism burden and to remove loculated areas of infection that would not respond to systemic antifungal agents. Four weeks after initial presentation, two sets of fungal cultures revealed mold growth consistent with aspergillus. The patient was readmitted for further work up and treatment. The patient was restarted on voriconazole 6 mg/kg for the first day and 4 mg/kg for the subsequent days, and fluconazole was discontinued because of poor efficacy against aspergillus. Micafungin was



*Fig. 1.* Both retinas – right (a) and left (b) – show evidence of fungal growth in the vitreous cavity.

also added initially for broader antifungal coverage because of some evidence of synergy with azoles against aspergillus. Because blood cultures were negative throughout the hospital course, the cause of the endophthalmitis, whether endogenous or exogenous, could not be determined. Thus, further work up was necessary to look for a source of seeding. Transthoracic cardiogram was unremarkable for any vegetation or valvular abnormalities. Magnetic resonance imaging (MRI) of the orbits and sinuses did not reveal any mass lesions or bony destruction. Computed tomography (CT) of chest was unremarkable for infection. Patient was instructed to continue voriconazole 300 mg po BID for the next 5–6 weeks and to follow up as an outpatient at the ophthalmology clinic. No definite source of infection was ultimately determined.

## Discussion

Endophthalmitis is a bacterial or fungal infection of the eye causing inflammation of the vitreous or aqueous humor. Acute endophthalmitis is a medical emergency. Most causes of endophthalmitis are because of exogenous organisms introduced into the eye via contamination during surgery or direct inoculation by trauma. Endogenous endophthalmitis, which is much rarer, occurs due to bloodstream seeding from foci of infection from other organs. The majority of endogenous fungal causes of endophthalmitis are candida, followed by aspergillus (1).

Aspergillus endophthalmitis is a devastating inflammatory condition of the intraocular cavities that may result in irreparable loss of vision and rapid destruction of the eye (2). Aspergillus species are ubiquitous saprophytic molds,

commonly found growing in soil and decaying vegetation. In most cases, infection with aspergillus is rare unless the host is immunocompromised. Ophthalmic infections with aspergillus usually cause keratitis or orbital cellulitis. Risk factors for this type of infection are patients with a history of IVDA, immune deficiency, or chronic corticosteroid use. Patients with high suspicion or increased risk factors need a complete ophthalmology exam. High-risk patients need to be counseled and educated on potential complications and infections that may be predisposed (3). Endogenous aspergillus endophthalmitis usually has an acute onset of intraocular inflammation and often has a characteristic chorioretinal lesion located in the macula. Treatment with vitrectomy and intravitreal amphotericin B is effective for eliminating ocular infection; however, the visual outcome is generally poor, especially when there is direct involvement of the macula (2).

In our patient, it was believed that her endophthalmitis was originally seeded hematogenously by the recent candida urinary tract infection. The patient's only notable risk factor for aspergillus infection was her immunocompromised state because of long-standing diabetes mellitus. MRI of orbits, CT of chest, and transthoracic echocardiogram were unremarkable for any possible seeding source. Even though the initial treatment began with broad-spectrum antifungals, the patient developed serious side effects that resulted in the need to switch from voriconazole to fluconazole, which was not effective against the later discovered aspergillus (4). In retrospect, it would have been beneficial for our patient to be kept on an antifungal with broad-spectrum activity rather than fluconazole, which was ineffective at eradicating the aspergillus species for 16 days.

## Conclusion

It was quite interesting that there was no identified source of infection, which is extremely rare because most causes of aspergillosis endophthalmitis are the result of direct extension of foci of disease or of disseminated aspergillosis. This case enlightens the medical practitioners the importance of starting with broad-spectrum coverage until culture results are out, regardless of previous infections. In situations with adverse drug reactions, it is critical for the ophthalmologist to work with infectious disease specialists and pharmacists in order to best treat the underlying infection to avoid loss of antibiotic coverage for possible organisms.

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