Embolic aspergillus endophthalmitis in an immunocompetent patient from aortic root aspergillus endocarditis

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Summary
We report the first case of endogenous aspergillus endophthalmitis in an immunocompetent person with systemic aortic root aspergillus endocarditis.

Introduction
The incidence of endogenous aspergillus endophthalmitis is rare and is usually associated with disseminated aspergillosis, severely immunocompromised and IV drug abuse. We report the haematogenous spread of aspergillus infection from aortic root 8 months following composite aortic root replacement in a young immunocompetent person, which has not been reported to the best of our knowledge and literature search.

Case report
A 34-year-old man had an aortic root replacement with composite graft for severe aortic regurgitation and dilated ascending aorta. Eight months following surgery for his severe aortic regurgitation and aortic aneurysm, he presented to the hospital with shortness of breath, severe chest pain. ECG had ST elevation, echocardiogram was normal. Aortogram had severe ostial stenosis of the aorta at the site of the composite graft. Blood cultures were negative. CT Brain and Abdomen had cerebral embolisation along with embolisation to spleen following stenting. Further investigations confirmed vegetative mass involving the right coronary ostial button. He underwent an emergency redo aortic root replacement with homograft. The mass was full of Aspergillus fumigatus. He was started on IV voriconazole 400 mg twice daily, which was changed to oral, once patient was able to take oral feed. He underwent Splenectomy for and has been under close watch for the cerebral metastases, which have showed no signs of progression or any neurological deficit.

Postoperatively the right eye developed conjunctivitis, which was treated with Occ. Chloramphenicol. One week later, he complained of painful loss of vision in his right eye. Vision in the right eye was Perception of Light (PL) and in the left eye 6/9. On examination, he was found to have severe endophthalmitis (Fig. 1). Ultrasound B-scan showed multiple small retinal detachments (RD) with vitreous activity (Fig. 2). The patient was put on hourly regime of fortified G. Cefuroxime 5% and G. gentamycin forte 1.5%. He had an anterior chamber and vitreous tap the next day with intravitreal Injection of 1 mg vancomycin, 400 μg amikacin and 5 μg amphotericin B. He was started on hourly G. amphotericin B 0.15% topical drops. The anterior chamber tap was sterile, but the vitreous tap showed moderate growth of Aspergillus fumigatus. In view of persistent aspergillus in eye, after consultation with infection control team, lipid base amphotericin (AmBisome) 200 mg day−1 IV infusion was added to oral voriconazole (400 mg twice a day), which was given for 3 weeks.

Pars plana vitrectomy (PPV) was deferred until his vitreous tap was sterile, to prevent further dissemination of aspergillus to other sites. No improvement was seen. His vitreous tap was repeated after 3 days with repeat intravitreal injection of vancomycin, amikacin and amphotericin B. On further follow-up, after 1 week of regular follow-up, anterior chamber activity gradually started to settle down. After 3 weeks of follow-up, there was reduction in the AC reaction, but no improvement in vision, which was still PL and the patient was persistently complaining of intolerable pain. Therefore, on patient’s request Evisceration was carried out for his eye.
Discussion

Aspergillus endophthalmitis (endogenous) is a very rare disorder. It is seen following orthotopic liver/kidney transplantation and valvular replacement surgeries in immunosuppressed patients (Pettit TH et al., Ocular Infection and Immunity, Mosby, St Louis, 1996, pp. 1262–85; Hunt KE et al., Ophthalmology 1996; 103: 757–67). Eyes are the next common site to lungs. Rarely Aspergillus endophthalmitis occurs in immunocompetent individuals with no apparent predisposing factors (Valluri S et al., Int Ophthalmol 1993, 17: 131–35). Aspergillus spp. commonly grows in soils and decaying vegetations (McDonnell PJ et al., Ophthalmology 1985; 92: 706–9; Weishaar PD et al., Ophthalmology 1998; 105: 57–65). The spores or conidia become air borne and seed the lungs and paranasal sinuses of humans. Although exposure is very common, the infection is very rare.

Haematogenous spread from the lungs to the choroid results in the ocular disease (Jampol LM et al., Trans Am Ophthalmol Soc 1988; 86: 422–40). Patients develop a rapid onset of pain and visual loss, which is exactly the way our patient presented to the eye department.

A confluent yellowish infiltrate is seen in the macula beginning in the choroid and the subretinal space. A hypopyon develops in the subretinal or the subhyaloid space. This can progress to retinal vascular occlusion and full thickness retinal necrosis. Although we had no view of the fundus initially, the presence of multiple retinal detachments in B-scan in our patient suggests retinal necrosis and intense vitreal activity.

Eventually, the infection spreads to the vitreous causing vitritis and into the anterior chamber producing varying degree of cells, flare, and hypopyon. The macular lesions heal to form an atrophic scar. Unlike candida where the vitreous is the primary focus of infection, in Aspergillus, endophthalmitis retinal and choroidal vessel invasion and subretinal pigment epithelial and sub retinal infection are more marked (McDonnell PJ et al., Ophthalmology 1985; 92: 706–9; Jampol LM et al., Trans Am Ophthalmol Soc 1988; 86: 422–40).

Treatment includes aggressive diagnostic and therapeutic Pars Plana Vitrectomy (PPV) along with intravitreal injection of amphotericin B 5–10 μg. PPV was not considered in our patient because of risk of dissemination. Amphotericin B may be re-injected weekly, but the total cumulative dose should be kept below 25 mg (Scherer WJ et al., Ophthalmology 1998; 105: 377–81; Samiy N et al., Int Ophthalmol Clin 1996; 36: 147–62; Essman TF et al., Ophthalmic Surg Lasers 1997; 28: 185–94). Intravitreal steroids may be used to reduce severe postoperative inflammatory response. As most of the patients suffer with systemic involvement, systemic antifungals should also be used. The role of systemic antifungals in isolated ocular disease is unknown and controversial.

Despite aggressive treatment, the visual prognosis is dismal. The final visual outcome is poor because of macular involvement (Essman TF et al., Ophthalmic Surg Lasers 1997; 28: 185–94; Weishaar PD et al., Ophthalmology 1998; 105: 57–65). This has been the case in our patient too as he had no visual improvement and was having intense pain because of inflammation and retinal necrosis that led him to have evisceration performed to his eye.

Figure 1 Right eye: severe inflammation with organised fibrinous exudates at pupillary margin and a fixed pupil.

Figure 2 Ultrasound: vitreous activity and funnel shaped retinal detachment.