Aspergillus terreus endogenous endophthalmitis: Report of a case and review of literature

Pradeep Kumar Panigrahi, Rupak Roy, Swakshyar Saumya Pal, Anjan Mukherjee, Aneesha Lobo

We report a rare case of Aspergillus terreus endogenous endophthalmitis in an immunocompetent patient with subretinal abscess and also review the reported cases. A 50-year-old healthy male presented with sudden painful loss of vision in right eye. He was diagnosed with endogenous endophthalmitis and underwent urgent vitrectomy. Aspergillus terreus growth was obtained in culture. At final follow-up, there was complete resolution of the infection but visual acuity was poor due to macular scar. Aspergillus terreus is a rare cause of endophthalmitis with usually poor outcomes. Newer antifungals like Voriconazole can be sometimes associated with better prognosis.

Key words: Aspergillus terreus, endogenous endophthalmitis, immunocompetent, subretinal abscess

Fungal endogenous endophthalmitis is usually associated with immunocompromised states. Aspergillus terreus is a rare cause of endogenous endophthalmitis with only six reported cases.[1-6] We report a rare case of A terreus endogenous endophthalmitis in an immunocompetent patient and review the other cases which have been reported. This is the first case report of A terreus endogenous endophthalmitis from India.

Case Report

A 50-year-old healthy non diabetic male presented with sudden painful decrease in vision in right eye (OD) since one week. The patient gave history of a bout of gastroenteritis 2 weeks back. On examination, best corrected visual acuity (BCVA) in OD was perception of light with accurate projection of rays. Anterior segment examination showed circumciliary congestion, corneal haze, anterior chamber cells 3+, clear lens, and 3+ vitreous cells. Intraocular pressure was 10 mm of Hg. Indirect ophthalmoscopy showed grade 3 vitritis with central yellowish sub retinal lesion [Fig. 1a]. The retina appeared attached. BCVA in the left eye was 6/6, N6. Left eye was normal. Ultrasonography confirmed the presence of a subretinal lesion. A provisional diagnosis of endogenous endophthalmitis in OD was made and the patient was advised urgent surgical intervention. A complete systemic examination which included HIV testing, urine, and blood culture along with a physician evaluation was done.
The patient underwent 20 G Pars Plana Vitrectomy. Undiluted vitreous aspirate was sent for microbiological tests. The patient received intravitreal Vancomycin (1 mg/0.1ml), Ceftazidime (2.25 mg/0.1ml), and Voriconazole (50 µg/0.1ml) at the end of the procedure. Microscopy of the wet mount preparation with 10% KOH and Calcofluor white under fluorescence microscope revealed plenty of septate filamentous fungal elements which were branched in acute angle [Fig. 2a]. Examination of the tease mount preparation from the culture revealed conidiophores of variable length, biseriate compactly columnar phialides covering the entire vesicle, which shows morphological characteristics of *Aspergillus terreus* [Fig. 2b]. In culture, velvety colonies were obtained with a characteristic cinnamon brown color, with brown pigmentation in the reverse [Fig. 3a] A broad ranged panfungal polymerase chain reaction (PCR) targeting the Internal Transcribed Spacer II (ITS II) region was also positive, thereby confirming the presence of fungi in the sample [Fig. 3b]. All other microbiological investigations like blood culture, urine culture, and HIV testing were negative. No active systemic foci of infection was detected.

In the postoperative period the patient received six injections of intravitreal Voriconazole. Three weeks following the surgery, he developed total retinal detachment which required revision with endolaser and silicon oil tamponade. At final follow-up after 2 months, right eye vision was perception of light (PL) only. Anterior chamber was quiet. Vitreous cavity was clear with a macular scar and persistent subretinal fluid inferiorly [Fig. 1b]. The patient was advised resurgery which he refused. He was prescribed oral Voriconazole 200 mg twice daily for 2 months.

**Discussion**

*Aspergillus terreus* is a saprophytic fungus occurring in the soil and is occasionally pathogenic. Out of six reports of *A. terreus* endogenous endophthalmitis [as summarized in Table 1], majority have been associated with immunosuppression.[1,2] Only one report by Ng et al.,[3] of *A. terreus* endogenous endophthalmitis in immunocompetent individual exists in literature. Three cases of postoperative and 1 case of posttraumatic endophthalmitis have been reported.[4] Riddell et al.,[5] have reported the ocular manifestations of endogenous *Aspergillus* endophthalmitis. Patients present with sudden painful unilateral blurring of vision, variable amount of circumciliary congestion, AC reaction and hypopyon. Fundoscopy reveals vitritis, exudative lesions in the posterior pole, pre and intraretinal hemorrhages. Pseudohypopyon (pre-retinal layering of exudates), pathognomic of *Aspergillus* endophthalmitis, has been reported. Our patient presented with subretinal abscess in the macular area which eventually formed a scar. A detailed microbiological analysis is necessary in all cases. However, the sensitivity of identifying the organism from vitreous aspirates, PCR, and vitrectomy specimen is 50, 72 and 90% respectively.[6]

Systemic and intravitreal Amphotericin-B has been the mainstay of treatment of *Aspergillus* endophthalmitis and has been reported to result in good outcomes.[1,7] However, *A. terreus* has been reported to exhibit resistance to Amphotericin-B in 98% of the isolates, which is a cause of concern. Alternative antifungal like Voriconazole, with an oral bioavailability of 96% and good aqueous and vitreous concentrations, is being used these days. Kramer et al.,[4] were the first to report the successful use of intravitreal Voriconazole in *A. terreus* endogenous endophthalmitis. In the present case, though the infection was controlled with intravitreal and systemic Voriconazole, however, the final visual outcome was poor because of the central macular scar. Our patient had no previous ocular trauma, surgery or medical history which could explain the present condition. The exact source of infection could not be determined inspite of our best efforts.

**Conclusion**

To conclude, our study adds to the body of literature available on *A. terreus* endogenous endophthalmitis. *A. terreus* endogenous endophthalmitis with subretinal abscess usually have a dismal prognosis. A high index of suspicion along with prompt medical and surgical intervention may result in better outcomes.

---

**Figure 1:** (a) Colour fundus photograph of OD at presentation, showing vitreous haze and subretinal abscess at the posterior pole (white arrow). (b) Colour fundus photograph of OD at final follow up, showing scarred subretinal abscess (white star) and persistent subretinal fluid inferiorly (white arrowhead)

**Figure 2:** (a) KOH mount prepared from the vitreous aspirate examined under fluorescent microscope after staining with calcofluor white reveals characteristic septate, branched, filamentous fungi (Magnification ×40) (b) Tease mount preparation stained with Lactophenol cotton blue reveals characteristic biseriate stigmata on dome shaped vesicles characteristic of *Aspergillus terreus* (magnification ×40)
Table 1: Clinical characteristics of patients with Aspergillus terreus endophthalmitis

| No | Author   | Year | Type | Age/sex | BCVA | Co morbid condition | Clinical findings                                                                 | Antifungals          | Final outcome |
|----|----------|------|------|---------|------|---------------------|-----------------------------------------------------------------------------------|----------------------|---------------|
| 1  | Kalina et al. | 1991 | E    | 65/F    | PL   | Chronic lymphocytic leukemia | Hypopyon Dense vitreous exudates                                                 | Amphotericin-B       | Deceased      |
| 2  | Gross et al.  | 1992 | E    | 32/M    | CF at 6 inches | Ethanol intake, Intravenous drug intake | Hypopyon Preretinal pseudohypopyon Midperipheral hemorrhagic vasculitis, Scattered subretinal infiltrates | Amphotericin-B       | Deceased      |
| 3  | Das et al.    | 1993 | PO   | 50/M    | PL   | H/o Cataract extraction   | Anterior chamber reaction White fluffy mass in anterior vitreous                   | Amphotericin-B, Natamycin Ketoconazole | 6/18          |
| 4  | Bradley et al. | 2005 | E    | 71/M    | HM   | Lung adenocarcinoma       | Hypopyon Cloudy vitritis Inferior hemorrhagic retinal mass                         | Fluconazole          | Deceased      |
| 5  | Kramer et al.  | 2006 | E    | 22/F    | 6/12 | Cystic fibrosis           | Hypopyon Perifoveal exudative lesions                                              | Amphotericin-B, Voriconazole | 6/15          |
| 6  | Dave et al.    | 2011 | E    | 33/M    | 6/24 | Acute lymphocytic leukemia | Macular exudates Vitreous exudates                                                | Amphotericin-B, Natamycin Ketoconazole | 6/6           |
| 7  | Ng et al.      | 2013 | E    | 35/F    | HM   | Immunocompetent Bronchiectasis | Anterior chamber fibrin Vitritis                                                  | Voriconazole         | CF            |
| 8  | Present study  | 2013 | E    | 50/M    | PL   | Immunocompetent Gastroenteritis | Anterior chamber reaction Vitritis                                               | Voriconazole         | PL            |

E: Endogenous endophthalmitis, PO: Post operative endophthalmitis, M: Male, F: Female, BCVA: Best corrected visual acuity at presentation, PL: Perception of light, HM: Hand movement, CF: Counting fingers

References
1. Dave VP, Majii AB, Suma N, Pappuru RR. A rare case of Aspergillus terreus endogenous endophthalmitis in a patient of acute lymphoid leukemia with good clinical outcome. Eye 2011;25:1094-6.
2. Kalina PH, Campbell RJ. Aspergillus terreus endophthalmitis in a patient with chronic lymphocytic leukemia. Arch Ophthalmol 1991;109:102-3.
3. Gross JG. Endogenous Aspergillus-induced endophthalmitis, successful treatment without systemic antifungal medication. Retina 1992;12:341-5.
4. Kramer M, Kramer MR, Blau H. Intravitreal voriconazole for the treatment of endogenous Aspergillus endophthalmitis. Ophthalmology 2006;113:1184-6.
5. Bradley JC, George JG, Sarria JC, Kimbrough RC, Mitchell KT. Aspergillus terreus endophthalmitis. Scand J Infect Dis 2005;37:529-31.
6. Ng J, Ho S, Krishnan P, Teeh SC. Aspergillus terreus endogenous endophthalmitis in a nonimmuno compromised patient with a history of bronchiectasis. Ocul Immunol Inflamm 2013;21:231-3.
7. Das T, Vyas P, Sharma S. Aspergillus terreus postoperative endophthalmitis. Br J Ophthalmol 1993;77:386-7.
8. Garg P, Mahesh S, Bansal AK, Gopinathan U, Rao GN. Fungal infection of sutureless self-sealing incision for cataract surgery. Ophthalmology 2003;110:2173-7.
9. Moinfar N, Smiddy WE, Miller D, Miller D, Herschel K. Posttraumatic Aspergillus terreus endophthalmitis masquerading as dispersed lens fragments. J Cataract Refract Surg 2007;33:739-40.
10. Riddell J, McNeil SA, Johnson MT, Bradley SF, Kazanjian PH, Kauffman CA. Endogenous aspergillus endophthalmitis, report of 3 cases and review of literature. Medicine (Baltimore) 2002;81:311-20.

Cite this article as: Panigrahi PK, Roy R, Pal SS, Mukherjee A, Lobo A. Aspergillus terreus endogenous endophthalmitis: Report of a case and review of literature. Indian J Ophthalmol 2014;62:887-9.

Source of Support: Nil. Conflict of Interest: None declared.