POST OPERATIVE ENDOPTHALMITIS CAUSED BY ACREMONIUM SPP –CLINICAL CHARACTERISTICS, MICROBIOLOGY, TREATMENT STRATEGY & OUTCOME

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ABSTRACT

Endophthalmitis secondary to cataract surgery is a rare but serious condition affecting vision. Previous studies have shown that fungi are responsible for 8.6-18.6% of all post-operative infectious endophthalmitis cases (Anand *et al.*, 2000; Buchler *et al.*, 2003). *Candida albicans, Aspergillus sp.*, and *Fusarium sp.* are the most frequently isolated organisms in the fungal cases. However *Acremonium sp.* has also been rarely reported as a cause of post cataract surgery endophthalmitis. Here we describe a rare case report with the aim to emphasize the need for clinical microbiology laboratories to be prepared to face the diagnosis of uncommon infectious diseases such as exogenous fungal endophthalmitis by *Acremonium* and to enhance the awareness of surgeons and clinicians of this occurrence.

INTRODUCTION

Exogenous endophthalmitis is one of the most vision-threatening complications of cataract surgeryfollowed by placement of a prosthetic lens. Typically it is caused by the perioperative introduction of microbial organisms (mainly coagulase- negative staphylococci and *Propionibacterium acnes*) into the eye. Mycotic postsurgical endophthalmitis is a rather unusual disease: *Candida albicans, Aspergillus sp.*, and *Fusarium sp.* are the most frequently isolated organisms in the fungal cases. However *Acremonium sp.* has also been rarely reported as a cause of postcataractsurgery endophthalmitis.

The present report describes rare case of *Acremonium* endophthalmitis occurring after cataract surgery and intraocular lens (IOL) implantation, with the aim of enhancing the awareness of surgeons and clinicians on the possibility of this risk.

CASES

A 75-year-old man, underwent phacoemulsification and Intraocular lens (IOL) implantation in his left eye at the ophthalmologic clinic. One weeks after surgery the patient reported with signs and symptoms of endophthalmitis with decreased visual acuity and pain. Topical antibiotics and corticosteroids were administered. After 10 days of this therapy the clinical situation had ostensibly worsened with intense conjunctival hyperemia, corneal oedema, hypopyon (2 mm), Tyndall ++ andeye fundus unsearchable. Because bio microscopic and clinical appearance continued to deteriorate, IOL and capsular remnants were removed. Microbiological cultures, performed onvitreous washing, aqueous fluid and intraocular lens samples using conventional methods for bacteria and fungi, were negative for bacteria. On the other hand, moulds with similar macroscopicand microscopic features were isolated from all the samples on Sabouraud dextrose agar (SDA) (Figure 1A). All colonies, grown within 5-7 days, were white with a colourless reverse, smooth, compact and moist at first, becoming powdery with age. The vegetative hyphae were hyaline and septate, very fine and narrow; the conidiophores were simple, slender presenting erect phialidesarising from vegetative hyphae. The phialides showed tapered apices and conidia were ellipsoidal to short-cylindrical, 1- celled, hyaline and often accumulating in slimy heads. While no macroconidia were observed, initial observations nevertheless suggested either Acremonium or Fusarium genus. However, slide culture was performed to better understand the arrangement of conidia with the hyphae (Figure 1B). Therefore, moulds were macroscopically and microscopically identified as Acremonium sp. With a diagnosis of Acremonium-related endophthalmitis, intravenous ampotericin B was given daily for post-operative five days. The patient was then discharged with directions to take oral voriconazole medication for four weeks.

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One month after the vitrectomy, the patient's best corrected visual acuity improved to 20/30 and the anterior chamber inflammation was reduced to grade 1. The thin plaque- like material around the intraocular lens that was noticed at the immediate postoperative period gradually decreased over time with extended oral antifungal treatment for six months.

DISCUSSION

Endophthalmitis secondary to cataract surgery is a rare but serious condition affecting vision. Previous studies have shown that fungi are responsible for 8.6-18.6% of all post-operative infectious endophthalmitis cases (Anand *et al.*, 2000; Buchler *et al.*, 2003; Kunimoto *et al.*, 1999). In particular, *Candida albicans*is implicated in endogenous endophthalmitis that usually occurs secondary to dissemination of organisms from a distant focus to the eye via blood: 2-15% of all endophthalmitis cases are estimated to occur in this way (Sallam *et al.*, 2006; Schiedler *et al.*, 2004; Caldwell *et al.*, 2009). On the other hand, *Aspergillus sp.* and *Fusarium sp.* are responsible for exogenousfungal endophthalmitis (Wycoff *et al.*, 2008) that is known to occur in a variety of clinical settings including contiguous spread of fungal keratitis, after penetrating keratoplasty, after retinal detachment surgery, with intraocular inoculations from irrigation solutions or infect IOL implantation and air conditioning systems, mainly during construction activities in hospitals (Narang *et al.*, 2001; Fridkin *et al.*, 1996).

Acremonium species, formerly termed Cephalosporium species, are soil fungi that are ubiquitous environmental contaminants (Scott et al., 2005; Weissgold et al., 1996; Cameron et al., 1996; Fridkin et al., 1996). They are saprophytic molds and have septate colorless hyphae like those of other hyaline molds (Fleming et al., 2002). Although invasive disease may occur in an immunocompromised person, usually most cases of human disease occur in immunocompetent hosts, unlike with other filamentous fungi (Fleming et al., 2002). Most cases of infection are mycetomas of the extremities in patients in the tropics (Fleming et al., 2002). Ocular involvement of Acremonium is uncommon. Exogenous fungal endophthalmitis is known to occur in a variety of clinical settings including contiguous spread of fungal keratitis, after penetrating keratoplasty, after retinal detachment surgery, with intraocular inoculations from irrigation solutions, and so on (Weissgold et al., 1996). Also, Acremonium may postoperativelyinvade through wounds. Air contaminated solutions such ashumidifier fluid or contaminated objects are also possible sources (Fridkin et al., 1996). The initial presenting symptoms of Acremonium endophthalmitis are similar to those of most delayed-onset fungal endophthalmitis, including mild pain, redness, floaters and slightly decreased visual acuity. The time interval between cataract operation and endophthalmitis ranges from 12 days to six weeks, but is usually one month (Scott et al., 2005; Weissgold et al., 1996; Cameron et al., 1996; Fridkin et al., 1996; Vescia et al., 2005). Interestingly, Acremonium infection may mimic Propioni bacterium infection in that both organisms yield similar plaque-like materials in and around the anterior chamber (Scott et al., 2005; Weissgold et al., 1996; Cameron et al., 1996). Cameron et al., (1996) reported that they had observed inflammatory multinucleated giant cells and slender septated fungal hyphae in the histopathologic specimen of the white plaque from anAcremonium endophthalmitis patient.

The definitive identification of *Acremonium* requires a culture, but it can be identified provisionally in tissue sections through the presence of a combination of histologic features, including hyaline septate hyphae and characteristic reproductive structures known as phialides and phialoconidia (Fleming *et al.*, 2002). The best stains for observing fungi are Grocottmethenamine-silver and Giemsa stains. But Gram stain and 10% potassium hydroxide are still used as an alternative method for identifying fungal organisms (Weissgold *et al.*, 1998). In our cases, Gramstaining of the vitreous sample showed *Acremonium* hyphae. To date, a treatment modality has not been well establishedfor these fungal infections. In a four-case series report, Weissgold *et al.*, (1996) suggested that higher drug doses or repeateddosing with amphotericin B (possibly in combination with vitrectomy) may be necessary to adequately treat suchinfections. Cameron *et al.*, (1996) reported that *Acremonium* remains viable in the anterior chamber despite surgical removalof the bulk of the fungal mass and treatment with several antifungal medications, including topical natamycin, topical amphotericinB, subconjunctivalmiconazole

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injection, and oral ketoconazole. In our case, the remaining white plaque in theanterior chamber after vitrectomy was treated with voriconazole medication for six months. Voriconazole is a triazole derivative that achieves a sufficient therapeutic level in aqueous and vitreous liquids by oral administration (Wang *et al.*, 2000; Mattei *et al.*, 2003). Mattei *et al.*, (2003) reported that voriconazole treatment appeared to be very effective in their case report of fungemia caused by *Acremonium*.



With the recent advances of vitreous surgical technique, including sutureless vitrectomy and a panoramic viewing system, vitrectomy is more widely accepted as a treatment option for chronic recurrent endophthmitis (Lemiley and Han, 2007). Especiallywhen a significant vitreous opacity is associated, as in our case, vitrectomy is preferred over vitreous tap and intravitreal injection.

In conclusion, the cases described in this study emphasize the need for clinical microbiology laboratories to be prepared to face the diagnosis of uncommon infectious diseases such as exogenous fungal endophthalmitis by *Acremonium* and to enhance the awareness of surgeons and clinicians of this occurrence.

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