CASE REPORT

A Case of Invasive Aspergillosis Presenting as Acute Angle Closure Glaucoma

Seong-Jae Kim^{1,2}, Che-Ron Kim¹, Gyu-Nam Kim¹, Yong-Seop Han^{1,2}, In-Young Chung^{1,2}, Seong-Wook Seo^{1,2}, Jong-Moon Park^{1,2}, and Ji-Myong Yoo^{1,2}

¹Department of Ophthalmology, College of Medicine and ²Gyeongsang Institute of Health Science, Gyeongsang National University, Jinju, Korea

ABSTRACT

Purpose: To report a case of invasive aspergillosis presenting as acute angle closure glaucoma.

Case: A 72-year-old male patient visited our clinic with decreased visual acuity and ocular pain on the right eye lasting for 3 d. His intraocular pressure was 42 mmHg in the right eye and 18 mmHg in the left eye. And, there was about 2 mm of exophthalmos, slight ptosis with decreased motility in all directions, conjunctival injection, moderate mydriasis with a relative afferent pupillary defect, and angle closure in the right eye. Orbital computed tomography and magnetic resonance imaging showed isointense mass involving right orbit and ethmoid sinus. Based on the biopsy, invasive aspergillosis was definitely diagnosed. Despite performing peripheral laser iridotomy and administering antifungal agent and antiglaucoma medication, the patient was blinded in his right eye. During the follow-up period, visual acuity in the left eye suddenly decreased due to the invasive aspergillosis in the left paranasal sinus and optic nerve, and eventually the patient lost his left vision as well.

Conclusion: This report is regarding a case of an invasive aspergillosis resulting in blindness in both eyes with the clinical manifestations of acute angle closure caused by invasive aspergillosis.

Keywords: Acute angle closure glaucoma, invasive aspergillosis, orbital cellulitis

INTRODUCTION

Orbital aspergillosis is a rare clinical condition caused by infection of the orbital tissues by *Aspergillus* fungus, most commonly *Aspergillus fumigatus*.¹ While orbital aspergillosis rarely develops in healthy people, ambiguous symptoms and uncertain clinical manifestations make the diagnosis and choice of appropriate treatment difficult, often leading to deterioration of the condition.² Here, we report a case of invasive aspergillosis resulting in blindness in both eyes. The condition was masked by the clinical manifestations of acute angle closure glaucoma caused by invasive aspergillosis on the optic nerve and surrounding area.

CASE REPORT

A 72-year-old male patient visited our clinic with visual disturbances and ocular pain in the right eye persisting for 3 d. He had no specific previous medical history, including diabetes or immunocompromised diseases. His best corrected visual acuity was 20/200 in the right eye and 20/20 in the left eye, and intraocular pressure (IOP) was 42 mmHg in the right eye and 18 mmHg in the left eye. About 2 mm of exophthalmos (Figure 1a), slight ptosis with decreased motility in all directions, conjunctival injection and moderate mydriasis with a relative afferent pupillary defect in the right eye was detected. In slit lamp and Scheimpflug images, corneal oedema,

FIGURE 1 Digital photograph showed proptosis of the right eye (a). Scheimpflug images demonstrate a shallow anterior chamber and angle narrowing in both eyes. In addition, pupil dilation was observed in the right eye (b and c). Fundus photographs showed no remarkable findings. (d and e) CT showed a mass-like lesion involving the right orbital cavity and the ethmoidal and sphenoidal sinuses (f and g).

a shallow anterior chamber, and 360° angle closure were observed in the right eye (Figure 1b). In addition, a shallow anterior chamber was noted in the left eye (Figure 1c). The fundus examination showed no remarkable findings (Figure 1d and e). We believed that the patient had acute angle closure in the right eye and occludable angle in the left eye; laser iridotomy was therefore performed in both eyes. Following this, the IOP in the left eye was stabilised at 10 mmHg, but the right eye pupil was moderately dilated and the IOP was not controlled. In addition, findings of continuous angle closure were consistently present but evidence of plateau iris was not observed.

While IOP-reducing agents including oral carbonic anhydrase inhibitor were administered during the follow-up period, exophthalmos developed. Orbital computed tomography (CT) showed a mass-like lesion involving the right orbital cavity and the ethmoidal and sphenoidal sinuses (Figure 1f and g). The patient was therefore transferred to otolaryngology for biopsy. In the post-operative biopsy, hematoxylin-eosin and Gomori methenamine-silver staining showed septa and dichotomously branching hyphae. Based on the above findings, the patient was diagnosed with invasive aspergillosis (Figure 2a and b). The patient was transferred to the internal

FIGURE 2 Hematoxylin-eosin and Gomori methenamine-silver staining showing septa and dichotomously branching hyphae (a and b; magnification 400 $\times$). Post-gadolinium T1-weighted image demonstrates markedly increased heterogeneous enhancement of the right orbit, left sphenoidal sinus, and orbital apex (c and d).

medicine department and systemic administration of amphotericin-B was commenced. However, the patient became blind in the right eye. Antifungal therapy was replaced to itraconazole. The IOP was controlled at 16 mmHg with pilocarpine and beta-blocker, and exophthalmos was stabilised at approximately 2.5 mm. About 5 months after discharge, the patient was admitted again from the outpatient department due to abrupt visual disturbances in the left eye. Visual acuity of the left eye was 20/200 and was not corrected, and the pupil was moderately dilated. Orbital magnetic resonance images showed findings of invasion into the left sphenoid bone and optic nerve (Figure 2c and d). After the patient was re-admitted to the internal medicine department, voriconazole was administered but the patient was blinded in the left eye.

DISCUSSION

In this paper, we present a case of invasive aspergillosis with the clinical manifestations of acute angle closure glaucoma. The patient lost vision in both eyes due to invasive aspergillosis originated by ethmoid

and sphenoid sinuses that began in the right eye and invaded into the left sphenoid bone and optic nerve of the left eye. The findings here suggest that the diagnosis of primary angle closure glaucoma should be revised if the IOP is not responding to treatment, and a secondary cause should be sought before further intervention is considered.

Secondary acute angle closure glaucoma can be associated with intumescent lens, choroidal melanoma, ciliary body melanocytoma, and aqueous misdirection.^{3,4} To the best of our knowledge, this is the first case report of acutely raised IOP due to angle closure following invasive aspergillosis of the orbit. In this case, ophthalmic examination revealed bilateral shallow anterior chamber depth suggesting that the patient was already at the risk of developing angle closure glaucoma.

Clinical presentation of orbital aspergillosis in immunocompetent patients is highly variable and can mimic malignancy, optic neuritis, orbital apex syndrome, and typical bacterial cellulitis or orbital abscess.⁵⁻⁸ According to Sivak-Callcott et al., symptoms in the early stage of orbital aspergillosis may include persistent ocular pain and headaches, visual disturbances, exophthalmos, and ophthalmoplegia.⁹

When unilateral ocular pain deteriorates without additional findings, orbital aspergillosis should be suspected.¹⁰ Elderly patients have a shallow anterior chamber with a narrow anterior chamber angle, which is a risk factor for acute angle closure glaucoma. Early diagnosis and treatment of invasive aspergillosis is difficult because ambiguous clinical manifestations of invasive aspergillosis are similar to symptoms of acute angle closure glaucoma.

In summary, clinical manifestations of invasive aspergillosis are non-specific, making a rapid and accurate diagnosis difficult. Multiple mechanisms related to the invasive aspergillosis appear to be involved in the aetiology of the elevated IOP. It is possible that raised episcleral venous pressure due to direct invasion of invasive aspergillosis into the cavernous sinus may have occurred, and subsequently increasing the IOP. Also, the patient with shallow anterior chamber had a risk for developing acute angle closure, and he exhibited moderate mydriasis, slight ptosis, and decreased motility in all directions. Since mid-dilated pupil is associated with increased resistance of aqueous humor flow between the pupillary portion of the iris and the anterior lens surface,¹¹ these situations can be triggered by the impairment of oculomotor nerve caused by direct invasion or compression of invasive aspergillosis. For this reason, another possible mechanism of IOP elevation in this case is an angle-closure form of glaucoma, with perhaps a minimal contribution. But, many factors may have contributed to increase IOP in this case, because elevated IOP did not respond well to laser peripheral iridotomy. The initial symptoms of invasive aspergillosis are similar to those of acute angle closure glaucoma, and therefore clinicians must be aware of the similarity of symptoms. And, exact and prompt diagnostics using radiological procedures, biopsy, as well as immediate initiation of

antifungal treatment and surgical excision can be life-saving in similar cases.

Declaration of interest: The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

We have no commercial interests.

REFERENCES

- [1] Jahrsdoerfer RA, Ejercito VS, Johns MM, Cantrell RW, Sydnor JB. Aspergillosis of the nose and paranasal sinuses. *Am J Otolaryngol* 1979;1:6–14.
- [2] Choi HS, Choi JY, Yoon JS, Kim SJ, Lee SY. Clinical characteristics and prognosis of orbital invasive aspergillosis. *Ophthal Plast Reconstr Surg* 2008;24:454–459.
- [3] Alsagoff Z, Aung T, Ang LP, Chew PT. Long-term clinical course of primary angle closure glaucoma in an asian population. *Ophthalmology* 2000;107:2300–2304.
- [4] FJ LoRusso, M Boniuk, RL Font. Melanocytoma (Magnocellular nevus) of the ciliary body: report of 10 cases and review of the literature. *Ophthalmology* 2000; 107:795–800.
- [5] Spoor TC, Hartel WC, Harding S, Kocher G. Aspergillosis presenting as a corticosteroid-responsive optic neuropathy. *J Clin Neuroophthalmol* 1982;2:103–107.
- [6] Choi MY, Bae IH, Lee JH, Lee SJ. Aspergillosis presenting as an optic neuritis. *Korean J Ophthalmol* 2002;16:119–123.
- [7] Yumoto E, Kitani S, Okamura H, Yanagihara N. Sino-orbital aspergillosis associated with total ophthalmoplegia. *Laryngoscope* 1985;95:190–192.
- [8] Slavin ML. Primary aspergillosis of the orbital apex. *Arch Ophthalmol* 1991;109:1502–1503.
- [9] Sivak-Callcott JA, Livesley N, Nugent RA, Rasmussen SL, Saeed P, Rootman J. Localised invasive sino-orbital aspergillosis: characteristic features. *Br J Ophthalmol* 2004;88:681–687.
- [10] Adler SC, Isaacson G, Sasaki CT. Invasive aspergillosis of the paranasal sinuses and orbit: can you save the eye? *Am J Otolaryngol* 1997;18:230–234.
- [11] Chandler PA. Narrow-angle glaucoma. *Arch Ophthalmol* 1952;47:695–716.