Case Report

Ocular infection from *Staphylococcus aureus* bacteraemia in a sero-positive HIV patient from Queen Elizabeth Central Hospital, Blantyre, Malawi

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Abstract

Ocular involvement in *Staphylococcus aureus* bacteraemia occurs with metastatic infection and has been identified as an independent risk factor for mortality. It manifests as either endophthalmitis or chorioretinitis and often leads to visual loss, particularly with delayed diagnosis. We present a case report of endogenous endophthalmitis and chorioretinitis in the background of methicillin-sensitive *Staphylococcus aureus* (MSSA) bacteraemia in a 23-year-old HIV-positive woman.

Key Words

Staphylococcus aureus, bacteraemia, chorioretinitis, endophthalmitis, HIV, vitritis

Introduction

Staphylococcus aureus bacteraemia (SAB) is associated with the highest morbidity and mortality compared to bacteraemia from other pathogens[1]. It commonly results in metastatic disease, which may involve the bone, joints, lungs, and kidneys[2]. Ocular involvement commonly leads to visual loss, so early identification and subsequent treatment are critical. However, being a rare condition, there is limited data on the incidence of intraocular infection with SAB[3]. Ocular involvement in SAB is seen commonly in individuals under immunosuppression and has been reported as an independent risk factor for mortality[3]. However, there is limited information in reports of ocular infection in the context of immunosuppression from human immunodeficiency virus (HIV) infection.

Case report

A 23-year-old woman of African descent newly diagnosed with HIV infection was admitted to the medical ward with pyrexia of 38.5°C. Within 2 days, blood culture yielded methicillin-sensitive *Staphylococcus aureus* (MSSA) and further workup revealed cavitatory lung lesions, obstructive jaundice and acute kidney failure. There were no remarkable findings on echocardiography, and intravenous ceftriaxone 2 g once daily was commenced for disseminated bacteraemia.

Signs of systemic infection persisted with blood culture remaining positive for MSSA at 14 days following admission, at which time she developed painless blurring of vision in both eyes with the best corrected visual acuity of light perception (LP) in the right eye and 6/15 in the left eye. The right eye had anterior chamber cells 2+, extensive posterior synechiae and a nuclear cataract (Figure 1A). Anterior segment examination of the left eye was unremarkable except for anterior chamber cells 1+ (Figure 1B). Dilated fundoscopy showed a vitritis of 2+ with retinal infiltrates in the right eye (Figure 2A), and a Roth's spot in the left eye

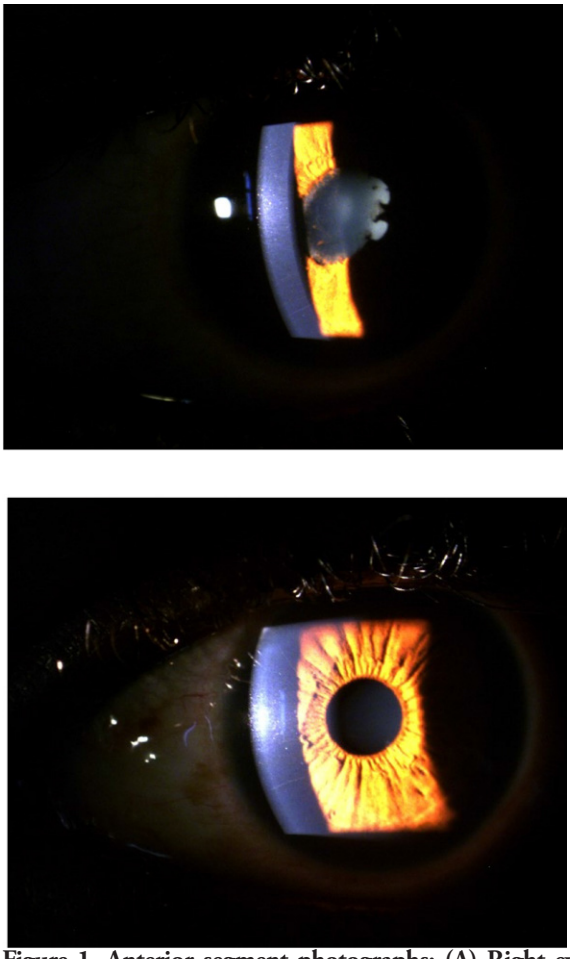

Figure 1. Anterior segment photographs: (A) Right eye, with an irregular pupil, cataract and 360° posterior synechiae. Vision is LP. (B) Left eye, with a normal round pupil.

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A clinical diagnosis of right eye endogenous endophthalmitis and left eye chorioretinitis was made. The intravenous antibiotic treatment was doubled (2 g ceftriaxone twice daily) and oral doxycycline (100 mg twice daily) was commenced as additional staphylococcal coverage.

Features of active intraocular inflammation were noted to be improving in both eyes four days later and the treatment was continued for 2 more weeks. At 1 month, there was resolution of signs of systemic infection and ocular signs of inflammation. However, the right eye vision was still LP, while the left eye vision had improved to 6/6 (Figure 2). There was almost complete resolution of the Roth's spot in the left eye.

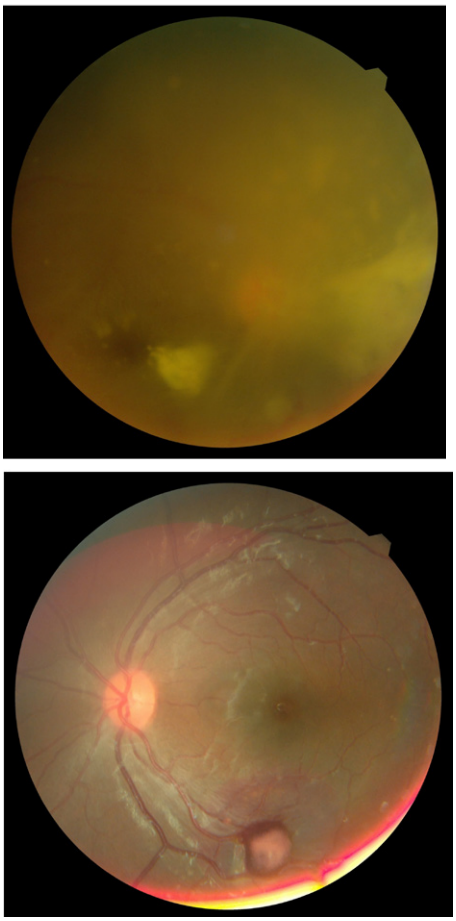

Figure 2. (A) Colour fundus photograph of the right eye, showing a vitritis with a hazy view, with multiple whitish round deep retinal infiltrates. (B) Colour fundus photograph of the left eye showing a Roth's spot (white centred intraretinal haemorrhage) along the inferior temporal arcade.

Discussion

Endogenous endophthalmitis is an uncommon but sight-threatening intraocular inflammation that can occur at any age and has no sexual predilection. Although bilateral involvement has been reported in 14–25% of cases[4], for patients with unilateral disease the right eye is involved twice as often as the left eye. Right eye predilection is postulated to be as a result of the proximity and more direct blood flow through the right carotid artery[5].

Predisposing conditions for the development of endogenous endophthalmitis include diabetes mellitus, liver cirrhosis, malignancy and acquired immunodeficiency syndrome (AIDS)[6]. Gram-negative bacteria account for most of the cases of bacterial endophthalmitis among non-Westerners, whereas gram-positive bacteria are the commonest aetiology among Westerners[7]. We could not find any report regarding the commonest bacterial aetiology of endogenous endophthalmitis in sub-Saharan African settings. In our patient, SAB in the background of a recent diagnosis of HIV strongly suggests that immunosuppression caused by HIV/AIDS may have been a predisposing factor for intraocular involvement.

Factors associated with metastatic infections in SAB include community-acquired infections, infective endocarditis, shorter times to positive blood culture results, and bacteraemia persisting for more than 48 hours[3]. Blood culture positivity within 2 days and the persistence of positivity for 2 weeks suggests a high bacteraemia load in our patient, which may have increased the risk of developing ocular metastases.

Timely diagnosis of endogenous endophthalmitis requires a high index of clinical suspicion, particularly for hospitalized febrile patients with ocular pain, discharge or decreased vision[4,6]. Positive cultures of intraocular aspirates help in establishing a definitive diagnosis[3]. However, there is a lack of consensus over their efficacy, with reported positive culture rates varying widely from 24% to –95%[4]. In practice, a presumptive aetiologic diagnosis of endogenous endophthalmitis is usually made if a pathogen has previously been cultured as part of the systemic work-up even in the absence of a positive culture of intraocular aspirate[7].

Due to rarity of bacterial endogenous endophthalmitis, there are no universal guidelines in the literature for the optimal management of the condition[6]. Otherwise, administration of intravenous antibiotic therapy is the mainstay of treatment[5,6]. The visual acuity at the time of diagnosis, the causative agent, and the degree of vitreous opacity are the main visual prognostic factors[4]. Intravitreal antibiotics are often employed if there is progression of lesions despite systemic therapy. However, their usage in endogenous endophthalmitis is not supported by conclusive evidence[4,5].

In our patient, resolution of ocular inflammation was observed in both eyes after doubling the dose of parenteral antibiotic therapy. Complete visual recovery was achieved in the left eye, and this is in line with other reports of good outcomes in patients with SAB treated for chorioretinitis with systemic antibiotics alone[3]. On the other hand, *Staphylococcus aureus* endophthalmitis is generally associated with a very poor visual outcome, even with prompt diagnosis and treatment with intravenous antibiotics and intravitreal antibiotics with or without vitrectomy[6]. Considering the condition's poor prognosis, with 25% of affected eyes getting enucleated or eviscerated[7], the right eye outcome in our case is encouraging despite the lack of visual recovery.

Conclusion

Although there are few reports of endogenous endophthalmitis among African patients with HIV infection, it is important to have a high index of suspicion for the condition. Prompt initiation of high-dose intravenous antibiotics in patients with bacteraemia and visual complaints may be sight-saving.

References

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