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Case Report Open Access

Polymicrobial Endophthalmitis in a Patient with Pyelonephritis

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Introduction

The genitourinary tract is well recognized as a route through which bacteria could gain access to the blood circulation. Under some circumstances, metastatic infections rarely occur in distant organs, including the eye. Endogenous endophthalmitis is a relatively uncommon but severe infection, and has a varied aetiology [1,2]. Moreover, polymicrobial infections in endophthalmitis are extremely uncommon, and are often associated with trauma [3]. However, polymicrobial infections in the eye of pyelonephritis patients have yet to be reported. We, herein, report a patient with pyelonephritis, who rapidly developed severe polymicrobial endogenous endophthalmitis.

Case Report

A 78-year-old Japanese woman complained of fever, appetite loss and general fatigue, as well as right eyelid swelling on September 17, 2013. The patient had experienced fever and back pain in July 2013. Urinalysis showed increased number of white blood cells. After diagnosis of pyelonephritis made by a primary physician, she underwent intravenous ampicillin sulbactam for 3 days. And then her systemic symptoms temporarily improved. The patient's past medical history was notable for diabetes mellitus for 25 years without any previous ocular disease or trauma. Her ocular symptoms deteriorated and proceeded to acute k.

Visual acuity was light perception in the right eye and 0.7 in the left eye. Intraocular pressure was 24 mmHg in the right eye. Examination of the left eye was unremarkable except for senile cataract. The right eye demonstrated conjunctival injection and corneal epithelial edemawithout hypopyon (Figure 1). There was dense whitish debris in the anterior chamber. The right fundus was invisible. B-scan ultrasound revealed marked high-echoic vitreous opacity. Blood test revealed elevated WBC (17.570/μl), elevated CRP (10.85 mg/dl), elevated hemoglobin A1c and serum glucose levels (7.5% and 291 mg/dl, respectively), negative Treponema pallidum or human immunodeficiency virus. Renal function was normal.

The patient underwent phacoemulsification and pars plana vitrectomy (Figure 2). During anterior vitrectomy, dense whitish opacity was cut and aspirated by a 23-gauge vitreous cutter (Figure 2A). After core vitrectomy, the retina demonstrated total necrosis with whitish coloration (Figures 2B, 2C). During vitrectomy, vancomycin and ceftazidime were continuously injected into the vitreous.She was started on intravenous vancomycin (1 g) and ceftriaxone (1 g) for 1 week. Material from the vitreous abscess grew *Klebsiella (K). pneumoniae* and *methicillin-resistant Staphylococcus aureus* (MRSA). Urine culture was positive for *K. pneumoniae*. Five days after admission, she developed right panophthalmitis with perforation of the cornea, which was eventually treated by evisceration. Now she is well without systemic symptoms or ocular inflammation in left eye.

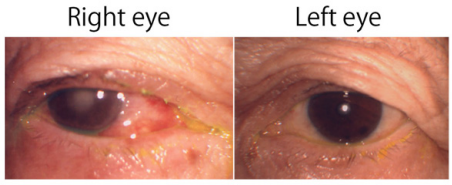

Figure 1: External ocular findings in both eyes at an initial presentation
Right eye presents with lid swelling, marked congestion and whitish debris upon the pupil, whereas left eye is normal.

Discussion

Endogenous endophthalmitis can be a catastrophic infection that occurs secondary to seeding of the intraocular cavity from extraocular foci, in which liver abscess is one of the major causes leading to metastatic endophthalmitis [4]. However, pyelonephritis rarely causes infectious endophthalmitis. In some cases, the pathogens such as *K. pneumoniae* [5,6], *Escherichia coli* [7] and *Candida* [8] have been identified. In this case, cultures from urinary and vitreous samples proved *K. pneumoniae*, indicating that *K. pneumonia* as a pathogen of endophthalmitis metastasized from urinary tract. In addition, the vitreous cultures grew MRSA, which was not grown in urinary culture. These results suggest that the endogenous endophthalmitis was due to a polymicrobial infection due to *K. pneumoniae* and MRSA. A recent study conducting large consecutive case series displayed that polymicrobial endophthalmitis was seen in 3.88% of culture-proven endophthalmitis patients [3]. Moreover, although polymicrobial infections can be commonly seen in endophthalmitis associated with open-globe injury (72.1%) and postoperative endophthalmitis (20.9%), endogenous endophthalmitis was rare: the frequency being 6.9% among all polymicrobial endophthalmitis [3]. In fact, intraocular infection with MRSAusually follows surgical interventions like corneal transplantation [9]. Therefore, this case is unique because the patient had no medical history of any ocular trauma or ophthalmic surgery.

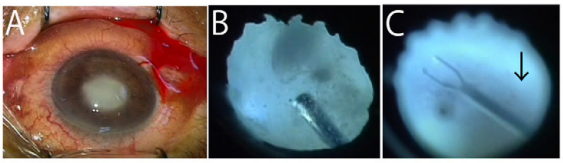

Figure 2: Intraoperative findings during phacoemulsification and vitrectomy.
A: Anterior chamber is filled with whitish soft materials with total posterior synechiae and ciliary injection.
B: During anterior vitrectomy, dense whitish opacity is cut and aspirated by vitreous cutter.
C: After core vitrectomy, the retina demonstrates total necrosis with whitish coloration. An arrow indicates the optic disc.

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Endogenous endophthalmitis can be associated with underlying immunosuppression including diabetes mellitus, cardiac disease, renal insufficiency and malignancy [4]. It is indisputable that patients with poorly regulated diabetes mellitus may develop severe infectious complications. Indeed, diabetes mellitus is a known risk factor for metastatic endophthalmitis associated with liver abscess [10]. Klouwens et al. described a diabetic patient with urosepsis, complicated by emphysematous pyelonephritis and endogenous endophthalmitis [11].

Recent reports suggest the increasing prevalence and incidence of *K. pneumoniae* as a causative organism in Asian countries [4]. Therefore, ophthalmologists should pay attention to *K. pneumoniae* as a candidate pathogen in patients from Asia. However, even though patients with *K. pneumoniae* endophthalmitis were treated by early and aggressive interventions including vitrectomy and retinal detachment surgery, the functional results of vision were usually poor. A number of studies have reported the visual outcome of *K. pneumoniae* endophthalmitis after treatment. Unfortunately, almost all large series and most case reports have very poor outcomes [4]. This patient showed severe vision loss and underwent vitrectomy as early as 3 days after initial ocular symptoms happened. However, the retina already demonstrated total necrosis.

References

1. Jackson TL, Eykyn SJ, Graham EM, Stanford MR (2003) Endogenous bacterial endophthalmitis: a 17-year prospective series and review of 267 reported cases. Surv Ophthalmol 48: 403-423.
2. Connell PP, O'Neill EC, Fabinyi D, Islam FM, Buttery R, et al. (2011) Endogenous endophthalmitis: 10-year experience at a tertiary referral centre. Eye (Lond) 25: 66-72.
3. Jindal A, Moreker MR, Pathengay A, Khera M, Jalali S, et al. (2013) Polymicrobial endophthalmitis: prevalence, causative organisms, and visual outcomes. J Ophthalmic Inflamm Infect 3: 6.
4. Kashani AH, Eliott D (2013) The emergence of Klebsiella pneumoniae endogenous endophthalmitis in the USA: basic and clinical advances. J Ophthalmic Inflamm Infect 3: 28.
5. Lin HH, Chien CC, Fang JT, Lai RH , Huang CC (2002) Unusual clinical presentation of Klebsiella pneumoniae induced endogenous endophthalmitis and xanthogranulomatous pyelonephritis in a non-nephrolithiasis and non-obstructive urinary tract. Ren Fail 24: 659-665
6. Kremer I, Gaton DD, Baniel J, Servadio C (1990) Klebsiella metastatic endophthalmitis--a complication of shock wave lithotripsy. Ophthalmic Surg 21: 206-208.
7. Rahav G, Levinger S, Frucht-Pery J (1994) Escherichia coli endophthalmitis secondary to pyelonephritis: another complication of diabetes? Clin Infect Dis 18: 117-118.
8. Nakanishi S, Hatayama T (2008) [Case of fungal endophthalmitis from pyelonephritis caused by ureterolithiasis]. Hinyokika Kiyo 54: 115-117.
9. Karth PA, Karth JW (2013) Endophthalmitis following photorefractive keratectomy with a history of radial keratotomy: a case report. J Ophthalmic Inflamm Infect 3: 31.
10. Abdul-Hamid A, Bailey SJ (2013) Klebsiella pneumoniae liver abscess and endophthalmitis. BMJ Case Rep 2013.
11. Klouwens MJ, Blok WL, Witmer AN, Verouden CJ, Mura M (2013) [Serious complications of urinary tract infection in diabetes: emphysematous pyelonephritis and endogenous endophthalmitis]. Ned Tijdschr Geneeskd 157: A5243.