• Letter to the Editor •

Klebsiella pneumoniae endogenous endophthalmitis secondary to liver abscess syndrome

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Dear Editor,

We report a case of endogenous endophthalmitis (EE) secondary to *Klebsiella pneumoniae* (KP) liver abscess syndrome. EE is a severe infection of the vitreous cavity that results from the hematogenous spread of microorganism from a remote source into the eye[1-2]. Usually, the causative pathogens show geographic diversity. Gram-positive and *Candida* organisms are responsible for most EE cases in Europe and America, whereas in eastern Asian countries, the most common causative agents are Gram-negative bacteria. Among the gram-negative microorganisms, KP has emerged over the last years as the predominant pathogen in east Asia[1-4]. Endocarditis, urinary tract infections, catheter-related infections, internal organ abscess and soft tissue infections are the most common infectious foci associated with EE[3-4]. However, the underlying source of the infection in more than 50% of patients with EE secondary to KP, is a liver abscess[1-2]. This rare condition has been called cryptogenic invasive *klebsiella pneumoniae*-associated liver abscess syndrome (CIKPLA) and is an infection, characterized by a solitary liver abscess, typically complicated by one or more septic conditions (endophthalmitis, lung abscess, meningitis or necrotizing fasciitis) and associated to diabetes mellitus (DM) in 50%-75% of the patients[4-8]. CIKPLA used to be a rare condition confined to the southeast Asia, however, the number of cases being reported in western countries are increasing, what suggest that may be a global problem.

A 60-year-old man of Asian descent presented to the Emergency Department with a 3-day history of redness, pain and decreased visual acuity (VA) in his right eye (OD). The patient reported a history of well-controlled type 2 DM, but denied any other medical condition. He was prescribed prednisolone 1% eyedrops every two hours and cyclogyl twice a day for presumed panuveitis, but after his symptoms did not improve over two days, he was referred to our hospital for second opinion. On examination, VA was light perception in the OD and 20/20 in the left eye (OS). Slit lamp exam of OD showed conjunctival hyperemia, mild corneal edema, moderate anterior chamber inflammatory cellular reaction with a 1 mm hypopyon. Funduscopic examination was remarkable for severe vitritis. The retina could not be visualized due to media opacity, but it was attached with B scan ultrasonography. The OS examination was unremarkable. With further questioning, the patient denied eye surgery or trauma or any drugs or medication, except for the treatment of his diabetes. However, systemic review was remarkable for a low-grade fever and low back pain one week before the onset of his symptoms that spontaneously improved without medication.

A presumptive diagnosis of right EE was made. Intravitreal injections of vancomycin (1.0 mg/0.1 mL) and ceftazidime (2.25 mg/0.1 mL) were administered in the OD after obtaining aqueous and vitreous taps. Six hours later, the Gram stain of the vitreous specimen revealed Gram-negative bacilli. The patient was admitted to the hospital. Blood work and blood cultures were done. His hemoglobin A1c was 9.8% so treatment with glargine and short acting insulin was started. Blood work showed elevation of the hepatic enzymes and the leukocytes. By this time, the patient noted increasing low back pain.

Given the known association of KP endophthalmitis with liver abscess, additional abdominal imaging test were performed. Abdominal ultrasound and computed tomography (CT) scan showed an ill-defined, multilocular low density lesion in the right lobe of his liver, what was suspicious for an abscess (Figure 1).

Within 24h, vitreous and blood cultures came back positive for KP. Ultrasound-guided percutaneous drainage of the mass was performed. The culture of the fluid collected from the liver abscess was also positive for KP, which confirmed the

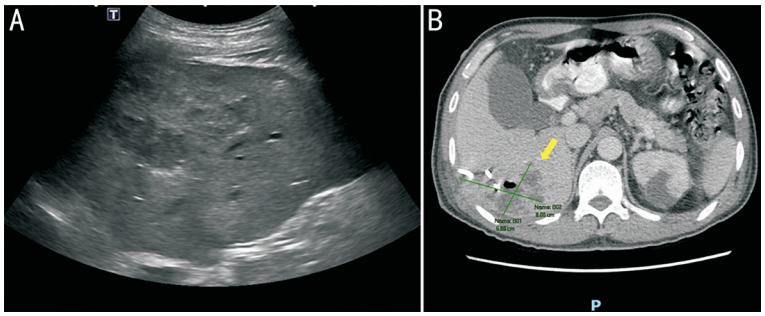

Figure 1 Abdominal computed tomogram with contrast (B) and ultrasound (A) demonstrate multilocular low density lesion, containing scattered locules of gas, what is consistent with liver abscess (yellow arrow).

diagnosis of EE secondary to KP liver abscess. Our patient was treated with intravenous ceftriaxone 2 mg and topical moxifloxacin. However, 5d later, the patient presented with increasing eye pain, eyelid swelling, and elevated intraocular pressure (45 mm Hg; Figure 2). An orbit scan was performed, but no evidence of retro-orbital involvement was found (Figure 3). The ocular ultrasound showed a retinal detachment in the OD hence the patient underwent vitrectomy (Figure 4). To assist the view during vitrectomy, pars plana lensectomy was required. During surgery, it was noted that the retina was totally detached and necrotic. Purulent debris was removed from the eye and intravitreal vancomycin (1 mg/0.1 mL), ceftazidime (2.25 mg/0.1 mL) and dexamethasone (0.4 mg/0.1 mL) were administered to control the infectious process. After surgery, the eye pain and swelling resolved but vision did not recover. Further systemic evaluation was negative. Echocardiogram, magnetic resonance imaging (MRI) of the brain and CT scans of the chest and abdomen were unremarkable. Colonoscopy was normal. Our patient was discharge home in stable conditions a week later, with oral antibiotic treatment (trimetroprim 160 mg, sulfamethoxazole 800 mg twice a day). By this time, blood cultures were negative and liver abscess was decreasing in size. On follow-up, his vision in the OD was no ligth perception (LP) but the eye remained quiet and comfortable.

This report is a good example of how an ocular condition can be the first symptom of a systemic disease and how a prompt ophthalmological diagnosis can prevent severe complications. Although EE is relatively rare, endophthalmitis is the most common septic lesion of the CIKPLA syndrome. As many as 60% of patients with distant septic seeding can develop this complication and the visual prognosis is often very poor[6]. In some studies, KP was found to be an independent factor associated with poor ocular outcomes, with more than 85% of the patients having severe visual loss and up to 29% requiring enucleation[7,9-10]. Chen *et al*[5] reviewed 120 eyes with KP EE and they found that initial VA worse than counting fingers (CF) and initially presented with ocular symptoms ahead of systemic symptoms were the significant independent factors

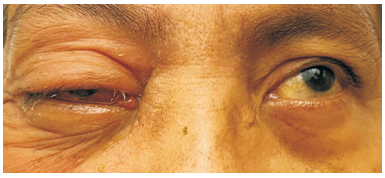

Figure 2 Right eye shows lid swelling, conjunctival hyperemia and chemosis.

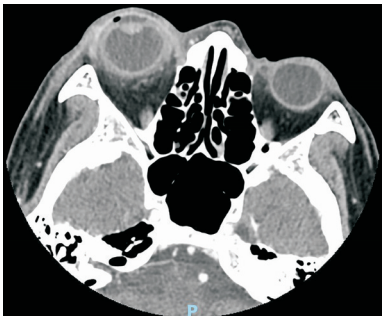

Figure 3 Contrast-enhanced computed tomogram of the orbits shows proptosis and vitritis of the right eye, without retrobulbar involvement.

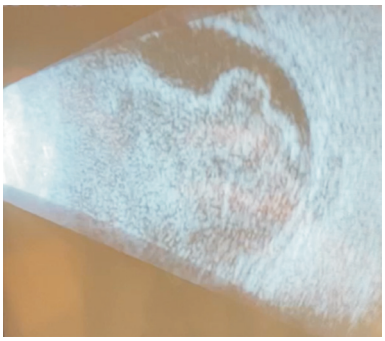

Figure 4 B-scan ocular ultrasonography shows retinal detachment of the right eye.

for poor visual outcomes in these patients. Furthermore, the extraocular location of the infection and the risk of septic shock, can make this condition life threatening. KP EE mortality rate ranges from 3% to 42% in the literature[5-10]. Meningitis and endophthalmitis are associated with poorer outcomes in 10%-12% of cases, and meningitis is associated with high mortality rates[7].

About 50-80% of patients with CIKPLA have systemic symptoms such as fever, arthralgias, fatigue, anorexia, nausea and vomiting, but sometimes, ocular symptoms can be the first sign of this syndrome[5,10]. Early recognition requires that physicians consider the diagnosis for patients who present with ocular symptoms and no history of surgery, especially in patients of Asian descent with diabetes. A multidisciplinary approach with early diagnosis and therapy represent the best opportunities to preserve life and vision.

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Conflicts of Interest: Fernández-Vega González A, None; **Berger AR,** None; **Chow DR,** None.

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