

## Endogenous Orbital Cellulitis and Endophthalmitis Induced by *Klebsiella* can be the First Sign of Pyaemia Originated from Not Healing Cellulitis of Groin

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(Received: 03 March 2013; accepted: 14 April 2013)

To report a case of endogenous unilateral orbital cellulitis and endogenous bilateral endophthalmitis caused by *Klebsiella friedlanderii* as a first sign of pyaemia. A 76-year-old man with orbital cellulitis in his left eye and endophthalmitis in double eyes was affected by pyaemia which resulted from not healing small cellulitis of groin. It is worthy of noticing that the patient received ameliorating circulation treatment for his cerebral ischemia just before his acute loss of vision. On investigation, neck rigidity (++) and positive Kernig's sign occurred after liver - lung abscess. The cultures of aspiration of liver abscess and pus of the eyes revealed the bacterium *Klebsiella friedlanderii*. The incomplete healing of cellulitis can cause pyaemia with endogenous orbital cellulitis and endogenous bilateral endophthalmitis as the primary sign. We should pay much attention to ameliorating circulation treatment even in inconspicuous small abscess which can lead to systemic infection.

**Key words:** Orbital cellulitis, Endophthalmitis, pyaemia, Cellulitis of groin.

Both endogenous orbital cellulitis and endogenous endophthalmitis result from the hematogenous spread of microorganisms from a remote source, such as infected organs. Endogenous orbital cellulitis or (and) endogenous endophthalmitis with the original focus of infection of liver abscess or lung abscess have been reported occasionally. While the case that simultaneous endogenous orbital cellulitis and endogenous bilateral endophthalmitis in immunocompetent patients with original infection of the groin cellulitis is extremely rare.

### Case report

A 76-year-old man came to our clinic complaining his painful swollen left eye and painful visual loss in double eyes for 5 days. He had received intravenous antibiotics for 5 days. The patient was affected by cellulitis of right groin 2 months ago, who was treated with 2 weeks of intravenous antibiotics and 8 days of debridement. However, he nearly regained during the phase of infection and refused further treatments. It was worthy of noting that he had received intravenous safflower for 6 days to treat his cerebral ischemia just before his visual loss. His body temperature was 38 degrees C on admission and then was measured lower. HIV and diabetes detection shows negative. He felt he got fever when being admitted. Laboratory tests revealed white blood cell count

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was  $14.5 \times 10^9/L$ . On general physical examination, we noted a well nourished man who had a 20-centimeter-long scar on his right groin and an orificium fistula on the scar. Ophthalmologic

examination revealed as follows: Right eye: Visual acuity was decreased to hand movement. He had swollen eyelids, low-grade conjunctival congestion, severe chemosis and corneal hydrops.



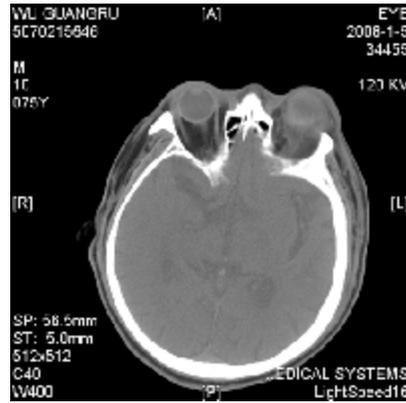
**Fig. 1.** Clinical manifestation—Right eye: swollen eyelids, congestive conjunctiva, chemosis. Left eye: Swollen and hyperemic eyelids. Chemosis



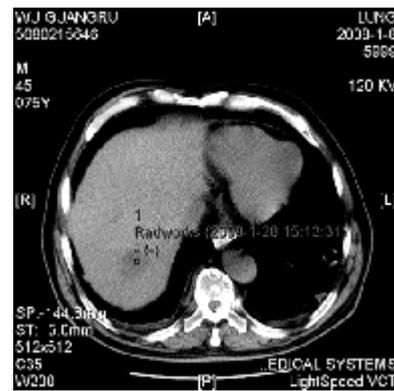
**Fig. 2(A).** Right eye: Corneal hydrops, hypopyon, extensive posterior synechiae, secondary cataract.



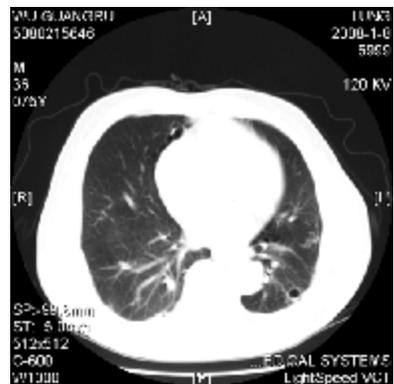
**Fig. 2(B).** Left eye: Corneal edema, keratomalacia, hypopyon, purulent conjunctiva



**Fig. 3.** The computed tomography scan of orbit showed the tissues destruction



**Fig. 4.** The computed tomography scans showed liver abscess



**Fig. 5.** The computed tomography scan of orbit showed lung abscess on the 4<sup>th</sup> day

The anterior chamber exhibited hypopyon with extensive posterior synechiae and secondary cataract. Further evaluation of posterior segment was not possible. Left eye: Visual acuity was decreased to no light perception. The pressure of fossa orbitalis was exceeding high. Eyelids were high-grade swollen and hyperemic. Skin temperature of eyelids was high. Orbital soft tissues were swollen. Chemosis was conspicuously severe. Tunica conjunctiva was foetor with much purulent secretion. We noted corneal edema, keratomalacia, and hypopyon after we pulled apart eyelids. Computed tomography scan of orbital part showed inflammatory exudative changes of left eye. Diagnoses of endophthalmitis (ou) and orbital cellulitis (os) were made. Swelling of his left eye decreased after administering of cefoperazone sulbactam sodium and vancomycin by intravenous and topical antibiotics. (Fig 1,2).

The computed tomography scan of orbit showed the tissues destruction of the orbital cavity, edema, and substantia ossea. (Figure 3). Ultrasound of abdominal part showed presence of hepatic abscess (Fig 4). Then the patient had a pricking on the liver under ultrasonic guidance. 5 ml pus of liver. And purulent secretion of orbital part was sent to bacterial culture and susceptibility test. On the 4th day, the computed tomography scan of lung revealed dispersed vomica in both lungs (Fig 5).

The internists could confirm hepatic abscess and lung abscess resulted from the hematogenous spread. Neck rigidity(++) and positive Kerning's sign were found by the neurosurgeon. The cultures of the pus of hepatic abscess and the orbital part revealed *Klebsiella friedlanderi* on the fifth day so that the susceptible drugs were known. The culture of blood remained negative, maybe due to previous administration of intravenous antibiotics. The patient's life has been saved, but he lost most of his sight eventually and get a poor prognosis.

## DISCUSSION

We report a case of endogenous unilateral orbital cellulitis and endogenous bilateral endophthalmitis as the primary sign of pyaemia. Orbital cellulitis can threaten potentially sighting even life. Most cases of orbital cellulitis are due to

direct extension of acute or chronic bacterial infection on the tissue and organs close to the eyes, especially sinusitis. Orbital cellulitis can also occur secondary on orbital trauma or on complicated ocular or paranasal sinus surgery. Orbital cellulitis can even be a complication of endophthalmitis after cataract surgery (Decock *et al.*, 2010). Endogenous orbital cellulitis due to blood-borne dissemination of bacterium is rare (Kanaski, 1999). For example: orbital cellulitis and endogenous endophthalmitis can occur secondary to *Proteus mirabilis* bacteremia that resulted from a calculus cholecystitis (Argelich *et al.*, 2009). Orbital cellulitis and endophthalmitis can be along with extensive focal skin lesions of ecthyma gangrenosum and pseudomonas pneumonia (Luemsamran *et al.*, 2008; Kronish *et al.*, 1996). Endophthalmitis is a severe suppurative inflammation of uvea and retina, including Post-operative, Post-traumatic and endogenous endophthalmitis. Endogenous endophthalmitis is the rarest one among them. Although Gram-positive bacterium *Bacillus thuringiensis* can lead to endophthalmitis or panophthalmitis and irreversible vision loss promptly (Peker *et al.*, 2010). 70% cases of endogenous bacterial endophthalmitis are caused by Gram-negative bacteria in East Asia. Among Gram-negative endogenous endophthalmitis cases, *Klebsiella* spp. is the most common etiologic agent (Jackson, *et al.*, 2003; Romero *et al.*, 1999). In East Asia, *Klebsiella friedlanderi* has been the most frequent infectious agent, accounting for 77.4% of endogenous endophthalmitis cases (Wong *et al.*, 2000). The frequent original focus of infection includes liver abscess, pneumonia, meningitis, endocarditis, urinary tract infection and wound infection. Over half of *Klebsiella friedlanderi* endogenous endophthalmitis patients were diabetic, and two-thirds had an underlying liver abscess caused by *Klebsiella* (Callegan *et al.*, 2007).

Liver abscess wasn't this patient's original focus of infection. Severe symptoms resulted from not healing small cellulitis of groin. The ultrasound showed that the liver abscess was on the process of forming. The general examination revealed normal CT scan of cephalosome and physical sign of the nervous system on admission. Both lungs dispersively existed small vomica from hematogenous dissemination. The negative culture

of blood was probably due to previous administration of intravenous antibiotics. The surgery of aspiration of vitreous fluid was not suitable for the patient's general conditions. Due to intravenous and topical antibiotics, the symptoms of orbital cellulitis markedly decreased. According to the result of susceptibility test and the decreased symptoms of orbital cellulitis, our therapeutic regimen was effective. The visual prognosis for patients with endogenous endophthalmitis is generally poor. This patient's pyaemia resulted from the incompletely healed cellulitis of right groin. The pyaemia led to the endogenous orbital cellulitis and endogenous bilateral ophthalmitis. Though the patient had no systemic complaints except fever and shivering, he had already had the infection in other organs. In this case, ameliorating circulation treatment may be a dangerous factor in latent not healing small abscess which can lead to severe consequence.

In conclusion, we should be on guard against the infected organs, especially when the infection hasn't been completely healed for a long time. That can cause pyaemia with endogenous orbital cellulitis and endophthalmitis as the primary sign.

#### ACKNOWLEDGEMENTS

This work was financed by the research fund of Jilin University basic scientific research operating expenses fund (Research Fund of the Bethune B plan of Jilin University, 450060481914), 2012 and the Research Fund of Jilin provincial science and technology department international cooperation item, 20120726.

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