

CASE REPORT

A mimicry of melioidosis by *Klebsiella ozaenae* infection

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Abstract

Klebsiella ozaenae is a Gram negative bacillus. It has been described as a colonizer of oral and nasopharyngeal mucosa and is a cause of atrophic rhinitis. *Klebsiella ozaenae* has seldom been isolated from serious infections. However, several reports have stated that *Klebsiella ozaenae* may cause invasive infections and even mortality. We report a 55-year-old man with *Klebsiella ozaenae* infection causing abscesses involving the right eye and left kidney and possibly also in the brain, lungs and prostate. The isolates were sensitive to ceftazidime, ciprofloxacin, chloramphenicol, gentamicin and sulfamethoxazole-trimethoprim but resistant to ampicillin. He responded well to 4 weeks of IV ceftazidime and IV amoxicillin-clavulanic acid. To our knowledge, such a multi-organ infection has not been reported previously for this organism.

Keywords: *Klebsiella ozaenae*, multiple organ abscesses, invasive infections

INTRODUCTION

Klebsiella ozaenae has been described as a colonizer of oral and nasopharyngeal mucosa and has been considered to be the cause of atrophic rhinitis.¹ Although it has seldom been isolated from serious infections,² it has been reported to cause invasive infections.^{3,4,5} We report a case of *Klebsiella ozaenae* causing abscesses in the right eye and around the left kidney with very likely involvement also in the lungs, brain and prostate. To our knowledge, such a multi-organ infection has never been reported previously.

CASE REPORT

A 55-year-old Malay gentleman who works as a lorry driver was admitted to the surgical ward with one week history of fever, headache, poor appetite and dysuria with associated suprapubic pain, poor urine flow and incomplete voiding. He also claimed to have a painful right eye with watery discharge and gradual blurring of vision for the past one week. He has type 2 diabetes mellitus and hypertension.

Physical examination revealed that he was febrile at 39°C, alert, and not in acute distress.

His blood pressure was 160/80 mmHg and pulse rate was 92 beats per minute. An abdominal examination demonstrated suprapubic tenderness with no organomegaly. Examination of the eyes revealed visual acuity of hand movement in the right eye and 6/9 in the left eye using reduced Snellen chart. There was reduced red reflex and presence of relative afferent pupillary reflex (RAPD) of the right eye. The cornea was edematous, conjunctiva was chemosed and hypopyon was present with total ophthalmoplegia. There was no view of fundus in the right eye but biometric ultrasonography showed posterior segment opacity suggestive of vitritis. Examination of the left eye was unremarkable except for the presence of a moderate non-proliferative diabetic retinopathy (NPDR) on funduscopic examination. The remaining examinations were unremarkable.

Investigations and clinical course

His blood leukocyte count was 22,300 cells per mm³ with predominant neutrophils of 88.4%. His blood glucose level was 9.2 mmol/L. His renal profile and coagulation profile were normal. Liver function test revealed normal transaminases

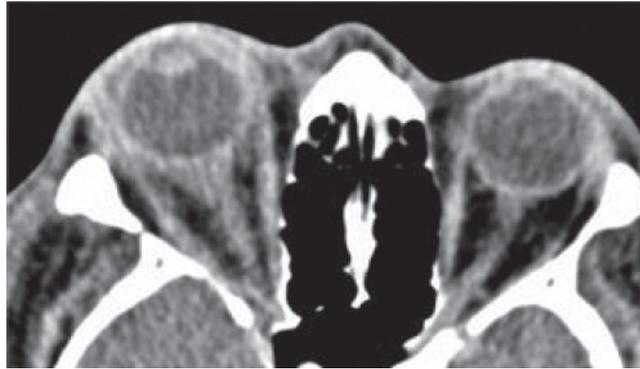


FIG. 1: Enhanced axial CT Orbit showing the slightly proptosed right globe. A small soft tissue lesion is seen immediately posterior to the right globe with some ill-defined densities within the retro orbital space suggesting infective or inflammatory process.

with elevated alkaline phosphatase of 184 u/L and low albumin level of 18.2 g/L. His urine examination showed leukocyte 3+, protein 4+, erythrocyte 5+, pH of 6 and negative for nitrate. An urgent ultrasound of the abdomen and pelvis on the day of admission revealed a left well-defined perinephric collection and an enlarged prostate. A computerized tomography(CT) scan of the abdomen, pelvis, orbit, paranasal sinuses and brain demonstrated a slightly proptosed right globe, minimal 'strandings' suggestive of infection or inflammatory process in the right retro-orbital region(Fig 1); a small cerebral abscess(0.9 cm in diameter) in the right thalamic region (Fig 2); a left perinephric abscess(8.7x7.2 cm) at the lower pole and posterior aspect of the left kidney (Fig 3); and abscesses within and around the prostate gland (Fig 4). There was also evidence of bilateral basal pneumonia associated with mild pleural effusion.

He was diagnosed to have pan-endophthalmitis of the right eye. No growth was found in his blood and nasal swab cultures. The indirect fluorescent antibody test to detect melioidosis was positive with a titre of 1:160. He was initially treated for melioidosis with intravenous(IV) ceftazidime 2g 8 hourly and IV amoxicillin-clavulanic acid 1.2g 8 hourly. An ultrasound-guided percutaneous drainage of the left perinephric abscess was performed and 90ml of brownish pus was aspirated and sent for culture. A pigtail catheter was inserted for further drainage of the left perinephric abscess but it dislodged the next day and the patient refused a re-insertion. A repeat ultrasound of the kidneys four days later again showed a reduction in the size of the left perinephric abscess to 6.5 x 6.5 x 2.4 cm. Culture of the pus grew *Klebsiella ozaenae*. Meanwhile,

the condition of his right eye worsened and a right eye evisceration was performed due to globe perforation secondary to infective necrosis. The culture from the eviscerated eye also grew *Klebsiella ozaenae*. The isolates in this patient were sensitive to ceftazidime, ciprofloxacin, chloramphenicol, gentamicin and sulfamethoxazole-trimethoprim but resistant to ampicillin. His fever settled after 4 weeks of IV ceftazidime and IV amoxicillin-clavulanic acid. Repeated blood cultures were negative at the fourth week of admission. He made a good recovery and was discharged home well with oral ciprofloxacin 500mg twice daily for 2 weeks. A follow up ultrasound of the abdomen and pelvis about 10 weeks later revealed complete resolution of the left perinephric and prostatic

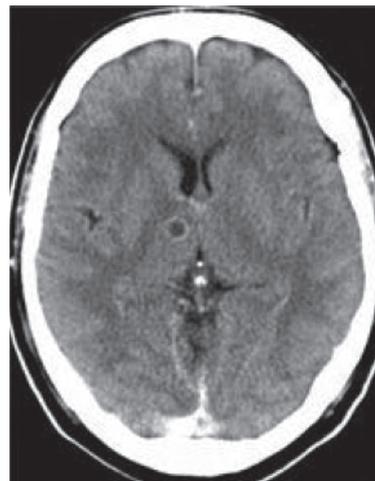


FIG. 2: Enhanced axial CT brain demonstrating a small well defined rounded rim enhancing lesion at the right thalamus indicating a cerebral abscess.

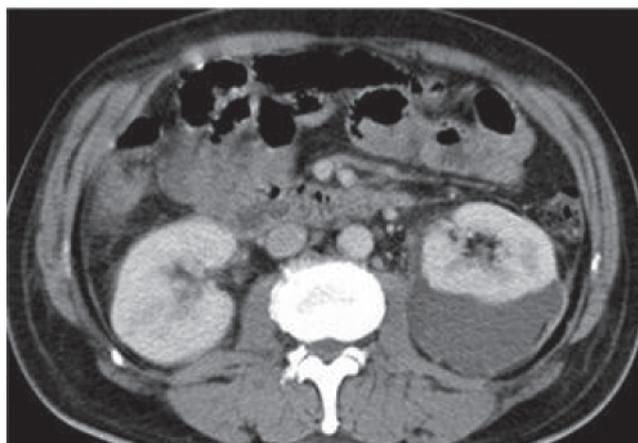


FIG. 3: Enhanced axial CT abdomen showing the left perinephric abscess displacing the kidney anteriorly.

abscesses. He remained asymptomatic and was well on subsequent follow up six months later.

DISCUSSION

Klebsiella pneumoniae subspecies *ozaenae* has long been considered a colonizer of the upper respiratory tract and rarely causes serious infection. Recently there have been reported cases demonstrating its invasiveness and leading to the infection of organs other than the upper respiratory tract. Goldstein *et al.*² reported a case series of *Klebsiella ozaenae* associated urinary tract infection, soft tissue infection, middle ear and mastoid infection and bacteremia. Individual case reports have also described *Klebsiella ozaenae* causing isolated splenic abscess⁴, pyogenic hepatic abscess⁵, meningitis⁶, and bacteremia.^{2,5,6} *Klebsiella ozaenae* has also been isolated from irrigation solutions in the hospital.²

Therefore it is known to cause both community and hospital acquired infections.

To our knowledge, this is the first report of *Klebsiella ozaenae* causing multiple organ abscesses involving the right eye, brain, left kidney and prostate. The cerebral abscess in this patient was probably due to direct spread from the infected right eye. *Klebsiella ozaenae* was deemed the causative pathogen for the multiple organ abscesses as there was a positive culture from two separate sites (right eye and left perinephric collection) for *Klebsiella ozaenae*. Unfortunately the patient's urine, two blood samples and nasal swab were all culture negative. He has never had any history suggestive of chronic rhinitis or rhinoscleroma.

Melioidosis was considered initially in view of the patient's diabetes with associated high grade fever, multiple organ abscesses and the positive serological test. Multiple risk factors



FIG. 4: Enhanced axial CT pelvis showing abscess cavities within the prostate gland

associated with *Klebsiella ozaenae* infection have been described in case reports, such as diabetes, chronic liver disease, leukemia, systemic lupus erythematosus, lung cancer and renal failure.^{2,3}

This patient was given intravenous antibiotics for 33 days until the fever settled. The prolonged fever was probably due to his refusal for drainage of the left perinephric and prostatic abscesses. Fortunately, the subsequent hospital course was uneventful and the patient recovered fully despite the extensive infection. There has been reported mortality associated with *Klebsiella ozaenae* septicemia.^{3,6} Strampfer *et al.*³ reported a case mortality from a cerebral abscess caused by *Klebsiella ozaenae*, whereas Tang *et al.*⁶ reported a fatal case of *Klebsiella ozaenae* meningitis. Therefore, early and adequate duration of antibiotics is definitely crucial in managing the patient with *Klebsiella ozaenae* infection.

In conclusion, *Klebsiella ozaenae* can no longer be considered a benign bacterium or simply a colonizer. It should be treated as seriously as other Gram-negative bacterial pathogens as it can certainly cause an extensive disease and even death in humans, especially in an immunocompromised host.

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