

***Chryseobacterium meningosepticum* Sepsis Complicated with Retroperitoneal Hematoma and Pleural Effusion in a Diabetic Patient**

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Intra-abdominal infection due to *Chryseobacterium meningosepticum* is rare, and bacteremia complicated with pleural effusion and retroperitoneal hematoma caused by *C. meningosepticum* has not been reported previously. A 57-year-old diabetic man presented with bacteremia with retroperitoneal abscess and pleural effusion caused by *C. meningosepticum* on the 12th day of hospitalization. His clinical condition improved after antimicrobial therapy with levofloxacin and rifampin, debridement of the retroperitoneal hematoma and left-side chest tube insertion. Antibiotics were administered for 1 month, and he was later transferred to a local respiratory care ward under afebrile condition. *C. meningosepticum* should be included in the list of suspected nosocomial infections, especially in patients with immunocompromised status. Administration of appropriate antibiotics, such as quinolone, minocycline, trimethoprim-sulfamethoxazole or rifampin, and treatment of local infection improve the clinical outcome of patients with *C. meningosepticum* infection. [J Chin Med Assoc 2008;71(9):473–476]

Key Words: *Chryseobacterium meningosepticum*, pleural effusion, retroperitoneal hematoma

Introduction

Chryseobacterium meningosepticum, formerly known as *Flavobacterium meningosepticum* or CDCII-a, is a non-fermentative, nonmotile, oxidase-positive Gram-negative rod that is widely distributed in nature.^{1,2} The pathogen mostly causes meningitis in premature and newborn infants,³ and rarely causes pneumonia, endocarditis and meningitis associated with severe underlying illness in adults.^{4–6} Accurate diagnosis of *C. meningosepticum* is important because the species is usually resistant to multiple antibiotics. In this case, we describe a patient with *Chryseobacterium* sepsis complicated with pleural effusion and retroperitoneal hematoma. Five other cases of adults with abdominal *C. meningosepticum* infection found in the MEDLINE database are also reviewed.

Case Report

A 57-year-old man was brought to the emergency department of our hospital because of fever and chills. A diagnosis of coronary artery disease had been made when he was 47 years of age, and he had undergone stent implantation. He also had hypertension and type 2 diabetes mellitus with diabetic nephropathy for 15 years that were regularly controlled with oral medication. The level of HbA_{1c} 2 weeks before admission was 9.7%.

One day before admission, the patient experienced episodes of fever and chills. Productive cough and exertional dyspnea developed. He did not have headache, nausea, dysphagia or dysuria. The patient did not smoke or drink alcohol, and he was a Buddhist monk residing in the countryside.



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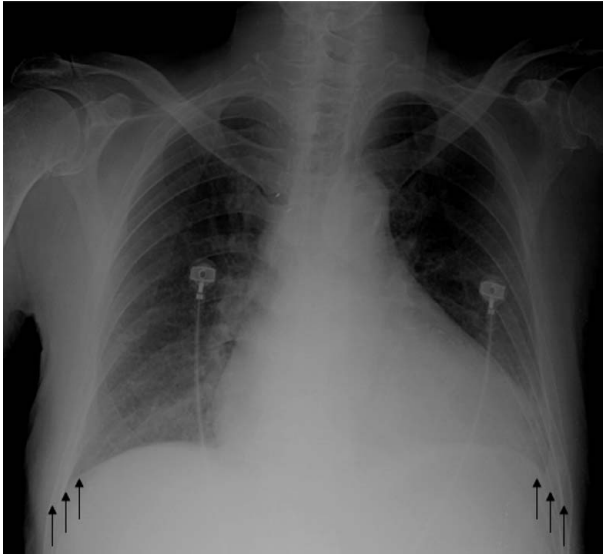


Figure 1. Chest roentgenography reveals blunting of bilateral costophrenic angles, indicating pleural effusion (arrows).

On admission, he had a body temperature of 38°C, heart rate of 114 beats/minute, blood pressure of 130/70 mmHg, respiratory rate of 22 breaths/minute and oxygen saturation of 98% under room air. On physical examination, he appeared to be mildly distressed. The neck was supple. Bilateral lower lungs were filled with rales on auscultation, and the heart rhythm was regular without murmur. The abdomen was soft and not distended, with normal bowel sounds. Chest roentgenogram revealed bilateral pleural effusion (Figure 1), and electrocardiography showed sinus tachycardia. Hemogram showed a white cell count of $15.8 \times 10^3/\mu\text{L}$ (normal, $4\text{--}11 \times 10^3/\mu\text{L}$), with 88% neutrophils, hemoglobin 9.5 g/dL (normal, 11.3–15.3 g/dL), and platelet count of $381 \times 10^3/\mu\text{L}$ (normal, $120\text{--}320 \times 10^3/\mu\text{L}$). Other examinations showed blood urea nitrogen to be 33.7 mg/dL (normal, 8–20 mg/dL), creatinine 9.42 mg/dL (normal, 0.6–1.2 mg/dL), protein 7 g/dL (normal, 6–8 g/dL), and lactic dehydrogenase 290 U/L (normal, 120–240 U/L). The evaluation of left-side pleural effusion at admission demonstrated transudative characteristic without obvious infection (white cell count, $286/\text{mm}^3$; protein, 3.2 g/dL; lactic dehydrogenase, 145 U/L; no bacilli growth). Two cultures of the blood sample collected on the first day of hospitalization yielded oxacillin-resistant *Staphylococcus aureus*, which was susceptible to vancomycin, so intravenous vancomycin was administered. There was an initial clinical improvement in the fever and dyspnea, but persistent bilateral pleural effusion was noted. Transthoracic cardiac echography revealed no vegetation.

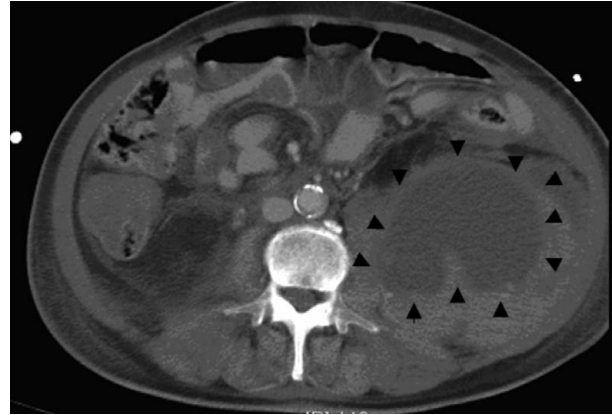


Figure 2. Computed tomography of the abdomen reveals hematoma in the left posterior pararenal space (arrowheads).

Unfortunately, the patient's blood pressure dropped on the 12th day of hospitalization. He also complained of abdominal tenderness and dyspnea. Computed tomography (CT) of the abdomen revealed hematoma in the left posterior pararenal space, extending from the subphrenic region to the pelvis and left inguinal area (Figure 2). Hemoglobin had dropped to 5.8 g/dL. Medical therapy and blood transfusion were adopted because surgical intervention was not feasible. Hemodialysis was used transiently because of progressive oligouria. One week later, his fever flared up and repeat CT of the abdomen revealed persistent retroperitoneal hematoma. A retroperitoneal drainage tube was inserted, and 2 pus samples yielded *C. meningosepticum* 5 days later. Two blood samples collected on the same day also yielded the same pathogen, but no bacilli was detectable from the culture of catheter tip. Based on the sensitivity test results—sensitive to quinolone but resistant to vancomycin—antibiotics were shifted to levofloxacin and rifampin. Chest CT showed bilateral pleural effusion (Figure 3). The following study of left-side pleural effusion revealed exudative characteristic with leukocytic change (white cell count $13,860/\text{mm}^3$, neutrophils 94%, protein 3 g/dL, lactic dehydrogenase 1,865 U/L), and culture of the pleural effusion also yielded *C. meningosepticum*. The patient underwent debridement of retroperitoneal hematoma and left-side chest tube insertion. The sputum of this patient grew *Klebsiella pneumoniae*. At the same time, no *C. meningosepticum* was found in other patients in the same ward. Antibiotics were administered for 1 month after sterilization. Ventilator weaning failed due to the patient's general weakness, and he was later transferred to the respiratory care ward under afebrile condition.

Discussion

Chryseobacterium meningosepticum is a Gram-negative aerobic rod that is widely found in soil and fresh water, but it is not part of normal human flora.⁷ Strains of this bacteria have rarely been reported to cause infection among immunocompetent adults, accounting for only 1–2% of Gram-negative rods isolated in microbiologic culture.⁸ Immunocompromised status, including malignancy, neutropenia, diabetes, organ transplant, steroid use, malnutrition or being on dialysis, may predispose patients to infection.⁴ The predisposing factors in our patient were diabetes mellitus and being on dialysis. Most cases among adults involve nosocomial outbreak of pneumonia (40%), followed by sepsis (24%) and meningitis (18%).⁹ Literature review revealed only 5 reported instances of abdominal infection (Table 1), and most of them



Figure 3. Chest computed tomography shows bilateral pleural effusion with left-sided lobulation (arrowheads).

were related to the containment of peritoneal dialysis. The first patient with *C. meningosepticum* abdominal abscess was mentioned in the report of a nosocomial outbreak, with no additional details provided.⁹ The second patient, a 76-year-old diabetic woman on continuous ambulatory peritoneal dialysis, presented with *C. meningosepticum* peritonitis and secondary sepsis.¹⁰ The third patient, a 63-year-old man with ileal conduit on peritoneal dialysis, suffered from refractory *C. meningosepticum* peritonitis, and was managed with Tenckhoff catheter removal and hemodialysis.¹¹ The fourth patient was a 14-year-old boy suffering from massive burns who developed acute renal failure, and was on urgent peritoneal dialysis. Culture of the wound and peritoneal dialysate both yielded *C. meningosepticum*, and he later died due to progressive sepsis.¹² The fifth patient, a 54-year-old woman with end-stage renal disease on long-term continuous ambulatory peritoneal dialysis, developed peritonitis due to *C. meningosepticum*. Treatment with Tenckhoff catheter removal, administration of levofloxacin and switching to chronic hemodialysis was adopted.¹³

Our patient had neither *C. meningosepticum* outbreak nor peritoneal dialysis via Tenckhoff catheter. Bacteremia complicated with pleural effusion and retroperitoneal hematoma due to *C. meningosepticum* has not been reported previously. Cure of the infection was achieved after prolonged intravenous antimicrobial therapy and drainage of the retroperitoneal hematoma. It is suggested that *C. meningosepticum*-related local infection needs drainage to prevent persistent infection. Because *C. meningosepticum* is often resistant to multiple antibiotics, appropriate antimicrobial therapy includes a combination of vancomycin, quinolone or minocycline with rifampin.^{14,15} However, a recent study revealing the high minimum

Table 1. Clinical features of patients with intra-abdominal *Chryseobacterium meningosepticum* infection

Reference	Sex	Age (yr)	Comorbidities	<i>C. meningosepticum</i> site	Treatment	Outcome
Marnejon & Watanakunkom ¹⁰	Female	76	Rheumatic heart disease, diabetes, ESRD on CAPD	Peritoneal dialysate, blood, pleural effusion	Ciprofloxacin	Died
Korzets et al ¹¹	Male	63	ESRD on CAPD	Peritoneal dialysate	Co-trimoxazole, pefloxacin	Recovered
Sheridan et al ¹²	Male	14	Burn, uremia on CAPD	Peritoneal dialysate, blood, wound	Ceftazidime, ticarcillin, amikcin	Died
Wu et al ¹³	Female	54	ESRD on CAPD	Peritoneal dialysate	Piperacillin-tazobactam, levofloxacin	Recovered
Our patient	Male	57	Diabetes	Retroperitoneal hematoma, pleural effusion, blood	Levofloxacin, rifampin	Recovered

ESRD = end-stage renal disease; CAPD = continuous ambulatory peritoneal dialysis.

inhibitory concentration ($\geq 16 \mu\text{g}/\text{mL}$) of vancomycin for *C. meningosepticum*, such as our case, indicate that vancomycin would not be effective against this organism.¹⁶ The medication to consider first should be quinolone, followed by minocycline, trimethoprim-sulfamethoxazole, and rifampin.

In conclusion, *C. meningosepticum* should be included in the list of suspected nosocomial infections, especially in patients with immunocompromised status. Administration of appropriate antibiotics and treatment of local infection will improve the clinical outcome of patients with *C. meningosepticum* infection.

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