

Klebsiella Distinctive Syndrome Presenting with Muscular Abscess and Osteomyelitis

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Abstract A 46-year-old man presented with progressive pain and swelling at the right side of his lower back and buttock for 3 weeks. Further investigation revealed abscesses at the right lower back and buttock, osteomyelitis of the iliac bone, and a liver abscess. The causative pathogen was confirmed to be *Klebsiella pneumoniae*, serotypes K1 and K2. The patient was treated with surgical drainage, percutaneous drainage, intravenous antibiotics, and diabetic control.

Keywords: *Klebsiella* distinctive syndrome, *Klebsiella* liver abscess syndrome, Hypervirulent *Klebsiella pneumoniae*, Liver abscess

INTRODUCTION

Klebsiella pneumoniae is one of the most common causes of community-acquired and nosocomial infection worldwide. Recently, a distinctive syndrome of multiple abscesses caused by a hypervirulent strain of *K. pneumoniae* has emerged. This *K. pneumoniae* strain is characterized by a distinct hypermucoviscosity phenotype, which has been classified as serotype K1 and K2. To date, more than 900 cases have been reported. Most of these cases have been reported in Asian countries (Taiwan^{1,2,3}, South Korea^{4,5}, Japan, Singapore^{6,7}, Hong Kong^{8,9}, and Vietnam¹⁰), but an increasing number of cases have also been reported from North America, Europe, South America, Australia, and Africa. Presence of diabetic mellitus seems to be a risk factor for this syndrome. Thus, it is possible that strict glycemic control may prevent this infection^{5,6}.

In *Klebsiella* liver abscess syndrome (KLAS), environmental exposure to fecal-oral transmission and

gastrointestinal colonization are possible routes of acquisition. After developing a liver abscess, *K. pneumoniae* bacteremia can cause subsequent extrahepatic infections, such as endophthalmitis, meningitis, septic pulmonary emboli, empyema, osteomyelitis, and subcutaneous or muscular abscesses.

The current antibiotic treatment of choice is third-generation cephalosporins (e.g., ceftriaxone, cefotaxime, and ceftazidime) with a treatment duration ranging from 2 to 6 weeks. Percutaneous drainage is useful for well-localized liver abscesses and for deep abscesses of the musculoskeletal system.

CASE REPORT

A 46-year-old Thai man presented with progressive pain and swelling at the right side of his lower back and buttock that had persisted for 3 weeks. Two months previously, he was diagnosed with type 2 diabetic mellitus and prescribed an oral hypoglycemic drug for control-

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ling his blood glucose level. At the time, his hemoglobin A1c (HbA1c) level was 11.0 mg%. Three weeks before hospital admission, he developed progressive pain and swelling at his right lower back and buttock coinciding with the development of a low-grade fever. Analgesic and antipyretic drugs did not relieve his symptoms. The patient subsequently came to our hospital and a physical examination showed a high-grade fever (39.5°C), with redness, warmth, marked swelling, and tenderness at his right lower back and buttock (Figure 1). Deep musculoskeletal abscess was suspected. A CT (Computed tomography) scan was performed and demonstrated the presence of a gas-forming abscess along the right iliopsoas and erector spinae, right iliacus muscle, measuring about 9.2 cm x 4.7 cm x 18.9 cm. Another lesion at the right gluteus maximus muscle, measuring about 5.5 cm x 14.9 cm x 17.7 cm, also suggested a gas-forming abscess.



Figure 1 Marked swelling and a fluctuation at the right lower back and buttock of the patient

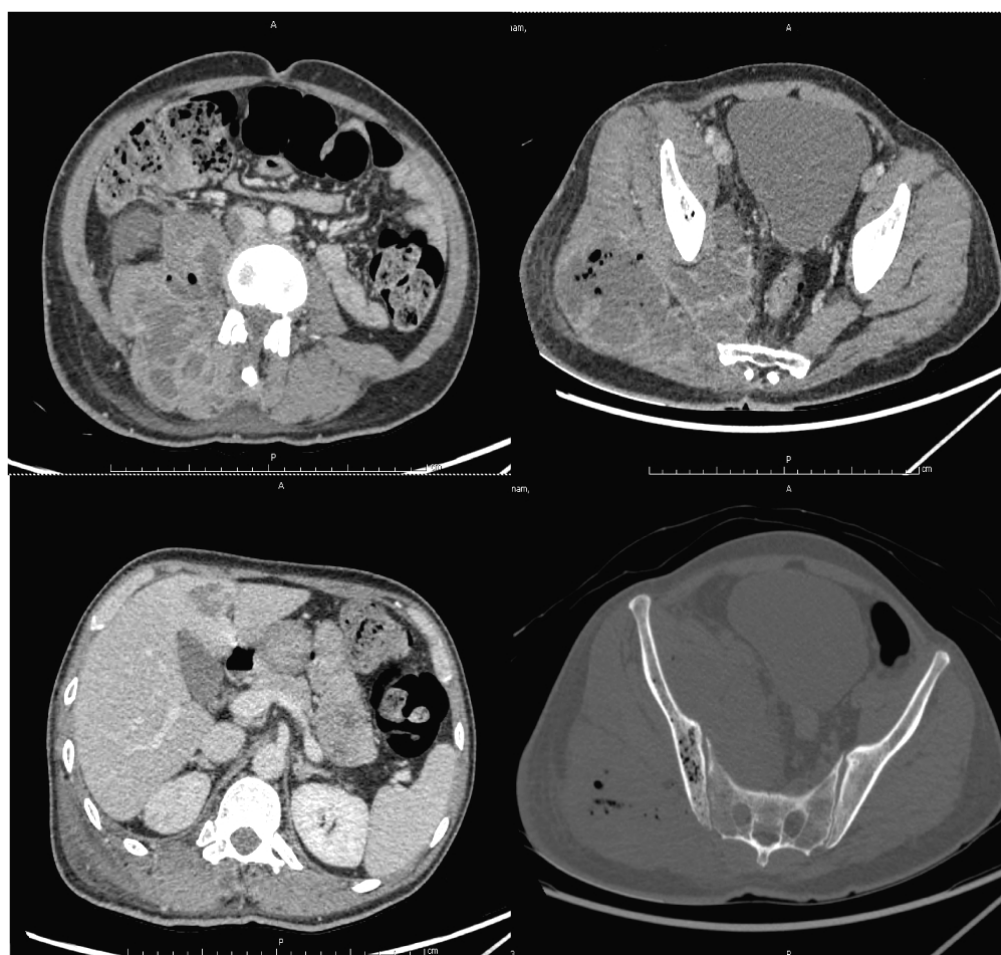


Figure 2 CT scan demonstrating a huge gas-forming abscess along the right iliopsoas, erector spinae, and right iliacus muscle (left, upper); another large abscess at the right gluteus maximus muscle (right, upper); and a liver abscess at segment 4b (left, lower). Osteomyelitis due to a gas-forming organism at the right iliac bone is also seen (right lower).

A liver abscess at hepatic segment 4b was also found, measuring 2.5 cm x 2.9 cm x 2.8 cm. Finally, a gas forming osteomyelitis was found at the right iliac bone (Figure 2).

Laboratory findings included a white blood cell count of 14,900 cells/cu.mm (neutrophil 86.6%, band form 5.2%); blood glucose level, 190 mg/dL; HbA1C level, 9.9%; ESR, 73 mm/hr; CRP, 21.21 mg/L; serum creatinine level, 0.65 mg/dL; liver function test: total bilirubin, 0.26 mg/dL; direct bilirubin, 0.14 mg/dL; aspartate transferase, 10 IU/L; alanine transferase, 12 IU/L; alkaline phosphatase, 69 U/L; albumin level, 3.4 g/dL; and globulin level, 4.3 g/dL.

At first the patient was empirically treated with intravenous piperacillin–tazobactam (4.5 gm) every 8 hours. Emergency surgical drainage of the patient's right buttock abscess was performed and an interventional radiologist was consulted for percutaneous drainage of the right iliopsoas abscess.

Pus culture from the abscess and two specimens of blood culture confirmed a *K. pneumoniae* infection with a sensitivity to all antibiotics tested, including ceftriaxone. Thus, the intravenous antibiotics was changed to ceftriaxone (2 gm) daily. Infectious disease specialists and an orthopedic surgeon were consulted and agreed with a plan to treat the patient with intravenous ceftriaxone for four weeks, followed by a switch to an oral form of amoxicillin/clavulonic acid and trimethoprim/sulfamethoxazole for another 8 weeks. An ophthalmo-

logic examination was performed and showed no evidence of endophthalmitis or other abnormal ophthalmic conditions. An endocrinologist was also consulted for glycemic control.

The patient's clinical status stabilized 6 days after admission and drains were removed on the 14th post-operative day. A CT scan was repeated and showed a resolution of both abscesses (at the iliopsoas and gluteus maximus muscle) with no further destruction of the right iliac bone. Additionally, the patient's blood glucose level was stable at around 100 to 130 mg/dL. The patient was discharged home after 4 weeks of intravenous ceftriaxone injection (Figure 3).

DISCUSSION

Klebsiella distinctive syndrome caused by a hypervirulent strain of *Klebsiella pneumoniae* has been found mostly in Asia¹⁻¹⁰. Poor glycemic control seems to be a risk factor for this syndrome and the associated metastatic complications.

In this report, the authors described a case of *Klebsiella* distinctive syndrome in a 46-year-old Thai man who presented with abscesses at his right lower back and buttock, osteomyelitis of the iliac bone, and a liver abscess. The causative pathogen was confirmed to be *Klebsiella pneumoniae*, of both serotypes K1 and K2. The patient was treated with surgical drainage, percutaneous drainage, and intravenous ceftriaxone for four weeks, then switched to an oral form of amoxicillin/clavulanic acid and trimethoprim/sulfamethoxazole for a further 8 weeks.

This case may be the first reported case of *Klebsiella* distinctive syndrome in Thailand and the authors believe that the incidence of this syndrome worldwide will significantly increase due to the increase in the number of diabetic patients. Therefore, there should be an increase in the awareness of this syndrome by all doctors and medical providers.

CONCLUSION

In this report, the authors described a case of *Klebsiella* distinctive syndrome in a 46-year-old Thai man with underlying type 2 DM. Radiologic investigation showed abscesses at the right lower back and buttock, osteomyelitis of the iliac bone, and a liver abscess. The patient was treated with surgical drainage, percutaneous drainage, antibiotics and control of his underlying disease.



Figure 3 The lower back and buttock contour after 1 month of treatment.

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บทคัดย่อ *Klebsiella Distinctive Syndrome* มารับการตรวจรักษาด้วยอาการแสดงของฝีหนองและภาวะกระดูกติดเชื้อ

ณัฐวุฒิ อัครานูชาต, ชานนท์ ภาควัฒนวิทยา

สาขาวิชาศัลยศาสตร์ตกแต่ง ภาควิชาศัลยศาสตร์ คณะแพทยศาสตร์ศิริราชพยาบาล มหาวิทยาลัยมหิดล

ในบทความวิจัยนี้ผู้เขียนนำเสนอกรณีของผู้ป่วยชายอายุ 39 ปี ที่มารับการตรวจรักษาด้วยอาการ ปวด บวม อักเสบบริเวณหลังและก้นด้านขวามากขึ้นเรื่อยๆ เป็นระยะเวลา 3 สัปดาห์ ผลการตรวจเพิ่มเติมทางรังสีวิทยาพบฝีหนองที่หลังด้านขวา ก้นด้านขวา และที่ตับ พร้อมทั้งพบภาวะอักเสบติดเชื้อของกระดูก iliac ผลเพาะเชื้อจากหนองพบ *Klebsiella pneumoniae*, ทั้ง serotype K1 และ K2 ผู้ป่วยได้รับการรักษาโดยการผ่าตัดกรีดระบาย การเจาะระบายหนองพร้อมใส่สายระบาย นีติยาฆ่าเชื้อทางหลอดเลือดดำ และควบคุมระดับน้ำตาลในเลือดให้อยู่ในเกณฑ์ปกติ (ผู้ป่วยมีโรคประจำตัวเป็นเบาหวาน)