

Spondylodiscitis with Epidural Abscess Caused by *Klebsiella pneumoniae*

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Spondylodiscitis is very rare complication caused by *Klebsiella pneumoniae*. Among those, few cases of spondylodiscitis concomitant with epidural abscess due to *Klebsiella pneumoniae* have been reported. We present a case of lumbar pyogenic spondylodiscitis with epidural abscess caused by *Klebsiella pneumoniae* that successfully treated with administration of cefotaxime, surgical drainage and intermittent closed continuous saline irrigation.

Key words: spondylodiscitis, spondylitis, epidural abscess, *Klebsiella pneumoniae*

Non-tuberculous pyogenic spinal infection has an incidence of 2–4% in adult musculoskeletal infection. The incidence is relatively low but mortality rate is high up to 1–20%, according to the condition of the patients and the kind of pathogenic organisms.¹⁾ In early stage, the patients do not show any specific symptom. But the disease progresses abruptly and rapidly, which may lead to paralysis or death. The most prevalent pathogenic organism identified in non-tuberculous pyogenic spinal infection is *Staphylococcus aureus* (60% of the patients was caused by the pathogen of *S. aureus*).^{2,3)} However, pyogenic spinal infection by *Klebsiella pneumoniae* is very rare and only a few cases have been reported.^{1,4,5)}

We report a case of non-tuberculous pyogenic spondylodiscitis with epidural abscess by *Klebsiella pneumoniae*.

CASE REPORT

A 65-year-old male presented sudden onset of fever and low back pain for one day. He underwent a L4–5 decompressive laminectomy for lumbar herniated nucleus pulposus 11 years ago. Since then, the patient had shown no specific symptoms and episodes in lumbar spine. On the admission day, he had a blood pressure of

143/76 mmHg, a pulse rate of 91/min and a temperature of 38.4°C. The patient did not show any neurologic symptom but had some local heatness and mild dull nature pain with tenderness in his lumbar area. Any other infectious focus was not found. The routine laboratory evaluation showed 21,540/mm³ white blood cell, 87.9% polymorphonuclear, and erythrocyte sedimentation rate/C-reactive protein of 35 mm/hr (normal range, 0 to 15)/12.3 mg/dl (normal range, 0 to 0.5). The blood culture with periodic acid stain (PAS) and tuberculosis polymerase chain reaction (PCR) were performed. The urine culture was performed. Also, a computerized tomogram (CT) and magnetic resonance imaging (MRI) evaluations were performed. CT and MRI revealed the epidural abscess at L2–3 level with the destruction and liquefaction of L2–3 intervertebral disc, the bone marrow edema in the vertebral bodies of L2 and L3, and the psoas abscess at L3–4 level caused by spreaded infection (Fig. 1). The treatment was started with empirical intravenous antibiotics (the 1st generation cephalosporin and aminoglycoside).

On the 2nd day after admission, body temperature elevated up to 40°C, general condition was worse than the 1st day. However, there was no neurologic symptom.

On the 3rd day, *Klebsiella pneumoniae* was identified in blood culture. But, PAS and tuberculosis PCR were negative. Urine culture was also negative. Antibiotics was changed to the 3rd generation cephalosporin (Ceftriaxone).

On the 7th day, the authors found elevated liver enzyme. Antibiotics was changed again from Ceftriaxone to Cefotaxime.

Received October 20, 2011 Accepted October 25, 2011

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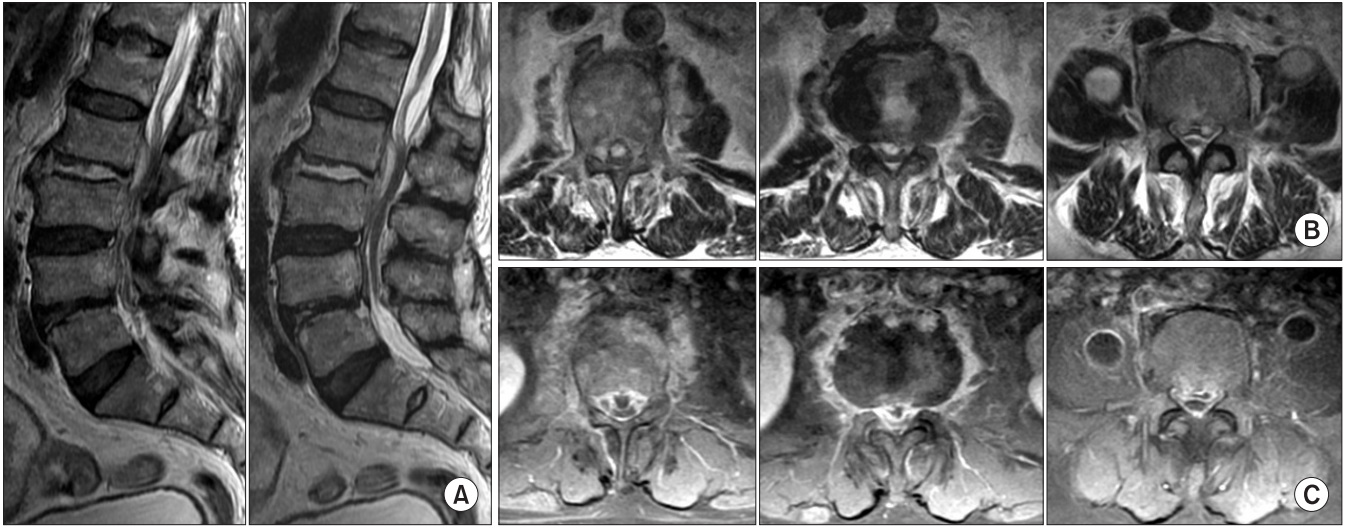


Figure 1. (A) Epidural abscess at L2-3 level on sagittal T2 weighted images, which compresses the dura of lumbar spine. Abnormal intensity of L2-3 intervertebral disc space was seen. (B) Epidural abscess and the destruction of intervertebral disc at the L2-3 level and Psoas abscess at L3-4 level on axial T2 weighted images. (C) Epidural abscess and the destruction of intervertebral disc at the L2-3 level and Psoas abscess at L3-4 level on axial Gadolinium enhancement images.



Figure 2. After the sudden onset of neurologic symptom, emergency follow-up magnetic resonance imaging revealed the increase of epidural abscess at L2-4 level.

On the 12th day, the patient showed sudden onset of neurologic symptoms such as radiating pain of both legs, dorsiflexion weakness of both ankle, and numbness at perianal area. Emergency follow-up MRI evaluation revealed the increased pus in epidural space (Fig.



Figure 3. Draining tube through L2-3 epidural space was seen on the sagittal T2 weighted (A) and the Gadolinium enhanced magnetic resonance imaging (B) 3 days after surgery.

2). This neurologic symptom seemed to be associated with cauda equina compression caused by surrounding epidural abscess. The authors planned the two stage operation. The first was urgent decompression and drainage of epidural abscess due to patient's severe neurologic symptoms and pain. The second was anterior lumbar interbody fusion (ALIF), which would be considered according to patient's condition. The patient underwent the urgent operation; L2-3

decompressive laminectomy, the drainage of epidural abscess, partial discectomy, and insertion of two draining tubes through L2–3 intervertebral disc space (Fig. 3). The psoas abscess was remained. If the drainage of the psoas abscess was necessary, it would be performed with the secondary operation, ALIF. Then the patient underwent the intermittent continuous saline irrigation through draining entry tube and outlet tube for 1 week. After the first operation, his general condition showed significant improvement and neurologic symptom was gradually disappeared. As a result of intraoperative specimen (pus) culture examination, *Klebsiella pneumoniae* was also identified. Because the patient was improved rapidly, the second operation was not performed. Until the 6th week, he was treated with intravenous antibiotics (Cefotaxime) until ESR/CRP were normalized. On the 6th week, the patient discharged with prescription of oral antibiotics (ciprofloxacin) for 1 month. Until now (for 22 months), the patient had no recurrent symptom and sign of lumbar infection.

DISCUSSION

Among the patients diagnosed as pyogenic arthritis, the pyogenic arthritis by *Klebsiella pneumoniae* has a rare incidence of 1%. It most commonly involves lower big joints, especially knee when it is accompanied with underlying medical conditions or immunocompromised states such as diabetes, malignancy, chronic renal failure, alcoholism, rheumatoid arthritis, and bone marrow stem transplant recipients.⁶⁾ Recently, an increased incidence of immunocompromised patients was associated with an increased incidence of atypical pyogenic infection. However, this patient had no evidence of immunocompromised condition except heavy alcohol drinking.

Pyogenic spinal infection by *Klebsiella pneumoniae* is more rarer than pyogenic spinal infection by *Staphylococcus* or *Streptococcus*. It was reported that the most frequent organism of pyogenic spinal infections is *staphylococcus* (69.6%) and others were *Pseudomonas* (8.7%), *E. coli* (4.3%), *Proteus* (4.3%), etc in Korea. Pyogenic spondylodiscitis with epidural abscess by *Klebsiella pneumoniae* had never been reported in Korea and only few cases had been reported in the world.^{1,7)} Although infection by *Klebsiella pneumoniae* was rare, it has a susceptibility to the 3rd generation cephalosporins and sulfonamides fortunately.

In general, conservative therapy with antibiotic administration is the treatment of choice for pyogenic spondylitis due to respond well to antibiotics. Also, psoas abscess rarely requires surgical treatment because it usually responds to antibiotics.⁸⁾ If conservative treatment is failed or neurologic symptom progresses, open surgery is required.

For an appropriate treatment, many authors recommend the adequate antibiotics, surgical debridement, and drainage.

The effectiveness of percutaneous drainage under CT or ultrasound guidance has recently been reported good or excellent result in the treatment of pyogenic abscess in most locations in the body, including the abdomen, thorax, and retroperitoneum.⁹⁾ However, valid long-term findings for use of this technique are not yet available. Because drainage alone may result in recurrence rates of up to 50%, percutaneous drainage may not be always sufficient for treatment of secondary epidural abscesses by pyogenic spondylitis.¹⁰⁾

Our treatment was the administration of adequate antibiotics, open surgical debridement and drainage with two tubes insertion and the intermittent continuous saline irrigation through these drainage tubes.

Although *Klebsiella pneumoniae* is rare organism to cause pyogenic spondylodiscitis, it could cause lumbar spondylodiscitis with epidural abscess. In the case of spinal infection, less common organism such as *Klebsiella pneumonia* should be also considered as pathogenic organism.

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*Klebsiella pneumoniae*균에 의한 경막외 농양을 동반한 척추추간판염

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성인에서 발생하는 비결핵성 화농성 척추 감염은 전체 골격계 감염의 약 2-4%를 차지하며, 사망률은 환자군과 원인균에 따라 1-20% 정도로 보고되고 있는 비교적 드문 질환이다. 저자들은 발열 및 요추부 동통을 주소로 내원한 65세 남자 환자의 척추감염 치료에서 아주 드문 경우인 *Klebsiella pneumoniae*에 의한 경막외 농양을 동반한 척추 추간판염을 확인하고 항생제 치료, 응급감압술 및 배농관 통한 지속적인 배농치료로 완치한 증례를 경험하였기에 이를 보고하고자 한다.

색인단어: 척추추간판염, 경막외 농양, 폐렴막대균

접수일 2011년 10월 20일 게재확정일 2011년 10월 25일

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