

Case Report

Delayed Diagnosis of Tuberculous Spondylitis Masked by Concomitant Methicillin Resistant Staphylococcus Aureus Infection

Yong Min Kim, M.D., Jae Hun Cha, M.D.

Department of Neurosurgery, Maryknoll Medical Center, Busan, Korea

We present a case of tuberculous spondylitis in which diagnosis was masked by a concomitant pyogenic infection. The patient had undergone percutaneous needle aspiration of an abscess in the cavity of the psoas muscle. Early results from the culture regimen showed isolation of methicillin-resistant *Staphylococcus aureus*. After eight weeks, mycobacterium tuberculosis was grown at regimen which was cultured at the same site. Initial isolation of pyogenic bacteria, considered to be highly virulent organisms, led to delayed diagnosis and treatment of the tuberculosis.

KEY WORDS : Tuberculous spondylitis · Pyogenic spondylitis · Concomitant infection.

INTRODUCTION

Tuberculous spondylitis with a concomitant bacterial infection is a rare disease and few cases of tuberculous spondylitis with a pyogenic bacteria superinfection have been reported. The rarity results in limited awareness of this concomitant infection. Moreover, the time required to obtain culture results varies by pathogens. Sometimes the results of tuberculosis culture may appear much later than other pyogenic bacteria, resulting in a missed diagnosis or diagnostic delay. Failure to select the adequate antimicrobial drugs could result in a neurological deficit, vertebral deformity, and elongation of the hospitalization and rehabilitation periods. Accurate diagnosis together with early stage and adequate antibiotic treatment based on identification of the infectious organism, is required.

Our report describes a rare case of tuberculous spondylitis masked by a concomitant staphylococcal infection.

CASE REPORT

A 74-year-old man was admitted with complaints of progressive back pain and paresis of the leg after percutaneous spinal procedures including a trigger point injection and epidural block. He had underlying diabetes and underwent operations including a laminectomy and discectomy at the 4th lumbar level two years previously. The patient also had a history of pulmonary tuberculosis. On physical examination, his temperature was 39°C. His clinical manifestation suggested of sepsis. An irregular palpable lump along the lumbar spine was noted and he complained of lower back pain and showed local tenderness at the mid lumbar level.

A laboratory study showed leukocytosis of 21,000/mm³, an erythrocyte sedimentation rate (ESR) of 120 mm/hr, and a C-reactive protein (CRP) of 240 mg/L. The serology for human immunodeficiency virus (HIV) and venereal disease research laboratory test (VDRL) were negative.

Magnetic resonance imaging (MRI) showed an abscess in the psoas muscle, and spondylitis of the 4th and 5th lumbar vertebrae, with an abscess in the anterior epidural space along the level of the 3rd-5th lumbar vertebrae compressing the thecal sac (Fig. 1).

A percutaneous needle aspiration of the abscess in the left

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• Address for reprints : Jae Hun Cha, M.D.
Department of Neurosurgery, Maryknoll Medical Center,
12 Daecheong-dong 4-ga, Jung-gu, Busan 600-730, Korea
Tel : +82-51-461-2456, Fax : +82-51-466-6164
E-mail : santanar@hanmail.net

psoas muscle was performed the following day. Methicillin-resistant coagulase negative staphylococci were yielded at from the gram stain and culture. The results from an acid-fast bacilli smear and MTB-PCR were negative. On the basis of the culture results, vancomycin was administered but his kidney fallen to acute renal failure. So vancomycin was switched to teicoplanin.

Because of patient's leg weakness was aggravated, surgical intervention of a decompressive laminectomy and discectomy was performed entailing removal of the infected tissue site in the posterior of the body and irrigation of the epidural abscess. After the operation and the administration of intravenous antibiotics, the patient's septic condition improved and he became afebrile. Some laboratory result, such as the white blood cell count, returned to a normal range. The results of histologic studies on the intervertebral disc showed degenerative fibrocartilaginous tissue with neutrophilic exudate. But, despite adequate treatment for staphylococcus, we were unable to achieve an improvement in leg movement, and the patient's back pain and leg weakness continued.

An MRI was performed after four weeks of intravenous antibiotics. The results of the second MRI demonstrated worsening infection. Bone destruction had progressed and new lesions in the psoas muscle's abscess and subligamentous abscess were noted (Fig. 2).

In view of the patient's neurologic state and based on the MRI results, we performed a lumbar corpectomy and autologous bone graft using the iliac bone. Percutaneous irrigation drains were inserted into the abscess site with antibiotic irrigation for one week.

Eight weeks after the first operation, epidural specimens obtained from the primary surgery showed positive culture results for mycobacterium tuberculosis. The result of the histologic studies on the 4th vertebral body following the second surgery showed necrotic tissue with granulation. We introduced the standard antituberculosis treatment regimen, consisting of isoniazid, rifampin, ethambutol and pyrazinamide, to the antibacterial drugs being administered.

After eight months of oral tuberculosis chemotherapy and intravenous antibiotic administration, the patient's motor powers recovered and he could ambulate without a cane. Laboratory results returned to a normal range. A follow-up MRI showed that a large amount of previously infected tissue had disappeared (Fig. 3).

DISCUSSION

Tuberculous spondylitis is more prevalent in females and risk factors include diabetes mellitus, HIV, and prior expo-

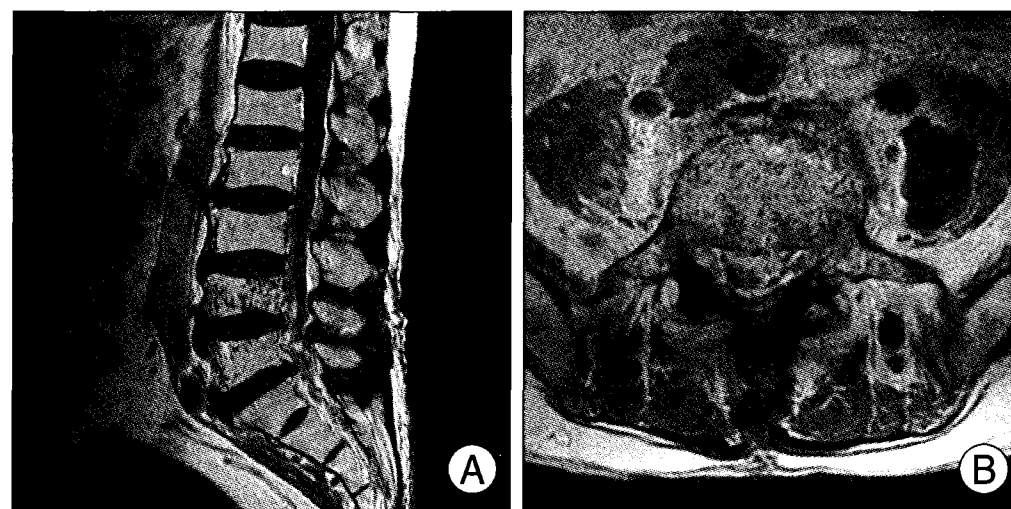


Fig. 1. Initial magnetic resonance T1-weighted images, obtained after intravenous administration of Gd-DTPA. A : Sagittal image showing vertebral body involvement and subligamentous abscess. B : Axial image showing abscess of the left psoas muscle and paraspinal muscle, and the subligamentous abscess.

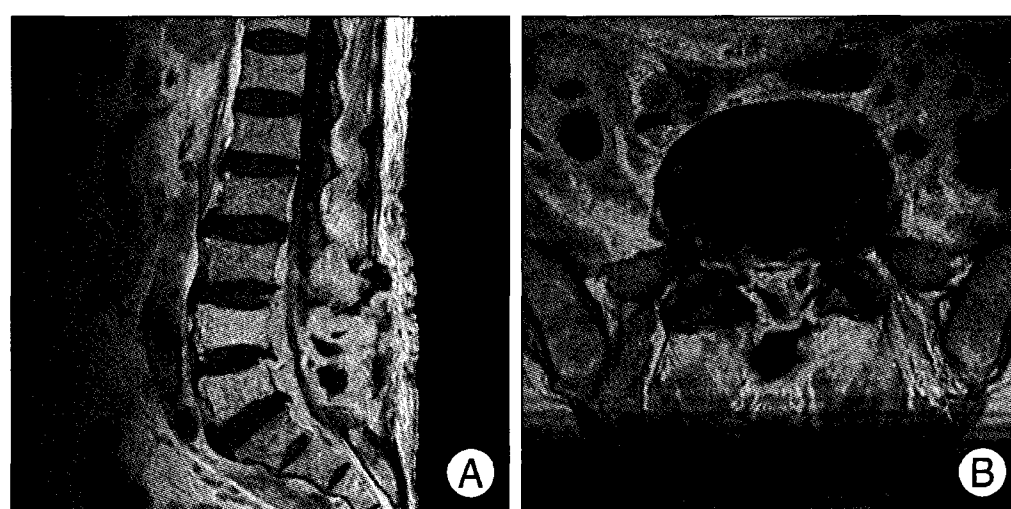


Fig. 2. Magnetic resonance T1-weighted images 1-month after the first operation, obtained after intravenous administration of Gd-DTPA. A : Sagittal image showing aggravation of the subligamentous abscess, paraspinal abscess and worsening of thecal sac compression. B : Axial image showing a new lesion at the right psoas muscle and the persistent left psoas muscle abscess.

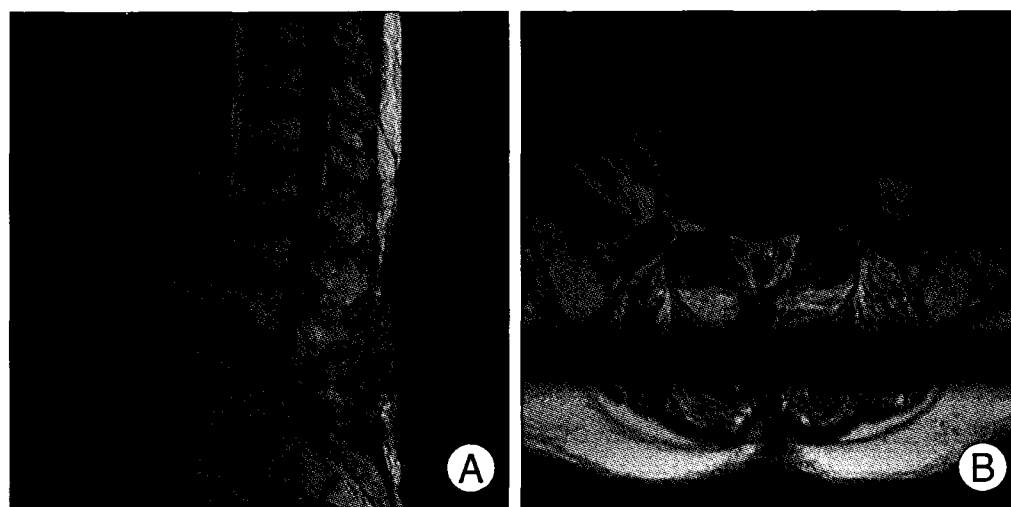


Fig. 3. After eight months of chemotherapy, magnetic resonance T1-weighted images were obtained after intravenous administration of Gd-DTPA. A : Sagittal images showing that a large part of the enhanced lesion, seen on previous magnetic resonance images (Fig. 1, 2), has disappeared. B : Axial images show significant improvements in the psoas muscle, subligamentous and paraspinal abscess.

sure to tuberculosis¹¹). The most commonly affected sites in adults include the lower thoracic spine and the upper lumbar spine. Tuberculosis may involve single or multiple sites of the spine including the vertebral body, intervertebral discs, ligaments and paravertebral soft tissues. Involvement of the posterior column is more common in tuberculous spondylitis than in pyogenic spondylitis¹). A neurological deficit is found in 40% of patients with tuberculous spondylitis¹²). Severe complications, such as a psoas abscess,

bony structure destruction and spinal cord compression can result from a delayed diagnosis and inadequate medical treatment⁹⁾. Disc involvement in pyogenic spondylitis is more common than in tuberculous spondylitis. Pyogenic spondylitis typically does not involve the posterior arch and spinous process. However, disease progression can result in pyogenic spondylitis involving the posterior column, and it is often difficult to distinguish between pyogenic and tuberculous spondylitis on radiologic studies. Paraspinal soft tissue abscesses are found in one third of cases and a neurologic deficit is found in 4-17% of patients with pyogenic spondylitis^{6,12)}.

Early diagnosis of spondylitis is important to avoid the onset of complications. The selection of adequate antibacterial drugs followed by a definite diagnosis play crucial roles in the prognosis of spondylitis.

Laboratory studies can provide useful data for managing spondylitis. Acute phase proteins—such as ESR and CRP—are typically elevated in this infectious disease. The value of CRP is more specific and sensitive than that of ESR. The CRP and ESR values can be used for monitoring the disease's progression and treatment efficacy^{4,8)}. Blood cultures are positive in up to one third of patients, and have 85% accuracy in the identification of pathogen^{2,10)}. The most common bacterial organism found is staphylococcus aureus which accounts for 60% of cases, followed by the gram-negative species *Escherichia Coli*^{2,10)}.

MRI and computed tomography scans accurately demonstrate vertebral osteomyelitis, disc space involvement and paraspinal soft tissue infections. MRIs show different features for tuberculous spondylitis and pyogenic spondylitis. Preservation of the disc space is a typical pathognomic finding for tuberculous spondylitis³⁾. In addition, the presence or absence of a paraspinal abscess, the grade of endplate erosion, and the margin of the paraspinal abscess are characteristic MRI findings for discriminating between tuberculous spondylitis and pyogenic spondylitis⁵⁾.

The treatment of spondylitis has traditionally included appropriate antimicrobial medication and surgical intervention. A minimum of 6-8 weeks is generally required for the nonsurgical treatment of pyogenic spondylitis¹²⁾. In the case of tuberculous spondylitis, a minimum treatment period of 12 months, entailing chemotherapy, is needed^{7,9)}. The initial regimen includes isoniazid, ethambutol, rifampin and pyrazinamide. Result of medical management should be reevaluated after 1 month of medical treatment. If there are persistent or worsening symptoms, and elevated ESR or CRP levels, medical treatment should be considered a failure^{7,12)}. Surgical treatment should be reserved for patients with advanced spondylitis and a major neurologic

deficit. General principles and indications for surgical intervention are diagnostic biopsy, spinal instability, severe deformity, myelopathy, severe sepsis, and an intolerance or poor response to medical therapy.

Only a few cases of tuberculous spondylitis with concomitant bacterial infection have been reported. Delayed diagnosis of mycobacterium tuberculosis was reported in one case. In our case, the patient's clinical manifestations, including a radiologic study, were not exactly compatible with tuberculous spondylitis. Furthermore, the result of a percutaneous needle aspiration blinded us from making a diagnosis of tuberculosis. Despite adequate antibacterial therapy, the patient's neurological deficit and radiologic findings worsened. It was apparent that medication to treat the staphylococcal infection had improved the septic conditions but could not block the progression of the spondylitis. Spondylitis in patients may progress during hospitalization and medical treatment for staphylococcus. After adequate medication for tuberculosis and pyogenic bacteria, it was possible to obtain satisfactory treatment results. The most important factor for diagnosing vertebral osteomyelitis is the examination of tissue using culture and histologic studies. However, the time required to obtain the culture results varies by pathogens. Furthermore, histopathologic results cannot show typical finding of disease in some cases. In our case, the histologic result was not specific and mycobacterium tuberculosis was only determined eight weeks after the tissue biopsy. To prevent unnecessary morbidity and mortality, initial treatment for tuberculosis is recommended for a patient who is suspected to have a tuberculosis infection. The factors that raise suspicion of tuberculosis include patients with known risk factors for tuberculous spondylitis, those who show a poor response to adequate antibiotics, the presence of isolated pyogenic bacteria of low virulence, and psoas muscle calcification.

CONCLUSION

Isolation of pyogenic bacteria from an infected site does not mean the exclusion of a tuberculosis infection. Occasionally, diagnosis of tuberculosis can be delayed. A concomitant staphylococcal infection can mask the characteristic of tuberculosis and results in diagnosis and treatment delays. Clinicians should give careful consideration to start an initial treatment for tuberculosis in cases where the possibility of a tuberculosis infection can not be excluded.

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