

Case Report

An Unusual Case of Post-Operative Spondylitis Caused by *Mycobacterium Intracellulare* in an Immunosuppressed Patient

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There are few reported cases of post-operative spondylitis caused by *Mycobacterium intracellulare*. A 75-year-old female presented to our hospital with low back pain and paraparesis after a fall. The radiologic examination revealed compression fractures of L1, L3 and L4 and an epidural hematoma compressing the spinal cord. The dark-red epidural hematoma was urgently evacuated. Four weeks post-operatively, neurologic deficits recurred with fever. On magnetic resonance image, an epidural abscess and osteomyelitis were detected in the previous operative site. Five weeks post-operatively, revision was performed with multiple biopsies. The specimen were positive for acid-fast bacilli and traditional anti-tuberculous medications were started. Because the Polymerase Chain Reaction for non-tuberculous mycobacterium (NTM) was positive, the anti-tuberculous medications were changed to anti-NTM drugs. However, the neurologic deficits did not improve and persistent elevation of erythrocyte sedimentation rate and C-reactive protein were noted. Eight weeks after the revision, *Mycobacterium intracellulare* was detected in the specimen cultures. Despite supportive care with medication, the patient died due to multiple organ failure.

Key Words : Post-operative spondylitis · *Mycobacterium intracellulare*.

INTRODUCTION

Post-operative spondylitis is an undesirable complication of spinal surgery. *Staphylococcus aureus* has been reported as the most frequently isolated organism in patients with post-operative spondylitis⁸⁾. Recently, infections with *methicillin-resistant S. aureus* (MRSA) and gram-negative organisms have increased dramatically¹⁴⁾. However, there are only few reports of post-operative spondylitis by non-tuberculous mycobacterium (NTM). In patients with spondylitis, the degree of immunosuppression is as high as 51.5%¹¹⁾. However, there are no consensus treatment guidelines for the treatment of spondylitis¹¹⁾. In a case, due to multi-drug resistance, prolonged anti-mycobacterial medications in combination with radical debridement with or without fusion are essential for spondylitis by NTM⁵⁾. We report an unusual case of post-operative spondylitis by *Mycobacterium intracellulare* in a immunosuppressed patient.

CASE REPORT

A 75-year-old female with low back pain and paraparesis after a fall presented to our hospital for evaluation. On the neurologic examination, motor function in both legs were decreased to a grade of 3/5 and severe low back pain was associated with localized tenderness over the lumbar region. She had received medications of steroids for rheumatoid arthritis for 2 years. No previous surgeries had been performed except for removal of fibromyoma in both wrists. Laboratory testing showed that the erythrocyte sedimentation rate (ESR), C-reactive protein (CRP) and white cell count were normal. The radiologic examination revealed osteoporotic compression fractures of L1, L3 and L4 bodies and an epidural hematoma compressing the spinal cord along the dura mater of the L2 to L4 spine (Fig. 1, 2). She underwent urgent decompressive laminectomies of L2, L3 and L4 and removal of the dark-red epidural mass with multiple tissue cultures. She was treated with cefazolin for prevention of post-operative infection and the steroids for rheumatoid arthritis were discontinued. She was symptom-free after surgery and ambulated well with braces. The histopathologic results showed that the stains of the biopsy specimens were all negative for bacteria, fungi and acid-fast bacilli (AFB). Ten days post-operatively, even though the ESR and CRP were elevated to 50 mm/hr

• Received : January 31, 2011 • Revised : April 4, 2011

• Accepted : November 14, 2011

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and 1.57 mg/dL, respectively, infectious signs such as erythema on the operative scar and fever were not detected. Four weeks post-operatively, she complained of severe low back pain and pain radiating to the right lower extremity with fever. Due to poor intake, the nutritional state of the patient had deteriorated with serum albumin of 2.6 g/dL. The ESR and CRP were increased to 88 mm/hr and 6.00 mg/dL, respectively. Due to recurrent neurologic deficits, a magnetic resonance imaging (MRI) of the lumbar area was obtained. On the MRI, a right epidural abscess occupying the right lateral canal and right post-laminectomy site of the L2 to L4 body was shown to compress the nerve roots and thecal sac and the L3 and L4 bodies had inflammatory lesions suggestive of osteomyelitis (Fig. 3). Five weeks post-operatively, considering the general condition of the patient and her age, revision was performed through the previous laminectomy site. A whitish epidural abscess extending from the epidural space to the bony structures was found in the operative field and removed with multiple tissue cultures and bone biopsies. The histopathologic results showed that three positive for AFB stain. While awaiting the final results of mycobacterial cultures, empirical anti-tuberculous medications (isoniazid, rifampicin, ethambutol, and pyrazinamide) were started and the previous antibiotics were discontinued. However, the patient could not ambulate due to refractory pain and her condition had deteriorated with poor oral intake. Even though blood, sputum and urine cultures were obtained to detect the cause for the deterioration in her condition, no significant findings were demonstrated. Two weeks after the revision, even though anti-tuberculous medications were continued pending the culture results, the ESR and CRP were increased as high as 92 mm/hr and 7.16 mg/dL and the neurologic deficits were not recovered. Based on the recommendation from infectious diseases consultant, we performed Polymerase Chain Reaction (PCR) method for both TB and NTM. Three weeks after the revision, the NTM-PCR was positive and TB-PCR was negative. Thus, we changed the previous anti-tuberculous medications into empirical anti-NTM medications (ethambutol, rifampicin, and clarithromycin) with evaluation of human immunodeficiency virus (HIV). A HIV serology test was negative. Five weeks after the revision, even though the ESR and CRP were decreased to 68 mm/hr and 3.02 mg/dL, the patient's condition had worsened with persistent neurologic deficits. Eight weeks after the revision, *mycobacterium intracellulare* was identified on multiple cultures and the medications were continued with a request of a drug resistance test. Ten weeks after the revision, pneumonia occurred with heart failure and the patient was treated in the intensive care unit with ventilator care. Twelve weeks after the revision, the patient expired due to multiple organ failure despite supportive care with medications.

DISCUSSION

Despite advanced aseptic techniques and prophylactic anti-



Fig. 1. X-ray findings. Compressive fracture of the L1, L3 and L4 vertebral bodies.

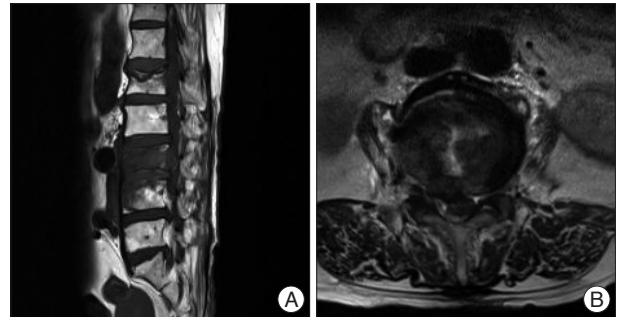


Fig. 2. Lumbar spine magnetic resonance imaging findings. Space-occupying lesions suggesting an epidural hematoma compressing thecal sac are seen (A). Epidural space occupying lesions extending from the L2 to L4 spines are evident (B). Compression fractures of the L1, L3 and L4 bodies rather than pyogenic infection or metastasis.

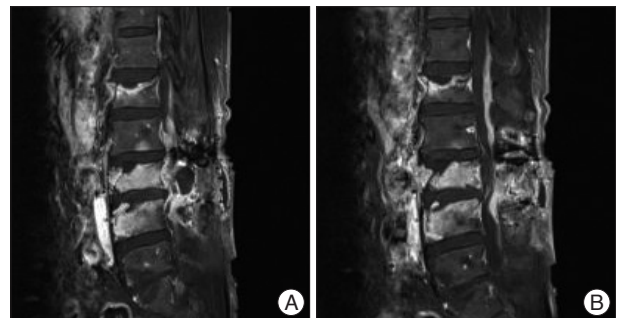


Fig. 3. Contrast enhanced lumbar spine magnetic resonance image. Right epidural abscesses occupying the right lateral canal and right laminectomy site at the level of the L2 to L4 vertebral bodies (A). Multiple areas with irregular enhancing high signals in the posterior epidural space of the L2 to L3 spines suggesting an inflammatory lesion such as osteomyelitis (B).

otics, the incidence of post-operative spondylitis is as high as 20%¹³. The most common causative organism of post-operative spondylitis is *S. aureus*, with MRSA currently recognized as one of the major pathogens³. There are only a few reports regarding spinal infections by NTM¹⁶.

Mycobacterium intracellulare is one of the species amongst NTM. *Mycobacterium intracellulare* is found in water, soil, plants, house dust and other environmental sources. It is the most common cause of systemic infection in persons with acquired immune deficiency syndrome (AIDS) or immunosuppression¹⁷. Although infections by *Mycobacterium intracellulare* are reported in lung, lymph nodes, skin and soft tissues, spine infections are very rare¹¹. A MedLine review of literature for spine infections by *Mycobacterium intracellulare* between 1965 and 2011 revealed only about 30 case reports and there are no reports regarding post-operative spondylitis by *Mycobacterium intracellulare*. In the present case, an epidural hematoma in the lumbar spine following a fall was evacuated and no abnormal findings on the histopathologic report were detected. Five weeks post-operatively, a spinal epidural abscess and spondylitis occurred. The serologic test for HIV was negative, but the patient was immunosuppressed secondary to steroid use for rheumatoid arthritis for 2 years. In particular, immunosuppression in patients with vertebral osteomyelitis by atypical mycobacteria has been reported to be as high as 51.5%¹¹. Despite the history of steroid medications for 2 years, we considered the epidural abscess and spondylitis to be TB spondylitis without considering the possibility of NTM spondylitis. In case of a patient with AIDS or immunosuppression, the possibility of infection by NTM should also be considered if suspected TB spondylitis is detected on the radiological examination.

Spinal infection by *Mycobacterium intracellulare* is easily mistaken for tuberculous spondylitis due to the similarity in clinical and radiologic features, as was the case with this patient². If the lesion is considered to be TB spondylitis and biopsies are positive for AFB, traditional empirical anti-tuberculous medications usually are usually started awaiting culture results because of the relative higher incidence. Because the incubation period is about 6 weeks¹², the PCR technique is recognized as a useful method for expediting the diagnosis and treatment by amplifying the DNA in specimens¹⁰. If the patient is immunosuppressed, PCR for TB and NTM are effective in the early differentiation until the culture results are available. In our case, the ESR and CRP were increased and the patient's condition deteriorated in spite of empirical anti-tuberculous medications. We performed PCR techniques for TB and NTM and the results were positive for NTM. If a patient with AIDS or immunosuppression is suspected to have TB spondylitis, PCR for TB and NTM is helpful in the differential diagnosis and treatment.

Mycobacterium intracellulare is usually resistant to most anti-tuberculous drugs⁹. A four-drug regimen (isoniazid, rifampicin, ethambutol, and pyrazinamide) usually is used initially for patients suspected to have TB spondylitis until the culture re-

sults are available¹. In the case of spondylitis by *Mycobacterium intracellulare*, isoniazid is not recommended due to the low activity against it. According to guidelines issued by the American Thoracic Society and Infectious Disease Society of America (ATS and IDSA)⁴, clarithromycin or azithromycin and ethambutol with or without rifabutin should be used in patients with disseminated *mycobacterium avium complex* infection⁴. In our case, a four-drug regimen was started as treatment for an epidural abscess presumed to be a TB infection. In spite of the four-drug regimen, the ESR and CRP were not decreased with persistent neurologic deficits. Because PCR for NTM was positive, the medications were changed to clarithromycin, rifampicin, and ethambutol according to guidelines by ATS and IDSA.

It has been reported that without surgical decompression, severe neurologic deficits do not resolve¹⁵. It has also been reported that in the case of decompression by means of laminectomy alone, neurologic recovery is not satisfactory^{12,18}. There exists a few reports that radical debridement and anterior fusion with posterior instrumentation is effective in treating *Mycobacterium intracellulare* spondylitis^{6,7}. Because of multiple drug resistance to traditional anti-tuberculous medications, the choice of surgical treatment is more important for infection by *Mycobacterium intracellulare* than TB. In our case, removal of the epidural abscess was done through the previous laminectomy site without radical debridement and anterior fusion. After the 1st operation, the patient's condition deteriorated and heart failure occurred with acute hepatitis by anti-tuberculous medications. Considering the patient's condition, we could not perform radical debridement and anterior fusion by an anterior approach and only removal of epidural abscess compressing the spinal cord was done through the previous laminectomy site with multiple biopsies. In spite of the revision and medication for NTM infection, the neurologic deficits did not resolve and the ESR and CRP remained elevated. Radical debridement with or without fusion may be more effective in treating patients with TB spondylitis because of multi-drug resistance.

CONCLUSION

We managed a rare case with postoperative spondylitis by *Mycobacterium intracellulare*. Even though spinal infection by *Mycobacterium intracellulare* is easily mistaken for TB spondylitis based on the similarity of clinical and radiologic features, due to multiple drug resistance to traditional anti-tuberculous medications, a differential diagnosis should be established as soon as possible. Because the culture results for *Mycobacterium intracellulare* is time-consuming, PCR is effective in expediting the diagnosis and proper treatment for a patient suspected to have spondylitis by TB or *Mycobacterium intracellulare*. Radical debridement with or without fusion may be necessary to control refractory infections by *Mycobacterium intracellulare* as well as appropriate medications according to histopathologic results.

• Acknowledgements

This study was supported by a 2010 research grant from Pusan National University Yangsan Hospital.

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