Shimane J. Med. Sci., Vol.34 pp.81-84, 2017

Pyogenic Spondylitis Accompanied by Urinary Tract Infection and Septic Arthritis of the Knee: A Case Report

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（Received September 16, 2017; Accepted October 16, 2017）

Vertebral spondylitis is difficult to diagnose and is often treated as fever of unknown origin. We encountered a 46-year-old man with complaints of fever and back pain. He had costovertebral angle tenderness on percussion and elevated inflammatory markers on blood biochemistry; he was suspected to have urinary tract infection. A likely cause of fever, such as pyelonephritis, was elusive on non-contrast chest/abdomen/pelvis computed tomography and subsequent contrast computed tomography and magnetic resonance imaging. Specialist radiology review was suggestive of vertebral spondylitis. Physical reexamination revealed numbness and muscle weakness consistent with the location of the lesions. Conservative antibiotic treatment was initiated. Septic right knee joint was also suspected, and arthroscopic washout with débridement was urgently performed. Inflammatory markers improved on conservative antibiotic treatment. In emergency settings, thorough physical examination and coordination between medical specialists is crucial.

Keywords: back pain, contrast CT, fever, radiology review, urinary tract infection, vertebral spondylitis

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INTRODUCTION

Vertebral spondylitis is often difficult to identify on initial presentation, and diagnosis is delayed because it is treated as fever of unknown origin（FUO）. Here, we report a case of fever and back pain where diagnosis was established using contrast-enhanced computed tomography（CT）.

CASE

A 46-year-old man（height, 175 cm; weight, 74 kg）presented with chief complaints of fever and low back pain. He had a past medical history of right patella fracture, right knee osteoarthritis（joint arthrocentesis once every 2 weeks, and at 5 days before presentation）, and no allergies.

Three days prior to presentation, he developed chills, mild fever of 37.4°C, and urinary frequency. Two days prior to presentation, joint pain, low back pain, and headache began, and due to continued fever and chills, he initially presented to another physician. Urinalysis revealed hematuria and inflammatory response; oral levofloxacin 500 mg and loxoprofen sodium 60 mg was administered. There were no features of common cold, dysuria, or residual urine, but fever persisted. He was subsequently reexamined by the same physician and elevated serum inflammatory markers were detected with C-reactive protein（CRP）of 23 mg/dL. He was referred to the emergency room that same day for further work-up for fever of undetermined origin.

Fig. 1a. Computed tomography abdomen/pelvis with contrast, axial view: low-signal region involving rim-enhancement around the right L3 facet joint.（arrow）

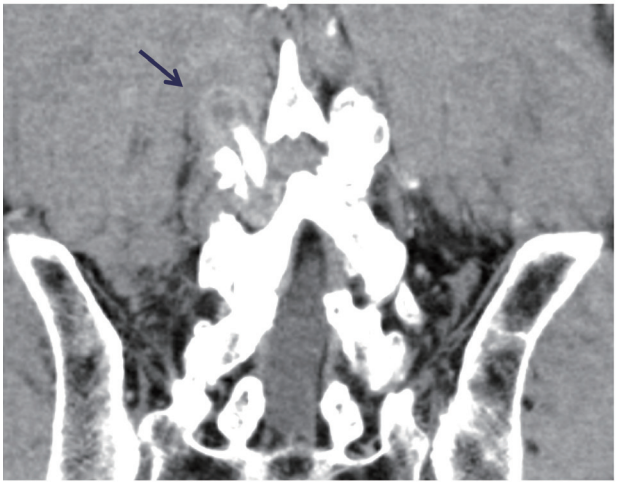

Fig. 1b. Computed tomography abdomen/pelvis with contrast, coronal view: low-signal region involving rim-enhancement around the right L3 facet joint.（arrow）

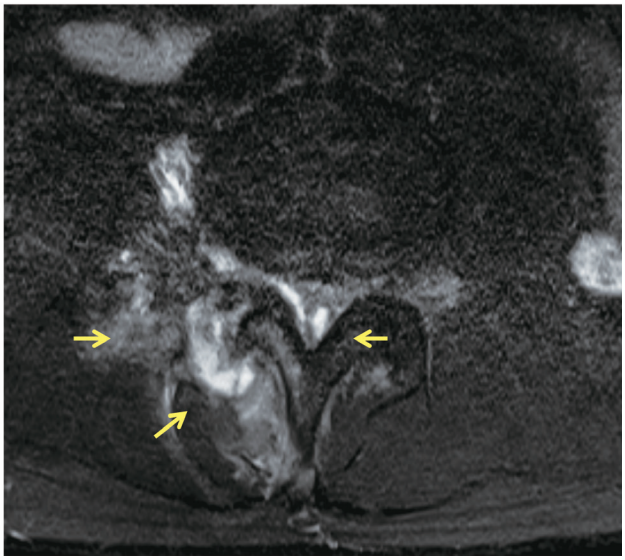

Fig. 2a. Magnetic resonance imaging lumbar spine with contrast, axial view: right L3/4 facet arthritis and adjacent abscess.（arrow）

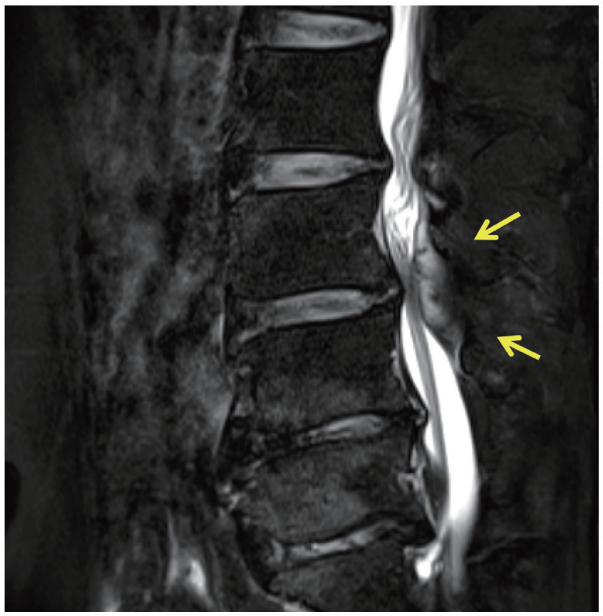

Fig. 2b. Magnetic resonance imaging lumbar spine with contrast, sagittal view: L3/4 epidural abscess.

On admission, his temperature was 36.9°C, blood pressure 122/68 mmHg, pulse 71 bpm, and SpO2 96% in room air. Abdominal examination was normal except for tenderness to percussion on the left side of the lower back.

Laboratory investigations showed white blood cell count（WBC）of 18,070 /μL, neutrophils of 16,970 /μL（banded 3.8%, segmented 90.1%）, features of elevated inflammatory response with CRP of 22.07 mg/dL, mild albuminemia with albumin of 3.4 g/dL; other results were normal. Urinalysis revealed protein（1+）, occult blood（+-）, red blood cells 10-19 /HPF, WBC 1-4 /HPF, bacteria 30-49 /HPF, and cocci 2+（suggesting urinary tract infection（UTI））.

Non-contrast chest/ abdomen/ pelvis CT could not detect the source of infection in these regions. Contrast-enhanced CT in the same regions still could not discern the source of infection. We then requested a read from a radiologist, who identified a low-signal region involving rim-enhancement surrounding

the right L3 facet joint (Figs.1a and 1b). Lumbar MRI showed signal abnormality representing small fluid accumulation on diffusion-weighted imaging at the right L3/4 facet joint and its vicinity (Fig. 2a), with elevated T2WI signal changes in surrounding tissues, a small epidural abscess (Fig. 2b). There was a small fluid accumulation in the L4/5 and L5/S1 intervertebral spaces, and slightly elevated T2WI signal changes were confirmed in the L4, L5, and S1 vertebral bodies. Immediate reexamination of the patient revealed mild numbness in the L4-5 distributions on the lateral aspect of the right leg and great toe with Manual Muscle Testing grade 4 weakness in the quadriceps and tibialis anterior. Based on these findings, he was diagnosed with vertebral spondylitis and referred to the orthopaedic surgeons. Despite no initial complaint of lower extremity weakness or numbness on initial examination of the extremities, these findings were determined on repeat exam, and he complained of mild pain in those regions.

Likely causative agents were though to be Staphylococcus aureus, streptococcal species, Enterobacteriaceae, and Pseudomonas aeruginosa, and so conservative antibiotic treatment with meropenem 1.5 g and minocycline 200 mg daily was initiated. However, on the night of admission, he developed right knee pain with difficulty standing. Septic right knee joint was suspected from X-ray and knee aspirate analysis, and on hospital day 2, arthroscopic washout with débridement was urgently performed. Inflammatory markers improved on conservative antibiotic treatment. Due to administration of levofloxacin by the initial attending physician, blood and urine cultures from the emergency room and synovial fluid culture after hospitalization were negative and the causative agent could not be identified. On hospital day 55, he was discharged.

DISCUSSION

Vertebral spondylitis is a bacterial infection involving anywhere from the cervical to sacral spine, with attendant destruction of the vertebral body and intervertebral disc. It occurs most frequently in the lumbar spine (66%), followed by thoracic (14%), sacral (11%), and cervical (9%) spine [1].

The route of infection is mainly hematogenous, but recently, epidural injections, lumbar puncture, and instrumentation have been noted as possible iatrogenic causes of infection. In our case, periodic arthrocentesis on the right knee was considered as the source of infection. Additionally, diabetes is a common risk factor for vertebral spondylitis along with malignant neoplasm, liver cirrhosis, dialysis, history of steroid use, history of infection, and advanced age [2]. Our case was a middle-aged man who did not have any of the above factors, with low risk of the present disease. Conversely, this is a case of hypoalbuminemia, which may have influenced the course of infectious disease.

Back pain and fever are typical symptoms of vertebral spondylitis and 86% of patients present with back pain. However, 10-45% of cases present with concurrent fever [3]. Inflammation involving the epidural space causes symptoms of myelopathy and radiculopathy. Myelopathy is more frequent in the cervical and thoracic spine and radiculopathy in the lumbar spine. Nerve root damage causes lower extremity pain, with a reported frequency in epidural abscess of 28-35%. In our case, thorough reexamination identified numbness from the lateral aspect of the leg to the great toe with muscle weakness, initially thought to be radiculopathy from epidural abscess. Our diagnosis was based on imaging, yet despite typical vertebral spondylitis symptoms of back pain and fever, the fact that we had assumed a diagnosis of UTI from urinalysis, without a more detailed examination, especially neurologic examination, warrants introspection.

MRI is the first-choice imaging modality for vertebral spondylitis, with a reported sensitivity of 96% and specificity of 93% [4, 5]. MRI is superior to other imaging modalities for ease of obtaining anatomic information about the spine and subdural space. According to reports by Tamura *et al*., MRI is advantageous for early diagnosis of vertebral spondylitis, and is useful for evaluating treatment efficacy and outcome [6]. Also comparing time to diagnosis from initial presentation at a medical institution, Yoshimatsu *et al*. divided the patients into early diagnosis group with ≤ 10 days from initial presentation to diagnosis (20 cases) and late diagnosis group with > 20 days (20 cases). Early

diagnosis was made possible by MRI in 10 cases, typical symptoms in 8 cases, worsening symptoms in 6, and contrast-enhanced CT in 3 cases [7]. In our case, non-contrast CT could not reveal the cause of fever and back pain, but contrast-enhanced CT enabled suspicion of vertebral spondylitis by the radiologist who detected an area of low-contrast signal bordering the right L3 facet joint region.

There are more cases of prolonged symptoms and treatment challenges where fever and accompanying back pain are not recognized as vertebral spondylitis, frequently treated as FUO in other specialties, and do not receive appropriate therapy [2]. Therefore, in emergency outpatient settings, even if a specific diagnosis can be made ab initio, detailed physical reexamination and coordination with other specialists, particularly radiologists, is needed for accurate diagnosis and treatment.

CONCLUSION

We encountered a case of vertebral spondylitis that presented with fever and back pain. Diagnosis was made by abnormal findings on contrast-enhanced CT by radiology review, and established by using MRI with contrast. Radiculopathy of the lower limb, which correlated to the disease level, was also confirmed. In emergency settings, thorough physical examination and coordination between medical specialists is crucial to prevent any misdiagnosis or other errows.

REFERENCES

1) Sato K, Nagata A. The current trend and treatment of infectious spondylitis. *Orthopedics & Traumatology* 2009;52:21-8.
2) Omata H, Nishiyama Y, Mikumo H, Henmi N, Kawasaki K, Ohshita Y. Report of 100 cases of pyogenic spondylitis in our hospital. *Showa Igakkai Zasshi* 2012;72:615-9.
3) Chelsom J, Solberg CO. Vertebral osteomyelitis at a Norwegian university hospital 1987-97: clinical features, laboratory findings and outcome. *Scand J Infect Dis* 1998;30:147-51.
4) Modic MT, Feiglin DH. Vertebral osteomyelitis: assessment using MR. *Radiology* 1985;157:157-66.
5) Sharif HS. Role of MR imaging in the management of spinal infections. *Am J Roentgenol* 1992;158:1333-45.
6) Taoka Y, Naruo M, Koyanagi E, *et al*. Diagnostic evaluation of MRI for pyogenic spondylitis. *Orthopedics & Traumatology* 1995;44:1080-2.
7) Yoshimatsu H, Nishida T, Yoshida K, *et al*. Diagnosis of pyogenic spondylitis. *Orthopedics & Traumatology* 2007;56:661-3.