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A case of infectious erector spinae myositis during treatment of lumbar disk herniation

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Abstract

We recently treated a patient who developed unilateral erector spinae myositis during inpatient treatment with continuous epidural block. The patient was diagnosed with radicular sciatica. A catheter was inserted (3.5 cm cephalad from L3/4) for continuous epidural block, and left L5 nerve root block was performed. The catheter site was disinfected and the dressing was changed every other day. Intradiscal pressurized injection was performed on day 8. Lower back and leg pain gradually improved, and then erythema and tenderness at the catheter insertion site was noted on day 13. Blood tests yielded severe inflammatory findings, so cefazolin sodium was started by infusion. Urgent contrast-enhanced MRI confirmed left erector spinae myositis. Erector spinae myositis was attributed to contamination of the catheter insertion site. In cases of suspected infection like this, early diagnosis by MRI and prompt treatment are considered to be necessary.

Key words : erector spinae myositis, continuous epidural block, *Staphylococcus aureus*

Introduction

Serious complications during epidural catheter placement include infections, particularly epidural abscess[1] ; however, erector spinae myositis has rarely been reported.[2]

We present herein a case of unilateral erector spinae myositis that developed during treatment with continuous epidural block in a patient with lower back and leg pain due to lumbar disk herniation.

Case

The patient was a 20-year-old man (height, 181 cm ; weight, 97 kg). His chief complaint was left lower back and leg pain. Three months previously, he had begun experiencing lower back pain. This pain gradually started to radiate to the left leg, so he went to see a local physician. Magnetic resonance imaging (MRI) showed lumbar disk herniation (L4/5, left-sided prolapse). The patient was treated primarily with lumbar epidural block, but was referred to our institute because of inadequate pain relief. Past and family medical histories were unremarkable.

On our initial evaluation, the patient showed left lower back and leg. Straight leg raising to 30° elicited pain radiating from the left buttocks to the posterior thigh. The patient was diagnosed with radicular sciatica due to lumbar disk herniation. He was hospitalized and continuous epidural block was started.

After disinfection with povidone iodine and chlorhexidine ethanol, a Tuohy needle was inserted from L3/4 into the epidural space using the loss-of-resistance technique. The catheter was inserted 5 cm cephalad, and a subcutaneous tunnel was created (insertion length from skin, 13 cm). A dressing (Tegaderm®; 3M) was placed over the catheter insertion site. Cefpodoxime proxetil 200 mg was administered orally for 3

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days after catheter placement.

Continuous infusion with 0.5% mepivacaine at 1.5 ml/h was started. A daily 5-ml bolus of 0.5% mepivacaine was also administered. The catheter insertion site was disinfected and the dressing was changed every other day. The dressing would sometimes loosen due to natural sweating, so the area was also disinfected as needed.

On day 3, left L5 nerve root block was performed using a mixture of 2 ml of 2% lidocaine and 20 mg methylprednisolone acetate. On day 8, intradiscal pressurized injection of L4/5 was performed at the level of the L5 spinous process (inserted 7 cm right from midline ; using a mixture of 5 ml of 2% lidocaine, 20 mg methylprednisolone acetate, and 9 ml isotonic saline). With this treatment, lower back and leg pain decreased to a VAS of 20.

However, on the evening of day 12, drug fluid leakage, erythema, and tenderness of the epidural catheter insertion site were noted, so the catheter was removed. At that time, the insertion depth from the skin was 8 cm, so the catheter had already deviated from the epidural space. On the morning of day 13, the patient showed a fever of around 37°C and complained of a headache and back pain. Blood testing revealed severe inflammatory findings (white blood cells, 14,600/mm^3 ; C-reactive protein, 5.0 mg/dl). Epidural space infection was suspected, and an infusion of cefazolin sodium (2 g/day) was started (Fig. 1). Inflammation increased on day 14, so contrast-enhanced MRI was performed (contrast medium : 0.1 mmol gadodimide hydrate per kilogram of body weight). Fast spin-echo pulse sequences were used in this patient. Pre-T_2 weighted imaging (T_2WI) and post-enhanced T_1 WI were performed in the sagittal and axial planes. The imaging parameters were : T_1WI : repetition time (TR) 550-600 ms, echo time (TE) 9-11 ms ; T_2WI : TR 3600 ms, TE 120 ms ; section thickness 3.5-5 mm.

Pre-T_2WI showed no remarkable findings. Sagittal and axial T_1WI at the L4 level showed contrast enhancement along the left erector spinae muscle (Fig. 2). Bacterial cultures isolated *Staphylococcus aureus*.

Three days after starting treatment with cefazolin sodium, the fever subsided. After 7 days, back pain disappeared. Inflammatory findings resolved, and the patient was discharged on day 22 without any sequelae (Fig. 1). Follow-up contrast-enhanced MRI has demonstrated the disappearance of inflammatory findings.

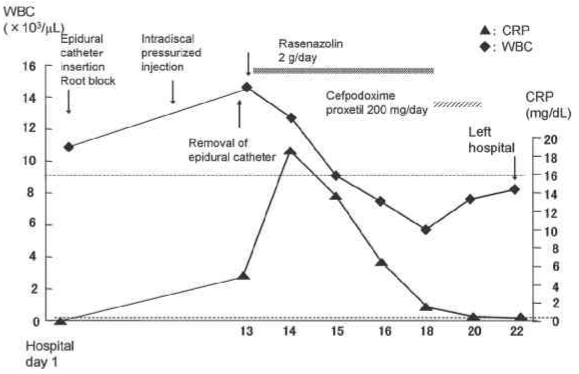

Fig. 1 Treatment course and changes in inflammatory findings.

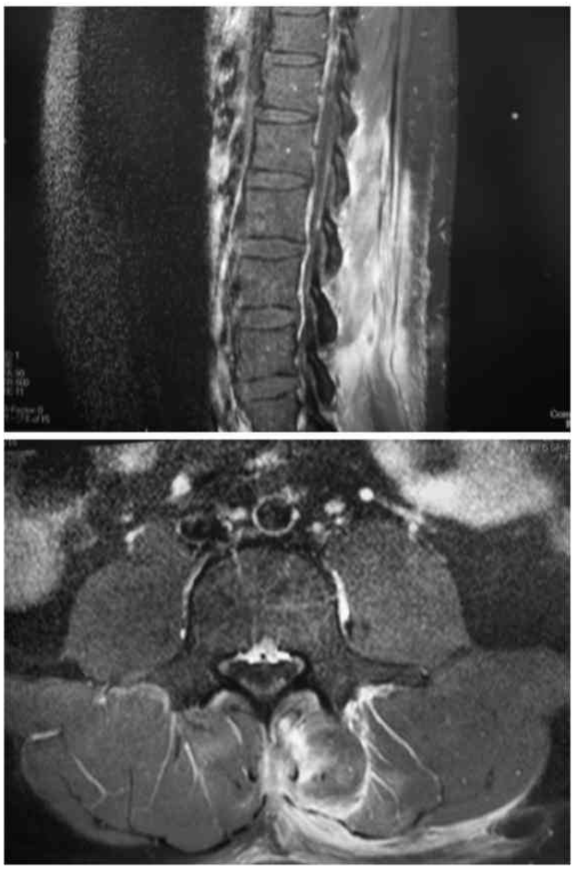

Fig. 2 Contrast-enhanced T_1-weighted image (T_1WI) in the sagittal and axial planes at the L4 level (TR : 550-600 ms, TE : 9-11 ms, section thickness : 3.5-5 mm). Enhancement of contrast is seen in the left erector spinae muscle.

Discussion

Routes of infection during epidural catheter placement include : 1) contamination at the time of catheter insertion due to incomplete disinfection ; 2) introduction of bacteria from the skin ;

and 3) hematogenous spread from the focus of infection.[3] In our patient, erector spinae myositis developed despite disinfection of the catheter insertion site every other day. Risk factors for infection include diabetes, use of corticosteroids or immunosuppressants, radiotherapy, and decreased nutritional status; 3 however, our patient was generally healthy and had none of these risk factors.

In addition, our patient showed no other sites of infection, but bacterial cultures isolated *Staphylococcus aureus*, suggesting infection by the introduction of bacteria from the skin. However, epidural catheter insertion did not involve multiple punctures, and considering the time of onset, the likelihood of contamination at the time of epidural puncture seems low. Also, intradiscal pressurized injection was performed in a left lateral decubitus position, so invasion from the block needle would not cause left erector spinae myositis. Moreover, the dressing loosened several times due to sweating. Catheter insertion site contamination was thus considered the most likely cause.

No clear standards exist for the frequency of disinfection after insertion of an epidural catheter,[4] but considering that skin damage due to disinfectants has been reported and that frequent dressing changes increase the risk of catheter displacement, our group disinfects the site every other day. In addition, during continuous epidural block, sweating has been reported as a cause of epidural space infections,[5] so dressing management needs to be investigated in patients who sweat excessively.

To prevent epidural abscess, one of the most serious complications of epidural block, MRI is highly recommended as soon as the diagnosis is suspected, even if neurological findings are absent.[6] If inflammation of the puncture site is noted, the catheter should be removed immediately.[7] In our patient, despite a lack of neurological findings, fever, headache, and puncture site pain were present, corresponding clinically to the first phase of epidural abscess as proposed by Heusner.[8] The catheter was thus removed immediately, and MRI was performed. Causative organisms of epidural space infection are mainly *S. aureus* and *S. epidermidis*.[1,9] Infusion was started with cefazolin sodium, to which both organisms are sensitive. This prompt treatment provided effective therapy without serious sequelae.

In our patient, infection did not spread to the epidural space, but was limited to the muscle. This was because the catheter was removed immediately and MRI was performed when inflammation of the puncture site was noted, and possibly because the epidural catheter had deviated into the muscle. Iseki et al. reported a case of epidural space infection following erector spinae myositis due to catheter deviation in a patient during continuous epidural block.[2] In that case, the cause of erector spinae myositis was attributed to the toxicity of a local anesthetic that had leaked and possible muscle crush injury due to multiple punctures at the time of epidural catheter insertion. In our patient, epidural catheter insertion proceeded smoothly, but we cannot exclude the possibility that multiple punctures were necessary at the time of the nerve root block, leading to crush injury of the erector spinae muscle.

In conclusion, in our patient with excessive sweating, unilateral erector spinae myositis developed during epidural catheter placement. In patients with excessive sweating, careful attention must be paid to possible contamination of the catheter placement site. As infection from the erector spinae muscle may spread to the epidural space, early diagnosis and prompt treatment are necessary, and it is important that we observe carefully the inflammatory symptom and the findings of blood testing and MRI is performed.

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