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Pyogenic spondylitis and epidural abscess distant from the site of continuous epidural block in a patient with postherpetic neuralgia

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Introduction

The most common cause of epidural abscess is hematogenous spread of infection from a distant source or direct extension from vertebral osteomyelitis [1,2]. However, several reports have also described epidural abscess occurring subsequent to epidural block [3,4]. In such cases, the abscess is usually found at the site of the epidural block or catheterization, but we encountered a patient with an epidural abscess that had developed far from the site of epidural block.

Case report

A 73-year-old man with postherpetic neuralgia (PHN) was referred to the Ishikawa Prefectural Central Hospital for control of his persistent pain. He had had a right upper lobectomy for a lung abscess 10 years previously, but there was no history of diabetes mellitus or immunosuppressive therapy. One month before presentation at our hospital, a skin rash and continuous pain had developed in his right chest wall, T9 dermatome. He was diagnosed with herpes zoster by a doctor at another hospital and received intravenous acyclovir and analgesics. However, the severe pain persisted for 1 month.

On admission to our hospital, epidural catheterization from the Th9-10 interspace was performed, and the catheter was introduced 5 cm cephalad into the epidural space. Chlorhexidine gluconate solution (0.5%) was used for skin disinfection at the time of epidural catheterization and for daily care. The catheter was left in place for 1 month, and disinfection was performed almost every day. The pain was reduced considerably (50% on the visual analogue scale) as a result of continuous epidural block with 50 ml of 0.5% bupivacaine and 200 μg of fentanyl per day, as well as oral administration of trazodone hydrochloride.

One month after hospitalization, the patient suffered a sudden onset of high fever (39.4°C). There was no evidence of redness or tenderness at the epidural block site, no back pain, and no neurological signs. However, the epidural catheter was removed and *Staphylococcus aureus* was identified in the culture from the specimen sampled from the catheter tip. Oral romefloxasone ($400\,mg \cdot day^{-1}$) given for 5 days reduced the fever. Two weeks later, a high temperature of 39.3°C recurred, accompanied by headache and neck stiffness. C-reactive protein (CRP) had increased to $15.4\,mg \cdot dl^{-1}$, and the erythrocyte sedimentation rate (ESR) was $124\,mm \cdot h^{-1}$. *S. aureus* was also detected by blood culture. The cerebrospinal fluid (CSF) had a high white blood cell count ($4800 \cdot mm^{-3}$), but CSF culture showed no bacterial growth. Magnetic resonance imaging (MRI) indicated a low signal intensity at the T4 and T5 vertebral bodies on T1-weighted images and a slightly low signal intensity on T2-weighted images, so that spondylitis was suspected.

Although intravenous imipenem ($1\,g \cdot day^{-1}$) reduced the fever, back pain, and neck stiffness, the ESR remained at $100\,mm \cdot h^{-1}$. There were no other neurological signs. Right leg paralysis and bilateral hypesthesia below the T9 level occurred abruptly 15 days after the second episode of high fever. MRI revealed a mass that was compressing the spinal cord at the T4-5 level and was enhanced by gadolinium on T1-weighted images (Fig. 1), so that an epidural abscess was suspected. Extensive spinal cord edema was seen on T2-weighted images (Fig. 2). These examination results led to a diagnosis of pyogenic spondylitis at T4 and T5 accompanied

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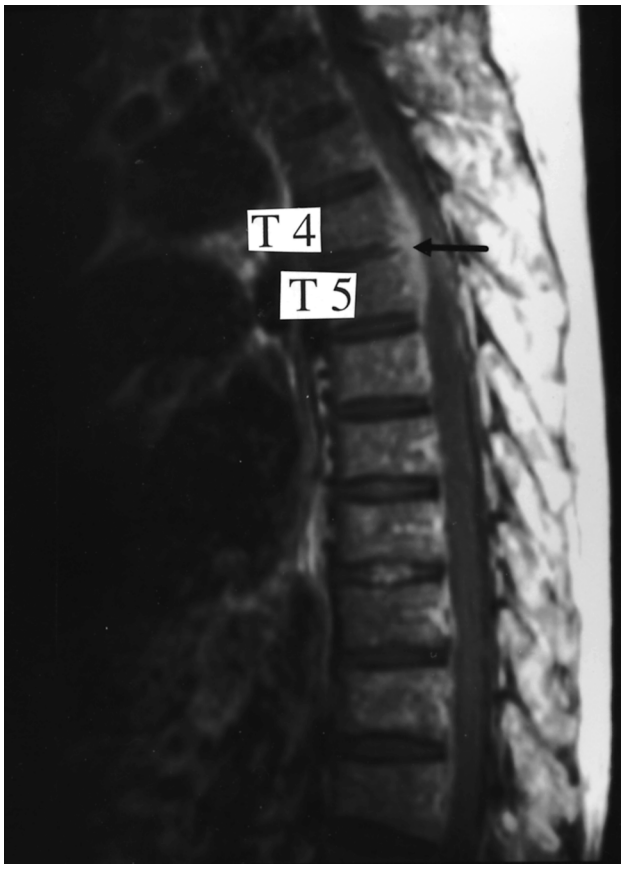

Fig. 1. Midsagittal T1-weighted magnetic resonance image obtained after gadolinium administration shows an abscess (*arrow*) compressing the spinal cord at the T4-T5 level

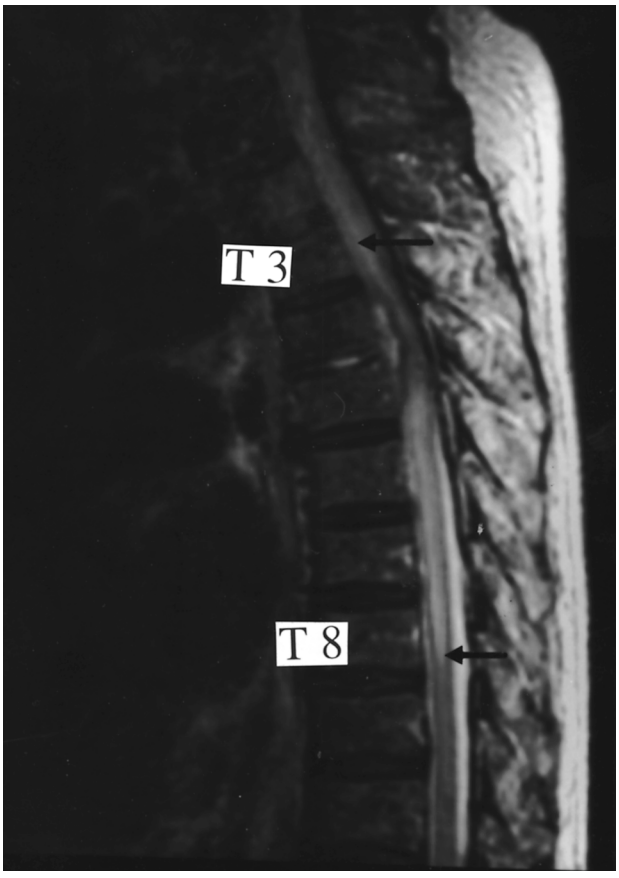

Fig. 2. Midsagittal T2-weighted magnetic resonance image shows an increased signal intensity of the spinal cord due to edema (between the *arrows*) at T3-T8

by an epidural abscess that had caused the leg paralysis. An emergency laminectomy was therefore performed.

Laminectomy from T3 to T6 was performed along with resection of granulation tissue involving the vertebral bodies and epidural space. Pathologic examination identified the granulation tissue as pyogenic spondylitis with an abscess, and culture of the granulation tissue demonstrated *S. aureus*. After the operation, paresis of the right leg improved until the patient was able to raise it against gravity. Intravenous piperacillin ($2\,g \cdot day^{-1}$) and fosfomysin sodium ($2\,g \cdot day^{-1}$) were continued for 5 weeks after the operation until the CRP had fallen to $0.1\,mg \cdot dl^{-1}$ and the ESR had been reduced to $11\,mm \cdot h^{-1}$. Two months after the operation, MRI showed no evidence of spinal cord compression. The patient eventually recovered from paresis sufficiently to be able to walk with a stick.

Discussion

Epidural abscess related to epidural block is rare, but it is one of the most serious complications. Contamination during placement of a catheter or catheter-related infection in the subcutaneous tissue is a common cause of epidural abscess. In most cases, the abscess occurs at the site of the epidural puncture or catheterization. However, our patient had an epidural abscess at a site (Th4-5) distant from the epidural block (Th9-10).

We consider that the following infectious routes may have caused the abscess. First, the tip of the catheter may have just reached Th4-5 from Th9-10, so that catheter-related infection may have caused the epidural abscess, although the position of the catheter tip could not be confirmed. Even if the tip did not reach Th4-5, it is also possible that the catheter infection caused this abscess by direct epidural spread.

Second, hematogenous spread from the infected catheter may have caused pyogenic spondylitis, which then extended to the epidural space and resulted in an epidural abscess. This route can be thought of as *S. aureus* being cultured from the tip of the epidural catheter, as well as from the blood, vertebral body, and epidural abscess.

The risk of epidural catheter-related infection is low for patients in surgical and intensive care units requiring

pain control [5]. However, Du Pen et al. [6] reported that among 350 immunosuppressed patients with conditions such as cancer and acquired immunodeficiency syndrome (AIDS), there were 30 (8.6%) exit site or superficial epidural catheter track infections, 8 (2.3%) deep catheter track infections, and 15 (4.3%) epidural catheter infections. Moreover, herpes zoster occurs frequently in patients who are older and have impaired immunity or malignancy [7]. Therefore, we should be aware of the risk of catheter-related infection in geriatric patients with PHN.

Third, this epidural abscess may not be related to the epidural block. A poor general state of health, such as that of an immunocompromised host, has been identified as one of the risk factors for pyogenic spondylitis [8]. Infection at another site may have caused pyogenic spondylitis, which in turn produced the epidural abscess.

MRI is recommended for the early diagnosis of pyogenic vertebral osteomyelitis and epidural abscess [4,9]. When symptoms of infection and neurological signs appear in geriatric patients with PHN, the vertebral column and epidural space should be extensively examined with sagittal MR imaging. Epidural abscess was reported to cause paralysis in 34% of the patients [4]. Once paralysis occurs, early surgical decompression is needed to prevent neurological sequelae.

To summarize, we reported the occurrence of an epidural abscess distant from the site of epidural block in a patient receiving continuous epidural block for PHN, and discussed the possible infectious routes. If epidural infection is suspected in patients receiving continuous epidural block, vertebral structures of distant sites should also be included in MRI examination.

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