Epidural abscess in a patient with dorsal hyperhidrosis

[Un abcès péri-dural chez un patient souffrant d'hyperhidrose dorsale]

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Purpose: To report the management of a patient who developed a lumbar epidural abscess when an epidural catheter was placed three years after a thoracic sympathectomy. The possible contribution of hyperhidrosis is discussed.

Clinical features: A 62-yr-old male had compensatory hyperhidrosis in his back after thoracic sympathectomy. The patient, who suffered from thromboangiitis obliterans, underwent lumbar (L2–3) epidural catheterization in order to improve arterial circulation and ameliorate resting pain in his left leg. On the third day after catheterization, the patient complained of a dull pain in his back. Emergency magnetic resonance imaging revealed a 12-mm abscess in the epidural space. On the tenth day after catheterization, laminotomy at the 3–4 lumbar vertebrae and local drainage were performed. A 14-mm abscess was removed from the epidural space. The patient was discharged on day 21 after catheterization without any disability.

Conclusion: Special precautions against infection may be necessary in patients with hyperhidrosis in the area where continuous epidural catheterization is attempted.

Objectif : Décrire le traitement d'un patient chez qui s'est développé un abcès péri-dural lombaire après la mise en place d'un cathéter péri-dural, trois ans après une sympathectomie thoracique. La contribution possible de l'hyperhidrose est discutée.

Éléments cliniques : Un homme de 62 ans présentait une hyperhidrose compensatrice au dos à la suite d'une sympathectomie thoracique. Souffrant de thromboangéite oblitérante, il a subi un cathétérisme péri-dural lombaire (L2–3) pour améliorer la circulation artérielle et soulager la douleur au repos dans sa jambe gauche. Le troisième jour après le cathétérisme, le patient s'est plaint de douleur sourde au dos. Un examen d'urgence d'imagerie par résonance magnétique a révélé un abcès de 12 mm dans l'espace péri-dural. Le dixième jour après le cathétérisme, une laminotomie des vertèbres lombaires 3-4 et un drainage local ont été réalisés. Un abcès de 14-mm

a été retiré de l'espace péri-dural. Le patient a reçu son congé, 21 jours après le cathétérisme, sans présenter d'incapacité.

Conclusion : Des précautions spéciales doivent être prises pour contrer l'infection chez les patients qui présentent de l'hyperhidrose au site d'un cathétérisme péri-dural continu.

EPIDURAL abscess is a rare but serious complication of epidural anesthesia.¹ It can occur either spontaneously or following epidural anesthesia. Herein we report the management of a patient who had undergone thoracic sympathectomy and who developed a lumbar epidural abscess when an epidural catheter was placed three years after sympathectomy. Compensatory sweating in the back following sympathectomy was considered to be an etiological factor of the local infection.

Case

A 62-yr-old male was diagnosed with thromboangiitis obliterans. The patient did not have any immunosuppressive disease, such as malignancy, renal failure, alcoholism, drug abuse, and was not under steroid therapy. Three years previously, bilateral endoscopic thoracic sympathectomy was performed for symptoms in the upper extremities. Compensatory hyperhidrosis was observed in his back after the sympathectomy. One year previously, he had right lumbar sympathectomy, and six months previously, he had left lumbar sympathectomy. At the time of admission, his general condition was good but he had severe resting ischemic pain in his left leg, despite treatment with limaprost alfadex (30 µg·day⁻¹) and sarpogrelate hydrochloride (300 mg·day⁻¹). The patient underwent lumbar (L2–3) epidural catheterization in order to improve arterial cir-

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culuation and ameliorate resting pain in his left leg. At the time of catheterization at the pain clinic, the physician washed his hands with chlorhexidine gluconate and wore sterile surgical gloves. The site of insertion and surrounding area were cleaned three times with 5% chlorhexidine gluconate and a sterile surgical drape with a round aperture (10 cm diameter) was used on the patient's back. A 17-G Tuohy needle and a 950-mm epidural catheter with a diameter of 1 mm were used for the insertion. The catheter had a side hole and an end hole, and a membrane filter with a pore size of 0.2 micron was attached between the end of the catheter and the disposable continuous infusor (Daiken-Ika Inc., Tokyo, Japan). All of the instruments came from a sterile epidural catheterization kit. The infusor was prepared aseptically in the pain clinic. Epidural catheterization was completed without incident in a single trial with loss of resistance to air. The site of insertion was covered with a sterile, water and bacteria proof wound dressing (8 cm $\times$ 10 cm) with a gauze pad (4 cm $\times$ 6.5 cm) at the centre of the dressing.

Following continuous epidural analgesia with 0.25% bupivacaine 2 mL $\cdot$ hr $^{-1}$, resting pain and cyanosis in the left leg dissipated. Although he was taking oral limaprost alfadex and sarpogrelate hydrochloride, laboratory examinations showed no coagulation abnormality. The infusor was filled with 96 mL of 0.25% bupivacaine, every 48 hr. The site of insertion was cleaned with chlorhexidine gluconate and the surgical dressing was changed every day by a practitioner wearing sterile gloves. However, due to excessive sweating of his back, nurses found that the dressing became saturated with perspiration within a day. No neurological symptoms were observed in either leg, with the exception of a slight numbness secondary to the effects of the local anesthetic infusion.

On the third day after catheterization, the patient complained of dull pain in his back. Upon removing the surgical dressing, the physician noted a 5-mm area of erythema surrounding the insertion site. The catheter was removed immediately. No neurological symptoms were observed in the lower extremities. Body temperature was 37.8°C. Blood tests revealed 7800 $\cdot$ dL $^{-1}$ leucocytes and 6.5 unit C-reactive protein (CRP). Administration of antibiotics (piperacillin 2 g $\cdot$ day $^{-1}$, cefmetazole 2 g $\cdot$ day $^{-1}$) was started immediately. However, on the fourth day after catheterization, the erythematous area had expanded. One millilitre of yellow exudate was aspirated from the insertion point and sent for bacterial culture. Beginning on day five, local inflammation gradually subsided, but CRP and white blood cell count continued to increase. Fever and low back pain persisted. Emergency magnetic res-

FIGURE Sagittal magnetic resonance image (MRI) of the vertebral column. Emergency MRI revealed a 12-mm abscess in the epidural space.

onance imaging revealed a 12-mm abscess in the epidural space (Figure). Cultures of the removed catheter and exudate obtained on the fourth day revealed staphylococcus aureus infection. Blood culture, sampled on the third day, revealed no bacteria in blood. Since the patient's symptoms of infection did not improve over the following six days, the patient and his family agreed that he should undergo laminotomy and local drainage.

On the tenth day after catheterization, laminotomy at the 3–4 lumbar vertebrae and local drainage were performed. A 14-mm abscess was drained from the epidural space. The patient became consistently afebrile on the fourth day postsurgery. Back pain disappeared within three days after the operation. Motor and sensory function were not disturbed at any point during this period. The patient was discharged on day 21 after catheterization.

Discussion

The reported incidence of spinal epidural abscess after epidural analgesia varies widely. Kindler reported the incidence as 1:13000² and Wang as 1:1930.³ In the

report by Wang, the majority of patients with epidural abscess were immunocompromised.³ Diabetes mellitus, corticosteroid use or anticoagulant therapy are well known risk factors for infection.⁴ In the case reported here, the patient was not immunosuppressed. We suspect that the compensatory hyperhidrosis in his back may have contributed to the infection. We speculate that bacteria on the surface of the skin multiplied in the humid environment and eventually contaminated the epidural space. *Staphylococcus aureus* is the most common causative organism in epidural abscesses, accounting for more than 60% of cases.⁵ In this case, we were able to culture the bacteria from the infected site. *Staphylococcus aureus* was the single bacteria detected in this case. This bacteria exists anywhere and can be transmitted not only from skin but also through blood.⁵ *Staphylococcus epidermidis* is another common bacteria causing catheter colonization and infection.⁶ However, *staphylococcus epidermidis* was not cultured in this case.

Compensatory sweating is a common complication of thoracic sympathectomy. Herbst reported the incidence as 67.4%,⁷ and Zacherl reported it as 67%.⁸ A combination of thoracic sympathectomy and lumbar epidural anesthesia is not uncommon in patients with thromboangiitis obliterans.⁹ Since ischemic symptoms often appear first in the upper extremities, patients commonly undergo thoracic sympathectomy in the early phase of the disease. Later, when the ischemic symptoms become apparent in the lower extremities, patients often have lumbar epidural blocks in order to relieve pain and to prevent vascular contraction. Permanent lumbar sympathectomy may be scheduled when the epidural block improves circulation in the legs.

Although several case reports describe the successful management of an epidural abscess using conservative therapy with antibiotics,^{10,11} surgical intervention is recommended in most of the available literature.³ In a review by Kindler, 76% of patients underwent laminectomy or other surgery.² The time elapsed between the first symptoms and the surgical treatment was six days in this case. In patients with an epidural abscess, delay in diagnosis and therapeutic intervention can result in severe morbidity. Wang reported four cases with long-lasting neurologic deficits among their nine epidural abscess cases.³ Early diagnosis and immediate initiation of treatment are crucial to prevent permanent disability.

In the case presented, the site of catheter insertion received regular daily care. Still, infection could not be prevented, suggesting that more intensive care against infection may be required in patients with hyperhidrosis.

To avoid infections, Smedstad recommended full aseptic precautions at the time of catheterization, such as use of scrub, gloves, gown and mask by the practitioner, and aseptic preparation of the patient using standard surgical antiseptic solutions.¹² Furthermore, Brookman and Rutledge recommended use of a closed drug delivery system, minimal bag changes, topical antiseptic and more frequent changes of dressing and filters.⁵ Bernard *et al.* reported a high incidence of catheter infection in cases of continuous peripheral nerve blocks.¹³ Thus, the precautions against infection mentioned above should probably be universal. Alternatively, practitioners may choose to be more conservative when considering the potential risks of epidural anesthesia in patients with hyperhidrosis.

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