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Varicella-zoster virus meningitis after spinal anesthesia: A case report

Ye-Won Lee, Byunghoon Yoo, Yun Hee Lim

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Abstract

BACKGROUND

Headache is a common complication of regional anesthesia. The treatment of post spinal anesthesia headache varies depending on the cause. Although meningitis is rare, it can cause significant harm to the patient. Post dural puncture headache and septic meningitis are the most commonly suspected causes of post spinal anesthesia headache; however, other causes should also be considered.

CASE SUMMARY

A 69-year-old woman was scheduled for varicose vein stripping surgery under spinal anesthesia. The procedure was performed aseptically, and surgery was completed without any complications. After 4 d, the patient visited the emergency room with complaints of headache, nausea, and anorexia. Clinical examination revealed that the patient was afebrile. Considering the history of spinal anesthesia, post dural puncture headache and septic meningitis was initially suspected, and the patient was treated with empirical antibiotics. Subsequently, varicella-zoster virus PCR test result was positive, and all other test results were negative. The patient was diagnosed with meningitis caused by varicella-zoster virus and was treated with acyclovir for 5 d. The headache improved, and the patient was discharged without any problems.

CONCLUSION

Viral meningitis due to virus reactivation may cause headache after regional anesthesia. Therefore, clinicians should consider multiple etiologies of headache.

Key Words: Aseptic meningitis; Headache; Regional anesthesia; Spinal anesthesia; Varicella zoster virus infection; Case report

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Core Tip: Aseptic meningitis is a rare complication of spinal anesthesia. Herein, we present the case of a patient who developed aseptic meningitis due to reactivation of the varicella-zoster virus after spinal anesthesia for varicose vein stripping surgery. The patient was diagnosed with meningitis caused by varicella-zoster virus based on positive PCR test results and was treated with acyclovir for 5 d. The headache improved, and the patient was discharged without any sequelae. This case highlights the importance of differential diagnosis of post spinal anesthesia headache because viral meningitis due to virus reactivation may cause headache after regional anesthesia.

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INTRODUCTION

Headache is a common complication of regional anesthesia. The treatment of post spinal anesthesia headache varies depending on the cause. Although meningitis is rare, it can cause significant harm to the patient. Post dural puncture headache (PDPH) and septic meningitis are the most commonly suspected causes of post spinal anesthesia headache; however, other causes should also be considered.

CASE PRESENTATION

Chief complaints

A 69-year-old Asian woman, who was a housewife, visited the emergency room with a complaint of headache in the right occipital region.

History of present illness

The patient was scheduled for varicose vein stripping surgery. Preoperative evaluation revealed degenerative spondylosis of the lumbar spine and scoliosis in the lumbosacral spine. However, there was no contraindication for regional anesthesia, and surgery under spinal anesthesia was planned.

The procedure was performed aseptically, and 10 mg of 0.5% bupivacaine was injected into the subarachnoid space using a 25 G spinal needle at the L4-5 level, which resulted in initial anesthesia at the L2 level. Therefore, for sufficient level of anesthesia, dexmedetomidine was injected as a 0.5 mcg/kg bolus over 10 min, followed by 0.3 mcg/kg/h infusion for 55 min. No additional drug was injected into the subarachnoid space. During surgery, the patient did not complain of symptoms such as headache and nausea. As the anesthesia level decreased to about T12 without any symptoms in the recovery room, the patient was shifted to a private room. The patient was discharged without specific symptoms on the following day. After 4 d, the patient visited the emergency room with complaints of headache, nausea, and anorexia.

History of past illness

The patient had a history of hypertension and dyslipidemia, which were treated with candesartan cilexetil 8 mg and rosuvastatin 5 mg, respectively, PO once a day.

Personal and family history

The patient's personal and family histories were unremarkable.

Physical examination

The patient was 154 cm, 59 kg, alert, and afebrile. Neurologic examination revealed no specific findings. No remarkable skin lesions were noted.

Laboratory examinations

Spinal tapping was performed to evaluate complications, such as bacterial meningitis. The results showed lymphocyte-dominant white blood cell (WBC) count, normal glucose levels, and slightly elevated protein and adenosine deaminase levels in the cerebrospinal fluid (CSF) (Table 1).

Imaging examinations

Computed tomography showed no specific findings such as cerebral hemorrhage.

Table 1 Results of spinal tapping

Variable	Value
Appearance	Clear
Cell count (cells/ μ L)	
RBC	5
WBC	120
Polycyte	0
Lymphocyte	100
Glucose (mg/dL)	46.2
Protein (mg/dL)	210.9
ADA (IU/L)	14.7

ADA: Adenosine deaminase; RBC: Red blood cell; WBC: White blood cell.

Initial diagnosis

Considering the history of spinal anesthesia, PDPH was initially suspected. However, the headache was limited to the right side, and there was no relief of symptoms with change of posture and motion, such as upright/seated/supine posture, and the likelihood of PDPH was low. Based on the lymphocyte-dominant WBC count and elevated adenosine deaminase level, tuberculous meningitis was suspected [1].

Initial treatment

Anti-tuberculous agents (isoniazid 75 mg, ethambutol hydrochloride 0.275 g, pyrazinamide 0.4 g, and rifampicin 0.15 g) were administered PO once a day prophylactically.

Clinical course

After 2 d, PCR test result for varicella-zoster virus (VZV) was positive. Results of PCR tests for *S. pneumoniae*, *H. influenzae*, *N. meningitidis*, Group B streptococcus, and *L. monocytogenes* were negative, and other tests, including Gram staining for Gram positive/negative bacilli and cocci, fungal culture, and acid-fast bacilli stain test, were negative.

FINAL DIAGNOSIS

The patient was diagnosed with meningitis caused by VZV.

TREATMENT

The patient was treated with acyclovir 300 mg IV every 8 h for 5 d.

OUTCOME AND FOLLOW-UP

After 5 d, the patient's headache improved, and she was discharged without any sequelae. There was no remarkable symptom or sequelae for 9 mo after meningitis.

DISCUSSION

The differential diagnosis of post spinal anesthesia headache includes PDPH, septic meningitis, and aseptic meningitis. Septic meningitis is caused by bacteria, whereas aseptic meningitis is caused by viruses, spirochetes, fungi, medications, or malignancy, is difficult to diagnose, and can be considered when all other causes are excluded[2].

Our patient had a history of spinal anesthesia and presented with headache without fever; therefore, we first suspected PDPH. Patients with PDPH present with headache in the supine position and is relieved in the sitting position. Headache can be accompanied by nausea, vomiting, neck stiffness, tinnitus, hearing loss, diplopia, or photophobia[3]. Puncture of the dura mater and leakage of CSF lowers the CSF pressure and leads to lowering of intracranial pressure. Therefore, the main characteristic of PDPH is that pain is aggravated in the sitting position and is relieved in the supine position. However, in this case, no change in pain according to posture and movement was reported. Therefore, although PDPH was suspected, it was less likely, and tests were conducted to identify other causes.

CSF examination findings can be used to differentiate between bacterial meningitis and aseptic meningitis (mainly viral). In viral meningitis, the CSF is clear in appearance and shows a lymphocyte-dominant WBC count, normal glucose level, and normal or elevated protein levels. Conversely, in bacterial meningitis, the CSF is turbid in appearance, shows a neutrophil-dominant WBC count, low glucose level, and significantly increased protein levels, and Gram staining is positive in $\geq 60\%$ of cases [4].

In our patient, the CSF was clear in appearance, showed lymphocyte-dominance with 100 lymphocytes per 120 WBCs, the glucose level was normal, and the protein level was elevated. Therefore, we suspected aseptic meningitis more than bacterial meningitis even before the results of various culture and PCR tests for bacteria, viruses, and fungi were revealed. Varicella-zoster meningitis is caused by VZV, which is a human herpes virus, and it usually occurs in immunocompromised patients. The virus remains latent in the cranial nerves and dorsal root ganglia and can occasionally reactivate and lead to meningitis, neuralgia, or myelitis[5].

In patients with active herpes infection, meningitis can occur due to the introduction of the virus into the central nervous system during spinal/epidural anesthesia[6]. However, our patient had no skin lesions or neurologic symptoms and was not immunocompromised. Although aseptic meningitis is a rare cause of headache after regional anesthesia, viral meningitis due to virus reactivation may occur.

In this case, a decrease in immunity related to surgery or direct stimulation during spinal anesthesia may have caused reactivation of VZV that was latent in the dorsal root ganglion. However, the exact mechanism could not be identified. In a previously reported case of *Herpes simplex* meningitis after dural puncture, the mechanism of meningitis was unclear[7].

According to a previous report comparing groups with VZV meningitis, central nervous system involvement, and peripheral nervous involvement, the meningitis group had a better prognosis than the other two groups in terms of mortality, incomplete recovery, and shorter treatment period[8]. In our patient, symptoms were relieved after 5 d of acyclovir treatment, and the patient was discharged without sequelae. Although the prognosis of VZV meningitis is good, the duration of acyclovir administration and recovery period would have been shortened if the patient had been diagnosed earlier. Treatment for tuberculous meningitis was administered based on the results of CSF examination, and acyclovir treatment was started after the results of PCR were obtained. The usefulness of CSF lactate level and serum procalcitonin as a method for differentiating aseptic meningitis and septic meningitis has been consistently suggested, but we did not evaluate the CSF lactate level and serum procalcitonin [9,10].

For early diagnosis, CSF examination with PCR and culture should be performed if the pattern of headache after spinal anesthesia does not match the characteristics of PDPH and if no evidence of increased intracranial pressure or cerebral hemorrhage is revealed on brain computed tomography.

CONCLUSION

In conclusion, in patients with post spinal anesthesia headache, clinicians should consider multiple etiologies and perform PCR and culture test on CSF to diagnose or rule out meningitis. This way, the patient's symptoms can be resolved through rapid diagnosis and treatment.

FOOTNOTES

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