



Case Report

Successful intrathecal ethanol block for intractable spasticity of AIDS-related progressive multifocal leukoencephalopathy

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Objective: To study the efficacy of intrathecal ethanol block to relieve intractable spasticity in AIDS-related progressive multifocal leukoencephalopathy (PML) when long-term intrathecal baclofen infusion cannot be used.

Methods: A 33-year-old man with AIDS-related PML developed very severe spastic paraparesis (Ashworth rigidity score, 4) and painful muscle spasms. The patient was unable to sit in his wheelchair and remained bed bound. Combined oral baclofen and tizanidine at therapeutical doses were used without any effect on the spasticity. The patient refused the placement of an intrathecal catheter for long-term baclofen infusion. A single intrathecal ethanol (6 ml) injection in the L2-L3 intervertebral space with the patient placed in a lateral Trendelenburg (40°C) position was performed.

Results: The procedure was very effective in improving the stiffness (Ashworth rigidity score, 2, after the technique) and the muscle spasms disappeared. No side effects during or after the injection were observed.

Conclusion: Intrathecal ethanol block is a last but very useful choice for treatment of intractable spasticity in PML and other neurologic disorders in AIDS patients when other oral treatments have failed and intrathecal baclofen infusion is not suitable.

Keywords: AIDS; progressive multifocal leukoencephalopathy; ethanol; injection; spinal; muscle spasticity

Introduction

Spasticity is a quite common and disturbing problem in AIDS patients with neurologic manifestations and in some cases can be an extremely painful, incapacitating, quality-of-life limiting condition. Different drugs are effective for controlling spasticity (diazepam, dantrolene, baclofen, tizanidine) although in some cases muscle stiffness becomes intractable.^{1,2} Surgical approaches (rhizotomies, tenotomies) are aggressive, mutilating procedures and not the desirable therapeutical choices for very severe spasticity in debilitated AIDS patients. Intrathecal phenol and ethanol blocks were common procedures to treat unmanageable muscle stiffness in the 1940s and 1950s although rarely performed nowadays.^{3–5} Long-term intrathecal infusion of baclofen, delivered by a programmable

pump, is a widely used technique to relieve spasticity.^{6–9} Placing a permanent intrathecal catheter raises the risk of meningitis secondary to catheter infection and so restricts the use of this procedure in patients severely immunocompromised and emaciated such as AIDS cases. We report a patient with AIDS-related progressive multifocal leukoencephalopathy (PML) with severe spasticity of lower limbs resolved with intrathecal ethanol injection, probably the first AIDS case treated with this technique published in the world literature.

Case presentation

A 33-year-old heterosexual man was diagnosed with AIDS in February 1995 after developing *Pneumocystis carinii* pneumonia. He had at the time a CD4 cell count of 20×10^6 /l. His medications included zidovudine 250 mg four times daily and one double-strength tablet of trimethoprim-sulfamethoxazole. During the

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following months he developed progressive spastic paraparesis, with bilateral extensor plantar responses and ankle clonus and was confined to a wheelchair. No mental changes were observed. Cerebrospinal fluid (CSF) showed no abnormalities and JC virus (JCV) DNA in CSF was not detected. Head and spinal cord computerized tomography (CT) and magnetic resonance imaging (MRI) showed no abnormalities at the time. An HIV-related vacuolar myelopathy was suspected. Combined oral baclofen and tizanidine at therapeutical doses were used without improvement of the spasticity. In May 1997 he developed an additional left upper limb paresis and left homonymous hemianopia. JCV DNA was detected in CSF, blood and urine samples by polymerase chain reaction (PCR) and/or molecular hybridization as previously described.¹⁰⁻¹² Head CT and MRI showed multiple right internal capsule and periventricular hypodensities. Spine MRI showed a thinned cervical spinal cord. He was diagnosed with PML. His CD4 cell count was $0 \times 10^6/I$ with a HIV viral load of 168 000 RNA copies/ml. His therapy was changed to lamivudine 150 mg twice daily, stavudine 40 mg twice daily and zidovudine 600 mg twice daily. Two months later the CD4 cell count rose to $166 \times 10^6/I$ and the HIV viral load fell to 7815 RNA copies/ml. In the following months his lower limb spasticity progressed to an extremely severe grade (Ashworth score for rigidity, 4),¹³ muscle spasms became very painful and the patient was unable to sit and became bed bound (Figure 1, left). A hypertonic urinary bladder with automatic emptying developed and trochanteric and ischial tuberosity ulcers appeared. Long-term intrathecal baclofen infusion was then indicated. This procedure was discarded by the patient and his family because they considered the care of the intrathecal catheter too complicated and infection-prone. Also the attending neurosurgeon thought that the patient was too weak and emaciated even to

undergo the easy neurosurgical procedure of placing an intrathecal catheter and he did not encourage him to proceed further. In February 1998 an intrathecal ethanol block to relieve spasticity was performed following the technique described by Sheldon³ and Guttman¹⁴: 6 ml of absolute ethanol were injected slowly with a 18 gauge spinal needle in the L2-L3 intervertebral space with the patient placed in a lateral Trendelenburg (40°) position. The foot of the bed was placed on two chairs for the procedure. Three minutes after the injection the patient was rolled to the contralateral decubitus position and left in this position for 5 min, and then rolled onto his back for 3 h. No side effects were observed during or after the technique and no special monitoring was required. A lower motor neuron lesion was produced almost immediately after the procedure and the plantar and ankle responses were abolished. An atonic bladder with retention of urine developed and a permanent urethral catheter was required. Our patient demonstrated impressive improvement in his spasticity (Ashworth score for rigidity, 2), the painful muscle spasms resolved, he was again able to sit down and restarted wheelchair strolls 3 days after the ethanol injection (Figure 1, right).

Discussion

Among the most frequent non-vascular causes of spasticity in AIDS patients are PML and vacuolar myelopathy.¹⁵ PML is a fatal demyelinating disease caused by JC virus infection of oligodendrocytes which affects up to 4% of AIDS patients.^{16,17} Motor weakness, visual fields impairment and altered mentation are the most frequent manifestations of PML, and many patients develop spastic hemiparesis in the course of the disease.¹⁸ Different approaches used to treat PML, including nucleoside analogs and immunomodu-



Figure 1 Intrathecal ethanol block in an AIDS patient with PML. The extremely severe lower limb spasticity (Ashworth score for rigidity 4, left) was greatly improved after the procedure and the patient could sit again and stroll in a wheelchair (Ashworth score for rigidity 2, right)

lators, have proved ineffective although the survival of these patients has been extended with the new highly active antiretroviral therapies (HAART).^{16,19} Our patient with advanced AIDS-related PML had an extremely severe spastic paraparesis unresponsive to baclofen and tizanidine. We induced in him a lower motor neuron lesion by intrathecal ethanol injection, and his lower extremity stiffness improved dramatically. This procedure should not be performed too late in the course of the spasticity in order to avoid the development of irreversible fibrosis and ankylosis of joints. Because ethanol is lighter than CSF no lesions in upper spinal cord segments are produced when the patient is placed in Trendelenburg, and ethanol is quickly absorbed from subarachnoid space in 1–5 h.^{14,20} A single ethanol injection is usually enough to control the spasticity. If muscle spasms return after months or years, the procedure can be repeated with equally satisfactory results.

Spastic complications of AIDS patients may become more common in the near future due to the longer life span of PML patients with HAART. We think that intrathecal alcohol block can be a last but very effective choice to treat spasticity in PML and other neurologic disorders in AIDS patients when other treatments have failed and long-term intrathecal baclofen infusion cannot be done.

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