INTRATHECAL ALCOHOL IN THE TREATMENT OF SPASTIC PARAPLEGIA

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The use of alcohol to produce more prolonged blocking of nervous impulses than infiltration with procaine can afford is a well established therapeutic measure. It has received practically universal use in the infiltration of the gasserian ganglion7 in patients with trigeminal neuralgia. Paravertebral injection of alcohol as an agent to produce prolonged sympathetic nerve blocks is also a widely used procedure,3,11 as is the infiltration of peripheral nerves in persistent neuralgias,9 particularly those of pure sensory distribution. Adson1 and others have reported the use of alcohol instilled in minute quantities into the subarachnoid space to block particular dorsal roots in the treatment of persistent pain. Until very recently, however, the injection of alcohol in relatively large quantities into the subarachnoid space, for the purpose of relieving the distressing spasticity in the lower extremities in cases of spastic paraplegia, was a relatively unknown procedure. Shelden and Bors10 recently reported their experience with this measure, and stated that “the amounts of alcohol injected into the subarachnoid space have never been sufficient to control spasticity, except for the recent work of Pudenz and Nourse, whose data are soon to be published.” Shelden and Bors reported the use of intrathecal injection of absolute alcohol with immediate relief of spasticity and mass reflexes in a series of 24 patients with spinal cord injuries. The present authors wish to report their results with the use of subarachnoid injection of alcohol in 8 patients who demonstrated extreme spasticity complicating paraplegia and to present 1 of these cases briefly. These results substantiate the value of this procedure originally reported by Shelden and Bors.

The necessity of relieving the extreme spasticity and mass reflex that complicate many cases of paraplegia is clearly evident. The pain accompanying these spasms is often severe, and interferes with the nourishment and nursing care of the patient. Decubitus ulcers are more prone to develop in patients with flexion contractures of the lower extremities, and treatment of these is rendered extremely difficult in the face of spasticity, or the mass reflex with its accompanying involuntary micturition. Rehabilitation to the stage of ambulation with walking calipers is impossible in the presence of extreme spasticity of the lower extremities. Munro9 and others5 have performed anterior rhizotomy for the relief of extreme spasticity in paraplegia. The section of posterior nerve roots to achieve this end has also been de-
scribed. However, there are certain drawbacks to these procedures: (1) The paraplegic patient is often too extremely debilitated to withstand the operative procedure. (2) It is a permanent mutilating operation. James and Braden have reported the successful use of curare in the treatment of muscle spasticity in paraplegia. However, in our hands, this drug has failed to alleviate spasm to any appreciable degree. Six of the 8 patients reported in this series had received curare without any substantial beneficial effect.

Our series of 8 injections was carried out between March 1946 and November 1946, approximately coinciding with those of Shelden and Bors. The flaccidity produced in our cases lasted a minimum of 6 months. During this period of alleviation of the spasticity, treatment of the decubitus ulcers, steps towards the development of an automatic bladder, and physical rehabilitation can make very gratifying strides. In none of our cases did the spasticity return to the degree of severity present prior to the intrathecal alcohol injection. However, in 1 case it did return to a degree necessitating further therapeutic measures. One patient succumbed to intercurrent urinary infection. The remaining 6 patients have been followed from 12 to 18 months without recurrence of spasticity. In each of these cases the urinary bladder was extremely hypertonic prior to the injection, so that the development of a satisfactory "automatic bladder" was impossible as long as the spasticity and mass reflexes persisted. Following intrathecal injection of alcohol the urinary bladder became hypotonic or tabetic in type, but within the ensuing 3 to 6 months in each case regained sufficient tonus to expel urine automatically at periodic intervals. The treatment was used in 8 patients, in 3 of whom it was considered to have been a life-saving measure, due to the extreme debilitating condition to which the spasticity and mass reflex had contributed. Many physicians postpone a mutilating procedure such as anterior rhizotomy until the patient is no longer strong enough to withstand the operation. This operation, therefore, although a valuable one in many instances, cannot be used in all cases of extreme spasticity in paraplegia. The intrathecal injection of alcohol produces flaccidity immediately, with little or no permanent additional loss of neurological elements, and does not insult the already precarious general physical condition of many of these patients.

METHOD

The patient is placed on one side in bed, and the foot of the bed elevated 18 inches so that the alcohol will rise to the caudal section of the thecal sack. A No. 18 spinal needle is inserted intrathecally and 95 per cent alcohol is introduced slowly, not more than 1 cc. every 60 seconds. An assistant stands on the opposite side of the bed to check the patient’s sensory level so that it is not allowed to rise above the level previously established. The assistant also gently attempts to straighten the lower extremities after each cc. of alcohol injected. When the lower extremities are flaccid and can be easily straightened, no additional alcohol is injected. Complete flaccidity
will result from 7 to 12 cc. of 95 per cent alcohol injected in this manner. The foot of the bed is kept elevated for 24 hours to allow fixation of the alcohol.

One case, which illustrates the dramatic effect achieved by the use of intrathecal alcohol, is herein briefly reported.

Case 8. W. K., a 29-year-old white male with an incomplete spinal cord lesion at the 8th thoracic segment, was subject to extreme flexor contractions and spasticity of the lower extremities and to the mass reflex. During these spasms the patient cried out and complained of excruciating pain, and demanded opiates for relief. He refused to take nourishment and declined in weight from 160 to 90 pounds. He acquired large decubitus ulcers over each greater trochanter and treatment of these in any manner was rendered ineffective by the intense spasm of the lower extremities. He became depressed and abusive, and very difficult to manage on the open ward. The urinary bladder dribbled continuously and a suprapubic catheter was inserted. Three months prior to the alcohol injection he refused any operative procedure. Alcohol injection was proposed to him when it was apparent that the patient would continue downhill to death if the spasm were not alleviated so that further treatment could be carried out.

Intrathecal injection of 8 cc. of 95 per cent alcohol resulted in immediate flaccidity of the lower extremities. Within 24 hours a complete change of personality was noted in the patient, who became cheerful and cooperative. Within 3 months skin grafting of the decubitus ulcers was carried out and the patient was up in a wheel chair. Six months following the injection the spasticity was still alleviated but the urinary bladder had regained considerable tonus, so that training of the bladder to achieve automaticity could be undertaken. In this case the intrathecal injection of alcohol was believed to be a life-saving measure.

**SUMMARY**

1. The use of the intrathecal injection of 95 per cent alcohol to alleviate spasticity in paraplegia is suggested in certain cases.
2. Its advantages over anterior rhizotomy in certain instances are cited.
3. The results of 8 cases in which this treatment was used are summarized and 1 case is presented in detail.

**REFERENCES**

