

Obturator neurolysis using 65% alcohol for adductor muscle spasticity

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ABSTRACT

Spasticity is motor alteration characterized by muscle hypertonia and hyperreflexia. It is an important complication of spinal cord injury, traumatic brain injury, cerebral palsy, and multiple sclerosis. If uncorrected, fibrosis and eventually bony deformity lock the joint into a fixed contracture. Chemical neurolysis using various agents is one of the therapeutic possibilities to alleviate spasticity. We are, hereby, reporting 3 patients in whom 65% alcohol was used as neurolytic agent for the treatment of hip adductor spasticity, and the effect lasted for a variable period.

Key words: Alcohol, obturator nerve block, spasticity

INTRODUCTION

Spasticity is defined as “Disordered sensory-motor control, resulting from an upper motor neuron lesion, presenting as intermittent or sustained involuntary activation of muscles.” It can range from mild muscle stiffness to severe, painful, and uncontrollable muscle spasm. It initially causes an apparent muscle shortening, but the passive range of motion is full.^[1] If not managed early and appropriately, it may result in progressive disability, resulting in secondary complications, such as contractures and pressure sores. Increased spasticity is a major source of pain and disability causing difficulty in physiotherapy, ambulation, and in perineal hygiene.^[2]

Chemical neurolysis using various agents is one of the therapeutic possibilities to alleviate spasticity by interrupting stretch reflex arc, especially when it is confined predominantly to certain muscle groups.^[2] Neurolysis of obturator nerve is commonly used for management of hip adductor spasticity. It is an efficient and cost-effective technique that is free from systemic side effects as with an oral therapy.^[3] The chemical agents used mainly are

phenol and alcohol. Phenol (5% - 12%) has been used in most of the studies. Ethyl alcohol (35% - 90%) is also a potent neurolytic agent used in pain control, but its use in spasticity is rather limited. There have been only 2 trials in literature documenting the use of alcohol in peripheral nerve block for the management of spasticity.^[4,5] Though phenol is claimed to be superior to alcohol due to its less risk of neuritis, it is not readily available. We used 65% alcohol in 3 cases because of non-availability of phenol and observed different results in all the patients.

CASE REPORTS

Case 1

An 18-year-old adult male was diagnosed with epidural abscess at thoracic level D₄₋₆. He had adductor muscle spasticity of both lower limbs. Modified Ashworth scale was 3 bilaterally. Numbers of muscle spasms were >10 per day. He was unable to abduct his thigh up to 45° and was not even able to walk. Treatment history included Tab baclofen 10 mg 3 times a day. A diagnostic nerve block was performed using 10 - 15 ml of 0.5% bupivacaine on both sides. The obturator nerve was blocked using interadductor approach with the patient supine; the surface landmark was located 1 - 2 cm medial to the femoral artery, immediately below the inguinal ligament. The adductor longus muscle tendon was identified at its pubic insertion, and the needle was introduced behind it, directed laterally and slightly posterior and superior toward the skin landmark until contractions of adductor longus and gracilis muscle were elicited. Patient consented for the neurolytic nerve block next day. Under all aseptic precautions,

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the block was performed again with 10 ml of 65% alcohol using interadductor approach as described above. He was followed up next day, on 7th day, and thereafter, at 1 month interval. The Visual Analogue Scale scores decreased significantly in the 1st week and reached the preblock value by the end of 4th month. A drastic increase in the range of motion of hip joint was noticed till 3rd month but did not reach baseline value. The hygiene scores decreased drastically in the 1st week and in the 1st and 2nd month but increased 3rd month onwards. An improvement in Ashworth Scale score was observed up to 3rd month, but they did not reach their initial values. The patient is able to stand up with the help of calipers and walk for few meters now. The patient did not report any complication such as dysesthesia, injection pain, muscle necrosis, and neuritis.

Case 2

A 16-year-old adult male was diagnosed with compression fracture of D₄ thoracic vertebra. Modified Ashworth scale was 3 on right side and 2 on left side. Numbers of muscle spasms were > 10 per day. He was unable to abduct his thigh up to 45° and was not able to walk. He was on Tab baclofen 10 mg 3 times a day. Under all aseptic precautions, bilateral obturator nerve block using interadductor approach without fluoroscopy with 8 - 10 ml of 65% alcohol was performed. He was followed up next day, on 7th day, and thereafter, at 1 month interval. There was significant improvement in pain, spasticity, range of motion of hip joint, hygiene scores, and number of muscle spasms. It has been 6 months now, and the effect of alcohol is still persisting. The patient is able to stand up now with the help of calipers.

Case 3

A 21-year-old adult male was diagnosed with cervical spine injury at C₄₋₅ level. Modified Ashworth scale was 4 bilaterally. Numbers of spasms were > 10 in 24 hours. He was unable to abduct his thigh to 45°. He was on Tab baclofen 20 mg 3 times a day but was not controlled even with this much dosage. Under all aseptic precautions, obturator nerve block was given using interadductor approach without fluoroscopy with 10 ml of 65% alcohol on both sides. Complete relief was not obtained in this patient. Though the VAS score decreased significantly but spasticity and numbers of spasms were not much alleviated, and the patient was quite unsatisfactory with the block.

DISCUSSION

A significant improvement was noticed in pain, spasticity, range of motion of hip joint, hygiene scores, and number of muscle spasms in all the patients, except the 3rd patient. The reported duration of neurolytic block varies between few weeks to 6 months, depending on the time required for remyelination and axonal regeneration, but in this case

series, it varied from 1 week to 4 - 6 months. The inadequate relief in 3rd patient could be explained due to an incomplete neurolysis of obturator nerve, severe spasticity, or underlying contracture. Such cases usually do not respond to repetitive blocks and are candidates for surgical tenotomies. Viel *et al* performed neurolysis with 65% alcohol in 23 patients of lower limb spasticity and reported improvement in adductor spasm, triple flexion scores, and gait scores for 4 months.^[5] In contrast, Kong *et al* reported a minimum duration of 6 months, and in few cases, it continued up to 18 months with the use of 100% alcohol in obturator neurolysis.^[4] This could be explained by the higher percentage used in their study.

Spasticity is persistent increase in the involuntary reflex activity of a muscle in response to stretch. Treatment choices include oral medications in form of centrally-acting muscle relaxants like baclofen and tizanidine, interventional treatment choices like intrathecal baclofen pump and neurolysis and surgical interventions like rhizotomy, myelotomy.^[6] The use of oral medications is associated with systemic side effects such as sedation, confusion, hepatotoxicity, and diffuse weakness. Many patients find sedation adversely affecting their ability to perform function.^[1] Intrathecal baclofen pumps are quite expensive and are rarely warranted in the initial stages of spasticity.^[7] The primary goal of obturator nerve block in spasticity is functional rehabilitation of the neurological patients, to obtain conversion from a bedridden or chair-bound status to an improved ability to walk. Physiotherapy and rehabilitation exercises also favor the development of a more efficient gait pattern. Obturator neurolysis is an efficient and cost-effective technique to reduce adductor muscle spasm and related pain and to improve gait and hygienic care in patients with neurological sequelae of stroke, head trauma or any lesion of the motor neuron.^[2]

Traditional approaches to the obturator nerve are quite unsuitable in patients presenting with spastic conditions of the lower limbs because of major difficulties in achieving adequate positioning. The classic approach involves the patient to lie supine with limb abducted, has high failure rate, and remains difficult even in expert hands while '3-in-1' technique is associated with high failure rate due to the deep location of obturator nerve. Our patients could not be placed in a suitable position as opening lower limbs was markedly difficult due to scissoring effect of adductor spasm. The interadductor approach was used to overcome these technical difficulties.^[5] The cutaneous and osseous landmarks are not essential for the accuracy of nerve location. It allows the tip of the needle to be placed easily in the obturator canal before division of the nerve. Ultrasonography was not used to localize the nerve due to unavailability of the Sonosite machine in our Deptt, which is under purchase now. Alcohol

application over a nerve is followed by degeneration and absorption of all the components of the nerve, except the neurilemma. Denervation and pain relief occurs over 1 week. Concentrations below 50% produce no motor dysfunction, and a concentration of 100% is associated with destruction of sympathetic, sensory, and motor components of a mixed somatic nerve and also more risk of neuritis.^[8,9] Therefore, we chose a concentration in between and also this percentage has been used in a previous study.^[5] The absolute alcohol was diluted by adding 2% lignocaine, which decreased pain on injection and also the risk of neuritis.^[10] Significant and longer duration of relief observed with an alcohol justify its use in such cases without any obvious risk. As absolute alcohol is associated with more risk of neuritis, dysesthesias, and discomfort on injection; we recommend its dilution with local anesthetic to decrease the above-mentioned risks. To conclude, obturator neurolysis with ethyl alcohol is a good and cheap alternative in cases of non-availability of phenol and gives satisfactory improvement in pain and spasticity and helps in rehabilitation of these patients without significant complications. However, further clinical trials with large number of patients might help to increase the success rate of blockade and widespread use of neurolysis with alcohol.

REFERENCES

1. Bavikatte G, Gaber T. Approach to spasticity in general practice. *Br J Med Pract* 2009;2:29-34.
2. Akkaya T, Unlu E, Alptekin A, Gumus HI, Umay E, Cakci A. Neurolytic phenol blockade of the obturator nerve for severe adductor spasticity. *Acta Anaesthesiol Scand* 2010;54:79-85.
3. Kumar ER, Tharion G, Bhattacharji S. A study to evaluate the effectiveness of phenol blocks to peripheral nerves in reducing spasticity in patients with paraplegia and brain injury. *Indian J Phys Med Rehabil* 2008;19:13-7.
4. Kong KH, Chua KS. Outcome of obturator nerve block with alcohol for the treatment of hip adductor spasticity. *Int J Rehabil Res* 1999;22:327-9.
5. Viel EJ, Perennou D, Ripart J, Pelissier J, Eledjam JJ. Neurolytic blockade of the obturator nerve for intractable spasticity of adductor thigh muscles. *Eur J Pain* 2002;6:97-04.
6. Ward AB. A summary of spasticity management – a treatment algorithm. *Eur J Neurol* 2002;9:48-52.
7. Barnes MP. Management of spasticity. *Age Ageing* 1998;27:239-45.
8. Jain S, Gupta R. Neural blockade with neurolytic agents in textbook of Pain management. In: Waldman SD, Editor, 1st ed, Philadelphia: Elsevier publishers; 2007.
9. Georgescu VA. Drugs and agents used for neurolysis and fluoroscopy in textbook of peripheral nerve blocks- A colored Atlas, In: Chilly JE, Editor, 3rd ed. Philadelphia: Lippincott Williams and Wilkins; 2009.
10. Raj PP, Denson DD. Neurolytic agents. In: Raj PP (editor): *Clinical practice of regional anesthesia*. New york: Churchill Livingstone; 1991.

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