

Clinical and Electromyographic Evaluation of Obturator Neurectomy in Severe Spasticity

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Summary

Obturator neurectomy was performed in 35 patients with severe spasticity of the lower limbs. Immediate release of excessive spasticity in the adductor group of muscles was observed and confirmed by E.M.G. In most cases, a beneficial reduction of spasticity in other groups of muscles in the lower limbs was also observed. As a result, rehabilitation of the patients was improved.

Key words: *Obturator neurectomy; Spasticity, E.M.G.; Rehabilitation.*

Introduction

In cases of severe spasticity of the lower limbs, whatever the cause, the adductor group of muscles play an important role. These muscles, particularly adductor magnus, are very powerful and excessive spasticity produces the scissoring effect of the thighs which interferes with the hygiene of the groins and ano-genital area and the management of bladder incontinence and prevents the patient lying, sitting and standing in the correct position.

The adductor group of muscles are supplied mainly by the obturator nerve, but other supply comes from the sciatic and femoral nerves. Even after complete section of the obturator nerve, some motor units are still innervated and this residual motor function is usually enough to maintain the stability of the hip joint and prevent excess abduction.

Clinical material

Thirty five patients with adductor spasticity were treated surgically. The extra-peritoneal, intra-pelvic approach to the nerve was used, as it is technically easier. In 28 cases, bilateral neurectomy was performed and in 7 cases only one nerve was cut, a total of 63 neurectomies on 35 patients.

All patients were examined before and after surgery, when the degree of spasticity was assessed clinically. In 22 cases, late follow up was carried out, 2-6 years after operation. E.M.G. was performed in all the follow up case group,

and in some cases, pre- and post-surgically also. All cases were documented photographically.

Early clinical results

In all cases, after section of the nerves, full abduction of the hips was possible, either at once or within a few days if the hip joints were stiff. In 29 cases, a marked reduction in spasticity was also noted in the hip flexor and knee flexor groups of muscles. In 9 cases, a reduction in calf muscle spasticity was noted.

All patients were very satisfied with the operation, and their nursing care became much easier. Their rehabilitation resumed two weeks after surgery.

Late clinical results

Twenty two patients were assessed 1–6 years after surgery. All were very pleased with the operation. They could manage their activities of daily living much more easily. The tone and power in the adductor muscles were similar to the post-operative state. In non-traumatic lesions, a little increase in voluntary power of the adductor muscles was noted.

Seven patients had resumed walking, 5 with cerebral lesions, 2 with severe spinal lesions, the latter two using braces. The improvement in function was due both to the reduction of spasticity of the adductor group, as well as improved voluntary power in the legs generally. The improvement in voluntary power could be ascribed as a true neurological improvement which had been allowed to develop with the reduction of adductor spasticity.

Four patients, previously confined to bed, were able to use a wheelchair. Five patients could use their wheelchairs more effectively. One patient with multiple sclerosis lost the ability to stand, but she was pleased with the improved wheelchair capability.

Electromyographic evaluation

All patients who came for control clinical examination were also checked by E.M.G. (22 patients). In 5 recently operated cases, E.M.G. was done before and after the procedure. E.M.G. was done using superficial electrodes and ELEM-EMG machine. Three muscle groups were examined simultaneously in each lower extremity. There were: long flexors of the knee joint (biceps femoris) adductors (adductor magnus) and calf muscles (m. triceps surae) during active and passive movements and during elicitation of the knee and plantar reflexes.

Generally, E.M.G. findings confirmed the clinical results (Fig.). Before operation, during the active adduction of the thigh, the strongest muscle activity was seen with the adductors group, similar activity within the long flexors of the knee and the weakest activity in the calf muscles. After operation, the situation was entirely different. There was practically no muscle activity in the adductors group. Muscle activity in the long flexors of the knee was evidently diminished, while in the calf muscles this was even higher than before operation. The elicitation of plantar and knee reflexes before operation produced strong activity mainly in flexors of the knee and calf muscles. After operation, this activity was much reduced in the flexors of the knee and less but still reduced in calf muscles.

E.M.G. has been used for diagnostic purposes of many kinds in tetraplegic and paraplegic patients (Dyro and Rossier, 1985; Dimitrijevic and Faganel,

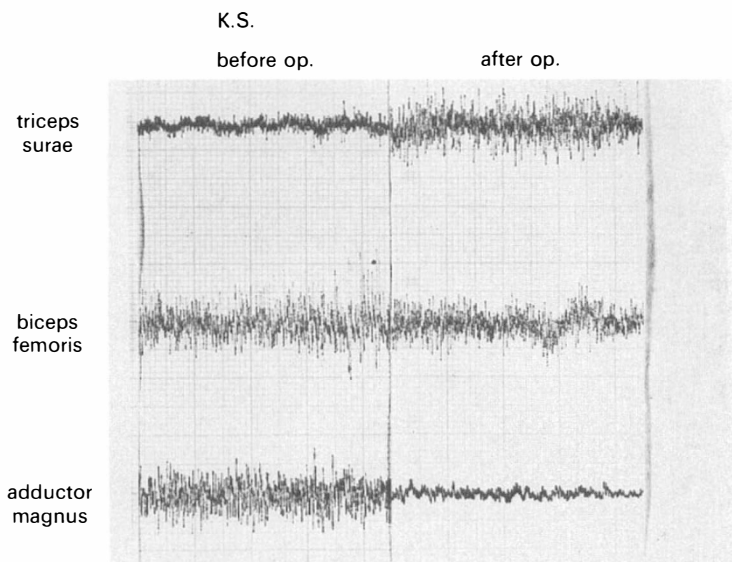


Figure E.M.G. confirms the clinical results.

1985; Knutsson, 1985). It is also a good method of examination in the evaluation of the degree of spasticity pre- and post-obturator neurectomy.

Conclusions

In most areas of the body, the complete section of a major nerve would not be acceptable in an attempt to reduce excessive spasticity, as it would also interrupt any useful reflex activity in the affected area, particularly the autonomic supply to the bladder and blood vessels. Therefore several methods of selective partial neurectomy, surgical and chemical, have been elaborated to destroy the gamma system which is responsible for the increased tone and spasticity, and to preserve the other systems which are vital for voluntary power, sensation and autonomic control.

Obturator neurectomy is the only exception to this rule, and complete section of the nerve can be done without any harm to the patient because of its particular function supplying the adductor group of muscles. The reduction of adductor spasticity greatly benefits patients who have problems with scissoring of the legs, and it greatly aids their independence and rehabilitation, allowing them to be nursed more easily, to sit better in a chair, and even allow some to stand and walk.

Our conclusions are:

1. Obturator neurectomy is a safe procedure.
2. It can be performed on patients with various forms of spasticity and is of special value in traumatic paraplegia.
3. Activities of daily living are much easier to perform after surgery both by the patient and his attendants, and rehabilitation and independence are enhanced.