Cervical Myelopathy with Fasciculations in the Lower Extremities*

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Fasciculations at rest in the lower extremities of 3 patients with progressive compression of the spinal cord caused by cervical spondylosis have disappeared or diminished following cervical laminectomy. No evidence of additional disease of the nervous system, more commonly associated with fasciculations in the lower extremities, has developed. Electromyograms in these 3 patients have shown no fibrillations of denervation. The patients have been followed for 25, 29, and 41 months postoperatively. We consider that the involuntary movements in the legs were incident to the cervical myelopathy and that fasciculations may not reflect, exclusively, a primary disorder of lower motoneurons.

Clarke and Robinson described 3 patients with fasciculations at rest in the lower extremities among 120 patients with cervical spondylosis but did not mention a long-term follow-up or evidence of associated disease. No other reference to this physical finding in such patients has been found in the literature.

Widespread fasciculations in the lower extremities with spasticity and minimal sensory deficit may lead to an unwarranted diagnosis of atrophy of the spinal cord or amyotrophic lateral sclerosis unless it is recognized that the fasciculations in the lower extremities do not necessarily imply a primary disorder of lumbar motoneurons.

Case Presentations

Case 1. A 52-year-old man complained of occasional aches and pains in his neck for 5 years. After a fall, 5 months before hospitalization, the pain became persistent and severe. He noted weakness of the right shoulder and arm. Two months prior to admission he dragged the right leg when walking. He recognized no subjective sensory deficit.

Examination revealed weakness of the right biceps, deltoid, serratus anterior, and rhomboid muscles. Deep tendon reflexes were normal. Fasciculations were frequent in all four extremities. Flexion of the neck to the left was limited. The spine was not tender. There was no sensory deficit nor spasticity. Cranial nerves were intact.

Roentgenograms of the cervical spine demonstrated straightening of the cervical lordosis and encroachment of neural foramen by "spurs" at C5-6 and C6-7 on the right side and C5-6 on the left side. The C5-6 interspace was narrowed, and there was slight posterior subluxation of C5 on C6. Myelography revealed ventral transverse defects in the contrast material at the C4-5 and C5-6 interspaces which were exaggerated by cervical flexion. A large dorsal defect was demonstrated at C4-5. A small lateral defect was present on the right at C4-5. The protein in the cerebrospinal fluid was 39 mg. per cent. There was no block of spinal fluid during flexion or extension of the cervical spine.

Operation. A wide laminectomy of C6, C5 and C4 was performed. The dural tube moved posteriorly after removal of each lamina. The C4-5 foramen on the right was very small. A foramenotomy was performed at this level.

Course. Fasciculations were uncommon a day later. At the time of discharge from the hospital, the fasciculations were not seen and strength of the muscles of the right shoulder girdle had increased.

Fourteen months after operation this man complained of continuous burning interscapular pain and occasional aching pain in the right shoulder.
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and right forearm. Strength and reflexes in the upper limbs were equal bilaterally. Minimal atrophy of the right infraspinatus and supraspinatus was present with slight winging of the right scapula. Sensation and coordination were normal. Fasciculations were not present in any extremity at rest.

Twenty months after operation no fasciculations, fibrillations, or other abnormal findings appeared in the electromyogram of the right calf.

Case 2. A 64-year-old man first noticed pain in both arms and shoulders 6 months prior to operation. The pain continued and was followed by an unsteady gait, difficulty in walking in the dark and tingling in the legs.

Examination. Fasciculations were present in the proximal muscles of the right shoulder girdle but were absent in the lower limbs. There was atrophy of the intrinsic muscles of both hands. The gait was spastic. He walked only with two aids in attendance or an aid and a cane. The reflexes were hyperactive throughout but were more brisk on the right. A jaw jerk was present but was not marked. A nondermatomal hypesthesia was found. No evident weakness, Babinski's sign or clonus were present. There were no abnormalities of cranial nerves.

Roentgenograms of the cervical spine demonstrated narrowing of the C6-7 intervertebral space, with posterior lipping of the vertebral bodies at this interspace and encroachment on neural foramina. A myelogram revealed ventral transverse bars at C1-5, C5-6 and C7-T1. The cerebrospinal fluid contained 61.5 mg. per cent of protein.

Operation. The laminae of T1, C7, C6, C5 and part of C4 were removed and the foramina at C4-5, C5-6, and C6-7 were explored. The dura mater was not opened.

Course. Widespread fasciculations first appeared in the lower limbs 4 days postoperatively. Serum electrolytes were normal. Three weeks later fasciculations were present in all four extremities. Spasticity was decreased. There was a brisk jaw jerk. Hypoesthesia was less marked than preoperatively.

Ten months later he was free from pain. He had mild spasticity in both lower extremities. His gait was shuffling, but he walked unaided. Cranial nerves were intact. There was no jaw jerk. The triceps jerks were absent bilaterally. Atrophy was noted in the dorsal interossei on the right. Knee jerks were hyperactive without clonus. Ankle jerks were normal. There was no Babinski's sign. Vibratory sense (128 c./sec.) and sense of position were diminished in the toes but were normal at the ankles. There were no fasciculations at rest.

Seventeen months after operation spasticity was decreased further. Fasciculations were not seen in the extremities at rest, and electromyography revealed no fibrillations or fasciculations.

Case 3. A 41-year-old man reported low-back pain of 11 years' duration which was aggravated by heavy lifting. This pain had radiated from low in the back up the spine to the cervical region. Rest relieved the pain. The patient "felt stiff" in the morning, with the stiffness diminishing as the day progressed. He described "pins and needles" in all extremities during flexion of the neck.

Examination in February, 1957 revealed generalized hyperreflexia and right ankle clonus. No fasciculations were evident. Films of the cervical spine at that time showed narrowing of the C5-6 interspace with ventral spurring. A myelogram showed no abnormality in the lumbar, thoracic or cervical regions except for a small filling defect at the C5 nerve-root sleeve on the right.

Course. In May, 1957 fasciculations were noted in the muscles of the shoulder girdle and in both lower limbs. Wasting of the right quadriceps femoris was minimal. Hyperreflexia and clonus persisted.

In November, 1957 he awoke with severe ach-

ing pain in the neck and left shoulder which did not radiate. He had lifted a heavy bag of coal the preceding day. The neck was rigid and tilted to the left. The cervical spine was tender. Pain was increased by vertical compression of the cervical spine and relieved by cervical traction. A mild paraparesis was present. Reflexes on the right were hyperactive with spontaneous sustained clonus at the right ankle. Cranial nerves were normal.

Myelography revealed a ventral midline de-

fect at C2-3. The protein contained in the cerebrospinal fluid was 39 mg. per cent.

Operation. The spinous processes and laminae of C3 and C4 were removed widely, and the dural tube was seen to migrate dorsally.

Course. His preoperative pain was relieved markedly on the 1st postoperative day. The reflexes became equal bilaterally and the clonus disappeared.

Following discharge from the hospital, he com-

plained of low-back pain when bending or lifting. In July, 1958 there was generalized hyperreflexia bilaterally. Fasciculations were observed in the right thigh and calf, in both pectoral major muscles and in both forearms. There were no fasciculations in the palate, face or tongue. There was sustained ankle and gluteal clonus bilaterally. There was no sensory deficit and no Babinski's sign. Cerebrospinal fluid contained 60 mg. per cent of protein. A myelogram revealed dorsal compression of the dural sac at C5.

2nd Operation. The spinous processes and laminae of C5, C6 and C7 were removed widely.