Thoracic myelopathy caused by osteophytes of the articular processes

Thoracic spondylosis

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Compression of the spinal cord or nerve roots resulting from degenerative spondylosis is commonly seen in the cervical or lumbar region, but it has not previously been described in the thoracic region. Despite this, the authors believe that the syndrome is not rare. They describe four cases, three of which were seen at one institution within 2 years. Decompression of the spinal cord by removal of the osteophytes may produce gratifying results, even when symptoms have been present for years. The syndrome should be considered in any patient who has a thoracic myelopathy and radiological evidence of spondylosis.

KEY WORDS • thoracic myelopathy • osteophytes • thoracic spondylosis • thoracic spine

SPONDYLOSIS or hypertrophic osteoarthritis of the spine is common in the cervical and lumbar regions. Bars of bone from the posterior aspect of the vertebral body, and spurs protruding from the unco-vertebral “joint,” compress the spinal cord and/or its nerve roots. This compression gives rise to symptoms of local pain and tenderness, stiffness, radiculopathy, and myelopathy. Despite the frequent occurrence of cervical and lumbar spondylosis, we were unable to find any reports of symptomatic spondylosis of the thoracic spine.

In the past 2 years, we have seen three cases of symptomatic spondylosis of the thoracic spine and have obtained details of a fourth from another center. Symptoms in all cases were caused by posterolateral compression of the spinal cord by osteophytes arising from the articular processes.

Case Reports

Case 1

This 50-year-old woman noted the onset of progressive weakness and numbness of the legs in 1969. She was admitted to a hospital in Savannah, Georgia, in 1970. Myelogram revealed an extradural block at T10–11 (Fig. 1 left), and a laminectomy of T9–11 was performed with findings of “laminal hypertrophy.” Six months after operation, she had spasticity of the right leg, but was otherwise normal. She did well until October, 1973, when she had a slight fall. At this time, she noted progressive weakness of the legs with pain in the back, radiating to the anterior aspect of the thighs bilaterally. She was readmitted, and examination at this time revealed a moderate spastic paraparesis, worse on the right than on the left. Pain and touch sensations were normal bilaterally. Position sense was absent in the right foot. A repeat myelogram (Fig. 1 right) was identical to the one in 1970. Surgery was planned, but the patient had a pulmonary embolus after induction of anesthesia, and surgery was cancelled.

She was followed by her local physician who noted a very slow deterioration in her status. She was admitted to the Neurology Service at the Medical University of South Carolina on October 11, 1976, with complaints of increasing leg weakness and back and leg pain.

Examination. The patient suffered from a moderate spastic weakness of the right leg and mild spastic weakness of the left leg. She was unable to walk, and...
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She was unable to void without a catheter. There was hypalgesia of the left leg. Position and vibratory sensation of the right leg was absent. The deep-tendon reflexes were increased bilaterally. Plantar response was extensor bilaterally. Tomography of the thoracic spine revealed very large osteophytes arising laterally from the articular processes on the right at T10-11 and T9-10 and projecting medially into the spinal canal (Fig. 2 left). Myelogram revealed an incomplete block at T10-11 with deviation of the dye column and spinal cord to the left (Fig. 2 right). This myelogram was identical to the myelograms performed in 1970 and 1973.

Operation. On October 27, 1976, the previous laminectomy site was explored. Large osteophytes at T10-11 and T9-10 were found arising from the articular processes on the right, indenting the dura and compressing the right side of the spinal cord. The osteophytes were adherent to the dura, and they were dense and hard, requiring an air drill for removal.

Postoperative Course. The postoperative course was complicated by meningitis that responded to appropriate antibiotics, but it was otherwise unremarkable. She had immediate relief of the pain in her back and anterior aspects of the thighs. Her strength improved, and at the time of discharge she was ambulating with a walker and able to void without the aid of a catheter. Follow-up examinations showed continued improvement. Her most recent examination (March, 1978) revealed no weakness of the left leg and moderate weakness of the right leg. She ambulated with the aid of a walker; sensation to pinprick was normal as was position sense. Vibratory sensation remained absent in the right leg. The reflexes were increased bilaterally, and the plantar responses were extensor bilaterally.

Case 2

This 72-year-old man noted the insidious onset of bilateral leg weakness and stiffness in July, 1977. By August, 1977, he needed a walker to ambulate. By September, 1977, he was unable to walk without assistance, and was confined to a wheelchair. He was
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admitted to the Charleston County Hospital on September 12, 1977, by the Neurology Service.

Examination. The patient had a severe paraparesis, with the right leg weaker than the left. There was no sensory deficit to pinprick or light touch. Vibratory sensation was diminished bilaterally in the feet, and position sense was absent in the right toes. The deep tendon reflexes were increased at the knees, but absent at the ankles. Plantar stimulation gave equivocal results bilaterally. Sphincter tone was normal. The patient voided without the aid of a catheter. A myelogram performed on September 24, 1977, revealed a complete block at T11-12. It appeared extradural in type and indented the dye column posterolaterally.

Operation. A laminectomy was performed on September 26, 1977, and dense, very hard osteophytes arising from the articular processes were removed.

Postoperative Course. The postoperative course was benign. The patient experienced rapid improvement in the leg weakness and was discharged in a wheelchair. At follow-up examination 1 year after operation the patient was able to ambulate with the aid of a walker. He had no sensory deficit, and bowel and bladder function were normal.

Case 3

This 55-year-old man had suffered chronic, non-radiating low-back pain for 20 years. Eighteen months before admission to the Charleston Veterans Administration Hospital, he noted increase in his back pain with radiation of the pain into the left lower abdomen and left anterior thigh. Twelve months before admission, he noted similar pain on the right. Six months before admission, he noted progressive stiffness and weakness of both legs. A feeling of numbness was noted in the distribution of his pain. There were no symptoms of bowel or bladder dysfunction. The patient was admitted to the hospital on September 6, 1977.

Examination. The patient had a mild spastic paraparesis, with the left leg weaker than the right. There was minimal hypesthesia and hypalgesia below
the level of T-12. Position and vibratory sensations were intact throughout. Deep-tendon reflexes were increased in the legs. Plantar stimulation gave extensor responses bilaterally. He was able to walk with a spastic gait.

Tomography of the thoracic spine revealed osteophytes of the articular processes of T11-12, with mediolateral extension into the spinal canal. A myelogram revealed a high-grade block at T11-12 with posterolateral indentation of the contrast column at T11-12.

Operation. A laminectomy was performed on September 14, 1977, and dense, very hard osteophytes arising from the articular processes at T11-12 were removed.

Postoperative Course. The postoperative course was benign. The patient has steadily improved, and is now able to walk without assistance. There is minimal residual weakness of the left leg, and he still complains of non-radiating low-back pain.

Case 4

This 45-year-old woman first noted pain in the back and right leg in August, 1973, while walking down stairs. In September, 1973, she noted the insidious onset of right-leg weakness that progressed to nearly total paralysis.

Examination. On admission to the Kaiser Hospital in Honolulu, Hawaii, on September 24, 1973, she had marked spastic paresis of the right leg and mild spastic paresis of the left leg. There was a sensory level to pinprick at T-10, with greater loss of sensation on the left. Myelography revealed a complete block at the T-8 level with deviation of the spinal cord from left to right.

Operation. A laminectomy of T7-10 was performed, and dense, unusually hard osteophytes arising from the articular processes at T8-9 were removed.

Postoperative Course. The patient showed steady improvement. At the time of discharge on October 18, 1973, there had been improvement in the right-leg paresis. Pain sensation in the legs had returned to normal. The patient was able to ambulate with the aid of a walker.

Discussion

As strictly defined, spondylosis refers to degenerative lipping of the vertebral body. In clinical practice, however, it is customary to refer to degenerative disease of the spine as spondylosis whether it involves the body or the articular processes (that is, the facets).

Cervical spondylosis is a common clinical entity and usually presents with symptoms of radiculopathy and/or myelopathy. Pathological findings usually include osteophytic lipping of the unco-vertebral "joints" and anterior and posterior aspects of the vertebral bodies, with anterior bar formation and compression of the spinal cord and its roots. In a recent report, Epstein, et al., have described compression of the cervical spinal cord by posterolateral osteophytes of the articular processes without significant spondylosis of the vertebral body. The etiology of the myelopathy is unclear, but it is probably a result of chronic spinal cord compression and ischemia. Therapy is directed to removal of the bar by anterior discectomy, or decompressive laminectomy.

Lumbar spondylosis is less commonly symptomatic, but it may frequently present with symptoms of radiculopathy as well as intermittent claudication of the cauda equina. Pathological findings are identical to those of spondylosis in the cervical region. Laminectomy and medial facetectomy usually relieve symptoms.

Compression of the thoracic spinal cord from non-neoplastic disease is usually caused by thoracic discs. Patients typically present with a long history of local or radicular pain and progressive paraparesis. Posterolateral discectomy or transthoracic discectomy is the treatment of choice.

Osteoarthritis of the thoracic spine is mentioned infrequently in the literature. Sachs and Fraenkel described four cases of "Spondylose Rhizomélitique" or progressive ankylosis rigidity of the spine. Their Case 3 was a man with progressive leg weakness and back pain who, at operation, had thick laminae and a thickened epidural membrane at T11-12. He improved significantly with operation. Bailey and Casamajor reported five cases of osteoarthritic compression of the spinal cord and its roots. Their Case 1 was a man with long-standing paraparesis due to cord compression. Laminectomy of T10-L2 revealed thickened and abnormally softened laminae and spinous processes. The patient made an excellent recovery. The gross description of their case varies greatly from our cases, and is highly suggestive of Paget's disease. Parker and Adson described eight patients with osteoarthritic compression of the spinal cord and nerve root. Three cases involved the thoracic spine. One case clearly appears to be a chronic infectious process while the other two cases were found to have spongy vascular thickening of the laminae and spinous processes compressing the spinal cord. This again is suggestive of Paget's disease. Shore, in an exhaustive anatomical study of skeletal material, described osteoarthritis in the "dorsal intervertebral joint." He clearly described examples of degenerative arthritis of the articular process with medial extension of the osteophytes into the spinal cord. No clinical correlation is available on these skeletons. Oppenheimer described and classified degenerative disease of the intervertebral joints. He described degeneration of the articular process with subsequent hypertrophy of the facets. The only clinical symptoms he acknowledged were local radicular pain corresponding to the involved segment of the spine. Brain mentioned briefly that degenerative disease of the
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thoracic spine causes spinal cord compression, but gave no direct details. Schorr, et al.,11 and Shapiro and Batt,12 described "thoracic spondylosis," but all their cases were patients with asymptomatic lateral osteophytes of the vertebral bodies without spinal or nerve root compression. Daita, et al.,9 also described thoracic spondylosis, but analysis of their cases reveals that these are all patients with anteriorly placed thoracic discs.

Other causes of thoracic myelopathy are more common, but can be readily excluded by the appropriate clinical, laboratory, and radiographic evaluation.

Vascular disease of the spinal cord is more apoplectic in onset. The syndrome of anterior spinal artery thrombosis is the most common, and presents clinically with loss of motor function, pain and temperature sensation, and preservation of posterior column sensation. Subdural or epidural hemorrhage usually presents as a rapid onset of diffuse paraplegia associated with trauma or a bleeding diathesis. In most cases, infections of the spine or epidural space can be distinguished by a history of fever and plain x-ray findings of osteomyelitis. Toxic and metabolic abnormalities and normal radiographic studies are usually found. The signs and symptoms of thoracic intervertebral disc prolapse and intraspinal tumors may be identical to those of spinal cord compression by osteophytes. However, these conditions are readily differentiated by tomography and myelography.

The myelopathy produced by osteophytic compression of the thoracic spinal cord is nonspecific. All our patients presented with a slowly progressive, asymmetric paraparesis. The sensory deficits were relatively mild. Pain in the back and legs was seen in three cases. A history of mild back trauma was present in two cases.

X-ray examination by plain radiography, tomography, and myelography was revealing in all cases. Plain films showed evidence of mild to severe spondylosis with osteophytosis. Tomography was particularly helpful in showing the size and extent of the osteophytes. Myelography showed a partial or complete block of extradural type with narrowing and displacement of the spinal cord and theca by the osteophytes.

Operative findings were similar in all cases. There was posterolateral compression of the spinal cord by large osteophytes that arose from the articular processes and extended medially. Total removal of the osteophytes was accomplished in all cases. Removal of the osteophytes is mandatory. As was seen in Case 1, laminectomy alone is insufficient treatment.

Patients experienced improvement in their weakness and sensory disturbances after surgery. The pain associated with this spondylosis disappeared in all cases. It is worthy of note that in Case 1, symptoms had been present for at least 6 years. Despite this long history, the patient made a significant recovery.

References


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