Cervical spondylosis accompanied by arthritic bony ridging with compression of the cord and nerve roots is not uncommon in older people. It is an insidiously progressive disease, frequently misdiagnosed as degenerative myelopathy, amyotrophic lateral sclerosis, or lateral sclerosis on the basis of arteriosclerotic vascular insufficiency. To date, surgical therapy has been less successful than in cases of laterally placed cervical lesions. Trauma to the cord in radical operations or limited improvement in conservative operations have all too often been the result. For the last 6 years the writer and his associate, Dr. Benjamin Whitcomb, have utilized a rather extensive laminectomy plus bilateral partial or complete facetectomy by means of an electric drill. The results have been sufficiently gratifying to justify a description of the operation and to report on a series of 6 of the author's cases.

HISTORICAL

In England there has been great interest in cervical spondylosis of the bony-ridge type for many years and complete descriptive clinical, anatomic and pathologic correlations have been contributed by British authors. Brain and Northfield should be mentioned specifically and the discussion on the cervical intervertebral disc and spondylosis by Brain constitutes a classical treatise. From Sweden, Frykholm has written an excellent monograph on cervical ruptured discs including anatomico-pathologic descriptions of the bone, annulus, nucleus, and fibrotic changes in the space of the intervertebral disc, the foramina, and the root sleeves. Most of his cases were of the lateral "bony type" of cervical ruptured discs and he stressed adhesions within the root sleeve as a common cause of symptoms. In the United States, Kahn introduced sectioning of the dentate ligaments to release their tethering effect on the cord. At present, this maneuver with laminectomy is the most commonly used procedure. Recently, there has been a renewed interest in the anterior approach, publicized by Cloward and more recently by the orthopedic and neurosurgical departments of Johns Hopkins Medical School. In enumerating the causes of combined compression of cord and root, Nugent and Brain correlated the present knowledge with specific mention of a vascular ischemic component by Brain, Mair and Druckman, and Clarke and Robinson. Spontaneous myelopathies similar to that found in spondylosis have been described by Bailey caused by aging of the cord and its vessels. Payne and Spillane and Hutchinson and Yates have described compression of the vertebral artery from spondylosis. Of interest is the finding of a kinking or infolding of the ligamentum flavum with dorsal compression overlying a bony ridge or shallow canal demonstrated by lateral myograms and by spinal fluid dynamics with the neck both flexed and extended. The sometimes dire results in trauma to the neck in older persons may well be ascribable to cervical hyperextension and kinking of...
the ligamenta flava against a vulnerable and compressed spinal cord. Transitory subluxation is probably a rare occurrence.

**DISCUSSION**

The writer takes tentative issue with certain of these observations, especially their surgical implications, but concurs in the need of lateral roentgen-ray films of the bone and myelograms. He is not in concurrence with Frykholm's explanation of adhesions within the root sleeve as a cause of pain inasmuch as 455 operations at the Hartford Hospital have been done on laterally placed cervical discs without opening the dural sleeve. The result has been an immediate and gratifying relief of pain. The dentate ligament as a tethering action of the cord seems of minor import in comparison to other factors because the ligament is fastened by alternating attachments to cord and dura mater, permitting a very considerable up-and-down movement of the cord. The writer prefers to believe that the chief tethering action of the cord against the bony-ridge defect is attributable to the root sleeves and their contents being held down by facets, and any benefit in the dentate operation is the result of decompression of both nerve roots and dura mater. The writer, therefore, advocates partial or complete bilateral facetectomy with total uncapping of the root sleeves followed by an extensive laminectomy, resulting in a decompression of the dorsal dura mater from possible compression by kinked ligamenta flava and at the same time permitting a dorsal migration of the dural contents and tethered root sleeves away from the ventral bony-ridge compression. This makes it unnecessary to open the dura mater; it preserves any minute bridging blood vessels within the dura mater\textsuperscript{19,28} which may save the cord from further ischemia; and at the same time gives dramatic relief of disability of the arm caused by foraminal osteophytes compressing the roots against the facets.

Successful operation by this new method has been carried out in 12 cases in which the operation was performed by the writer in the past 5 years. A brief summary of the clinical, pathological, diagnostic and surgical results is given.

**CASE REPORTS**

*Case 1.* J.D., a 73-year-old male, had progressive spastic gait; pathological deep reflexes; fibrillation and weakness of arms, especially the right; no involvement of the posterior columns; spondylosis at C3 interspace demonstrated by roentgenograms of the bone and myelography, and a rise of the spinal fluid protein to 77 mg. per cent. Bilateral facetectomy and laminectomy at C3 level were performed. He was discharged on the 6th postoperative day. A 5-year follow-up showed marked improvement in the right arm and legs within 2 months; there was no regression in 5 years.

*Case 2.* A.G., a 55-year-old male, had progressive onset over an 8-year period of dragging, spastic, ataxic gait, especially of the left leg, with recent weakness of both hands. He had bilateral pyramidal tract signs; combined upper and lower motor-neuron signs in the arms; no involvement of the posterior columns; nearly complete block by dynamics, with spinal fluid protein of 90 mg. per cent and myelographic block, initially miscounted at another hospital to represent C5-6. Initial bilateral facetectomy and extensive laminectomy at C5 were performed with immediate improvement in the legs. Second-stage bilateral facetectomy at C4 was carried out upon later review of myelograms. Operative contusion of left C5 nerve root caused temporary increased weakness of the left arm and regression of the function of the legs to preoperative state. He was discharged on the 2nd postoperative day. Recovery of upper extremities was nearly complete. Disability of legs was stationary. There was no regression in 2½ years in spite of coronary occlusion.

*Case 3.* C.A., a 66-year-old male, had progressive right spastic hemiparesis over the previous 3 years, precipitated by a fall. There was evidence of bilateral pyramidal-tract signs; there was no involvement of the posterior columns. He was a poor candidate for operative relief because of age, duration of illness, normal spinal fluid protein and beginning parkinsonism. However, he showed marked defects of bony ridges and root sleeves with nearly complete block at C5 and C6 interspaces, and operation was advised to prevent progression. Bilateral decompressive facetectomy at C5 and C6 interspaces with laminectomy was performed. There was moderate improvement in arms with no change in legs. There was no progression in 2½ years.