DIAGNOSIS AND TREATMENT OF PAINFUL NEUROLOGICAL DISORDERS CAUSED BY SPONDYLOSIS OF THE LUMBAR SPINE

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INVESTIGATION of the specific causes of radicular pain and neurological alterations in patients with spondylosis has resulted in a greater appreciation of the contributory role played by osteophytes. Involvement of the spinal cord and nerve roots in the cervical region has received ample recognition during the past 10 years and a well documented syndrome has been established; one that has often been confused with demyelinizing diseases, amyotrophic lateral sclerosis, primary and posterolateral sclerosis, neoplasm and myelopathies of a nonspecific nature.\textsuperscript{2-4,9} This report will focus attention on the results of compression of the cauda equina and lumbosacral nerve roots in lumbar spondylosis. Earlier papers have dealt with this subject in a fragmentary manner.\textsuperscript{8,10,11} This presentation will review all of the accumulated cases and experiences in the diagnosis and treatment.

Spondylosis, often referred to as arthrosis or osteophytosis, begins as a degeneration of the intervertebral disc relatively early in life. Progressive dehydration and fibrillation of the annular fibrocartilage is followed by a loss of turgescence with thinning and outward bulging of the annulus fibrosus. The connection of the spinal ligaments to the periosteum at the ring epiphysis is loosened with deposition of new periosteal bone between the elevated periosteum and the original corticalis of the vertebral body.\textsuperscript{5,7} Osteophytes formed in this manner may protrude into the spinal canal and intervertebral foramina and result in significant compression of the soft, neural structures traversing them. Progressive stenosis or a sudden protrusion of disc tissue into such constricted areas, even if small, may result in irreversible damage. In contrast to the cervical and thoracic spine, the absence of spinal cord below the 1st lumbar level makes it possible for a considerable degree of spondylosis to occur before neurological symptoms appear. Spurs on the anterolateral portions of the vertebral bodies are rarely symptomatic. However, the posterior and posterolateral protrusions cannot be ignored as a potential source of trouble. The true extent of stenosis of the spinal canal caused by osteophytes may not be fully appreciated on plain roentgenograms because of the presence of unossified osteoid tissue.
in these structures. Myelography is a possible means of identification under such circumstances.

The syndrome produced by neural compression in the lumbar area is manifested by increasing disability, severe radicular pain being conspicuous. Weakness associated with atrophy, sensory alterations and, in advanced cases, profound and often irreversible loss of sphincter control may be found. The findings may simulate those caused by neoplasm and herniated discs in this area. The combination of a herniated disc at one level and significant spondylosis at the same or at an adjacent level may co-exist. To treat one and ignore the other may result in failure to relieve symptoms.

Unusual narrowing of the spinal canal has been encountered while exploring certain individuals suspected of having herniated discs. The ligamentum flavum, neural arches and articular processes were abnormally thickened, contributing to further stenosis of the canal. Initially, it was felt that the structural alterations were part of a general process of spondylosis of advanced degree. These alterations in many respects resembled those found during laminectomy in young achondroplastic dwarfs, representing a type of congenital malformation. Verbiest\textsuperscript{17,18} has described similar alterations, in otherwise normal individuals, which he refers to as “developmental narrowing.” Schlesinger and Taveras\textsuperscript{16} reported on a similar group and recommended interpedicular measurements in multiple-root syndromes as a diagnostic aid. Variations of this character may render such individuals susceptible to critical injury of the neural structures by spurs or protruding disc tissue of relatively minor degree.

Gill\textsuperscript{13} has indicated that the individual with a transitional 5th lumbar vertebra also has a smaller neural canal at this level, approximating in size that of the 1st sacral segment. Since the canal of the transitional vertebra must accommodate the same nerve-root content as a normal 5th lumbar vertebra, a slight protrusion of disc tissue or a spur will quickly give rise to symptoms of nerve-root compression as in the achondroplastic or dyschondroplastic spine. The most effective treatment includes laminectomy and excision of the involved tissue whenever practicable.

Unlike the cervical syndrome, there are few reports describing the neurological changes produced by spondylosis in the lower portion of the spinal canal. Bailey and Casamajor\textsuperscript{4} presented 5 patients with “osteo-arthritis” of the spine and compression syndromes both in the dorsal and lumbar regions. They were among the first to emphasize the compressive effects of the yellow ligaments and in one of the surgically verified cases described the unusual thickening of the lamina referred to in 3 patients of this series.

In discussing a syndrome of cauda-equina radiculitis, Cramer\textsuperscript{6} noted marked "arthritic" changes in the lumbar vertebrae in 18 of 26 cases. In each of these patients, laminectomy revealed a red and swollen appearance of the caudal roots which was related to bony and arthritic changes, "spurs and hypertrophic spondylitis" and not to inflammatory disease per se. All showed temporary or more lasting improvement after laminectomy. The