THE MECHANISM OF NEUROLOGICAL SYMPTOMS
AND SIGNS IN SPONDYLOLISTHESIS AT THE
FIFTH LUMBAR, FIRST SACRAL LEVEL

ROBERT DEAN WOOLSEY, M.D.*
St. Louis, Missouri

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Neurological symptoms and signs are variable in spondylolisthesis of the 5th lumbar on the 1st sacral segment. According to Meyerding's sciatic pain is not common unless there is a protrusion of an intervertebral disc. He found that the association of backache and sciatic pain was more common among males than females: 78.8 per cent to 21.2 per cent. A total of 18 cases of sciatica—10 unilateral, 8 bilateral—were found by Guri in his series of 60 cases. Three patients had numbness and paresthesia of lower extremities; 2 had abolished Achilles reflex bilaterally. Signs of nerve root compression were noted by Macnab in 11 patients. The ankle jerk was absent in all of them, and the knee jerk was absent in 2. One patient had anesthesia in the distribution of the 4th lumbar dermatome, and 2 showed marked weakness of the quadriceps, tibialis anterior, and tibialis posterior. In 1 patient who had never suffered from backache or sciatica the presenting symptom was a dragging of the left foot.

As to the cause of pain in spondylolisthesis, Kleinberg called attention to the fact that the laminar defect in a pre-spondylolisthesis of the 4th or 5th lumbar vertebra is close to the lumbar nerve roots. Consequently, when the connective tissue bridging the bony hiatus is injured, the resultant hemorrhage and edema may irritate the nerve roots. Macnab spoke of displacement of the vertebra forward associated with narrowing of the two inferior intervertebral foramina. The osteoarthritis which occurs in the articular joints may be associated with marked capsular thickening, and occasionally there is spur formation on the posterior edge of the displaced vertebral body. Any one or all three of these factors may play a part in root compression. Macnab also thought that the roots may be compressed by the lamina of the displaced vertebra or by an associated prolapsed intervertebral disc.

Low back symptoms in patients with spondylolisthesis are probably caused by narrowing of the intervertebral disc and arthritic changes in the lumbosacral articulation, Caldwell stated, rather than by progressive displacement of the spinal column with consequent drag upon the supporting ligaments.

*16 Hampton Village Plaza, St. Louis 9, Missouri.
The classical treatment of spondylolisthesis has been lumbosacral fusion by either the Hibbs or Albee method or some variation or combination of the two. Myerding's results with fusion in 118 patients are recorded as: good in 60.1 per cent; improved in 28 per cent; and unimproved in 11.9 per cent. Guri reported 69.2 per cent of good results in 39 patients treated by spinal fusion, and only 41.1 per cent in 34 patients treated by conservative measures. Briggs and Keats emphasized the poor results obtained with conservative treatment. They presented 18 patients operated on for the relief of backache and leg pain associated with spondylolisthesis. In 9 patients with no history of leg pain and no evidence of root compression, the operation consisted of laminectomy of the affected vertebra with subsequent Hibbs type of fusion. In the other 9 patients with nerve root involvement and severe pain in the legs, a thorough exploration of the intervertebral foramina was necessary. In addition to the laminectomy and chip fusion, the authors performed a foraminotomy of the roots compressed on the side of the sciatic pain or bilaterally if there was pain in both legs. When they removed the roof of the foramen with a sharp osteotome and curette, the nerve root seemed to bulge out and expand. The exposed roots were covered with fat grafts. Performing a Hibbs fusion in routine manner, they were careful to cover the area of the exposed dura mater and roots with small, flat bone chips. They found a disc protrusion in only 1 of the 9 patients with sciatica. These authors stated that a fusion is always necessary and have obtained good results in 18 patients operated on.

SYMPTOMS

Low back pain is usually the first symptom in spondylolisthesis. This low back pain may be severe and is often disabling and chronic. A trifling injury may bring on acute pain. Besides low back pain, unilateral or bilateral sciatic radiation is common in the more severe degrees of the disease. Sometimes the pain will be so predominately unilateral that one suspects the presence of an intervertebral disc lesion. The pain may radiate along the course of the sciatic nerve to the foot and may be increased by coughing, sneezing, and straining at stool. Forward bending and straight leg raising are likewise painful.

PHYSICAL FINDINGS

The physical findings depend largely on the degree of spondylolisthesis. There may be no neurological findings, and diagnosis may depend entirely upon x-ray. In the more advanced degrees of spondylolisthesis, there is a definite offset; the 5th lumbar spine is displaced over the 1st sacral so that one can feel a definite ledge when he examines the patient in the upright and flexed positions. Signs of bilateral or unilateral compression of the 5th lumbar and 1st sacral roots are often present. They consist of weak or absent ankle jerks, hypesthesia over dorsum of foot and lateral aspect of the calf, and atrophy and weakness of lower leg musculature.