Case Reports and Technical Note

Cauda Equina Compression Due to Spondylolisthesis with Intact Neural Arch*  
Report of Two Cases

RICHARD MOIEL, M.D., AND GEORGE EHN, M.D.  
Division of Neurological Surgery, Baylor University College of Medicine, Houston, Texas

Spondylolisthesis, a forward slipping or displacement of one vertebra on the bone below, was first described by pathologists and obstetricians in the early 19th century. Its severest form was found to be an obstruction to childbirth.1 Most patients with spondylolisthesis have discontinuity of the neural arch, but this feature (spondylolysis) is not invariably present. Some regard spondylolisthesis with spondylolysis as the genuine form of the disease, and use the term "pseudo-spondylolisthesis" (or lumbosacral subluxation) when the neural arch is intact and the slipping the result of malorientation or other defect of the facets.2,4-6 The probability of damage to the cauda equina depends upon whether spondylolisthesis occurs with or without separation of the neural arch from its body. In the former, damage is rare; in the latter, it can be severe.8

Before the discovery of roentgen rays 75 years ago, W. Arbuthnot Lane described a patient in the latter group.9 She was a 35-year-old servant in the employ of a lunatic who frequently believed himself to be playing cricket. With a heavy stick he struck furniture and other objects in reach, imagining them to be cricket balls. On many occasions he struck his servant in the low back with his stick. She developed insecure gait, weakness of the back, diminished sensation in the legs, and other findings which suggested compression of the cauda equina. At exploration, Lane found the spinous process and lamina of the L-5 vertebra displaced forward. During removal of the laminae of L-4 and L-5, the cauda equina was found compressed between the lamina of L-5 and the body of the sacrum. The body of L-5 lay 1\(\frac{1}{2}\) inch forward on the sacrum. Clearly this was an instance of spondylolisthesis with an intact neural arch that resulted in cauda equina compression, perhaps the first and still one of the best described cases of this sort.

We are reporting two comparable cases in which a severe neurological lesion was caused by compression of the cauda equina between the neural arch of L-5 and the body of the sacrum.

Case Reports

Case 1. The patient, an obese housewife, began to have backache in 1945 following hystereotomy for excessive bleeding. In 1959, at the age of 53, cervical stump removal and cystocele repair were performed under spinal anesthesia. Following this she lost control of anal and urinary sphincters, had pain in the buttocks extending down the back of the right leg, and paresthesia in the perineum and legs. Over a period of 4 years she and her physicians believed that she had suffered "nerve damage" from the spinal anesthetic.

Examination. The patient was first seen by us in 1963 when she was 57. She displayed diminished sensation in the sacral dermatomes bilaterally. Motor power in the legs was normal except for weakness of the right gluteus. Neither Achilles reflex could be elicited, but the other reflexes were normal. Lumbosacral spine x-rays revealed a second degree spondylolisthesis at the lumbosacral level with anterior sacral buttressing. There was no spondylolysis; rather, the neural arch of L-5 had moved forward with its body. Lumbar myelography showed a characteristic transverse block where the lamina of L-5 approached the upper posterior edge of the first sacral centrum (Fig. 1). The spinal fluid protein was 46 mg%, and serology was negative.

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Operation. At exploration on September 10, 1963, the spinous process and lamina of the fifth lumbar vertebra lay deep to the back of the sacrum, and the mobility of this neural arch was minimal, that is, it was firmly attached to its centrum. The lumbosacral yellow ligament was broad, delicate, and appeared normal. The laminae of the fourth and fifth and the first sacral segments were removed. A sharp declivity measuring 1.6 cm was found where the anterior wall of the sacral canal merged with the back of the L-5 body. The prelaminectomy anteroposterior dimension of the spinal canal at this point had, of course, been reduced by this amount. The plane of the facets was observed to be horizontal.

Postoperative course. When last seen 3 years after laminectomy, the patient had recovered strength in the right hip extensors as well as sensation below the knees, but still had serious difficulty controlling the bladder.

Case 2. An 11-year-old girl was admitted in 1966 with progressive low back pain and numbness in the buttocks and posterior thighs, which during the last few years was severely aggravated by walking.

Examination. When examined on the orthopedic service, the patient had no weakness in the legs, but the Achilles reflexes were greatly diminished bilaterally. X-ray examination showed a third-degree spondylolisthesis of L-5 on the sacrum.

First operation. In June, 1966, bilateral spinal fusion from L-4 to S-1 was performed. The neural arch of L-5 was noted to be stable and displaced anteriorly with respect to S-1.

Postoperative course. The patient was devoid of sensation in the saddle area and was unable to void voluntarily or to control the rectal sphincter. Post-operative x-rays displayed the fusion mass from L-4 to the upper sacrum, but no change in the degree of the spondylolisthesis. Lumbar myelography showing the termination of the thecal sac at the level of L-5 was interpreted as a normal variant. The protein in the cerebrospinal fluid was 65 mg%. Cystometry after hospital dismissal showed the bladder to be paralyzed with no detrusor contraction at any