NERVE-ROOT ANOMALIES IN LUMBAR-DISC SURGERY

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The finding of anomalies of nerve roots during operations on lumbar discs either has escaped the surgeon’s observations or has been considered relatively unimportant. We report our observations describing three varieties: the conjoined roots, the transverse root, and the anastomotic roots.

The analysis of our cases and the few reported in the literature suggests that the procedure of removal of lumbar discs and/or decompression of anomalous nerve roots has been somewhat unrewarding. Furthermore, we have been under the impression that some of these anomalies may cause pain without the presence of a herniated disc.

We hope to stimulate others to be alert for these anatomical variants and to report their findings in order to further elucidate this problem.

CASE REPORTS


O.T.S., a 46-year-old farmer, 10 weeks prior to examination, during heavy lifting, started to have low-back pain. It was severe enough to keep him away from work, and he had been almost nonambulatory since onset. The pain was localized and without radiation, disappeared when lying down, but was present or worse with movement or strain.

Examination. Neurological findings were normal, including Lasègue’s sign bilaterally, but there was loss of lumbar lordosis with marked spasm of muscles. Cerebrospinal fluid contained 30 mg. of protein. Myelography revealed indentation at the 5th lumbar interspace.

Operation. Partial hemilaminectomy at L4 and L5 was performed. No protrusion of disc was found at L5 level, but the L5 root was found emerging at a right angle from the dural sac, and passing directly to its intervertebral foramen after a brief transverse course (Fig. 2a). No abnormality of disc was found at this level. Exploration at L4 did not reveal evident protrusion of the disc, but it was found to be quite soft. It was opened and a piecemeal removal was carried out.

Evolution. Four months after surgery, patient remained symptomless.

Case 2. Usual history of disc and neurological findings. Herniated disc overridden by conjoined L5 and S1 roots. Minor relief.

C.V., a 30-year-old Negro truck driver, was examined 2 months after injury of his back. He suffered pain which initially radiated along the left leg, but later spread into the right gluteus, thigh, and to the knee. There was severe tingling in the right leg. The pain was worse when arising from sitting or lying on his back.

Examination. There was a positive Lasègue’s sign bilaterally. Reflexes were equal, but slight weakness of the extensor hallucis longus, as well as slight sensory impairment, probably in the L4 distribution, were found.

Operation. Exploration with patient in lateral position was carried out. Partial hemilaminectomy at L4 permitted satisfactory observation of normal-looking disc and L4 root. Partial laminectomy of the lower rim of L5 lamina exposed the L5 and S1 roots, conjoined in a common trunk, not longer than 1 cm. The L5 root went out from the dura mater in a perpendicular course whereas the S1 coursed obliquely downward to normal exit from spine (Fig. 2b). A bulging paracentral lumbar-sacral disc was found and removed.

Evolution. The patient kept complaining of variable pain in his back and his leg, particularly on arising from sitting position. On wearing a brace, some improvement was obtained. Disability was still present 6 months after operation.

Case 3. Three unsuccessful explorations for low-back and leg pain. Last one showed conjoined L5 and S1 roots and no herniation of disc.

F.R.M., a 60-year-old housewife, about 2½
years prior to examination, suffered severe low lumbar pain which was aggravated by motion. Myelography at that time revealed slight deviation of the contrast medium at L5 interspace. Following this procedure, pain became worse and radiated to buttocks. She was operated upon elsewhere; bilateral exploration of L4 and L5 interspaces was carried out through L5 laminectomy. Following operation, the patient continued to suffer from numbness and pain in her right back, hip, and all of leg. This persisted to point that 1 year later the area was explored again elsewhere; no abnormality was found. The pain was unmodified. When admitted to hospital, the patient complained of dull, boring pain in the lumbar area, and numbness, or “woody” feeling of the right leg and ankle. Pain was worse on movements or strain at which time it radiated along the thigh to her toes.

**Examination.** Abnormal neurological findings were moderate spinal spasm, some weakness of the extensor hallucis longus, depressed left Achilles reflex, and sensory changes within the distribution of L5 and S1 roots. Lasègue’s sign was negative. Myelography revealed the same changes as were found the first time. In view of the uncontrollable pain, operation was advised.

**Operation.** With the patient lying on her side, the previous scar was excised, and the roots were clearly identified. The S1 and L5 roots on the left side were found arising from a common trunk. The L5 root ran a course perpendicular to the dura mater, and S1 ran obliquely downward (Fig. 1). Careful dissection of roots from scar tissue was carried out. No further herniation of disc was demonstrated.

**Evolution.** The patient has shown practically no change since operation. She complains of pain in the leg as well as pain in her back.

**Case 4.** Chronic low-back and gluteal pain. Midline herniation of L4 disc and conjoined L5 and S1 roots at one level below. Poor results.

B.C.R., a 55-year-old white housewife, complained of lumbosacral and right gluteal pain for approximately 4 years. It was worse under movements or strain, and often radiated as a sharp or dull ache into the right groin. There was complaint of pain in the vagina.

**Examination.** There was marked spasm of the spinal muscles and Lasègue’s sign was present. The right leg was thinner than the left, particularly at the calf. The patient was of neurasthenic type. Myelography carried out 1 year previously had shown persistent defect at L4 right. Repeated myelography previous to operation corroborated the findings.

**Operation.** Exploration was made with patient in lateral position. Subtotal hemilaminectomy of L4 and total of L5 had to be carried out. The L4 root was found lying over a mid-line protrusion of disc, which was removed. The S1 nerve root was fused with L5 to form a larger common trunk, less than 1 cm. long, originating from the lumbar area down (Fig. 2d). It was impossible to retract these roots medially or downward. Exploration of the lumbosacral disc was carried out with great difficulty through an anomalous axilla of S1 root. The disc was hard and somewhat elevated, but not ruptured. Complete hemilaminectomy was carried out to evaluate the anomaly properly and to provide suitable decompression.

**Evolution.** During 3 months after operation, the patient continued to complain of rectal-vaginal burning pain. There was no catching pain in the back, but there was soreness in the leg. Her emotional unbalance was outstanding.

**Case 5.** Recurrent lumbar sciatica with neurological symptoms. Bifid sacrum and situs inversus of abdominal viscera. Lumbosacral herniation of disc and overriding conjoined L5 and S1 roots. Backache not relieved.

F.F.C., a 34-year-old housewife, had a 2-year history of low backache until 2 months prior to examination. Heavy lifting then produced low-back pain and bilateral sciatica. Backache was noted on turning of head. Pain was aggravated...