ORIGINAL ARTICLE
นิพนธ์ต้นฉบับ

Conjoined Lumbar Nerve Roots Associated with Neurofibroma and its Surgical Treatment, A Case Report

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The author reports a case of conjoined L_4 and L_5 nerve roots associated with neurofibroma of the S_1 root on the same side. The patient came to the hospital with symptoms of nerve root tumor. The rare conjoined nerve roots were found coincidentally during operative treatment of the tumor. Conjoined nerve roots are more susceptible to compression and entrapment and they require appropriate treatment. A review of the literature and management of this condition are discussed.

Index : conjoined nerve roots, neurofibroma, sacralization.

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ความผิดปกติแต่กำเนิดของเส้นประสาทไขสันหลัง Lumbar เกิดร่วมกับ Neurofibroma ของเส้นประสาท Sacrum และการรักษา

*ณรงค์ ปวีณเวชวสุ**

ได้รายงานผู้ป่วย 1 ราย เป็น conjoined nervw roots L_4 และ L_5 ด้านซ้าย ร่วมกับ Neurofibroma S_1 ด้านซ้าย Conjoined nerve roots เป็นความผิดปกติซึ่งพบได้น้อยมาก และเมื่อเกิดร่วมกับภาวะบางอย่างจำเป็นต้องได้รับการรักษาที่เหมาะสม ได้รวบรวมรายงานเกี่ยวกับ conjoined nerve roots และการรักษามารายงานไว้ในคำวิจารณ์ด้วย

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Introduction

Anomalous nerve roots do not by themselves provoke symptoms unless there are associated factors causing neural entrapment. The most frequently encountered abnomality is a common dural origin of two nerve roots exiting through a single intervertebral foramen. Because of their size and being rather fixed to surrounding structures, minor degrees of compression or entrapment are amplified. Water-soluble myelography provides an opportunity to recognize the anomaly preoperatively, if carefully look for.

Case Report

Clinical presentation

This 35 year-old-woman was hospitalized with a 5-year history of low back pain and sciatica of her left leg for 1 month. Physical and neurological examinations revealed spasms of the back muscles and a limping gait. Straight-leg-raising tests of the right side was about 70 degrees and for the left side was about 45 degrees, with pain in the left calf. There was no local tenderness at the spinous process of the lumbosacral level, and the motor power of the lower limbs was unremarkable. Hip joint and sacroiliac joint movements were normal. The left ankle jerk was absent and all other DTR were within normal limits. Plain X-rays of the lumbosacral spine showed decreased lordosis and sacralization of the L_5 vertebra. Myodil myelography was performed and an showed intradural spindle shaped mass beginning at the L_{3-4} level with partial block of the contrast medium at that level. Two close nerve root shadows at L_{4-5} left side were demonstrated but first thought to be the effect of pressure from the tumor (Figure 1).

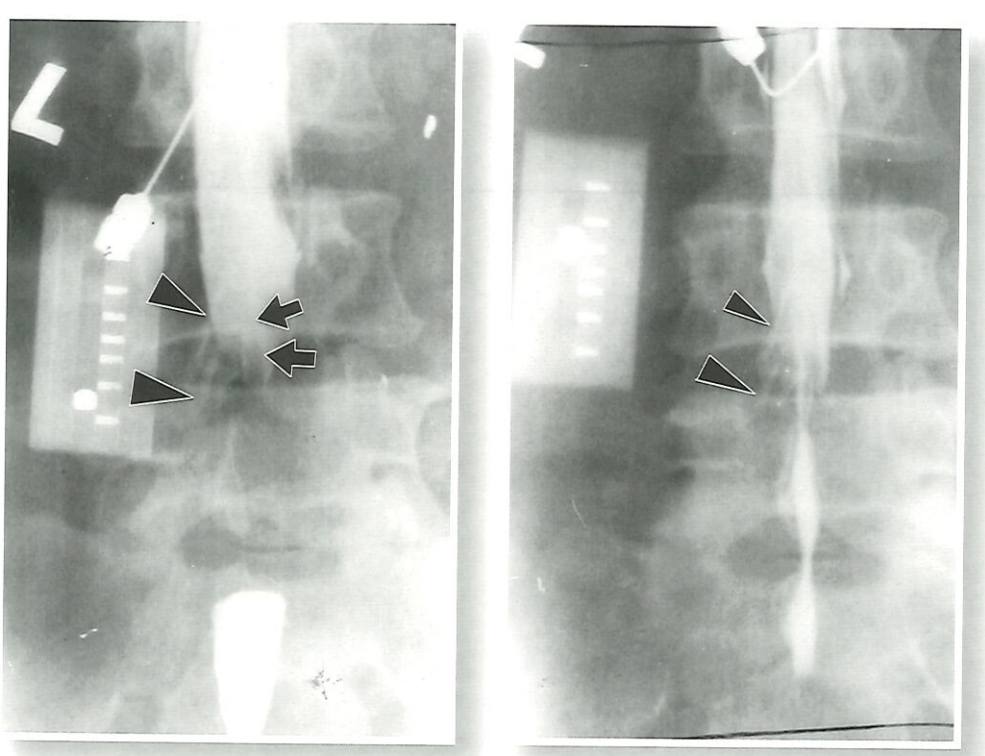
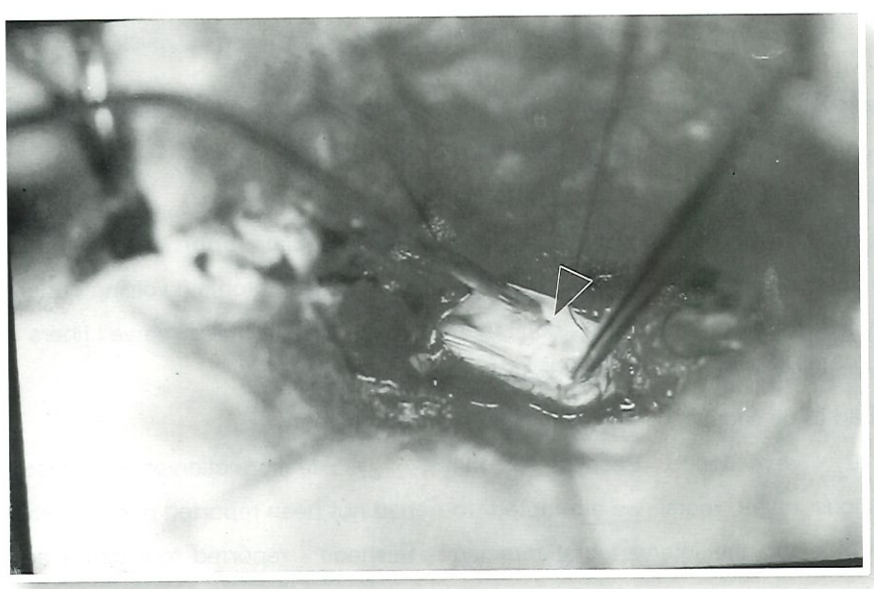


Figure 1. Myodil myelography showed an evidence of an intradural spindle shape mass beginning at L_{3-4} level with partial block of the contrast medium (left, arrows). Two closed nerve roots are seen at left L_{4-5} intervertebral foramen (right and left, arrow heads).

2 A



2 B

Figure 2. Operative finding after resection of nerve root tumor showing two nerve roots exiting at the same left L_{4-5} level (2A, arrow) as compared to right L_{4-5} level (2B, arrow head).

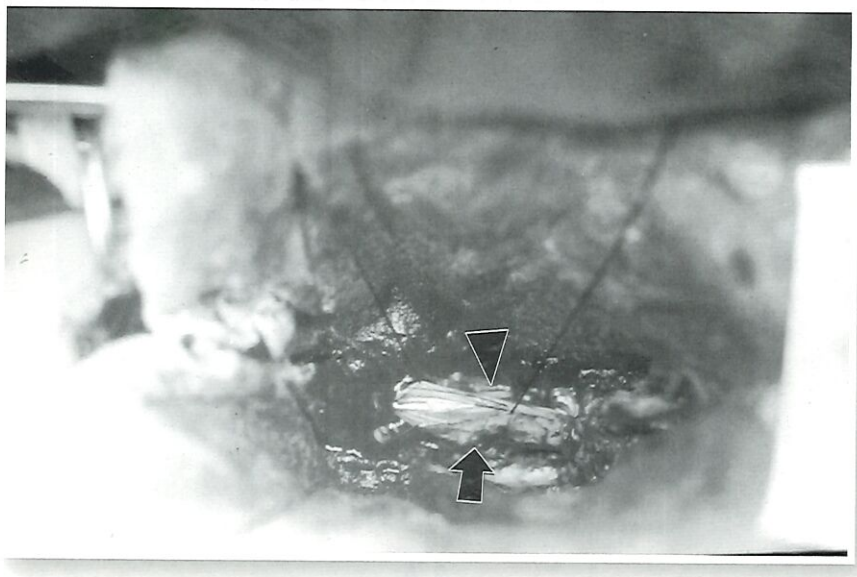


Figure 3. Operative finding after dura mater was reflected medially showing conjoined root sleeves of L_4 and L_5 at left L_{4-5} intervertebral foramen (arrow) as compared to right L_4 root (arrow head).

Operation

An operation was performed to solve the problem. A total laminectomy of L_4 and L_5 were done and the dura mater opened. A spindle shaped tumor of the S_1 nerve root, size 0.8 x 1.5 cm., was found and conjoined L_4 and L_5 nerve roots exiting through the same left L_{4-5} intervertebral foramen was confirmed (Figure 2). A total resection of the tumor was done and the S_1 nerve root had to be sacrificed. No intervertebral discs at L_{3-4} and L_{4-5} were found. Because of the rather fixed anomalous nerve roots, we attempted to explore and follow it along the intervertebral foramen to search for other pathology outside of the dural sac. During that procedure we had to perform wide foraminotomy, unroof lateral recess, and medial facetectomy, but no other pathology was found except for moderate compression from lateral recess stenosis and the anomalous conjoined L_4 and L_5 roots exiting through the same intervertebral foramen (Fig. 3). After the operation the patient was completely relieved of her sciatic pain and made an uneventful recovery through 5 years of follow-up except for hypalgesia at the left S_1 dermatome.

Pathological report

1. Neurofibroma involving ganglion with hyalinization
2. Hypertrophied nerve fibers

Discussion

Malformation of nerve roots in the lumbar region had not been reported prior to 1952 until Ethelberg and Riishede[1] reported four cases among a total of 1162 patients operated on for herniated discs in 8 years. In none was a frankly herniated disc found. Cannon, et al.,[2] 1962, found five cases in the course of lumbar disc surgery, and in one patient,when the root was opened, the ganglion was seen in an abnormal location in the conjoined root sleeve. Wober and Bock,[3] 1971, presented five patients with anomalous nerve roots from a total of 1900 operations for lumbar nerve root compression. Four patients had prolapse discs and one

had a large epidural vein with no other pathology. Pecker, et al.,[4] 1974, using water - soluble contrast myelography (Dimer-X) clearly demonstrated the conjoined nerve root anomaly. Agnoli AL,[5] 1976, reviewed 20 cases of his own and 18 cases from the literature, and found that the most frequently encountered abnomality was a common dural origin of two nerve roots exiting through a single intervertebral foramen. Other anomalies included intraradicular connections and Y-shaped or horizontally disposed nerve roots. The clinical findings in all cases reviewed suggested a prolapsed intervertebral disc. Rask M.R,[6] 1977, described two patients in whom both roots made their exit though the same foramen. Bouchard, et al,[7] 1978, presented 12 patients with conjoined nerve roots and described asymmetry of the root exit zones when comparing both sides in the myelography. At surgery, a relatively fixed conjoined root was observed, compressed by a small herniated disc. They recommended a larger surgical exposure by means of hemilaminectomy because of the fixation of the nerve roots and difficulty in retraction. In the case explored by Ciric, et al.,[8] 1980, the dura mater was opened and the roots were found in a common arachnoidal sheath extending proximally into the cauda equina. The abnormalities were considered to be defects in migration of the roots during embryological development. Epstein, et al,[9] 1981, described the management of eight patients with conjoined nerve roots among 707 patients operated on for herniated discs. The diagnosis of the anomaly in all cases were made preoperatively by water-soluble contrast myelography. Seven of these patients had small herniated discs, and one had lateral recess stenosis without disc herniation. They recommended wide exposure by hemilaminectomy with unroofing of the lateral recess and wide foraminal decompression because an improper surgical approach in exposure and in removing the underlying herniated disc might result in serious neural injury. In one case, they had to perform laminectomy over three levels because of frank evidence of spinal stenosis. In three patients, the abnomalities occurred at the L_{4-5} level and in five patients occurred at the L_5 S_1 level. Conjoined nerve roots may be miss-diagnosed as a herniated disc when using myodil myelography.[9] With water-soluble myelography there is much more likelihood for recognizing the anomaly preoperatively.[4]

The conjoined nerve roots by themselves are asymptomatic. It has broader root sleeves occupying space between two pedicles. Because of its size and being rather fixed to the surrounding structures it is more susceptible to any factors that compromise the depleted reserve space. The effects of compression or entrapment, such as lateral recess stenosis or a minor herniated disc or other space taking lesions, are thus amplified.[9] In the presence of spinal stenosis which depletes the available space, laminectomy, unroofing of the lateral recess, foraminotomy, and medial facetectomy are mandatory.[9] In our case, except for laminectomy for the treatment of the neurofibroma, we found lateral recess stenosis and performed foraminotomy, unroofing of lateral recess and medial facetectomy for the previously stated reason and because from the literature review it was the appropriate treatment for the patient. The tumor in this case was the cause of back pain, sciatica and absence of ankle jerk. The conjoined nerve roots, which is a very rare finding, and has never before been reported before in a Thai patient, had been successfully treated.

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