

Cauda Equina Herniation

Yasuharu NAKASHIMA, Kazuhiro OHNARU and Yoshihiro MIKAWA

*Department of Orthopaedic Surgery, Kawasaki Medical School,
Kurashiki 701-0192, Japan*

Accepted for publication on January 10, 2006

ABSTRACT. The author describes a case of a 55-year-old man who presented with severe low back pain and paraparesis due to cauda equina herniation. Diagnosis was made with a suspected spinal fluid leakage in T2 weighted MR images. In surgery, herniated cauda equina roots through a rent of the dura mater were noticed and the dura was repaired. There has been no reports on idiopathic cauda equina herniation and this is the first report.

Key words : cauda equina — herniation

CASE REPORT

A 55 year old man had bilateral sciatic pain in the S1-dermatomes, as well as a 3 month history of intermittent claudication occurring after a gait of 200 meters.

On examination, the patient had a positive left SLR test, sensory deficit in the left S1 distribution, and a mild paresis of the toe flexors. Neuroradiologic examination demonstrated left eccentric lumbar disc protrusion at the L5/S1 level.

At surgery, ossification of the posterior longitudinal ligament was found at the L5/S1 disc level, but only bilateral fenestration operation was performed. The surgical procedure proceeded uneventfully. Postoperatively, the patient experienced considerable improvement in symptoms, and he returned to work doing well.

Two months status post surgery, the patient complained of slight bilateral leg weakness with gait disturbance. Four days later, the patient suddenly complained of severe bilateral sciatic pain below the inguinal level and an inability to walk secondary to pain.

On examination, the patient was afebrile, with a negative SLR test, a sensory deficit in the bilateral S1 distribution, and a mild paraparesis of the toe extensors.

Because the patient could not lie still secondary to severe pain, MRI images could not be obtained. Based on the history of his illness, the pain was thought to be secondary to recurrent or new disc herniation. Epidural and bilateral L5 and S1 spinal nerve root blocks were performed with no pain amelioration. Subsequently, the patient's paraparesis worsened, with loss of bowel and bladder control. Lumbar MRI was performed under general anesthesia. A small, new disc herniation was demonstrated at the

L3/4 disc level, with no abnormal changes demonstrated at the L5/S1 level of the previously performed fenestration operation. A MR-T2 weighted image showed a high intensity line in the L3/4 interspinous space, suggestive of spinal fluid leakage (Fig 1).

Bilateral L3/4 fenestration with discectomy was performed. On flavectomy at the lower part of the right L3 lamina, a few prolapsed, tangled cauda equina roots were found to have herniated through a small dural rent (Fig 2). The tangled cauda equina roots were naked, devoid of arachnoid membrane cover, but there was no gross evidence of cerebrospinal



Fig 1. A MR-T2 weighted image showing a high intensity line in the L3/4 interspinous space, suggestive of cerebrospinal fluid leakage.



Fig 2. Intraoperative microphotograph, showing a few prolapsed, tangled cauda equina roots dorsal to the dura mater.

fluid leakage. The dural rent was dorsal, longitudinally oriented and about 10 mm in length. After the herniated cauda equina roots were repositioned gently into the dural sack, the dural rent was sutured.*

After the operation the patient's pain had completely resolved. At 2 years and 3 months after operation, although the patient's mild paraparesis with sensory deficit persisted, he could walk without assistance and had near normal bladder control.

DISCUSSION

Although reports of idiopathic spinal cord herniation,^{3,7,11)} cauda equina herniation associated with lumbar fractures,^{1,2,6,9)} and herniation of a nerve root secondary to dural laceration at lumbar puncture/surgery^{4,5,8,10)} have been published previously, there have been no published reports of idiopathic cauda equina herniation.

The dural laceration might have occurred during myelography prior to the first surgery, although spinal puncture for myelography is usually performed at the L4/5 or L5/S1 level. Even if the myelography puncture had been performed at the L3/4 level, two months had passed since the first operation, making it difficult to conjecture that the cauda equina herniation could occur at a time so remote to the original insult.

In sudden onset of severe leg pain and acute progress of motor/sensory disturbances with bladder disfunction, idiopathic cauda equina herniation should be added to the differential diagnoses. MRI findings of cerebrospinal fluid leakage is a key finding for this diagnosis.

REFERENCES

- 1) Camisa FP, Eismont FJ, Green BA : Dural laceration occurring with burst fractures and associated laminar fractures. *J Bone Joint Surg* **71-A** : 1044-1052, 1989
- 2) Denis F, Burkus JK : Diagnosis and treatment of cauda equina entrapment in the vertical lamina fracture of lumbar burst fractures. *Spine* **16** : s433-439, 1991
- 3) Dix JE, Griffitt W, Yates C, Johnson B : Spontaneous thoracic spinal cord herniation through an anterior dural defect. *AJNR Am J Neuroradiol* **19** : 1345-1348, 1998
- 4) Hasegawa K, Yamamoto N : Nerve root herniation secondary to lumbar puncture in the patient with lumbar canal stenosis. A case report. *Spine* **24** : 915-917, 1999
- 5) Kothbauer KF, Seiler RW : Transdural cauda equina incarceration after microsurgical lumbar discectomy : case report. *Neurosurgery* **47** : 1449-1451, 2000
- 6) Miller CA, Dewey RC, Hunt WE : Impaction fracture of the lumbar vertebrae with dural tear. *J Neurosurg* **53** : 765-771, 1980
- 7) Miyake S, Tamaki N, Nagashima T, Kurata H, Eguchi T, Kimura H : Idiopathic spinal cord herniation. *J Neurosurg* **88** : 331-335, 1998
- 8) Nishi S, Hashimoto N, Takagi Y, Tsukahara T : Herniation and entrapment of a nerve root secondary to an unrepaired small dural laceration at lumbar hemilaminectomies. *Spine* **20** : 2576-2579, 1995
- 9) Pickett J, Blumenkopf B : Dural lacerations and thoracolumbar fractures. *J Spinal Disord* **2** : 99-103, 1989
- 10) Toppich HG, Feldmann H, Sandvoss G, Meyer F : Intervertebral space nerve root entrapment after lumbar disc surgery. *Spine* **19** : 249-250, 1995
- 11) Wada E, Yonenobu K, Kang J : Idiopathic spinal cord herniation. *Spine* **25** : 1984-1988, 2000