Intradural Migration of a Sequestrated Lumbar Disc Fragment Masquerading as a Spinal Intradural Tumor

Hyeong-Suk Kim, M.D., Jong-Pil Eun, M.D., Ph.D., Jung-Soo Park, M.D.
Department of Neurosurgery, Research Institute of Clinical Medicine, Institute for Medical Science, Chonbuk National University Medical School and Hospital, Jeonju, Korea

Intervertebral intradural lumbar disc herniation (ILDH) is a quite rare pathology, and isolated intradural lumbar disc herniation is even more rare. Magnetic resonance imaging (MRI) may not be able to reveal ILDHs, especially if MRI findings show an intact lumbar disc annulus and posterior longitudinal ligament. Here, we present an exceedingly rare case of an isolated ILDH that we initially misidentified as a spinal intradural tumor, in a 54-year-old man hospitalized with a 2-month history of back pain and right sciatica. Neurologic examination revealed a positive straight leg raise test on the right side, but he presented no other sensory, motor, or sphincter disturbances. A gadolinium-enhanced MRI revealed what we believed to be an intradural extramedullary tumor compressing the cauda equina leftward in the thecal sac, at the L2 vertebral level. The patient underwent total L2 laminectomy, and we extirpated the intradural mass under microscopic guidance. Histologic examination of the mass revealed a degenerated nucleus pulposus.

Key Words: Intradural disc herniation · Spinal intradural tumor · Magnetic resonance imaging.
Intradural Lumbar Disc Herniation | HS Kim, et al.

Intradural Lumbar Disc Herniation (ILDH) is a rare clinical entity, generally detected during surgery, and 92% of such intradural disc herniations (IDHs) are seen at the lumbar level. ILDH's reported incidence is 0.04-0.33% of all lumbar disc herniations. The most commonly affected site is L4-5 (55%), followed by L3-4 (16%) and then L5-S1 (10%). Although some authors, including Han et al., have reported ILDHs at the L2-3 level, such are quite rare. Moreover, intradural migration of disc fragment, to the level of the vertebral body from the level of ruptured intervertebral disc space, is particularly rare.

Although researchers are not certain of IDHs' disease mechanism, the most widely accepted hypothesis states that adhesion between the ventral dura and PLL leads to the subsequent perforation of these firmly adhesive tissues, including the annulus fibrosus, due to the increased intradiscal pressure. Floeth and Herdmann have reported that the herniated fragments work like a fingertip and the relative movements of the lumbar spine lead to a repetitive impression of the fixed dural sac and subsequent to a chronic inflammation and erosion process with thinning of the dura. Finally, the ligament and the adherent dura sheets are perforated and free disc material can herniate into the dural sac. Furthermore, some studies suggest that dense adhesions, whether congenitally formed or caused by trauma, previous surgery, inflammation, or osteophyte or disc protrusion, fixate the dural sac. Many previous studies report seeing ILDH most frequently at the L4-5 level; the fact that the L4-5 level shows the densest adhesions between the PLL and ventral dura supports the hypothesis.

ILDH's clinical symptoms generally include long-lasting low back pain and signs of cauda equina syndrome. ILDH above the conus medullaris seems to lead to neurological dysfunction more rapidly than does ILDH below the conus medullaris. However, cases may present solely with signs of root compression.

Myelography and myelo-computed tomography can accurately reveal this pathology, typically showing a complete blockage of the contrast medium, but these imaging methods do not allow the physician to characterize the compression's nature. Although CT can provide valuable information, it cannot reliably identify intradural disc ruptures. Benyamin et al. report an incident diagnosis of ILDH that occurred during a discography. In that case, the physicians saw the annular fissure and extrusion of the injected contrast medium into the intrathecal space on the discography.

DISCUSSION

Fig. 1. Preoperative MRI. A: A 10×23 mm sized isointense mass-like lesion on sagittal T1-weighted image (arrow) B: Inhomogenous signal intensity on T2-weighted image.

Fig. 2. Gadolinium-enhanced axial image shows peripherally enhanced of the lesion.

Fig. 3. Intraoperative photograph. Yellowish mass occupying the thecal sac (white arrow) and peripheral displacement of the adherent cauda equine nerve roots (black arrow).
MRI is regarded as the most reliable method for diagnosing ILDH, and indeed for diagnosing any IDH. A study by Choi et al. presented a T2-weighted image showing the PLIs loss of continuity and its sharp, beak-like appearance, which presages an IDH. Wassestrom et al. reported an IDH with a rim enhancement pattern visible on a gadolinium-enhanced MRI. In spite of these diagnostic modalities for ILDH, the preoperative diagnosis of ILDH is difficult due to gadolinium-enhanced MRI being in limited use and to ILDH’s rarity and nonspecific presentation. In our case, we also observed a peripheral rim enhancement pattern on the gadolinium-enhanced MRI, but it depicted only a small, inferior portion of the mass.

Mut et al. classified IDH into types A and B. Type A is disc herniation into the dural sac, while type B is disc herniation into the dural sheath, in the preganglionic region of the nerve root. However, classifying IDHs into type A or B presents difficulties, not only because ILDH detection most often occurs incidental to other surgery, but also because Mut et al. based their classification on operative field findings.

In our case, we located an intradural mass-like lesion at the level of the L2 vertebral body and extending into the L2-L3 disc space. Because most of the mass was at the level of the L2 vertebral body and totally within the thecal sac, we thought the mass might be an intradural extramedullary spinal tumor, such as a neurinoma, meningioma, ependymoma, or dermoid. Interestingly, however, biopsy revealed the mass to be an ILDH.

While Sarliève et al. reported the first case of an intradural cranial migration of disc material, the patient in their case had undergone previous spinal surgery. Therefore, that patient had fibrosis and cicatricial arachnoiditis around the dura mater. In our case, the patient peculiarly had no history of trauma, previous surgery, or inflammation in the area. Moreover, he lacked any dural defect comprised of a dense adhesion between the ventral dura and PLL. Therefore, until biopsy revealed the mass was an ILDH, we could not have imagined that the mass was an intradural migration of sequestrated disc material.

CONCLUSION

We report a rare case of an ILDH that migrated upwardly from the level of the disc space to the level of vertebral body. In the treatment of a spinal intradural mass lesion, physicians should keep in mind the possibility of not only spinal tumors but also intradural disc herniation, to insure a correct diagnosis and proper management.

References

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