Spontaneous Resorption of Intradural Lumbar Disc Herniation: A Rare Case Report

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Intradural disc herniation, first described by Dandy in 1942, is a rare pathological condition¹⁻⁵⁾. Because symptoms of this type of herniation are often severe, most patients are treated surgically^{5,6)}. To our knowledge, only two patients have been reported whose intradural herniation showed spontaneous resorption, but they were related to surgical treatment^{5,6)}. One of these patients was local recurrence after surgery and the other one was surgically treated after resorption since leg symptoms were not disappeared. Here, we present a rare observation of a spontaneously resorbed intradural herniation confirmed by magentic resonance images (MRI) in one patient who was managed conservatively.

A 51-year-old man with a 2-week history of bilateral lateral leg pain was admitted to our hospital. Bilaterally, the straight-leg-raising test was positive. Manual muscle testing indicated grade 4 in the tibialis anterior and gastrocnemius muscles and grade 2 in the extensor hallucis longus, and the ankle jerk was decreased, bilaterally. Sensory disturbance was detected on and below the L5 dermatome on the right and on and below the S1 dermatome on the left. No urinary disturbance was present.

MRI revealed a small disc herniation in the epidural space at right L4-5. An irregularly-shaped fragment with isointensity on both T1- and T2-weighted images (WI) filled the dural sac at L4-5 (Fig. 1). On gadolinium-enhanced T1 WI, the intradural fragment demonstrated rim enhancement (Fig. 2). The posterior longitudinal ligament (PLL) at L4-5 was also enhanced. We suspected this was an intradural herniation at L4-5 and to confirm it, discography using 2 ml of the contrast medium was performed. The computed tomogram after the discography showed the contrast medium entering the subdural space but not into the subarachnoid space (Fig. 3), which possibly indicated that the herniation was located between the dura mater and the arachnoid.

During the examination period, the patient's symptoms improved markedly; therefore, conservative treatment was continued. The volume of the herniation was significantly decreased at 40 days, 4 months, and 7 months after the initial examination (Fig. 4). Thirteen months after symptom onset, the patient's pain and neurological deficits had completely resolved, and no recurrence was detected by MRI (Fig. 4).

A herniated mass rarely enters the intradural space by breaking the dura mater. The incidence of intradural herniation is very low with 0.04%-0.33% of all lumbar disc herniations²⁻⁵⁾. The possible causes of the invasion of disc herniation into the dura mater have been discussed as follows: congenital or acquired adhesions between the PLL and the dura mater occur first, before the herniation penetrates the dura mater. Hypertrophy of the PLL accompanied by osteophytes may cause chronic irritation of the dura mater, which increases fragility of the anterior wall of the dura²⁻³⁾. Then, the weakened dura mater may be broken by herniated disc materials.

Only two patients have been reported demonstrating spontaneous resorption of an intradural herniation^{5,6)}. Sakai et al. reported a patient with an L2-3 intradural herniation removed surgically. However, 9 months postoperatively, the herniation recurred and another 9 months later, spontaneous resorption was confirmed by MRI⁵⁾. Borota et al. reported a patient with similar herniation at L4-5⁶⁾. Although the intradural herniation had disappeared on MRI after 8 months,

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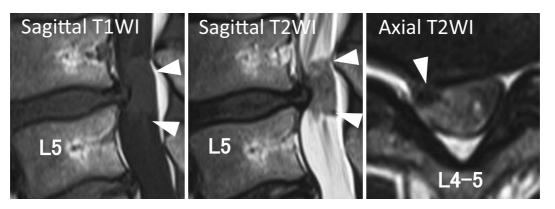


Figure 1. Magnetic resonance images at the initial visit.

An irregularly-shaped, isointense fragment on T1- and T2-weighted images is seen in the cerebrospinal fluid (arrowheads). Cauda equina cannot be confirmed in the axial image.

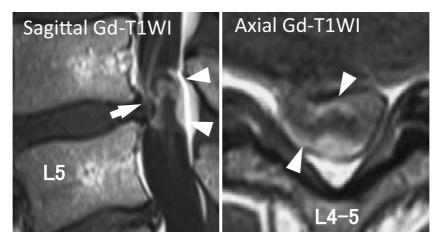


Figure 2. Enhanced magnetic resonance images at the initial visit. The fragment inside the dura mater shows rim enhancement (arrowheads). In addition, the posterior disc wall or the posterior longitudinal ligament at L4-5 is also enhanced by gadolinium (arrow).

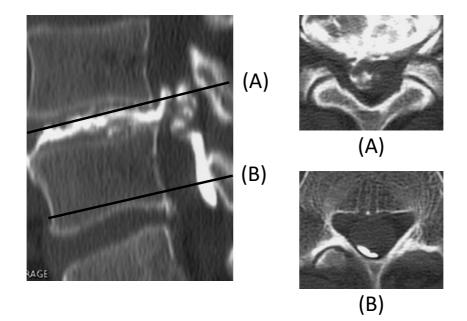


Figure 3. Computed tomography after discography at L4-5. The contrast medium enters the intradural space but does not spread into the sub-arachnoid space (A: L4-5 disc level, B: Caudal part of L5 vertebra).

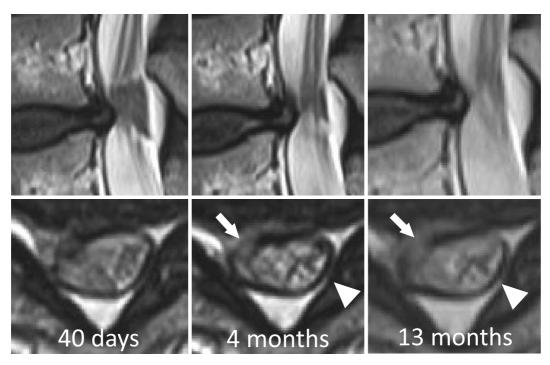


Figure 4. Follow-up magnetic resonance image at 40 days, 4 months and 13 months postoperatively. The intradural herniated mass gradually decreases after surgery. In axial planes, the mass decreases from middle to right side, and cauda equina is clearly seen (arrowheads). There is a discontinuity of dura mater at 4 months and 13 months after onset (arrows). It may indicate a dural defect through which the herniation mass passed.

the symptoms were severe, and microsurgical discectomy was performed⁶. Therefore, our patient is the first case whose intradural herniation showed spontaneous resorption with no relation to any surgical interventions.

Vascular formation and inflammatory cell infiltration with several molecules, such as tumor necrosis factor-alpha, are closely-related to spontaneous resorption of disc herniation^{7,8)}. The extradural herniation with rim enhancement on gadolinium-enhanced MRI disappears or markedly decreases in size in 75%-100% of patients^{9,10)}. The intradural herniation in our patient also showed clear rim enhancement, suggesting the herniated mass, particularly its periphery, was a vascular-rich condition. Regardless of the location of herniation, if the herniated mass shows rim enhancement, it may resorb spontaneously.

Conflicts of Interest: The authors declare that there are no relevant conflicts of interest.

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Author Contributions: NM, MS, YK, and SK: Treatment of the patient and correct the data.

TA: correct the data and writing.

Informed Consent: Informed consent was obtained by the participant in this study.

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