

Case Report

Discal Cyst of the Lumbar Spine

Jae Ha Hwang, M.D., In Sung Park, M.D., Dong-Ho Kang, M.D., Jin-Myung Jung, M.D.

Department of Neurosurgery, Gyeongsang National University School of Medicine, Jinju, Korea

Discal cysts are rare lesions that can cause radiating leg pain. Because they are very rare, their natural history and the details of the therapeutic guidelines for the treatment of these cysts are still unknown. A 30-year-old male patient presented to our institute with radiating pain in his left leg and mild back pain. Magnetic resonance imaging (MRI) revealed an intraspinal extradural cystic mass with low signal intensity on T1-weighted images and high signal intensity on T2-weighted images at the L5-S1 level. The partial hemilaminectomy and cyst resection were performed. We report a patient with low back pain and radiating leg pain caused by a lumbar discal cyst and discuss the treatment of this cyst.

KEY WORDS : Discal cyst · Intraspinal · Lumbar spine.

INTRODUCTION

Intraspinal cysts with a distinct connection to the corresponding intervertebral discs have been referred to as discal cysts^{2,9,18}. Discal cysts were recently defined as a clinical entity by Chiba et al.². MRI has recently made it possible to establish a diagnosis and identify the origins of intraspinal cysts^{11,16,19}. However, due to the small number of cases in the literature, the natural history of discal cysts is still unknown. Thus, a definitive description of the treatment of discal cysts has not yet been completely elucidated but nearly all reported discal cysts in the literature have been performed surgical treatment successfully. We report a patient with low back pain and leg pain due to a lumbar discal cyst and discuss the treatment of this cyst.

CASE REPORT

A 30-year-old male patient presented to our institute suffering from mild back pain and severe radiating pain in his left leg despite of treatment with medication and physical therapy for 3 months. He had noted aggravated radiating leg pain over the previous month. The straight leg raising test was positive at 30 degrees in the left leg. The neurological examinations in both lower extremities were

unremarkable. Plain radiography of the lumbar spine showed no remarkable pathological findings. MRI revealed a spherical extradural cystic mass with low signal intensity on T1-weighted images and high signal intensity on T2-weighted images at the ventrolateral side of L5-S1 level (Fig. 1). We considered to perform discography to obtain information of connection between the cyst and the corresponding disc. But, we couldn't perform discography because of patient's refusal of the invasive procedure. The left partial hemilaminectomy was performed at L5-S1 level. A dark blue-colored cyst compressing the left S1 root was visualized over the ventrolateral side of the thecal sac. The cyst contained serous fluid without blood. A connection between the cyst and the L5-S1 intervertebral disc was identified, and the cyst was removed at the base of the connection by dissecting the annulus fibrosus. A round defect in the annulus fibrosus was observed. The apparent connection between the corresponding disc and the cyst was found. There was no evidence of disc herniation (Fig. 2). Histo-



Fig. 1. A, B Sagittal and axial T2-weighted magnetic resonance image of the lumbar spine demonstrating an oval-shaped cyst originating from the left L5-S1 disc.

• Received : April 21, 2008 • Accepted : August 18, 2008

• Address for reprints : In Sung Park, M.D.

Department of Neurosurgery, Gyeongsang National University School

of Medicine, 90 Chiram-dong, Jinju 660-702, Korea

Tel : +82-55-750-8018, Fax : +82-55-759-0817

E-mail : gnuhps@nongae.gsnu.ac.kr



Fig. 2. Intraoperative photograph shows a dark blue colored cyst containing serous discharge. A connection between the disc and the cyst is found after the removal of the cyst.



Fig. 3. Microscopic appearance of the cyst wall and associated soft tissue having areas of myxoid degeneration. There are no epithelial lining cells or disc materials (H&E, original magnification $\times 100$).

logical examination of the cyst wall revealed fibrous connective tissue with hemosiderin deposits without lining cell layers and disc materials (Fig. 3). The patient's low back pain and radiating pain in the left leg improved remarkably immediately after surgery. Six months after surgery, the patient had only a mild back pain without radiating pain in the left leg.

DISCUSSION

The discal cyst is a new clinical entity and it communicates with the intervertebral disc¹⁸. Kono et al. initially described intraspinal extradural cysts as well defined homogeneous cysts located in the ventrolateral extradural space, which displace the dural sac dorsomedially and communicate with the intervertebral disc⁹. Chiba et al. described the clinical presentation, diagnostic imaging features, and histopathological findings associated with discal cysts^{2,18}. Histologically, intraspinal cysts of the facet are referred to as synovial cysts. Although the difference between discal cysts

and synovial cysts is based on the presence of lining cells^{2,18}.

The clinical symptoms of patients with discal cysts are indistinguishable from those of patients with a typical disc herniation manifesting as a unilateral single nerve root lesion^{2,8}. MRI and discography are useful for obtaining a presumptive diagnosis of this disease^{2,8}. In 2006, Lee et al. provided a detailed description of the MRI features of discal cysts¹¹. They reported that the MRI features of discal cysts are : (1) a ventrolateral extradural cyst attached to a lumbar disc, (2) rim enhancement on contrast-enhanced MRI, and (3) occasional extension into the lateral recess. These MRI features are the key to differentiating between a discal cyst and lumbar disc herniation. Discography and CT discography provide a connection channel between the cyst and the corresponding disc, and it is possible to differentiate discal cysts from lumbar disc herniation or other intraspinal cysts^{2,8,13,15,18}. And, intraoperative findings of the apparent connection between the corresponding disc and the cyst are also possible to differentiate discal cysts from other intraspinal cysts^{9,13}. However, whether or not discography is absolutely necessary in all patients with an intraspinal cysts is controversial because the removal of the cyst leads to symptom improvement, regardless of its origin^{2,13}.

The pathogenesis of discal cysts is still unclear. Several pathogeneses, such as resorption of a preexisting herniation and hematoma associated with a disc prolapse, have been suggested¹¹. Kyo et al. reported a case of discal cyst with an annular defect of the corresponding disc¹⁰. Jeong and Bendo argued that the underlying pathological mechanism of discal cysts is not avascular phenomenon but involves a subsequent change in a herniated disc⁷. Tokunaga et al. confirmed the presence of cartilaginous tissue in the cyst wall and thought that the discal cyst might have developed from the absorption process of an intervertebral disc herniation¹⁷. Chiba et al. proposed that discal cysts arise first from an underlying intervertebral disc injury that causes an annulus fibrosis fissure in the posterior intervertebral disc. Hemorrhage from the epidural venous plexus with a rich blood flow then occurs in the space between the peridural membrane and the vertebral body². We agree with Chiba's hypothesis regarding the possible causes of discal cysts because histological examination of the cyst wall revealed fibrous connective tissue with hemosiderin deposits.

Whatever the pathogenesis may be, an intraspinal cyst is responsible for the development of the symptoms in patients with discal cysts. Nearly all reported discal cysts have been treated surgically or with some form of direct intervention. Chiba et al. described eight patients who presented with discal cysts, all of whom underwent surgery². Coscia and Broshears presented two cases of discal cysts

that were also treated surgically⁴). Ishii et al. reported a patient with a discal cyst who was treated with minimally invasive surgery⁶). Recently, several authors reported cases of lumbar discal cysts treated surgically^{11,12,14,15}). Notably, Lee et al. reported one case of recurrence among nine patients of discal cysts who underwent surgery at one year follow-up after the operation¹¹). To our knowledge, this report represents the first documented case of recurrence of discal cysts after surgery. It is suggested that careful long-term follow-up is necessary after surgery.

Koga et al. reported a case of a lumbar discal cyst treated with percutaneous CT-guided aspiration and steroid injection⁸). However, the mechanism of efficacy of steroid injection into the discal cyst for treatment of this disorder has remained unclear and this procedure may promote chemical meningitis due to intradural steroid leakage⁸). Although the cyst diminished in size at six months follow-up after this procedure, the cyst was remained on MRI. The long-term prognosis of discal cysts treated by this procedure have not been reported.

Demaerel et al. reported a case of imaging-documented regression and symptomatic relief without surgery⁵). However, their report did not document whether any type of injection, medication, or other intervention was administered. In 2007, Chou et al. reported a case of spontaneous regression of a discal cyst³). They reported a patient who was treated with a routine epidural injection and selective nerve root block, and the discal cyst regressed spontaneously after 5 months. However, it is unclear whether steroid injection contributed to the regression of a discal cyst. Nevertheless, it is important to consider that although steroids influence the regression of discal cysts, potential spontaneous regression may also occur in discal cysts.

Standard therapeutic guidelines for discal cysts have not been established because the natural history and the long-term prognosis of discal cysts treated by surgery or percutaneous CT-guided aspiration and steroid injection are still unknown. It is difficult to make decisions regarding the proper treatment for patients with discal cysts, but we recommend surgical resection for the management of symptomatic lumbar discal cysts. We suggest that additional cases of discal cysts accompanied by analysis and careful follow-up are required to provide standard therapeutic guidelines.

CONCLUSION

We report a rare case of lumbar discal cysts with severe

symptoms and signs resembling lumbar disc herniation. Although it is rare disease, lumbar discal cysts should be considered in the differential diagnosis of low back pain and lower limb weakness. We recommend surgical resection for the management of lumbar discal cysts with severe pain or persistent neurological symptoms and signs.

References

1. Brish A : Lumbar intraspinal extradural ganglion cyst. *J Neurol Neurosurg Psychiatry* 35 : 771-775, 1972
2. Chiba K, Toyama Y, Matsumoto M, Maruiwa H, Watanabe M, Nishizawa T : Intraspinal cyst communicating with the intervertebral disc in the lumbar spine : discal cyst. *Spine* 26 : 2112-2118, 2001
3. Chou D, Smith JS, Chin CT : Spontaneous regression of a discal cyst. Case report. *J Neurosurg Spine* 6 : 81-84, 2007
4. Coscia MF, Broshears JR: Lumbar spine intracanalicular discal cysts : two case reports. *J Spinal Disord Tech* 15 : 431-435, 2002
5. Demaerel P, Eerens I, Goffin J, Wilms G : Spontaneous regression of an intraspinal disc cyst. *Eur Radiol* 11 : 2317-2318, 2001
6. Ishii K, Matsumoto M, Watanabe K, Nakamura M, Chiba K, Toyama Y : Endoscopic resection of cystic lesions in the lumbar spinal canal : a report of two cases. *Minim Invasive Neurosurg* 48 : 240-243, 2005
7. Jeong GK, Bendo JA : Lumbar intervertebral disc cyst as a cause of radiculopathy. *Spine J* 3 : 242-246, 2003
8. Koga H, Yone K, Yamamoto T, Komiya S : Percutaneous CT-guided puncture and steroid injection for the treatment of lumbar discal cyst : a case report. *Spine* 28 : E212-216, 2003
9. Kono K, Nakamura H, Inoue Y, Okamura T, Shakudo M, Yamada R : Intraspinal extradural cysts communicating with adjacent herniated disks : imaging characteristics and possible pathogenesis. *AJNR Am J Neuroradiol* 20 : 1373-1377, 1999
10. Kyo M, Kitano K, Miyawaki Y, Habonaga H : Lumbar spinal discal cyst : a case report. *Seikeigeka* 49 : 1350-1352, 1998
11. Lee HK, Lee DH, Choi CG, Kim SJ, Suh DC, Kahng SK, et al : Discal cyst of the lumbar spine : MR imaging features. *Clinical Imaging* 30 : 326-330, 2006
12. Lim G, Kim HS, Kim SW, Shin H : Discal Cyst Diagnosed by Radiologic Finding. *J Korean Neurosurg Soc* 41 : 418-420, 2007
13. Marshman LAG, Benjamin JC, David KM, King AJ, Chawda SJ : "Disc cysts" and "Posterior ligament ganglion cysts" : synonymous entities? : Report of three cases and literature review. *Neurosurgery* 57 : E818, 2005
14. Murata K, Ikenaga M, Tanaka C, Kanoe H, Okudaira S : Discal cysts of the lumbar spine : a case report. *J Orthop Surg (Hong Kong)* 15 : 376-379, 2007
15. Nabeta M, Yoshimoto H, Sato S, Hyakumachi T, Yanagibashi Y, Masuda T : Discal cysts of the lumbar spine : Report of five cases. *J Neurosurg Spine* 6 : 85-89, 2007
16. Shah RV, Lutz GE : Lumbar intraspinal synovial cysts : conservative management and review of the world's literature. *Spine J* 3 : 479-488, 2003
17. Tokunaga M, Aizawa T, Hyodo H, Sasaki H, Tanaka Y, Sato T : Lumbar discal cyst followed by intervertebral disc herniation : MRI findings of two cases. *J Orthop Sci* 11 : 81-84, 2006
18. Toyama Y, Kamata N, Matsumoto M : Pathogenesis and diagnostic title of intraspinal cyst communicating with intervertebral disk in the lumbar spine. *Rinsho Seikei Geka* 32 : 393-400, 1997
19. Watanabe N, Ogura T, Kimori K, Hase H, Hirasawa Y : Epidural hematoma of the lumbar spine, simulating extruded lumbar disc herniation : clinical, discographic, and enhanced magnetic resonance imaging features : A case report. *Spine* 22 : 105-109, 1997