Discal cyst of the lumbar spine: a case report and literature review

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Abstract: Discal cysts of the lumbar spine are rare degenerations in the corresponding discs and are located in the spinal canal but outside the endorhachis. Due to the small number of cases reported in the literature, discal cysts are always treated as lumbar disc hernias at the early stage. A definitive description of the treatment for discal cysts has not yet to be given. Here, we report a case of a lumbar discal cyst, which treated by endoscopic cyst resection. The discal cyst was confirmed by surgery and subsequent pathological diagnosis.

Keywords: Discal cyst, disc hernia, lumbar spine, endoscopic cyst resection

Introduction

A discal cyst of the lumbar spine is a cystic degeneration connected to the corresponding lumbar disc, which is located in the spinal canal outside the endorhachis [1, 2]. Most lumbar discal cysts present with clinical symptoms similar to those of herniated lumbar discs. Magnetic resonance imaging (MRI) has recently enabled the possibility of establishing a diagnosis and thus identifying the cyst, contrast-enhanced MRI reveals the cyst to have a circular enhancement [3, 4]. There has been no definitive description of an effective treatment for a discal cyst yet. In this paper, we report a case of a discal cyst located at the L4/5 level, which was treated by endoscopic cyst resection, an MRI performed 1 year later revealed no palindromia. We mainly discuss the treatment of this disease.

Case report

A 37-year-old man, who experienced radiating pain from the left lower limb, was transferred to our hospital. Before transfer, he was prescribed bed rest and conservative therapy, but his symptoms were not relieved.

On admission, the patient experienced a tenderness at the L4/5 level. A Lasègue test of the left lower limb was performed and was positive at an angle of 30°. Numbness was present on the lateral side of the calf and the acrotarsium, the motor examination of the foot dorsal expansion was significant weakness (3/5). There was normal foot plantarflexion strength, and the Babinski sign was negative. The sensation and strength of the right lower limb were normal. Slight scoliosis was present on X-ray, but no obvious defect was detected in the bony structure. An MRI scan indicated an oval-like cyst located in the spinal canal and outside the endorhachis at the L4/5 level. The cyst was connected with the L4/5 disc by a pedicle, and displayed a low signal intensity in T1-weighted images and a high signal intensity in T2-weighted images. On contrast-enhanced MRI, a circular enhancement appeared at the cyst site, which was highly suspected to be the discal cyst (Figure 1).

After the preoperative examination was complete, the patient was treated with a left partial hemilaminectomy. The dural sac and L5 nerve root were exposed, and a light blue cyst was observed at the ventral side of the L5 nerve root. The margin of the cyst was well defined, with no obvious adhesion to the L5 nerve root. As the wall of the cyst was very thin, the cyst ruptured when we tried to reveal it more clearly.
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The cyst discharged a yellow jelly-like fluid, with no obvious bloody substance mixed with it. The patient was given an endoscopic cyst resection, and the suspected herniated disc was also resected to ensure that the symptoms resolved. No intraoperative or postoperative complications were observed. The later pathological diagnosis of the cyst indicated there was a cyst lined by fibrous connective tissue, plenty of haemosiderin in the wall of the cyst was observed, fibroblastic proliferation and inflammatory cells were noticed around the cystic lesion (Figure 2). A postoperative MRI performed 1 year later indicated no relapse (Figure 3).

Discussion

The lumbar discal cyst is a rare cystic degeneration, which always connects to a corresponding disc, and is located in the spinal canal outside the endorhachis. Kono [5] first described this disease in 1999, and found that the cyst always had a pedicle connected to a corresponding disc. In 2001, Chiba [6] identified the cyst as a lumbar discal cyst, and described its clinical manifestation, imaging features and pathology. However, due to the low incidence rate, a definitive description of the discal cyst has not yet been elucidated.

Toyama and Chiba [6, 7] considered a lumbar discal cyst to be caused by a potential rupture of the annulus fibrosus, accompanied by intraspinal venous plexus bleeding, leading to the formation of a haematoma located intraspinal extradural region. The haematoma is absorbed slowly over time, and the discal cyst is subsequently formed. In fact, a large volume of bloody substance is usually detected in the discal cyst, so this hypothesis has been accepted by many researchers. In our case, we found plenty of haemosiderin in the wall of the cyst, which supported the hypothesis of Toyama and Chiba. But, a large amount of fibrocartilaginous tissue

Figure 1. Thirty-seven-year-old man with left lower limb radiating pain. A. Sagittal T1-weighted image, the cyst displayed a low signal intensity, communicated with the L4/5 disc by a pedicle. B. Sagittal T2-weighted image, the cyst displayed a high signal intensity. C. Axial T2-weighted image, the cyst pressed the left L5 nerve root. D. Contrast-enhanced MRI, a circular enhancement appeared at the cyst site.

Figure 2. Histological examination indicated a cyst lined by fibrous connective tissue, plenty of haemosiderin cells (↑) in the wall of the cyst was observed, fibroblastic proliferation (*) and inflammatory cells (**) were noticed around the cystic lesion (HE × 100 and × 200).
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The pathogeny and treatment of discal cyst cases and summarised the features as follows: 1) they are located in the spinal canal and outside the endorhachis, connecting to the corresponding disc; 2) they display a circular enhancement under contrast-enhanced MRI; and 3) they may occasional herniate into the lateral recess. Discography can distinguish a discal cyst from other masses, such as epidural haematomas and spinal subarachnoid cysts [9]. But, discography is an invasive examination. In our case, on MRI the pedicle that connected the cyst and the corresponding disc could be observed, and on contrast-enhanced MRI a circular enhancement appeared clearly at the cyst site, therefore there was no need for the patient to undergo further examination by discography.

There is, as yet, no golden standard for the treatment of discal cysts. Jeong [10] considered that therapy for discal cysts should also refer to the disc hernia. If the radiating lower limb pain appears at an early stage and is not very serious, conservative treatment is recommended. Surgical treatment, including discectomy and cyst extirpation, should be considered if conservative treatment has no effect. Considering that there is a pedicle connecting the cyst to the disc, it is vital to ensure that the pedicle is completely removed. Using the surgical procedure described above, Nabeta treated five cases of discal cyst, and no one relapsed. Lee performed the same operation for nine cases of discal cyst, with only one case relapsed. Recently, the technique of microsurgical and endoscopic cyst resection is recommended by many researchers, which provides good clinical results and little trauma [11]. Ishii [12] reported the first usage of endoscopic cyst resection in two cases, and no one relapsed. Ha [13] reported the clinical outcomes of endoscopic cyst resection in eight patients, which produced favourable results. Other studies have attempted to treat discal cysts with even less invasive therapy [14]. Kang [15] treated eight cases of discal cyst via percutaneous and hydatid fluid drainage under CT-guidance, and found that the symptoms of radiating lower limb pain were subsequently resolved in seven cases.

The clinical manifestation of a lumbar discal cyst is similar to that of a herniated lumbar disc, with symptoms of lower back pain and radiating pain from the lower limbs. According to the literature, the L4/5 level is the most frequent region of discal cysts' occurrence. Lee [8] described nine cases of the discal cyst, and found that four cases occurred at the L4/5 level, two cases occurred at the L2/3 level, and three cases occurred at other levels. He proposed that the L4/5 level was the most active level may be the reason for the higher incidence.

The diagnosis of the discal cyst mainly depends on MRI. X-ray and CT scan are unable to provide a definitive diagnosis. On MRI, the discal cyst looks like a cystic mass, which shows as a low signal intensity in T1-weighted images and a high signal intensity in T2-weighted images. Lee analysed the MRI manifestation of nine discal cyst cases and summarised the features as follows: 1) they are located in the spinal canal and outside the endorhachis, connecting to the corresponding disc; 2) they display a circular enhancement under contrast-enhanced MRI; and 3) they may occasional herniate into the lateral recess. Discography can distinguish a discal cyst from other masses, such as epidural haematomas and spinal subarachnoid cysts [9]. But, discography is an invasive examination. In our case, on MRI the pedicle that connected the cyst and the corresponding disc could be observed, and on contrast-enhanced MRI a circular enhancement appeared clearly at the cyst site, therefore there was no need for the patient to undergo further examination by discography.

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cases. Koga [16] injected corticosteroids into
cyst after percutaneous and hydatid fluid drain-
age in one case, and the symptom of radiating
lower limb pain rapidly resolved. Some re-
searchers consider the clinical symptoms of
discal cyst patients can disappear on their own
[17, 18]. Chou [19] reported a discal cyst case
at the L5/S1 level. By only blocking the nerve
root and providing conservative treatment, the
volume of the cyst decreased and the radiating
lower limb pain resolved. Sae [20] also report-
ed a discal cyst case treated by selective tran-
sforaminal epidural blocks, the radiating pain
alleviated obviously. In our case, because the
discal cyst was large and the patient’s symp-
toms were severe, we decided to treat him with
microsurgical and endoscopic cyst resection.

Conclusion

In summary, a lumbar discal cyst is a rare dis-
ease, and because its pathogenesis is unclear,
there are still some issues involved in effective-
ly treating it. If the clinical symptoms are severe,
the technique of microsurgical and endoscopic
cyst resection offers reliable treatments.

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Disclosure of conflict of interest

None.

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References

[1] Nabeta M, Yoshimoto H, Sato S, Hyakumachi T,
Yanagibashi Y and Masuda T. Discal cysts of
the lumbar spine. Report of five cases. J
[2] Aydin S, Abuzayed B, Yildirim H, Bozkus H and
Vural M. Discal cysts of the lumbar spine: re-
port of five cases and review of the literature.
[3] Lame A, Kaloshi G and Xhumari A. Insights on
the natural history and pathogenesis of multi-
level discal cysts. J Clin Neurosci 2012; 19:
617-619.
[4] Coscia MF and Broshears JR. Lumbar spine in-
tracanalicular discal cysts: two case reports. J
Shakudo M and Yamada R. Intraspinal extra-
dural cysts communicating with adjacent herni-
ated disks: imaging characteristics and pos-
sible pathogenesis. AJNR Am J Neuroradiol
Watanabe M and Nishizawa T. Intraspinal cyst
communicating with the intervertebral disc in
the lumbar spine: discal cyst. Spine 2001; 26:
2112-2118.
Pathogenesis and diagnostic title of intraspi-
nal cyst communicating with intervertebral
disk in the lumbar spine. Rinsho Seikei Geka
1997; 32: 393-400.
[8] Lee HK, Lee DH, Choi CG, Kim SJ, Suh DC and
Kahng S. Discal cyst of the lumbar spine: MR
imaging features. Clin Imaging 2006; 30: 326-
330.
[9] Endo Y, Miller TT, Saboeiro GR and Cooker PM.
Lumbar discal cyst: Diagnostic discography fol-
lowed by therapeutic computed tomography-
guided aspiration and injection. Radiology
Case 2014; 8: 35-40.
[10] Jeong GK and Bendo JA. Lumbar intervertebral
disc cyst as a cause of radiculopathy. Spine J
Clinical Analysis of Microscopic Removal of
[12] Ishii K, Matsumoto M, Watanabe K, Nakamura
M, Chiba K and Toyama Y. Endoscopic resec-
tion of cystic lesions in the lumbar spinal ca-
nal: a report of two cases. Minim Invasive
HS. Clinical outcomes of percutaneous endo-
scopic surgery for lumbar discal cyst. J Korean
[14] Dasenbrock HH, Kathuria S, Witham TF,
Gokasian ZL and Bydon A. Successful treat-
ment of a symptomatic L5/S1 discal cyst by
percutaneous CT-guided aspiration. Surg
Neurol Int 2010; 1: 41.
term results of percutaneous CT-guided aspira-
tion of symptomatic lumbar discal cysts. AJR
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