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Original Article

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.

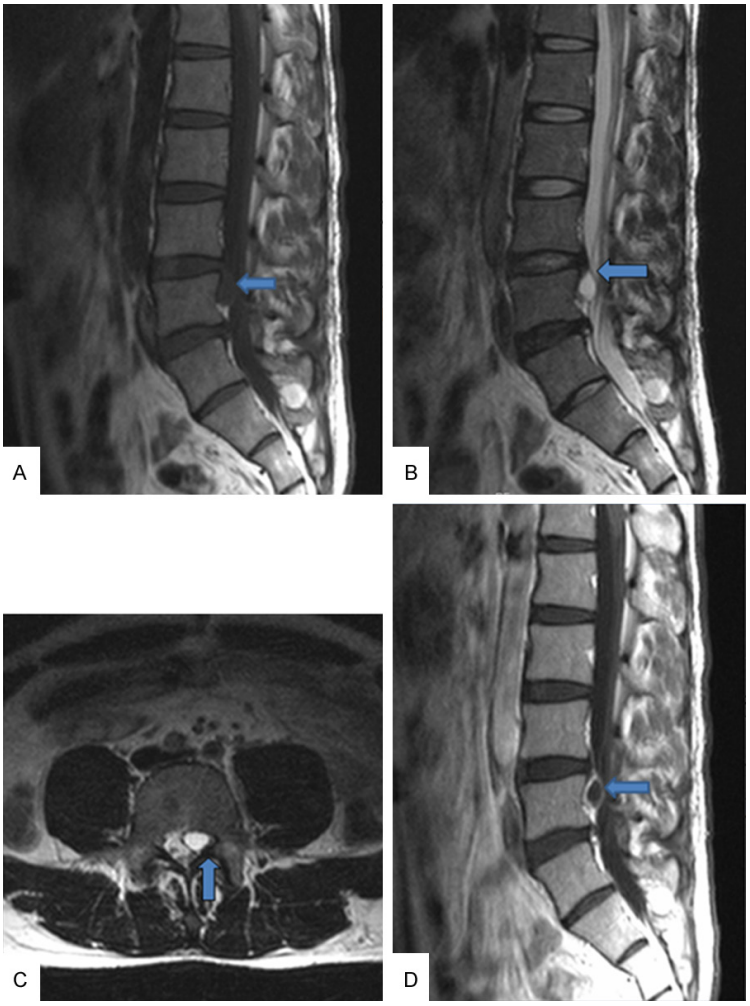


Figure 1. Thirty-seven-year-old man with left lower limb radiating pain. A. Sagittal T1-weighted image, the cyst displayed a low signal intensity, communicated with the L4/5 disc by a pedicle. B. Sagittal T2-weighted image, the cyst displayed a high signal intensity. C. Axial T2-weighted image, the cyst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

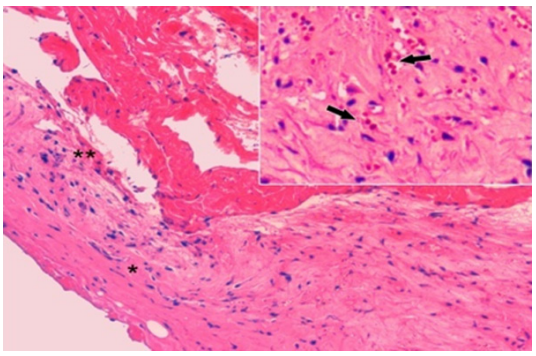


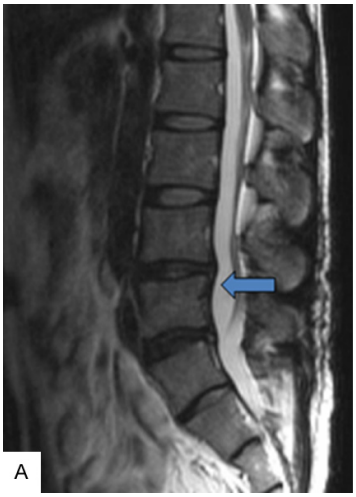
Figure 2. Histological examination indicated a cyst lined by fibrous connective tissue, plenty of hemosiderin cells (↑) in the wall of the cyst was observed, fibroblastic proliferation (*) and inflammatory cells (**) were noticed around the cystic lesion (HE × 100 and × 200).

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



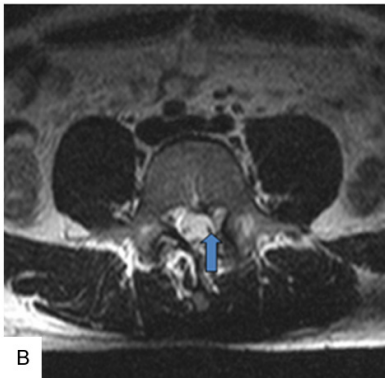


Figure 3. A postoperative MRI performed 1 year later. A. Sagittal T2-weighted image; B. Axial T2-weighted image.

was also detected in the cyst wall, which could not be explained by the hypothesis above. Kono reported two cases of discal cysts and analysed their pathogenesis. He proposed a hypothesis that discal cysts are caused by herniated discs. The herniated discs are compressed by the surrounding tissue, and that fluid is squeezed from it. At the same time, an envelope forms around the herniated disc tissue because of the inflammatory reaction. After the herniated disc tissue is completely absorbed, the discal cyst is formed. The phenomenon of inflammatory cells found around the cystic lesion in our case also supports this hypothesis.

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.

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. Koga [16] injected corticosteroids into cyst after percutaneous and hydatid fluid drainage in one case, and the symptom of radiating lower limb pain rapidly resolved. Some researchers 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 reported a discal cyst case treated by selective transforaminal epidural blocks, the radiating pain alleviated obviously. In our case, because the discal cyst was large and the patient's symptoms were severe, we decided to treat him with microsurgical and endoscopic cyst resection. After surgery, the symptoms immediately resolved, and a postoperative MRI performed 1 year later indicated no relapse. Therefore, we consider this therapy as a reliable treatment.

Conclusion

In summary, a lumbar discal cyst is a rare disease, and because its pathogenesis is unclear, there are still some issues involved in effectively 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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