

## Steroid Injection Performed with Fluoroscopy for Treatment of a Discal Cyst

To the Editor:

Intraspinal extradural cysts that communicate with the intervertebral disk are a rare entity and thus an uncommon cause of lumbar radiculopathy. Several types of lumbar intraspinal cysts with different pathogenesis have been reported, such as perineural cysts, synovial cysts<sup>1,2</sup>, arachnoid cysts<sup>3</sup>, epidural hematoma<sup>4</sup>, cyst of the ligamentum flavum<sup>5</sup>, ganglion cysts<sup>6</sup>, intraspinal gas<sup>7</sup>, and discal cysts<sup>8</sup>. We describe a discal cyst treated by roentgenography-guided steroid injection.

A 35-year-old man presented with lower back pain that gradually worsened over the course of a year. The pain became radicular, and radiated down the lateral portion of his left leg to just above the knee. The neurological examination demonstrated intact sensation along all dermatomal patterns and normal deep tendon reflexes bilaterally. Plain radiographs of the lumbosacral spine revealed minimal degenerative changes, but no signs of spinal segmental instability, deformity, or spondylosis.

Magnetic resonance imaging (MRI) revealed an extradural spherical mass  $7 \times 8 \times 10$  mm seated in the left ventrolateral epidural space of the spinal canal behind the L3 vertebral body (Figures 1 to 4) that extended into the lateral recess of L4, with low signal intensity on T1-weighted imaging, slight high signal intensity on T2-weighted imaging, and rim enhancement after contrast injection. The cyst displaced the dural sac dor-



Figure 1. Sagittal T2-weighted MR image (left paramedian) shows extradural spherical mass of high signal intensity just below the L3-L4 intervertebral disc. A small L3-L4 herniated disc and L4-L5 and L5-S1 disc herniations are visible.

sally. The L3-L4 disk adjacent to the cyst and the L4-L5 disk showed degeneration and disk herniation.

On roentgenographic images, discography (Figure 5) was performed by the posterolateral route at the L3-L4 disk level with an 18-gauge 3.5-inch and a 22-gauge 7-inch coaxial spinal needle inserted as far as the



Figure 2. Sagittal T1-weighted MR image (left paramedian) shows extradural spherical mass of low signal intensity.



Figure 3. Axial T2-weighted MR image shows cyst in the left ventrolateral extradural space. The cystic lesion displaces the dural sac dorsomedially.

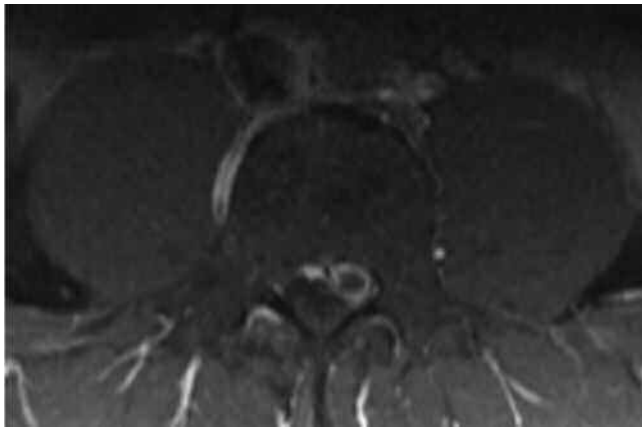


Figure 4. Gadolinium enhanced T1-weighted MR image shows rim-enhancing cystic lesion.



Figure 5. Discography at the L3-L4 level depicts iodine contrast material in the L3-L4 disc that communicates with the intervertebral cyst through a thin channel.

disk. On discography, contrast medium (0.7 ml of iopamidol 200) rapidly flowed into the cyst through a thin channel from the nuclear cavity of the L3-L4 disk. At the same time, severe radiating pain was reproduced in the affected leg. Based on these findings, a diagnosis of discal cyst was made. The tip of the needle being positioned in the disk, 1 ml of a long-acting steroid solution (prednisolone) was injected into the disk under fluoroscopic guidance and flowed into the cyst.

A few days after the procedure, low back pain and left extremity pain disappeared. Six months after the procedure, no new symptom had developed, and the cyst had disappeared on MRI examination (Figures 6 and 7). One year after the steroid injection, the low back pain had not reappeared.

Discal cysts are rare. To our knowledge, only 20 cases have been reported in the English language literature. This disease can be characterized by clinical symptoms indistinguishable from those of typical disk herniation, manifesting as a unilateral single nerve root lesion, with incidence at slightly younger age and at higher intervertebral levels than with typical disk herniation.

In the diagnosis of an intervertebral discal cyst, MRI was more helpful than computed tomography (CT) imaging and discography for visualizing the cystic structure of the lesion and its relation to the disk and the thecal sac, narrowing the differential diagnostic possibilities. It demonstrated an



Figure 6. MRI 6 months after the steroid injection procedure. Sagittal T2-weighted MR image shows herniated discs at L3-L4, L4-L5, and L5-S1. The cystic lesion has disappeared. The discal cyst shows complete regression on MRI.

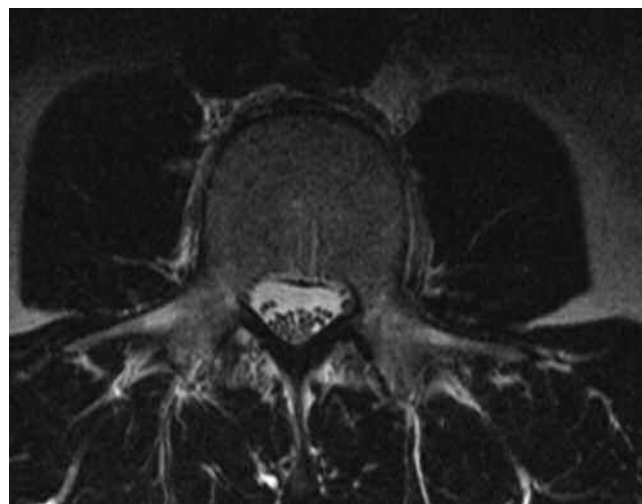


Figure 7. Axial T2-weighted MR image confirms disappearance of the cyst.

oval extradural lesion with a low signal intensity on T1-weighted images and a high signal intensity on T2-weighted images. The surrounding rim of the cyst was enhanced by addition of gadolinium medium. Discography revealed the cyst communicating with an intervertebral disk herniation via an annular rupture, with severe radiating pain in the affected leg at the time of injection.

The etiology and pathogenesis of an intervertebral disk cyst remain unknown; 2 hypotheses for the formation of cysts have been proposed. Chiba, *et al*<sup>8</sup> have proposed that an epidural hematoma is initially formed from hemorrhage of the epidural venous plexus, resulting from either a disk herniation or an underlying disk injury. The discal cyst develops as a result of an unspecified impairment in hematoma resorption. Chiba, *et al* suggested this epidural hematoma theory from the findings that the content of most of their cysts consisted of either hemorrhagic fluid or hemosiderin. Kono, *et al*<sup>9</sup> hypothesized that a discal cyst results from focal degeneration of an intervertebral disk, causing herniation of the disk with subsequent spilling of fluid from the herniated disk material. The extruded fluid incites an inflammatory response that leads to reactive pseudomembrane formation and the development of a discal cyst. The histology of the cyst wall in previous series<sup>10</sup> demonstrated fibrous connective tissue without synovial lining cells, which also supports this hypothesis.

Surgical removal of the cyst has usually been performed as the treatment of discal cysts. Operative treatment is reserved for cases in which the cyst results in clinical symptoms recalcitrant to nonoperative measures and includes a laminectomy and excision of the cyst along with the associated herniated disc. The symptoms disappear immediately after surgery.

Besides surgery, different treatments have been reported in the English literature. Koga, *et al*<sup>11</sup> described the efficacy of percutaneous CT-guided puncture and steroid injection for one case. Norman, *et al*<sup>12</sup> described a discal cyst treated by CT-guided aspiration of the lesion followed by a course of steroid injections. Thus, percutaneous puncture and steroid injection under CT guidance may be useful for treatment of discal cysts. However, care must be taken to avoid intradural steroid leakage that may promote chemical meningitis<sup>13</sup>. Hyeong, *et al*<sup>14</sup> reported the clinical outcome of 8 men with symptomatic lumbar intervertebral discal cyst who were treated by percutaneous CT-guided aspiration of the cyst, without steroid injection. One of the 8 patients (12%) reported recurrent radiculopathy at the 3-month followup evaluation.

In our case, discography and steroid injection under fluoroscopic guidance were sufficient for successful treatment. A limitation of our work would be that the cyst in our case was not confirmed by pathologic analysis. A larger number of cases and longterm followup would be required for firm conclusions in this regard.

In summary, an intervertebral disk cyst is a rare cause of radiculopathy, and discography is useful in demonstrating a communicating fissure between the cyst and the intervertebral disk. Various treatment options are available and include conservative therapy, surgery, and percutaneous aspiration of the cyst followed or not by steroid injection. In our case, roentgenography-guided steroid injection was effective in the management of a lumbar discal cyst.

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