Spinal Extradural Arachnoid Cyst
—Case Report—

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Abstract

A 48-year-old male presented with progressive leg weakness. Magnetic resonance imaging and computed tomography myelography showed an extradural arachnoid cyst extending from the T-12 to L-2 levels in the thoracolumbar region. The cyst was confirmed at surgery and completely removed. This surgical intervention achieved improvement in the neurological symptoms.

Key words: arachnoid cyst, extradural cyst, spinal cyst, thoracolumbar spine

Introduction

Intraspinal extradural cystic lesions are uncommon, and include synovial cyst, ganglion cyst, Tarlov’s perineural cyst, meningeal diverticula along spinal nerve roots, extradural arachnoid cyst, meningocele, dermoid cyst, and neuroma with cystic changes. The classification of these cysts is indistinct, confusing, and histologically misleading. In particular, extradural arachnoid cysts are rare expanding lesions in the spinal canal, previously referred to as congenital extradural spinal cysts until about 1985. However, early reports of extradural spinal cysts might have included spinal nerve root diverticula. Recently, extradural arachnoid cyst, a term used interchangeably with extradural meningeal cyst, has been differentiated from other extradural cysts by magnetic resonance (MR) imaging, computed tomography (CT) myelography, and surgery.

We describe a case of spinal extradural arachnoid cyst in the thoracolumbar region, which was identified by MR imaging and CT myelography and successfully treated by surgery.

Case Report

A 48-year-old male presented with slowly progressive weakness and atrophy of the right thigh for 2 years. He had noticed ascending numbness in his lower extremities.

Neurological examination revealed moderate atrophy of the right quadriceps. He had weakness of right hip flexion and knee extension graded at 4/5. Hypesthesia to pinprick and touch was noted in both lower limbs. Bowel and bladder functions were normal.

Radiography of the thoracolumbar spine revealed increased interpedicular distance. MR imaging of the thoracolumbar spine demonstrated a dorsally located intraspinal cystic lesion extending from the T-11 to L-2 levels, compressing the thecal sac to the ventral side. Myelography revealed a partial block at the levels of T-12 to L-2 by a dorsal mass. CT myelography showed an intraspinal extradural cyst filled with contrast medium and anterior displacement of the dural sac. Communication was observed between the spinal subarachnoid space and the cyst cavity.

A T-11 to L-2 laminectomy revealed a cystic mass dorsal to the dural sac. The cyst was incised, yielding a colorless CSF-like fluid. The cyst wall was separated easily from the theca and completely removed. No dural defects were found adjacent to the nerve root sleeves and in the dorsal midline. Histological study of the cyst wall showed fibrous connective tissue with an inner single-cell lining. These findings were consistent with arachnoid cyst.

The postoperative course was uneventful. MR imaging revealed no evidence of the extradural cyst.
Extradural Arachnoid Cyst

The patient’s strength in the lower extremities was improved and the numbness had resolved at the 6-month follow up.

Discussion

The etiology of spinal extradural arachnoid cyst remains uncertain. Extradural arachnoid cysts can develop from arachnoidal herniation through a congenital defect in the spinal dura at or near a nerve root or in the midline. In the present case, the dural defect was not observed in the dorsal midline at operation. The communication with the subarachnoid space may lie adjacent to the entrance of the dorsal nerve root or around the neural foramen. Spinal extradural arachnoid cyst most likely arises from a congenital dural rent. Progressive enlargement of the cyst is presumably due to active and passive fluid transport.

The diagnosis is usually established by MR imaging and adjunctive CT with myelography: MR imaging demonstrates the posterior extradural location of a CSF-containing lesion in the spine, and CT myelography demonstrates the communication with the subarachnoid space. Histological examination does not always show a single-cell arachnoid layer in the cyst wall. Extradural meningeal cysts can be classified into three groups, based on the presence of spinal nerve root fibers. Extradural arachnoid cysts are extradural meningeal cysts without nerve root fibers along the thoracic and lumbar spine. Therefore, histological examination combined with operative findings will provide better understanding of extradural arachnoid cyst.

In the present case, MR imaging and CT myelography demonstrated a dorsally located extradural CSF-containing cyst in the thoracolumbar spine, and the cyst was filled with contrast medium. Gross inspection at surgery showed no spinal nerve root fiber within the cyst, and histological examination of the cyst wall demonstrated a single-cell arachnoid layer.

Ten cases of spinal extradural arachnoid cysts, including the present case, have been identified by MR imaging and CT myelography and confirmed at surgery (Table 1). The patients were eight males and...
Table 1 Summary of 10 cases of spinal extradural arachnoid cysts

<table>
<thead>
<tr>
<th>Case No.</th>
<th>Author (Year)</th>
<th>Age (yrs)/Sex</th>
<th>Symptoms</th>
<th>Location of lesion</th>
<th>Surgery</th>
<th>Outcome (Follow up, mos)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Kim and Weinberg (1986)</td>
<td>16/M</td>
<td>bil leg numbness</td>
<td>T7–9</td>
<td>removed small leak at Lt T-8 nerve root, closure</td>
<td>improved (—)</td>
</tr>
<tr>
<td>2</td>
<td>Nabors et al. (1988)</td>
<td>18/M</td>
<td>rt low-back pain</td>
<td>L1–2</td>
<td>removed pedicle at Lt L-1 nerve root, closure</td>
<td>recovery (—)</td>
</tr>
<tr>
<td>3</td>
<td>Gray et al. (1988)</td>
<td>11/M</td>
<td>bil leg weakness</td>
<td>T3–9</td>
<td>removed not found</td>
<td>improved (—)</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>49/F</td>
<td>bil leg weakness and paresthesia</td>
<td>T8–9</td>
<td>resected not found</td>
<td>recovery (—)</td>
</tr>
<tr>
<td>5</td>
<td>Takahashi et al. (1993)</td>
<td>42/M</td>
<td>bil leg weakness</td>
<td>T3–7</td>
<td>removed stalk at T-5 nerve root, closure</td>
<td>improved (2.5)</td>
</tr>
<tr>
<td>6</td>
<td>Rohrer et al. (1993)</td>
<td>28/M</td>
<td>rt leg weakness</td>
<td>T11–L2</td>
<td>resected dural defect at Lt L-1 nerve root, closure</td>
<td>unchanged (24)</td>
</tr>
<tr>
<td>7</td>
<td>Inoue et al. (1996)</td>
<td>49/F</td>
<td>rt leg weakness</td>
<td>T5–6</td>
<td>removed dural defect at T-5 nerve root, closure</td>
<td>recovery (3)</td>
</tr>
<tr>
<td>8</td>
<td>Uemura et al. (1996)</td>
<td>30/M</td>
<td>rt leg weakness</td>
<td>T10–L2</td>
<td>removed dural defect at rt T-10 nerve root, closure</td>
<td>improved (—)</td>
</tr>
<tr>
<td>9</td>
<td>Rimmelin et al. (1997)</td>
<td>14/M</td>
<td>bil leg weakness</td>
<td>T2–9</td>
<td>incised</td>
<td>improved (6)</td>
</tr>
<tr>
<td>10</td>
<td>Present case</td>
<td>48/M</td>
<td>rt leg weakness, bil leg hypesthesia</td>
<td>T12–L2</td>
<td>removed not found</td>
<td></td>
</tr>
</tbody>
</table>

—: unknown, removed: total removal, resected: resection of posterior cyst wall.

two females, aged from 11 to 49 years. Four patients were teenagers and four were in the forties. Four patients had progressive paraparesis. Three patients had remission and fluctuation of symptoms. Our patient had slowly progressive weakness in the legs, as in the previous case. Six cases of extradural arachnoid cyst occurred in the middle to lower thoracic spine, three in the thoracolumbar spine, and one in the lumbar spine. The cysts extended for two to eight vertebral segments. All cysts were located posterior or posterolateral to the dural sac, and three extended into or through neural foramina.

Eight of 10 patients underwent total cyst removal by laminectomy, and two patients underwent resection of the posterior cyst wall. Closure of the dural defects or pedicles from the subarachnoid space into the cyst was performed in only four patients. There was no reaccumulation of fluid in the cyst in any patient. Nine of the 10 patients achieved complete recovery or improvement of neurological function. In the present case, the cyst was completely removed but the dural defect was not found, and the patient showed neurological improvement. Total removal of cyst is the primary treatment for extradural arachnoid cyst. Resection of the posterior cyst wall is the treatment of choice when total excision of the cyst is difficult due to adhesions. The closure of the ostium between the cyst and the subarachnoid space is unimportant therapeutically.

References

9) Uemura K, Yoshizawa T, Matsumura A, Asakawa H,


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