Synovial cyst of spinal facet

Case report

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The authors report a case in which a true synovial cyst was found attached to a cervical facet joint. The differential diagnosis involving herniated cervical disc as well as other types of extradural cyst is discussed. The anatomically oriented term "juxta-facet cyst" is proposed to include both ganglion and synovial cysts seen in this area.

KEY WORDS • synovial cyst • ganglion cyst • juxta-facet cyst • herniated intervertebral disc

There are two types of cyst known to arise from the periarticular tissue throughout the body. One type has a synovial lining membrane and is therefore called a "synovial cyst;" the other, without any specific lining, is called a "ganglion cyst." Both synovial and ganglion cysts have been found arising at the joint capsule of the spinal facet synovial joint.

We propose the term "juxta-facet cyst" to represent both synovial and ganglion cysts arising in this area and to distinguish this group of cysts from other varieties of cysts.

Case Report

A 52-year-old man came to the Madison Veterans Administration Hospital on March 28, 1973, because of sudden severe pain in the left side of the neck of 2 weeks' duration; the pain radiated to the left scapula, forearm, middle and ring fingers, and was most noticeable upon getting out of bed each morning. His job on a factory assembly line required bending and stretching of the neck; he had often experienced mild neck pain for the past 20 years. There was no history of trauma.

Examination. The patient was a well-built man who constantly held his head toward the right side. His blood pressure was 140/90 mm Hg. Movement of the head to both the left and right produced neck pain. Muscle-testing showed a weak grasp in the left hand, but the deltoid, biceps, and triceps were normal. No reflex change nor long-tract signs could be seen. Palpation of ulnar and median nerves was normal. No Tinel's sign was elicited. The Adson's maneuver was normal. A chest film, electrocardiogram, complete blood examination, and serum electrolyte studies were all normal. Radiographs of the spine showed only mild spondylotic anterior lipping at C5-7. There was no bone encroachment on the intervertebral foramina. A myelogram showed a defect at the left C-7 nerve-root sleeve, visible only in the anteroposterior
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FIG. 1. Left: Preoperative myelogram showing an extradural defect at the left C-7 nerve root sleeve. Right: Normal postoperative myelogram 3 months later.

projection (Fig. 1 left). The CSF contained 34 mg% protein, 70 mg% glucose, and no cells. Because of the fairly acute onset of symptoms, a definite myelographic defect, and a normal intervertebral foramen at the same level, a preoperative diagnosis of herniated left C6–7 disc was made.

Operation. On April 12, 1973, the area was explored. A partial left C-6 and C-7 hemilaminectomy revealed, to our surprise, a spherical thin-walled cyst measuring about 0.7 cm in diameter attached to the facet joint and compressing the C-7 nerve root dorsally. The cyst was detached from the dura mater without difficulty, since there was no connection to the dura mater or subarachnoid space. Part of the cyst was located at the entrance of the intervertebral foramen. The cyst was removed; it contained clear, viscid fluid. No communication was found between the cystic cavity and the synovial cavity. Pulsation of the dural sheath covering the nerve root was observed after the cyst was removed. The disc space was examined and showed no evidence of herniation. The facet joint was not disturbed, and the wound was closed.

Histological Examination. Microscopic examination showed that the cyst lumen contained amorphous proteinaceous material. The wall consisted of loose and well-vascularized fibrous connective tissue with an incomplete mesothelial cell lining (Fig. 2).

Fig. 2. Photomicrograph of fibrous wall of cyst removed at surgery showing mesothelial cell linings. H & E, X 100.
TABLE 1
Summary of reported cases of intraspinal juxta-facet cyst

<table>
<thead>
<tr>
<th>Case No.</th>
<th>Author, Year</th>
<th>Patient's Age, Sex</th>
<th>Cyst Location &amp; Size</th>
<th>Duration of Radicular Pain</th>
<th>Bone Erosion</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Kao, et al., 1968</td>
<td>52 F rt. L4-5 ganglion cyst 1 cm</td>
<td>3 yrs</td>
<td>pedicle erosion</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>45 M lt. L4-5 ganglion cyst 1.1 × 0.7 cm</td>
<td>2 wks</td>
<td>none</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Sypert, et al., 1973</td>
<td>58 M rt. L4-5 synovial cyst 1.2 × 1.5 cm</td>
<td>3 wks</td>
<td>indistinct facet</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Kao, et al., 1974</td>
<td>52 M lt. C6-7 synovial cyst 0.7 cm</td>
<td>2 wks</td>
<td>none</td>
<td></td>
</tr>
</tbody>
</table>

There was no evidence of inflammatory reaction or new growth.

The patient's radicular pain disappeared immediately after the operation, and strength of his left hand returned within 1 week. A follow-up myelogram on July 6, 1973, no longer showed the preoperative defect (Fig. 1 right); the CSF at this time contained 24 mg% of protein, 65 mg% of glucose, and no cells.

Discussion

This case is the fourth symptomatic juxta-facet cyst to be reported (Table 1); of these four cases two were ganglion cysts and two synovial cysts. Ganglion cysts contain gelatinous material, whereas synovial cysts contain clear or xanthochromic fluid. Trauma to the facet joint was thought to have been the etiological factor in the formation of a synovial cyst in one patient; however, in the remaining three patients with juxta-facet cysts no history of trauma was recorded.

Typically, these cysts are about 1 cm in diameter, are not compressible, and have a firm attachment to the facet joint capsule. They cause radicular pain and motor weakness indistinguishable from the symptoms of a herniated intervertebral disc. Bone erosion is absent or minimal; the myelogram shows a dorsolateral extradural defect but contrast material should not enter the cyst cavity.

Non-neoplastic, non-parasitic intraspinal extradural cysts, which occur near the intervertebral foramen, can be classified into

Fig. 3. Differential diagnosis of spinal extradural cysts. Cross sections of three types of cyst at the level of the L4-5 foramen. The normal L-4 root and its spinal ganglion at one side are compared with the pathological counterpart on the other side. Left: Spinal perineurial cyst. Center: Spinal extradural arachnoid cyst. Right: Spinal “juxta-facet cyst.”
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TABLE 2
Differential diagnosis and treatment of extradural spinal cysts

<table>
<thead>
<tr>
<th>Clinical Factors</th>
<th>Perineurial Cyst</th>
<th>Arachnoid Cyst</th>
<th>Juxta-facet Cyst</th>
</tr>
</thead>
<tbody>
<tr>
<td>site</td>
<td>posterior root ganglion</td>
<td>pedicle attachment to spinal dura near nerve root</td>
<td>attachment to periarticular connective tissue of the facet joint</td>
</tr>
<tr>
<td>size</td>
<td>small, multiple, ≤ 3 cm</td>
<td>single, longitudinally elongated over several spinal levels</td>
<td>single, spherical, ≤ 1 cm</td>
</tr>
<tr>
<td>histology</td>
<td>cyst wall contains nerve fibers &amp; occasional ganglion cells or hemorrhage</td>
<td>connective tissue capsule with mesothelial cell lining, contains clear or xanthochromic fluid</td>
<td>ganglion cyst; connective tissue capsule with no mesothelial cell lining, contains gelatinous material</td>
</tr>
<tr>
<td>myelogram</td>
<td>no initial filling of cyst, 24 hours delayed filling possible</td>
<td>50% filling of cyst</td>
<td>no filling of cyst</td>
</tr>
<tr>
<td>treatment</td>
<td>excision of cyst, posterior root, &amp; ganglion from which it arises</td>
<td>division of pedicle attachment between silver clips, removal of cyst</td>
<td>excision of cyst</td>
</tr>
</tbody>
</table>

three distinct entities: perineurial cysts, extradural arachnoid cysts, and juxta-facet cysts (Fig. 3). Their differential diagnosis is summarized in Table 2.

In a recent communication, Tarlov5 has further clarified spinal perineurial cysts. These cysts occur at or distal to the junction of the posterior root and the dorsal ganglion. They are often small and multiple, but may attain a diameter of 3 cm. The cyst wall contains nerve fibers and at times ganglion cells. They do not fill on initial myelography but may fill 24 hours later if a small amount of Pantopaque is left in the subarachnoid space. At surgery the diagnosis can be made with certainty because in order to remove the cyst the posterior root has to be divided.

Spinal extradural arachnoid cysts, on the other hand, frequently develop from an arachnoidal herniation through a small "congenital" defect at or near the dural sleeve over the nerve root. The cysts may be large and extend over several segments of the spine and produce bone erosion and kyphosis. Communication between the cyst and the subarachnoid space, when it is demonstrated by myelography or at surgery, confers the diagnosis. In Cloward's1 report of 92 cases of "congenital spinal extradural cysts," 48 cases showed no communication between the cysts and subarachnoid space by either myelography or at surgery.

Thus, it is difficult to differentiate the noncommunicating type of spinal extradural arachnoid cyst from the true synovial juxta-facet cyst because in both cases the cysts may have clear fluid contents, are easily separable from the dura, and have no communication with the subarachnoid space; moreover, on histological section both may show the identical connective tissue capsule with mesothelial cell lining.

At laminectomy, whenever an extradural cyst is found but no subarachnoid connection is seen, one should search along the lateral aspect of the cyst to prove or disprove attachment to the facet synovial joint. Only by this means can a noncommunicating extradural arachnoid cyst be differentiated from a true synovial juxta-facet cyst.

References

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