

# Synovial Cyst in the Cervical Region Causing Severe Myelopathy

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The authors describe a case of an 80-year-old man with a gradual weakness of the lower extremities not linked to any known traumatic episode over the 2 weeks before admission. CT scan and MRI of the spine revealed a cystic formation, measuring about 1 cm in diameter, at C7-T1 at the left posterolateral site at the level of the articular facet. During surgery, the mass appeared to be in the ligamentum flavum at the level of the articular facet and was in contact with the dura mater. After the removal of the mass, there was an immediate and significant improvement of the patient's symptoms. Histopathologic examination showed the cyst to be composed of nonspecific degenerative fibrous tissue with mild inflammatory change and confirmed the cyst as a synovial cyst. Synovial cyst in the cervical region is a very rare lesion causing myelopathy. Surgical removal of the cyst and decompression of the spinal cord results in good neurological recovery.

**Key Words:** Synovial cyst, surgical treatment

## INTRODUCTION

Intraspinal extradural synovial cysts have been reported by various authors as cystic lesions adjacent to the facet joints or in the ligamentum flavum of the spine. The cysts tend to arise mostly from the facets and are commonly found in the lower lumbar region.<sup>1</sup> Occurrence of the cyst in the cervical region causing myelopathy is extremely rare. We describe a case of cervical synovial cyst and discuss the pathological and clinical

aspects of this rare pathology.

## CASE REPORT

An 80-year-old man presented with a 1-month history of gradually progressive gait disturbance and paresthesia in the lower limbs. Over 2 weeks, his gait disturbance gradually worsened, and the numbness extended up to the bilateral upper chest region.

Examination revealed a severe motor deficit in the lower limbs, to the extent that (he was only able to raise his legs while lying in bed for a few seconds), as well as an increased response to knee and ankle jerks. There was superficial and deep hypoesthesia below C8, and also urinary retention, which required catheterization.

A CT scan of the cervical spine identified a hypodense cystic formation with hyperdense rim, located in a left posterolateral position with respect to the spinal cord, behind the left joint facet at the C7-T1 level (Fig. 1).

Cervical MRI with axial and sagittal views revealed not only spondylosis of the vertebral bodies and narrowing of the perimedullary subarachnoid spaces, but also a mass located posterolaterally to the left of the spinal cord at the C7-T1 level with marked compression of the neuraxial structures. The central portion of this formation was hypodense in relation to the spinal parenchyma on T1-weighted images, with a peripheral signal increase following intravenous administration of gadolinium (Fig. 2).

Histopathologic examination showed the cyst to be composed of nonspecific degenerative fibrous granulation tissue compatible with a cyst of

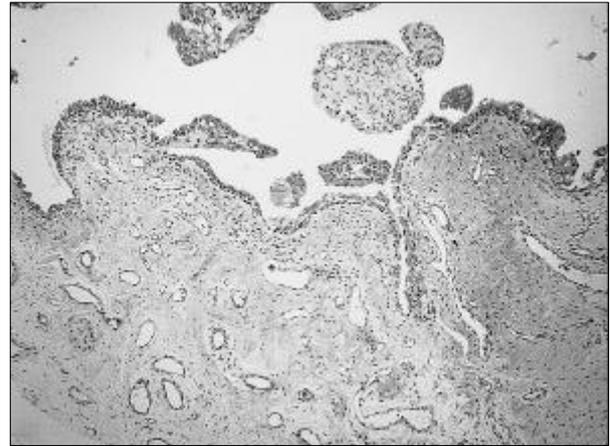
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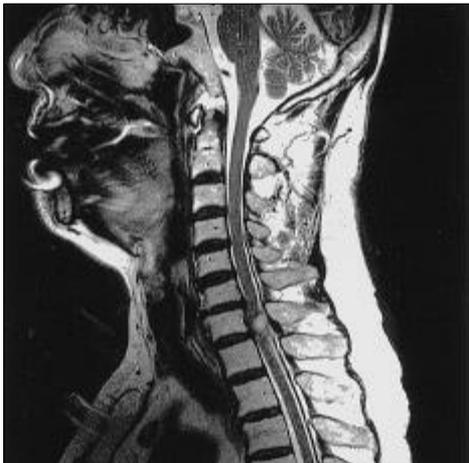
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**Fig. 1.** Computed tomographic shows a mass lesion in the spinal canal adjacent to the left C7-T1 facet with gas content.



**Fig. 3.** Photomicrograph of the cyst wall shows nonspecific degenerative fibrous tissues with a cyst of synovial origin.



**Fig. 2.** Sagittal T2-weighted magnetic resonance image shows a mixed-intensity extradural mass at C7-T1.



**Fig. 4.** Postoperative 6 months MRI shows complete removal of the mass.

synovial origin (Fig. 3). During C7 laminectomy, a large extradural cyst causing severe cord compression was removed without complication (Fig. 4). After surgery, the patient experienced a uneventful recovery with relief of myelopathy symptoms.

## DISCUSSION

Synovial cysts of the spine are rare and usually asymptomatic, unless acute hemorrhage or marked increase in size occurs, in which case they

may cause nerve root or spinal cord compression. They usually occur during the fifth and sixth decades and have no gender predominance. Many theories have been proposed to explain their cause. Although some investigators have seemed to imply that trauma is the cause, others, as reviewed by Miller et al, have suggested metaplasia, the presence of developmental rests, and

excess stress at the facet joints with herniation of synovial tissue.<sup>2</sup> Generally, synovial cysts are considered an extrusion of the synovium through a capsular defect from a degenerated or unstable facet joint. Such a cyst occurs most frequently in the lumbar spine, but rarely in the cervical spine. A search of the literature disclosed only 27 reports of synovial cysts of the cervical spine, of which 10 were located in the upper cervical region and the 17 in lower cervical region.<sup>3</sup> The upper cervical cysts were located near the odontoid process, C1-C2 facets and adjacent to an os odontoideum. Most of the lower cervical cysts were located near C6-C7, and C7-T1 facet joints where the occurrence of degenerative changes is most frequent.

The gross appearance of a spinal synovial cyst resembles an extradural cystic formation about the size of a pea or nut, situated posterolateral to the dural sac at the level of the ventral aspect of articular facets. The terms "spinal synovial cyst" and "spinal ganglion cyst" have been used synonymously by some authors. However, Kao et al suggested that the difference between synovial and ganglion cysts is that the former often contain clear and serous fluid, whereas the latter contain gelatinous, highly viscous fluid, and they proposed the term "juxtafacet cyst" to categorize cysts that arise at the joint capsule of the spinal facet.<sup>2,4</sup> However, synovial or ganglion cysts cannot be classified or diagnosed solely by their location and the origin and nature of their contents; they can only be distinguished by their pathological findings. Microscopically, synovial cysts are lined with pseudostratified columnar cells, whereas ganglion cysts have no such synovial cell lining and no communication with the joint cavity. Nevertheless, in cases described by Hsu et al.,<sup>4</sup> the distinction between ganglion and synovial cysts is only a matter of terminology.<sup>5</sup> In fact, Sabo et al. affirmed that "there is no clinical significance in distinguishing between the ganglion and synovial cyst because their treatment and prognosis are the same".<sup>6</sup> In our case reported here, the cyst was found to communicate with the facet joint, and microscopic examination revealed synovial cell lining. Therefore, based only on a histopathological point of a view, a diagnosis of synovial cyst was made.

Differential diagnosis of an extradural spinal

cyst include a detached disc fragment, extradural metastasis, meningioma, schwannoma, cystic neurofibroma, dermoid cyst, parasitic cyst, perineural cyst, extradural arachnoid cyst, hypertrophic synovitis, and hypertrophic pigmented villonodular synovitis.<sup>4,7,8</sup>

For accurate diagnosis and decompression of the spinal cord, the basic treatment for a cervical extradural cyst compressing the spinal cord is surgical excision. Most authors have performed laminectomy and excision. If the cysts have been properly excised, the chance of recurrence remains low. Some authors performed percutaneous aspiration of the cyst content but this only provided temporary improvement and furthermore, is accompanied by risks of neurologic complication even if performed under proper image guidance.<sup>5</sup> Therefore, total removal of the extradural cyst and decompression of the spinal cord is recommended unless surgery under general anesthesia is contraindicated. Surgical removal of the cyst can be performed without difficulty and the consequent decompression of the spinal cord should result in good postoperative neurological recovery. Synovial cyst of the cervical spine is a rare lesion. The cyst may cause progressive myelopathy, and synovial cyst should be considered in the differential diagnosis irrespective of whether it develops acutely or subacutely. Surgical removal of the cyst and decompression of spinal cord results in good neurological recovery.

## REFERENCES

1. Lunardi P, Acqui M, Ricci G, Agrillo A, Ferrante L. Cervical synovial cysts: case report and review of the literature. *Eur Spine J* 1999;8:232-7.
2. Miller JD, Al-Mefty O, Middleton TH. Synovial cyst at the craniovertebral junction. *Surg Neurol* 1989;31:239-42.
3. Shima Y, Rothman SL, Yasura K, Takahashi S. Degenerative intraspinal cyst of the cervical spine. *Spine* 2002;27:18-22.
4. Kao CC, Winkler SS, Turner JH. Synovial cyst of spinal facet. *J Neurosurg* 1974;41:372-6.
5. Hsu KY, Zucherman JF, Shea WJ, Jeffrey RA. Lumbar intraspinal synovial and ganglion cyst(facet cysts). Ten-year experience in evaluation and treatment. *Spine* 1995;20:80-9.
6. Sabo AR, Tracy PT, Weinger LM. A series of 60

- juxtafacet cysts. Clinical presentation, the role of spinal instability, and treatment. *J Neurosurg* 1996;85:560-5.
7. Cloward RB. Congenital spinal extradural cyst: case report and review of the literature. *Ann Surg* 1968;168: 851-64.
  8. Frank JI, King RB, Petro GR, Kanzer MD. A post-traumatic lumbar synovial cyst. *J Neurosurg* 1987;66: 293-6.