

# Lumbar Synovial Cyst: Case Report

## Lomber Sinoviyal Kist: Vaka Takdimi

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**Abstract:** Synovial cysts of the spinal canal are very rare. We report a case in which synovial cyst of a spinal facet joint in the lumbar region caused nerve root compression. The clinical picture of intraspinal synovial cyst can mimic many other conditions, and this lesion should always be included in the differential diagnosis for radiculopathy.

**Key Words:** Magnetic resonance imaging, nerve root compression, spine surgery, synovial cyst

**Özet:** Spinal kanalın sinovial kisti nadir bir durumdur. Biz sinir kökü kompresyonu yapan spinal fasetin sinoviyal kistini sunmaktayız. Pek çok klinik tabloyu taklit edebildiğinden radikülopatisi olan olgularda ayırıcı tanıda akılda bulundurulmalıdır.

**Anahtar Sözcükler:** Manyetik rezonans görüntüleme, sinir kökü basısı, spinal cerrahi, sinoviyal kist

### INTRODUCTION

Symptomatic synovial or ganglion cysts rarely arise in the spinal canal (1). These lesions are most common in the hand and wrist, but they also develop in a variety of other locations (3). Patients with intraspinal synovial cysts usually present with the symptoms of radiculopathy. In addition to this condition, these cysts should also be included in the differential diagnosis for cauda equina syndrome (8).

In typical cases of intraspinal synovial cyst, computed tomography (CT) shows a posterolateral extradural mass that may be partially calcified or contain gas (13). The cyst usually appears as a hypointense epidural lesion adjacent to a

degenerated facet joint, and it may have a dense rim. The signal characteristics on magnetic resonance imaging (MRI) are variable (13).

Prior to surgery, the tentative diagnosis of true synovial cyst should be considered for any patient with an unusual clinical history and with CT and MRI features that are compatible with this lesion. In this article, we present a case of lumbar synovial cyst which was diagnosed preoperatively and successfully treated by surgical excision.

### CASE REPORT

A 44-year-old woman presented with low-back and left lower extremity pain that was exacerbated by standing during housework,

driving and walking, and was not responsive to medical treatment. In the week before she was admitted to hospital, the pain had persisted throughout the night. Physical examination revealed essentially full flexion but mildly restricted extension of the lumbar spine. There was no scoliosis, listing or shifting of the spine on forward flexion. The straight leg-raising test was positive on the left side. Sensory testing revealed hypoesthesia in the left S1 dermatome.

Magnetic resonance imaging revealed a well-circumscribed lesion in the left dorsolateral portion of the spinal canal at L5-S1. The lesion appeared hypointense on axial T1-weighted images. T2-weighted images demonstrated a hyperintense central region and a hypointense rim that enhanced with contrast (Figure 1a, b).

Laminotomy was performed at L5-S1. The left sides of the L5 and S1 vertebrae were covered with abundant whitish connective tissue that extended to the adjacent ligamentum flavum. A cystic lesion was identified dorsal to the shoulder of the left S1 nerve root, and this was found to originate at the facet joint. There was no disc herniation at L5-S1. The involved solid and cystic tissues were resected with a partial facetectomy. The patient's low-back and leg pain was relieved, and she was able to resume normal activities within a week after surgery (Figure 2 a,b). During 1 year of follow-up, she had no recurrent symptoms.

Pathological examination of the surgical specimen revealed a cystic structure that contained pieces of tissue and dense fibrin. The cyst wall was composed of connective tissue and fibrous

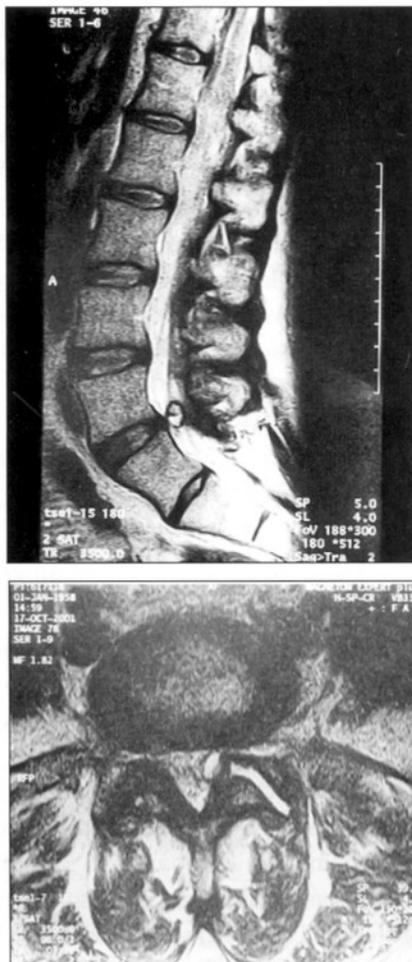


Figure 1: A preoperative T2-weighted sagittal image shows a hyperintense mass with a hypointense rim (a); and a preoperative T2-weighted axial image confirms total excision of the lesion (b).

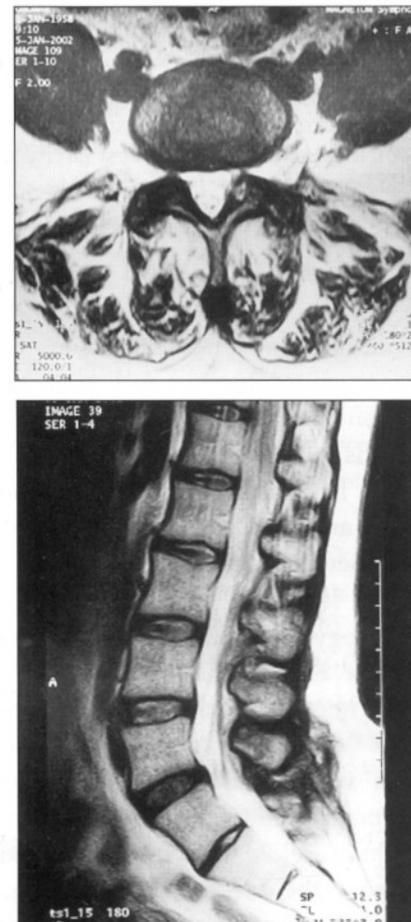


Figure 2: A postoperative T2-weighted axial image shows hyperintense mass with a hypointense rim in the left dorsolateral region of the spinal canal at L5-S1 level (a); and a postoperative T2-weighted sagittal image confirms total removal of the mass (b).

cartilage. The parts of the specimen differing from the mentioned characteristics consisted of a few lines of cells with proliferating synovial cysts. The eroded parts of the cyst wall where lining cells were absent exhibited dense mononuclear cell infiltration with osteoclastic-type giant cells. All of these pathological findings were consistent with synovial cyst. (Figure 3)

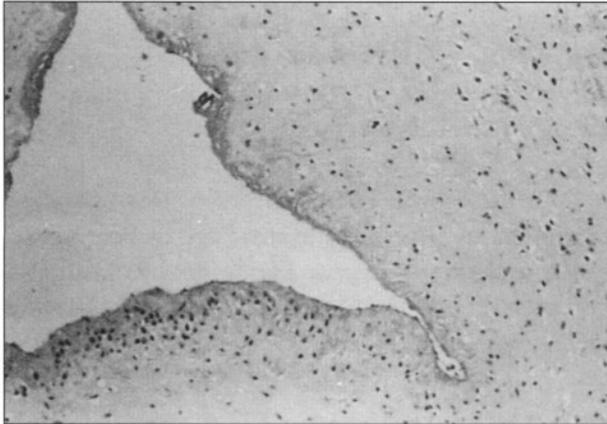


Figure 3: A photomicrograph of a section of the surgical specimen shows stromal edema, myxomatous changes, and a few microcalcifications. The cyst cavity does not have synovial lining.

## DISCUSSION

Extradural spinal synovial cysts are rare, but are known to cause lumbar radiculopathy. The most common site of intraspinal synovial cyst development is the lower lumbar spine adjacent to facet joints (5). These lesions arise most frequently in patients who are older than 50 years and have severely degenerated facet joints.

The etiology of intraspinal synovial cyst is unknown (13). Histological findings of myxoid degeneration, microcystic change, calcification and hemosiderin deposits suggest that chronic microtrauma with occasional focal hemorrhage may play a major role (8). The exact steps are not clear, but may relate to either herniation of synovium from the facet joint, or to mucinous degeneration of the connective tissue adjacent to the joint. Other suggested etiological theories are: extrusion of herniated synovial lining through a defective joint capsule; myxoid degeneration of collagen tissue with cyst formation; fibroblast

proliferation with increased hyaluronic acid production, secondary cyst formation and proliferation of non-specific pluripotential mesenchymal cells; and direct post-traumatic degeneration. (7,8,11). Reports in the literature have focused on trauma leading to cyst enlargement (1); however, there was no trauma history in our case.

Juxta-articular cysts related to hypertrophic vertebral facet joints have alternatively been referred to as synovial cysts or ganglion cysts, depending on the presence of a true synovial lining (11). Synovial cysts in the spinal spine are rarely symptomatic (9). The clinical pictures in patients with synovial cysts of the lumbar spine vary considerably. The symptoms differ according to the size and location of the cyst in relation to neural structures (10). Reports have identified intraspinal synovial cysts at a number of different sites. These include the dorsal midline with involvement of the dura mater and the base of the neural arch; the inner aspect of the ligamentum flavum without attachment to the facet; the spinal canal with attachment to the facet through the interlaminar space dorsally; the ligamentum flavum itself; and the interspinous ligament in juvenile kyphoscoliosis cases (8).

Extradural spinal synovial cysts are usually diagnosed on the basis of myelography, CT and MRI. Typically, these cysts appear on CT and myelography as posterolateral extradural masses that may be partially calcified or contain gas (12).

On MRI, these cysts appear as well-circumscribed juxta-articular structures, often without evidence of association with a facet joint (2,14). The signal intensity varies greatly depending on the characteristics of the cyst. In general, on T1- and T2-weighted images the cystic cavity is hyperintense compared to cerebrospinal fluid because the material within usually contains some protein. In contrast, cysts with wall calcification may produce low-intensity signals (6). In most cases, administration of gadolinium contrast results in uniform rim enhancement due to the presence of chronic inflammation (13).

The differential diagnosis for dorsolateral extradural lesions with thecal sac effacement includes synovial cyst, perineural cyst, primary and secondary neoplasms, herniated nucleus pulposus, arachnoid cyst and neurofibroma with cystic degeneration (11). Patients may present with dull back pain only, with pain radiating to the hips, with unilateral sciatica, or with neurogenic claudication (8). Associated neurological deficits may be subtle.

Hemminghytt et al. reported that most patients with synovial cysts present with pain, and stated that surgery is only indicated when the pain is accompanied by sensory or motor symptoms (4). Our patient presented with low-back and left leg pain that limited her daily activities. The problem was not responsive to analgesics and anti-inflammatory drugs. The straight leg-raising test was positive, and she exhibited hypoesthesia in the left S1 dermatome. Radiological investigation showed a synovial cyst compressing S1 nerve root. Considering these symptoms of radiculopathy, surgery was the treatment of choice in this case. The patient's pain was completely relieved by the operation.

In conclusion, intraspinal synovial cysts are rare lesions that most often arise in the lumbar region. These cysts should always be included in the differential diagnosis for lumbar spinal disease. The clinical presentation is usually identical to that of intervertebral disc herniation. Surgical decompression and excision may result in significant neurological improvement. Establishing the definitive diagnosis preoperatively is important in planning the most appropriate treatment for these patients.

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