

# A rare cause of radiculopathy: Ligamentum flavum cyst

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## SUMMARY

Ligamentum flavum cysts are rare causes of neurological signs and symptoms and usually seen in persons over 45 years of age. We report the case of a right-sided ligamentum flavum cyst occurring at L5-S1 level in a 60 year-old woman, which was surgically removed with excellent postoperative results, and complete resolution of symptoms. Lumbar magnetic resonance imaging demonstrated an extradural cystic mass at the L5-S1 intervertebral space and disc hernia with canal stenosis at the L4-5 intervertebral space. Right hemilaminectomy and flavectomy at the L4-5 and L5-S1 space were performed, and cystic mass with sequestered disc was excised. Histological examination of the resected material showed findings consistent with the ligamentum flavum cyst. After surgery, claudication and radiculopathy completely disappeared and the patient made a good recovery.

**Key words:** Ligamentum flavum cyst, radiculopathy, pseudocyst

## ÖZET

### Radikülopatinin ender bir nedeni: Ligamentum flavum kisti

Ligamentum flavum kistleri nörolojik semptom ve bulguların ender bir nedeni olup, genellikle 45 yaş üstü insanlarda görülmektedir. Altmış yaşında bayan hastada L5-S1 seviyesinde sağ tarafta yerleşen bir ligamentum flavum kist olgusunu rapor ettik. Kist cerrahi yöntemle çıkartıldı ve sonuç kusursuzdu. Ameliyat sonrası hastanın semptomları geriledi. Lomber magnetik rezonans görüntüleme; L5-S1 intervertebral yerleşimli kistik kitle ve L4-5 seviyesinde disk hernisiyle birlikte dar kanal görüntüledi. Sağ L4-5 ve L5-S1 hemilaminektomi yapıldı ve kistik kitle sekestre diskle birlikte çıkartıldı. Çıkartılan materyalin histolojik incelemesi ligamentum flavum kistiyle uyumluydu. Cerrahi sonrası hastanın kladikasyon ve radikülopati yakınmaları tamamen düzeldi.

**Anahtar kelimeler:** Ligamentum flavum kisti, radikülopati, psödokist

There are different cystic lesions in the lumbar spinal canal including hemorrhagic, perineural, dermoid, arachnoid, parasitic and juxtafacet cysts (1). The term 'Juxtafacet cyst' was proposed for all cysts located at the facet joint, ligamentum flavum and posterior longitudinal ligament (2,3). On the other hand, Juxtafacet cysts classified histologically as synovial (true) and pseudocysts (ganglion) (4,5). Synovial cysts or pseudocysts can be clearly distinguished by the presence or absence of a synovial lining membrane. Ligamentum flavum pseudocyst in the lumbar spine has been rarely reported.

## CASE

A 60 year-old woman presented with right leg weakness persisting for one year. She had suffered low back, and right leg pain for 2 years. Neurological examination revealed weakness (grade 4/5) of the right ankle at dorsiflexion and sensation of the lower limbs was intact. Motor examination of the other muscle groups was normal. Reflexes were normoactive. Three months prior to her admission her walking distance had decrease to 100 m and her low back and right leg pain exacerbated, not responding to conservative therapy. Radiographs of the lumbosacral spine showed chronic degenerative changes. Magnetic Resonance Imaging (MRI) showed

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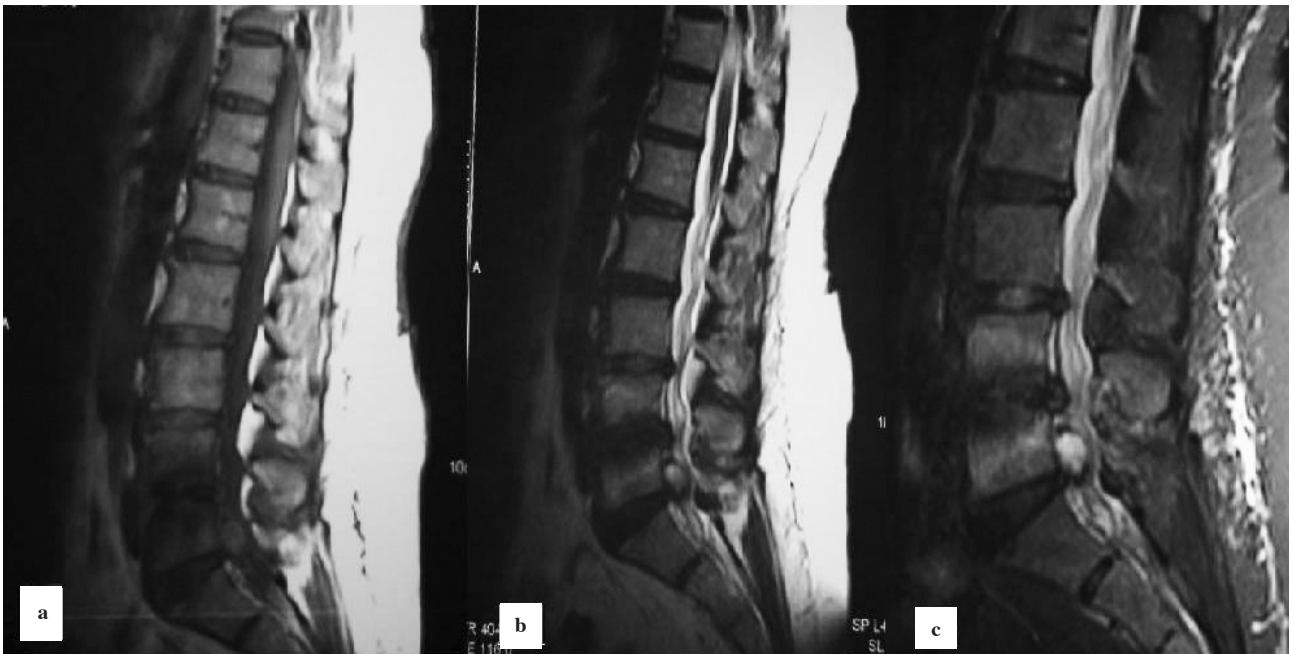


Figure 1. a) Sagittal T1 weighted, b) Sagittal T2 weighted, c) Saggital weighted with contrast.

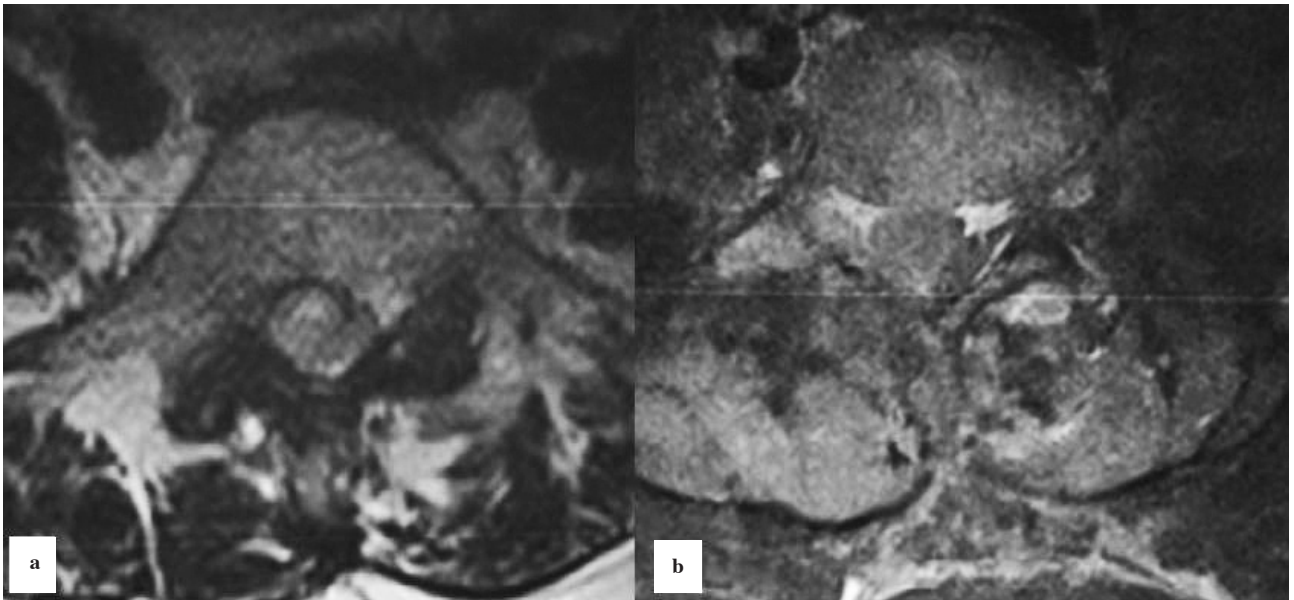


Figure 2. a) Axial T1 weighted, b) Axial T2 weighted with contrast.

right L5-S1 space hypointense on T1-weighted, and hyperintense on T2-weighted images. Besides, L5-S1 space demonstrated non-contrast enhancement on T2-weighted images, and sequestered disc fragments within right L4-5 space were seen (Figure 1-2). Microscopic posterior decompression with right hemilaminectomy and flavectomy at the L4-5 and L5-S1 space were performed, and cystic mass

with sequestered disc was excised. The cystic lesion between the spinal cord and root was resected with the hypertrophied ligamentum flavum. No connections with the dura mater and facet joints were observed. Histological examination of the resected material showed calcified and degenerated fibrocollagenous tissues. These findings were consistent with pseudocystic degeneration of the ligamentum

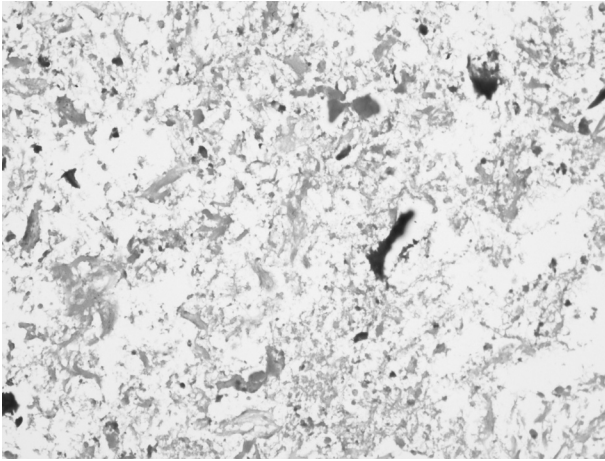


Figure 3.

flavum (Figure 3). After surgery, claudication and radiculopathy completely disappeared and the patient made a good recovery.

## DISCUSSION

As a cystic lesion in the lumbar spine, pseudocyst of ligamentum flavum is an unusual cause of neurologic symptoms such as radiculopathy, neurogenic claudication, myelopathy, neurologic deficit and cauda equina syndrome <sup>(6,7)</sup>.

Synovial cyst communicates with the facet joint, contains clear and xanthochromic fluid and has a synovial lining epithelium <sup>(8)</sup>. The spinal pseudocyst does not communicate with the facet joint cavity, has a fibrous tissue wall and it is filled with a viscous, and gelatinous material <sup>(9)</sup>.

This lesion usually seen in elderly persons due to degenerative changes. In previously reported cases, the cysts localized at L4-L5 or L5-S1 were usually associated with degenerative changes <sup>(1,2)</sup>. The pathogenesis of ligamentum flavum cysts remains unknown <sup>(1,10,11)</sup>. The ligamentum flavum is a well defined elastic structure composed of 80 % elastic and 20 % collagen fibers. Progressive replacement of elastic fibers by connective tissue and thickening of the ligamentum flavum is part of normal aging in the spine and it is prominent in degenerative osteoarthritis <sup>(12)</sup>. The development of the ligamentum

flavum cyst may be related to necrosis or myxoid degeneration occurring in a hypertrophied ligamentum flavum. Also increased stress placed on the most mobile segment of the lumbar vertebrae may precipitate the development of the lumbar synovial/ganglion cyst <sup>(11)</sup>. This hypothesis is supported by the common presentation of synovial/ganglion cyst at most mobile segment of the lumbar vertebrae, ie. L4-5 and L5-S1 <sup>(6,8)</sup>. Most ligamentum flavum cysts reported in the literature were also located laterally within the spinal canal. While possibly as a consequence of chronic bony degenerative disease, this phenomenon may be further elucidated in certain cases by the observation that the yellow ligaments are not as thick laterally as they are medially <sup>(13)</sup>. Furthermore, they form posterior recesses bilaterally to the vertebral bodies. These recesses are filled with epidural fat and offer an area of decreased resistance and may, as a result, tolerate cyst formation.

There are no specific clinical symptoms for juxtafacet cysts. In a study performed by Wildi et al on pseudocystic degeneration of the ligamentum flavum, 97 % of the patients complained of radicular pain, while the patients also demonstrated motor deficits (39 %), sensory changes (55 %), abnormal reflexes (18 %) and a positive Laseque sign (33 %) <sup>(14)</sup>. Our patient presented with 1 year history of right leg weakness and suffered low back and right leg pain for 2 years. Neurological examination revealed weakness (grade 4/5) of the right ankle at dorsiflexion.

MRI imaging is useful for the diagnosis of ligamentum flavum cyst. Before the surgery, differential diagnosis between the ligamentum flavum cyst, and synovial cyst is helpful for the surgeon. Synovial cyst often has a calcified rim while ligamentum flavum cyst do not <sup>(13)</sup>.

Conservative therapy appears to have no success <sup>(13)</sup>. Surgical treatment is the gold standard in patients with severe pain and neurological deficit <sup>(15)</sup>. Spontaneous resolution of the synovial cyst has been reported but the cyst may be the cause of lysis in the

bone and hemorrhage which mimicks infection and malignancy on MRI <sup>(16,17)</sup>. The cyst wall must be removed to avoid recurrence <sup>(11)</sup>. Dense adhesion of the ligamentum flavum cyst to the dura is a surgical difficulty for complete excision of the ligamentum flavum cyst. Dural tear might occur and cerebrospinal fluid fistula can be the surgical sequila. Larger cyst is more likely to adhere to the dura mater <sup>(18)</sup>. In our patient the ligamentum flavum was dissected easily from the dura matter.

As a conclusion, there are no clinical symptoms specific to ligamentum flavum cyst and its treatment is complete removal by surgery. The postoperative outcome is very good.

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