Cyst of the Ligamentum Flavum
—Case Report—

Shunji ASAMOTO, Hiroyuki JIMBO, Yasuyuki FUKUI, Hiroshi DOI*,
Hajime SAKAGAWA**, Masahiro IDA***, Manabu TAKAHASHI†,
and Naoki SHIRAISHI††

Spine and Spinal Cord Center, Tokyo Mita Hospital, International University of
Health and Welfare, Tokyo; Departments of *Neurosurgery, **Orthopedics,
***Radiology, and †Pathology, Tokyo Metropolitan Ebara Hospital, Tokyo;
††Department of Anatomy, Kyorin University School of Medicine, Mitaka, Tokyo

Abstract
An 86-year-old man presented with intermittent claudication caused by a cyst of the ligamentum flavum. Lumbar magnetic resonance imaging demonstrated an extradural cystic mass at the L5-S1 intervertebral space and canal stenosis at the L4-5 space. L-5 laminectomy and flavectomy at the L4-5 and L5-S1 spaces were performed, and the cystic mass was excised. The histological features were consistent with cyst of the ligamentum flavum. The histological diagnosis was ganglion cyst of the ligamentum flavum. After surgery, claudication completely disappeared and the patient made a good recovery.

Key words: cyst of the ligamentum flavum, histological feature, pathogenesis

Introduction
Cysts of the ligamentum flavum are rare and uncommon causes of neurological signs and symptoms.1,4,6,8,28,30,34) Ligamentum flavum cyst is a type of juxtafacet cyst.5,6,15,19,20) Cyst of the posterior longitudinal ligament (PLL) or the facet joint are also types of juxtafacet cyst.15,16,19,20) The perioperative findings also allow classification by location into three groups, joint (facet) cyst, flavum cyst, and PLL cyst.1,2,6,12,16,31) On the other hand, the histological classification includes only true cyst and pseudo cyst. A true cyst is a so-called synovial cyst, which has a synovial lining membrane.13,14,17,24,25,29) Synovial cyst seems to originate from a synovium of the facet.20,29) However, synovial cyst has originated from the ligamentum flavum, possibly by advanced degeneration of the ligamentum flavum.3,10) Almost all cysts of the ligamentum flavum and cysts of the PLL are pseudo cysts.5,10,22) Pseudo cyst is also known as ganglion cyst.

We describe a rare case of cyst of the lumbar ligamentum flavum.

Case Report
An 86-year-old man presented with a 2-month history of intermittent claudication. He had suffered low back pain and bilateral dysesthesia of the lower extremities at rest for 10 years. He was admitted to our department with gradually progressive intermittent claudication and dysesthesia of the lower limbs on August 26, 2004. Neurological examination revealed marked intermittent claudication (5 meters) and urinary incontinence associated with neurogenic bladder, but no motor paresis or sensory disturbance. Magnetic resonance imaging revealed a cystic mass in the right posterolateral area of the L5-S1 space, appearing as hypointense on T1-weighted imaging and hyperintense on T2-weighted imaging, and canal stenosis at the L4-5 space (Fig. 1). Post-myelogram computed tomography showed complete block of the contrast material in the extradural area adjacent to the right L5-S1 ligamentum flavum (Fig. 2).

En bloc laminectomy at the L-5 level and flavectomy at the L4-5 and L5-S1 spaces were performed through a midline posterior approach. The ligamentum flavum at the L5-S1 space was removed completely with the cystic mass. The ligamentum flavum...
Fig. 1 Sagittal T₁-weighted (A) and T₂-weighted (B) magnetic resonance (MR) images showing an extradural cyst at the right L5-S1 space and canal stenosis at the L4-5 space. Axial T₂-weighted MR image (C) demonstrating the compressed right S-1 root (arrowhead) causing the ligamentum flavum cyst.

Fig. 2 Computed tomography myelogram showing complete block of the contrast material at the L5-S1 space.

Fig. 3 Photograph of the surgical specimen of the ligamentum flavum at the L5-S1 space showing the surface is substantial and hard, with no cyst, hemorrhage, and necrosis (A). Photograph of the sagittal section showing the cyst formation (B).

was dissected easily from the dura. The removed ligamentum flavum had a smooth surface, and the cyst formation could not be identified from the surface. The surface was elastic, harder than the normal ligamentum flavum. The cyst did not originate from the L5-S1 facet joint (Fig. 3).

Histological examination of the resected material showed a wall of fibrous connective tissue without synovial cell lining. There were some degenerative clefts representing chronic granular formation. Necrotic tissues, histiocyte infiltration, hemosiderin deposits, and neovascularization were also present in the wall (Fig. 4). The histological diagnosis was ganglion cyst of the ligamentum flavum.

The patient had excellent relief of intermittent claudication and dysesthesia after surgery.

Discussion

We speculate that the pathogenesis of the juxtafacet cyst[33] is based on the clinical anatomy of the facet

Neurol Med Chir (Tokyo) 45, December, 2005
(zygapophysial) joint and exercise loading on the spine. The facet (zygapophysial) joint has two peculiar structures: the capsule of the facet joint, with a posterior wall consisting of thin fibrous capsule and an anterior wall of very thick ligament flavum; and the pores of the capsule, present at the caudal pole and capital pole of the facet joint, which allow the fat tissue to form intra- and extracapsular connections.\(^7\) We consider that these specific structures of the facet joint and the load to the spine form the pathological structure of the juxtapacet cyst complex. Of course, the dynamics of the spine exert the greatest exercise loading on the joint, but some exercise loading is also exerted on the surrounding tissues such as the PLL and ligamentum flavum.\(^9\)\(^,\)\(^2\)\(^1\)\(^,\)\(^3\)\(^,\)\(^2\)\(^3\)\(^,\)\(^3\)\(^4\) No reports have described the appearance of these cysts in any region other than the mobile spine. The T2–10 vertebrae mainly act with the ribs to form the thorax and are not generally considered to be part of the mobile spine.\(^11\) There are no specific clinical symptoms for juxtapacet cyst and treatment depends on surgical intervention.\(^3\)\(^3\) The postoperative outcome is generally very good.\(^2\)\(^7\)

**References**


Address reprint requests to: S. Asamoto, M.D., Department of Neurosurgery, Tokyo Mita Hospital, International University of Health and Welfare, 1–4–3 Mita, Minato-ku, Tokyo 108–8329, Japan.
e-mail: spine-ns@sb.dcns.ne.jp