Ligamentum Flavum Hematoma in the Cervical Spine
—Case Report—

Naohisa MIYAKOSHI, Yoichi SHIMADA, Yuji KASUKAWA, and Shigeru ANDO

Department of Orthopedic Surgery, Akita University School of Medicine, Akita

Abstract

A 67-year-old man presented with a rare case of ligamentum flavum hematoma manifesting as progressive tetraplegia following cervical traction therapy. Magnetic resonance imaging of the cervical spine showed a posterior mass that was continuous with the ligamentum flavum at the C3–4 levels. Complete resection of the mass that contained brownish hemorrhage was performed, resulting in excellent symptom relief. We speculate that repeated trivial trauma to the degenerative ligamentum flavum was the main predisposing factor in the present case. Ligamentum flavum hematoma is a rare cause of spinal root or cord compression which typically occurs in the lower thoracic or lumbar spine, but may also appear in the cervical spine.

Key words: ligamentum flavum, cervical spine, hematoma

Introduction

Ligamentum flavum hematoma is a rare cause of spinal root or cord compression and usually occurs in the lower thoracic or lumbar spine. Symptomatic ligamentum flavum hematoma has been described in only 13 patients. All patients underwent surgery and the diagnosis was histologically confirmed. Ligamentum flavum hematoma in the cervical spine is extremely rare, with only one such case reported. Here we describe another case of the ligamentum flavum hematoma in the cervical spine.

Case Report

A 67-year-old man with diabetes mellitus and hypertension, who had been suffering from mild cervical pain for 3 months, presented with a 2-week history of progressive weakness and numbness of the bilateral upper and lower extremities following cervical traction therapy. The patient had incomplete tetraplegia and was unable to stand without a walker when he visited our clinic. Radiography of the cervical spine showed mild spondylotic change. Magnetic resonance (MR) imaging revealed spinal cord compression at the C3–4 levels caused by a posterolateral mass, which was continuous with the ligamentum flavum on the left (Fig. 1). T1-weighted MR imaging showed the lesion as heterogeneous isointensity to hyperintensity, and T2-weighted MR imaging showed hyperintensity in the center. The wall of the mass was well enhanced after intravenous administration of gadolinium-diethylenetriaminepenta-acetic acid. These MR imaging findings were suggestive of ligamentum flavum hematoma in the cervical spine. The results of routine laboratory studies indicated no evidence of bleeding tendency or infectious disease.

The patient underwent a C3–4 laminectomy for decompression of the spinal canal and resection of the mass lesion. The thickened ligamentum flavum was incised. The ligamentum flavum had adhered to the dural sac, and contained dark brownish fluid which was aspirated. The remaining ligamentum flavum was completely removed. The cavity of the left C3–4 facet joint was not filled with the hematoma. The intraoperative diagnosis was ligamentum flavum hematoma in the cervical spine.

Immediately after surgery, the patient experienced improvement in strength of the upper and lower extremities, increased sensitivity, and reduced pain. He resumed walking without a cane 3 weeks after the surgery. MR imaging obtained 4 months after the surgery confirmed total removal of the lesion and effective decompression of the spinal cord (Fig. 2). At follow up, 12 months later, he had slight numbness in both hands but was neurologically intact.
Fig. 1 Magnetic resonance images demonstrating an extradural mass lesion posterolateral to the spinal cord at the C3–4 levels. (A) Sagittal and (D) axial T₁-weighted images showed the mass originating from the left ligamentum flavum as isointensity to hyperintensity, (B) sagittal and (E) axial T₂-weighted images showed central hyperintensity, and (C) sagittal T₁-weighted image showed marginal enhancement after administration of gadolinium-diethylenetriaminepenta-acetic acid.

Fig. 2 Magnetic resonance images obtained 4 months after the surgery showing good decompression of the spinal cord with total removal of the lesion. (A) Sagittal T₁-weighted image; (B) sagittal T₂-weighted image; (C) axial T₁-weighted image; (D) axial T₂-weighted image.

Histological examination of the ligamentum flavum surrounding the hematoma revealed degenerated ligament with loss of elastic fibers containing granulation tissue and proliferating small blood vessels (Fig. 3). There was no evidence of neoplasm or infection. The final diagnosis was hematoma in the degenerated ligamentum flavum.

Discussion

The first case of symptomatic ligamentum flavum hematoma in the cervical spine occurred in a 72-year-old man with diabetes mellitus and hypertension who complained of neurological symptoms after repeated trivial trauma (chiropractic and massage therapy). The lesion was located at the C3–4 levels and laminectomy with resection of the hematoma relieved the symptoms. The present case occurred in a 67-year-old man with diabetes mellitus and hypertension, who had a history of repeated trivial trauma (cervical traction), and the lesion involved the C3–4 levels.

Analysis of the previously reported cases revealed that ligamentum flavum hematoma had following characteristics: the most commonly affected level was the lumbar spine; the disease was caused by

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minor trauma during normal activities; most patients were middle-aged or elderly males with a history of hypertension; and preoperative diagnosis was difficult because of the rarity and variety of findings. The findings of MR imaging may vary with time following the initial injury due to known changes of hematoma, and in particular, MR imaging of chronic hematoma may show no characteristic hemorrhagic intensity. Therefore, it is difficult to distinguish whether the mass is a ganglion, a synovial cyst, a neoplasm, or a hematoma.\(^1,5,8,14\)

The pathomechanism of the disease is still unclear, but vessel rupture within the ligamentum flavum\(^1,7,8\) or hemorrhage from the degenerated facet joint\(^11\) may be the cause of the hematoma. Increased intra-abdominal pressure after minor trauma might have transmitted excessive pressure to the very small, thin-walled, and irregularly dispersed blood vessels within the ligamentum flavum.\(^8,10,12\) Degeneration of the ligamentum flavum could promote this process as proliferating small blood vessels have been observed in degenerated ligamentum flavum.\(^4\) In the present case, there was no trace of hemorrhage in the facet joint cavity of the affected level, so vessel rupture within the ligamentum flavum was the most plausible cause.

The present case of ligamentum flavum hematoma in the cervical spine was cured by complete resection of the mass, which relieved the patient’s symptoms of incomplete tetraplegia. As in previously reported cases of ligamentum flavum hematoma in the thoracic or lumbar spine, repeated trivial trauma was probably the leading predisposing factor in the present case.

**References**


Address reprint requests to: N. Miyakoshi, M.D., Department of Orthopedic Surgery, Akita University School of Medicine, 1–1–1 Hondo, Akita 010–8543, Japan.

e-mail: miyakosh@doc.med.akita-u.ac.jp