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Spinal Cord Compression by Ligamentum Flavum Hematoma in the Thoracic Spine

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S t r u c t u r e d A b s t r a c t

S t u d y D e s i g n . C a s e r e p o r t .

O b j e c t i v e . T o r e p o r t a n

e x t r e m e l y r a r e c a s e o f

h e m a t o m a d e r i v e d f r o m t h e l i g a m e n t u m f l a v u m w i t h i n t h e t h o r a c i c s p i n e .

S u m m a r y o f B a c k g r o u n d

D a t a . Only one previous case has been reported of a hematoma derived from the ligamentum flavum in the thoracic spine.

Methods. A 61- year-old male presented with gait disturbance and numbness below the navel. Magnetic resonance imaging (MRI) on the 16th day after the onset of the symptoms showed spinal cord compression at the T10-11 level caused by a round mass. This intraspinal, extradural space occupying lesion, continuous with ligamentum flavum was centrally hypointense and marginal hyperintense on a T1-weighted image and central heterogeneous and marginal hypointense on a T2-weighted image. The wall of the lesion was slightly enhanced after use of a contrast medium.

Results. The patient underwent a T10 laminectomy and the mass was carefully resected from the dura mater. Histologic examination showed that the wall of the mass comprised fibrous connective tissue that contained elastic fibers derived from a degenerative ligamentum flavum

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tear. It also revealed evidence of previous hemorrhagic events within the mass. There was no evidence of neoplastic nor synovial tissue. After surgery, the patient's numbness and gait disturbance disappeared.

Conclusions. This report identifies an extremely rare case of spinal cord compression by a hematoma from the ligamentum flavum within the thoracic spine.

K e y W o r d s : l i g a m e n t u m
f l a v u m , h e m a t o m a , t h o r a c i c
s p i n e

I n t r o d u c t i o n

Disc herniation and spondylotic spinal canal stenosis are the common causes of spinal root and cord compression. Calcification or hypertrophy of the ligamentum flavum can also cause spinal canal stenosis. We report a n e x t r e m e l y r a r e c a s e o f h e m a t o m a derived from the ligamentum flavum in the thoracic spine.

Case report

A 61-year-old man was referred to our clinic with a 6-week history of gait disturbance and numbness below the navel. His symptoms occurred suddenly after getting off a bus. He had worked as a heavy trailer driver but had experienced no remarkable episodes of back pain or trauma. His medical history included steroid resistant nephrosis syndrome, hypertension, and hyperlipidemia, but they were well medically controlled. Several coagulation studies showed normal values. There was no history of surgery or puncture wounds to the back.

Physical examination at the time of his first visit to our clinic showed mild spastic gait and 10-20% hypalgesia below T10 dermatome. Knee and ankle jerk reflexes were slightly decreased bilaterally. Vibration sensation was intact and no motor weaknesses in either the upper or lower extremities were seen. There was also no bowel and bladder dysfunction.

X-ray of his thoracic spine was unremarkable except for some signs of degenerative spondylosis. Magnetic resonance imaging (MRI) on the 16th day after the onset of the symptoms

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showed spinal cord compression at the T10-11 level caused by a round mass (figure1). This intraspinal, extradural space occupied by a lesion continuous with ligamentum flavum that was centrally hypointense and marginally hyperintense on a T1-weighted image and centrally heterogeneous and marginally hypointense on a T2-weighted image. The wall of the lesion was enhanced after intravenous administration of contrast medium. These findings indicated a possible hematoma in the ligamentum flavum, but distinguishing a hematoma from a synovial cyst was difficult using MRI alone.

The patient underwent a T10 laminectomy. A reddish tan-brown solid mass was found beneath the ligamentum flavum, which was adherent with the dural sac. A lump of lamina, ligamentum flavum and a round mass was carefully resected from the dura mater (figure 2).

Histologic examination showed that the wall of the round mass comprised fibrous connective tissue that contained elastic fibers from part of the torn degenerative ligamentum flavum. There was also evidence of a previous hemorrhagic event after histological examination of the mass. There was no evidence of any neoplastic or synovial tissue (figure3). After surgery, the patient's numbness and gait disturbance disappeared.

Discussion

Hematoma derived from the ligamentum flavum is a rare cause of neurologic deterioration.¹⁻⁵ The ligamentum flavum consists of poorly vascularized elastic and collagenous fibers in its normal state.¹⁻⁴ However, as Minamide et al¹ suggested, when the ligamentum flavum undergoes degenerative or hypertrophic change, proliferating vessels may be susceptible to rupture after minor trauma. Many of these reported hematomas were relatively old events occurring in degenerative ligamentum flavum.¹⁻⁴ More recently, Kono et al⁵ documented acute ligamentum flavum hematoma in the lumbar spine causing sudden-onset foot drop. Consecutive MRI examinations performed 5 days apart in the early stages after the onset of symptoms clearly demonstrated significant intensity change within the lesion. These findings indicated that acute hematoma in the degenerative ligamentum flavum was the likely cause of neurologic compromise.

Though several cases of this disorder have been reported, the majority of cases were associated

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with defects in the lumbar spine.^{1-3,5} Conversely, thoracic ligamentum flavum hematoma is extremely rare. Only one case report has been presented, which suggested that hematoma of the ligamentum flavum might occur within the thoracic spine, where mobility of the spinal segment is less than that of the lumbar spine.⁴ Maezawa et al⁴ reported a case of a hematoma of ligamentum flavum at T11-12 in a 66-year-old man who presented with weakness in his right foot and numbness of both legs but had no history of anticoagulant use or hypertension. The resected specimen showed an old hematoma with degenerative changes in the ligamentum flavum. In the present case, there was no evidence of major trauma and the patient's hypertension was well controlled. However, the patient occupation involved manual work on a moving trailer platform for many years. This repeated minor trauma might lead to hemorrhage from proliferating vessels in the degenerative ligamentum flavum.

It has previously been noted that it is difficult to make a differential diagnosis of intra-ligamentous hematoma from that of a synovial cyst that was followed by intra-synovial hemorrhage because of a similarity in MRI signal in both diseased tissues.^{2, 3} The present case was also confirmed by histologic examination after surgical resection and the treatment resulted in complete relief of the patient's symptoms.

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Conclusion

This report identifies an extremely rare case of spinal cord compression by a hematoma from the ligamentum flavum within the thoracic spine.

Figure legends

Figure 1. MRI on the 16th day after the onset of the symptoms showed spinal cord compression at the T10-11 level caused by round mass. The intraspinal, extradural space was occupied by a lesion continuous with the ligamentum flavum and was centrally hypointense and marginally hyperintense on a T1-weighted image and centrally heterogeneous and marginally hypointense on T2-weighted images. The wall of the round mass was slightly enhanced with the use of contrast medium. (A) T2-weighted sagittal image, (B) T1-weighted axial image, (C) T2-weighted image.

Figure 2. A reddish tan-brown mass was found beneath the ligamentum flavum, which was found to be tightly adherent to the dural sac.

Figure 3. Histologic examination showed that the wall of the lesion comprised fibrous connective tissue that contained elastic fibers derived from torn degenerative ligamentum flavum.

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It also revealed evidence of an old hemorrhagic event within the mass. There was no evidence of neoplastic or synovial tissue (stained with hematoxylin-eosin, magnification x 10 and 100).









