Ligamentum flavum haematoma: a report of two cases

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ABSTRACT

We present 2 cases of ligamentum flavum haematoma causing root compression. Magnetic resonance imaging showed an epidural mass linked to the ligamentum flavum. The mass was isointense in T1-weighted images, and was centrally hyperintense and peripherally hypointense in T2-weighted images. Surgical removal of the ligamentum flavum achieved resolution of the symptoms. The definitive diagnosis could only be confirmed by histopathological examinations. The differential diagnoses include lumbar disc herniation and lumbar spinal canal stenosis caused by neoplasm, infection, epidural haematoma, or facet cyst.

Key words: hematoma; ligamentum flavum; magnetic resonance imaging

CASE REPORTS

Case 1

In January 2007, a 63-year-old woman presented with an 8-week history of low back pain radiating to the right leg. She had no history of trauma or lumbar surgery/puncture or urinary/rectal incontinence. She was hypertensive and taking calcium-blockers. Her right tibialis anterior muscle strength was 2 out of 5. She had no sensation in her medial right calf. Radiography showed degenerative spondylolytic spondylolisthesis at L4. Magnetic resonance imaging (MRI) demonstrated severe spinal canal stenosis at L3-L4 caused by a posterior mass linked to the ligamentum flavum, suggestive of an epidural haematoma or lumbar epidural tumour. On T1-weighted images, the mass was isointense, with heterogeneous areas of hypointensity within. On T2-weighted images, the mass was hyperintense in the
centre and hypointense in the periphery. The wall was not enhanced after intravenous administration of gadolinium diethylene-triamine-pentaacetic acid (Fig. 1).

The patient underwent a laminectomy of L3 including some of the medial part of the facet bilaterally. A solid brownish mass was resected from the ligamentum flavum, with no adhesion to the dural sac. The resected mass was solid, with no liquid content. Histological examination confirmed the diagnosis of an old haematoma with haemosiderin deposits in the degenerated ligamentum flavum (Fig. 2). The wall consisted of fibrous connective tissues containing elastic fibres of the ligamentum flavum. There was no evidence of infectious or neoplastic lesion or synovial tissues. Postoperatively, the patient showed immediate improvement of the pain and recovery of her leg strength. At the 18-month follow-up, the patient had recovered fully and reported no recurrence of her symptoms.

Case 2

In August 2008, a 63-year-old man presented with a 12-week history of low back pain radiating to the left leg. He had no history of trauma or lumbar surgery/puncture. He was hypertensive and taking calcium-blockers. Conservative therapy was ineffective and the pain became disabling and accompanied by neurogenic claudication. The straight leg-raising test was positive on the left side, and his left dorsiflexor muscle strength was 4 out of 5. He had no sensation in his lateral calf and foot. Radiography showed non-specific degenerative changes of the lumbar spine. MRI demonstrated severe spinal canal stenosis at L5-S1 caused by a posterior mass linked to the ligamentum flavum, suggestive of an epidural haematoma or lumbar epidural tumour. On T1-weighted images, the mass was isointense. On T2-weighted images, the heterogeneous mass was isointense in the centre and hypointense in the periphery (Fig. 3).

The patient underwent a left hemilaminectomy of L5. A solid brownish mass firmly adherent posteriorly to the dural sac at L5-S1 was resected with difficulty (Fig. 4). The resected mass was solid and had no liquid content. The histological examination of the mass had similar findings to those of case 1 (Fig. 5). There

Figure 1 Case 1: magnetic resonance images showing a posterior epidural mass at L3-L4 compressing the thecal sac and spinal canal and linking with the ligamentum flavum.

Figure 2 Case 1: photomicrograph showing degenerative elastic fibres in the ligamentum flavum adjacent to the area of haemorrhage (H&E, x20).
was no evidence of infectious or neoplastic lesions or synovial tissues. Postoperatively, the patient’s symptoms resolved, and his gait returned to normal, with no pain or claudication. At the 10-month follow-up, the patient had recovered fully and reported no recurrence of his symptoms.

**DISCUSSION**

Ligamentum flavum haematoma is a rare cause of spinal root and canal compression.\(^1\text{-}\text{8}\) It usually presents as low back and leg pain, occurring in the fourth decade of life or later.\(^1\text{-}\text{3},\text{5}\text{-}\text{8}\) Although there is usually a history of minor trauma,\(^5\text{-}\text{7}\) none of our patients had any trauma before onset of their symptoms. The haematoma is made up of poorly vascularised, dense tissue with elastic fibres and collagen. It stretches with spinal flexion, rotation, and shearing forces. It is hypothesised that intraligamental bleeding may
occur from a partial tear in a degenerative ligament.\textsuperscript{2} With fibrinolytic and haemolytic changes, the bleeding increases considerably in volume within the ligamentum flavum and leads to neural compression and pain. Minor trauma or laceration of the ligamentum flavum frequently occurs during lumbar punctures for epidural or intrathecal injections,\textsuperscript{3} but an intraligamentous haematoma has never been reported. Therefore, trauma cannot fully explain the mechanisms governing haematoma formation in the ligamentum flavum.

The neurological symptoms caused by ligamentum flavum haematoma are similar to those of other spinal canal disorders, such as lumbar disc herniation, neoplasm, infection, epidural haematoma, and facet cyst. Thus, making a diagnosis based on clinical findings alone is difficult. MRI is an important diagnostic tool because it reveals the connection between the ligamentum flavum and a mass. The heterogeneous intensity seen on MRI may be due to the reflected deoxyhaemoglobin or methaemoglobin contents of the haematoma. Therefore, it is difficult to differentiate an intraligamentous haematoma from a facet cyst.

REFERENCES