

# Chronic Lumbar Epidural Hematoma in a Patient Suffering With Spondylolytic Spondylolisthesis at the L4-5 Level: A Case Report<sup>1</sup>

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Nontraumatic spinal epidural hematoma (SEH) is a rare condition and the exact cause of the hemorrhage in SEH has never been established. However, there have been a few recent reports on some types of the epidural hematoma with a detectable origin of hemorrhage. We encountered a case of chronic SEH in a patient who had spondylolytic spondylolisthesis, which is also a rare condition to be associated with SEH. We report here on the radiologic findings of a case of chronic epidural hematoma in a patient who had spondylolytic spondylolisthesis at the L4-5 level, and we include a review of the related literatures.

**Index words :** Spondylolysis

Magnetic resonance (MR)

Hematoma

Spinal cord

Nontraumatic spinal epidural hematoma (SEH) is a rare clinical entity and the majority of these conditions are thought to result from rupture of the epidural vascular network. Hemorrhagic lumbar synovial cysts (1) and a hematoma occurring from the ligamentum flavum (2) or from a lumbar facet joint (3) have been reported as rare types of epidural hematoma. We report here on the radiologic and surgical findings of a case of chronic nontraumatic SEH in a patient who had spondylolytic spondylolisthesis at the L4-5 level.

## Case Report

A previously healthy 44-year-old woman was admit-

ted to our hospital with a 3-month history of lower back pain along with tingling and radicular pain in her left lower limb. These symptoms had progressively worsened and were exaggerated upon walking. The neurologic examination revealed weakness during both leg flexion and plantar flexion, and the sensory examination was normal. She had no history of coagulopathy, previous lumbar operation or epidural puncture. The lateral radiograph (Fig. 1) and CT scan (Fig. 2A) showed spondylolysis (arrow) at the L4 vertebra with a mild degree of spondylolisthesis at the L4-5 level. CT (Fig. 2), and the MRI (Fig. 3A - C) enabled us to make the correct preoperative diagnosis. These modalities revealed a nodular, well-circumscribed mass in the posterior epidural space at the L4 - 5 level. The signal intensity was high, but not homogeneous on the T1-weighted image, and the signal intensity was high with a low-signal intensity rim on the T2-weighted image. An axial image showed an epidural mass that was continuous with the left vertebral foramen at the L4 - 5 level and the signal intensity of the mass was consistent with chronic

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hematoma. The patient underwent the left total facetectomy with fusion of L4 and L5; the operation revealed a nodular encapsulated black fibrotic mass at the L4-5 level that compressed the dural sac forward. The mass was strongly adhered to the dura and there was severe adhesion around the spondylolysis. The mass was completely extirpated under microscopic magnification. The capsule of the mass was hard and elastic, and it was filled with dark red-gray solid and liquid materials.

Examination of the histological sections of the mass re-

vealed an organizing hematoma with infiltration by the surrounding fibrous granulation tissue (Fig. 4)

The postoperative course was uneventful; the patient experienced rapid and complete relief from the pain.

## Discussion

Nontraumatic SEH is a rare clinical entity and it can occur at any level, but it is most frequently found at the cervical and the thoracic spines and rarely at the lumbosacral level (4). Hematomas below the level of the conus medullaris are more likely to be chronic because the spinal roots appear to better tolerate pressure than can the spinal cord, and the subarachnoid space of the lumbar spinal canal is larger than that of the cervical or thoracic spine (5 - 7).

The cause of epidural hematoma in the lumbar spine is not clear. The majority of these conditions are thought to result from rupture of the epidural vascular network. A hemorrhagic lumbar synovial cyst (1) and a hematoma occurring from the ligamentum flavum (2) or from a lumbar facet joint (3) were recently reported as rare types of epidural hematoma. Nagata *et al* (8) reported the case of an epidural hematoma associated with spondylolysis in a seventeen-year-old rugby player. They suspect that the hemorrhage occurred from the epidural veins under the pars interarticularis at the L3 level because of recurrent minor traumatic episodes during rugby training.

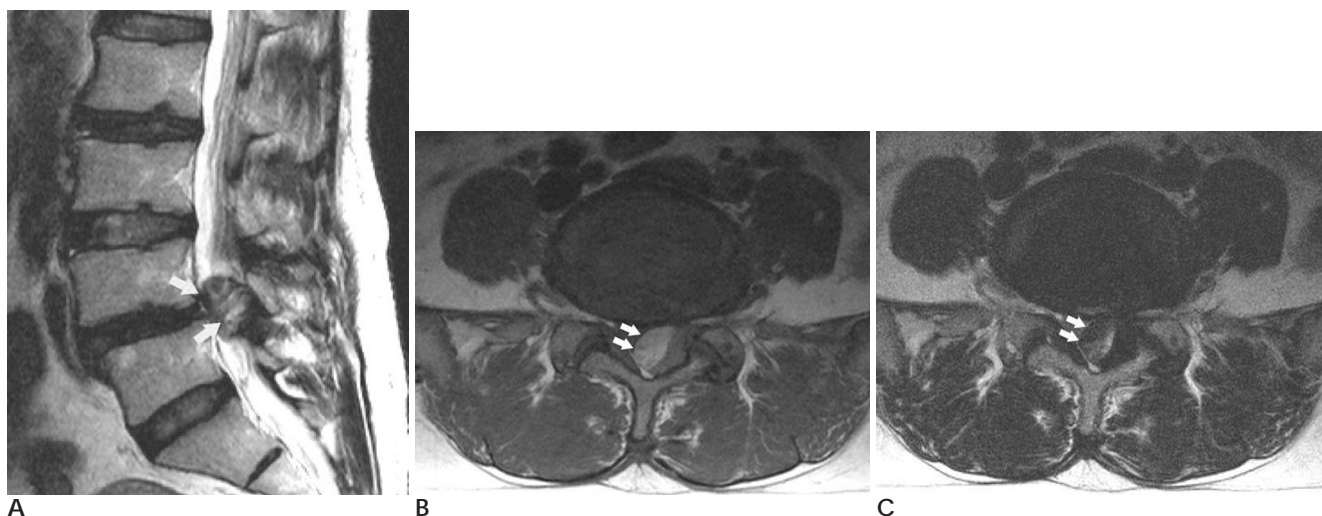
In the present case, the radiologic and surgical findings clearly suggested a chronic epidural hematoma in a patient who has spondylolysis at the L4 level along with



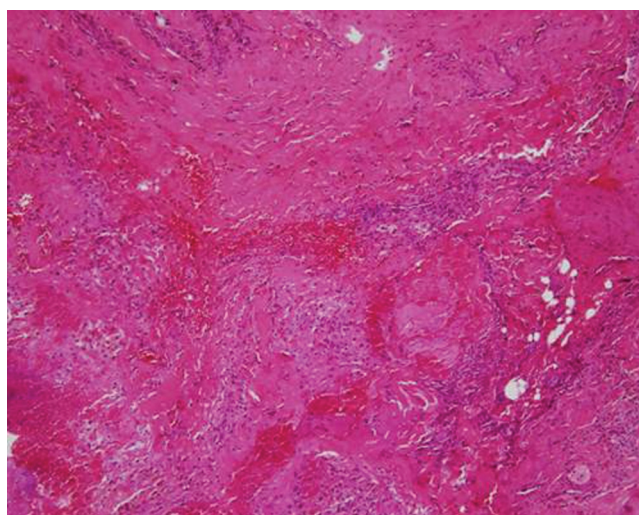
**Fig. 1.** A 44-year-old female with back pain and left radiculopathy. The lateral radiograph shows spondylolysis (arrow) at the L4 vertebra with a mild degree of spondylolisthesis at the L4-5 level.



**Fig. 2. A, B.** The transaxial CT scan demonstrates bilateral spondylolysis (arrows in A) with a high attenuated mass-like lesion (arrows in B) in the left posterolateral epidural space at the L4-5 level.



**Fig. 3.** **A.** The T2-weighted sagittal spin echo image shows a large oval mass (arrows) in the posterior epidural space of the L4-5 level.  
**B, C.** The T1 and T2-weighted axial spin echo images show an epidural mass (arrows) that's continuous with the left vertebral foramen at the L4-5 level. The signal intensity of the epidural mass is high on the T1-weighted axial image (**B**) and there is high signal intensity with a low-intensity rim on the T2-weighted image (**C**).



**Fig. 4.** Examination of the histological sections of the mass shows an organizing hematoma with infiltration by the surrounding fibrous granulation tissue (Hematoxyline and eosin,  $\times 400$ ).

mild spondylolisthesis at the L4 - 5 level. Spondylolysis is a common condition and it usually occurs at the L5 vertebra; it is caused by a fatigue fracture in patients who have a lower lumbar index (a trapezoidal lumbar vertebra) (9). The cause of spondylolysis at a more caudal level in the lumbar spine is considered to be related to a history of trauma. For our patient, we suspect that chronic stress over time in the lumbar spine could have developed the spondylolysis of L4 along with spondylolisthesis at the L4-5 level, as well as the weakness of the walls of the epidural veins and the rupture of the

veins. MRI is the generally used modality to diagnosis epidural hematoma. There are signal intensity changes over time for hemorrhage on MRI after the onset, according to the oxidation and deoxidation of hemoglobin, the hemolysis of erythrocytes and their phagocytosis. Our patient's lesion showed high signal intensity that wasn't homogeneous on the T1-weighted image, and high signal intensity with a low-signal intensity rim was seen on the T2-weighted image. These findings suggested an old hemorrhage. The differential diagnosis of chronic SEH should include other benign spinal epidural masses such as synovial or ligamentum flavum cysts, and both of these are prone to intralesional hemorrhage and epidural cavernous angiomas (7).

Excision of the mass and spinal decompression with fusion is considered to be the definite treatment for symptomatic epidural hematoma that occurs from spondylolytic spondylolisthesis.

In conclusion, we report here on a rare case of chronic SEH that occurred in a patient who had spondylolytic spondylolisthesis at the L4-5 level.

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