

# Fracture of L2 with massive spinal epidural hematoma in a patient with ankylosing spondylitis

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## Keywords

Ankylosing spondylitis, spinal epidural hematoma, surgical decompression, spinal fracture

## Summary

It has been reported that even mild trauma may result in a fracture and a spinal epidural hematoma in patients with ankylosing spondylitis (AS). We herein presented a case of a patient with AS who sustained a fracture of L2 in an automobile accident and developed a massive spinal epidural hematoma.

**Findings:** The patient had few neurological symptoms until numbness and pain developed 50 hours after the initial trauma. T2-weighted magnetic resonance imaging showed an epidural hematoma over the posterior aspect of the spinal canal, reaching from T12 to L4. Posterior decompression surgery was performed. The neurological deficits resolved completely after the surgery.

**Conclusion:** Early surgical decompression of a massive epidural hematoma produced a favorable outcome in a patient with AS with neurological deficits.

## Schlüsselwörter

Ankylosierende Spondylitis, spinales epidurales Hämatom, Dekompressions-Operation, Wirbelkörperfraktur

## Zusammenfassung

Bekanntlicherweise können auch nur milde Traumen bei Patienten mit ankylosierender Spondylitis (AS) zu Frakturen und einem spinalen epiduralen Hämatom führen. Wir berichten hier den Fall eines Patienten mit AS, der bei einem Autounfall eine Fraktur von L2 erlitten hat und ein massives spinales epidurales Hämatom entwickelte.

**Befunde:** Der Patient wies wenig neurologische Symptome auf, bis 50 Stunden nach dem initialen Trauma Sensibilitätsstörungen und Schmerzen auftraten. Eine T2-magnetische Resonanz-Untersuchung zeigte ein epidurales Hämatom auf der hinteren Wand des Spinalkanals, von T12 bis L4. Es wurde eine Dekompressions-Operation durchgeführt. Die neurologischen Symptome verschwanden nach der Operation völlig.

**Schlussfolgerung:** Die frühzeitige Dekompression eines massiven epiduralen Hämatoms ergab ein positives Resultat bei einem Patienten mit AS und neurologischen Ausfällen.

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## Fraktur von L2 mit massivem epiduralen Hämatom bei einem Patienten mit Spondylitis ankylosans

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We herein report a case of a patient with AS who was injured in an automobile accident and sustained a fracture of the L2 vertebral body. Though initially stable, his neurological condition rapidly deteriorated. MRI revealed an epidural hematoma extending from T12 to L4. This case demonstrates the challenges of diagnosing and treating patients with AS and spinal fractures.

## Case Report

A 39-year-old male was seen in the Emergency Department with severe lower back pain following an automobile accident. His history was significant for AS for approximately 15 years without regular medical treatment, hepatitis B with fatty liver, and type 2 diabetes mellitus. Physical examination revealed him to be alert and conscious with normal vital signs and no neurological deficits. His sclera was mildly icteric, had several small contusions on his face and anterior chest wall, and his abdomen was soft and flat.

Laboratory studies revealed hemoglobin of 13.6 gm/dL; platelets, 129 000 per mL; serum glutamic oxaloacetic transaminase (SGOT), 120 U/L; and prothrombin time and International Normalized ratio (PT/INR), 1.12. Radiographs revealed a linear fracture of L2 involving all three columns. The fracture line went through the L2 vertebral body anterior to the ankylosing lamina and posterior spinal process (▶ Fig. 1, 2). Posterior fixation and spinal fusion was recommended; however, the patient declined surgery and was admitted for observation and absolute bed rest.

Approximately 51 hours after the accident, the patient complained of numbness and tingling in his right foot which progressed to involve the entire right lower leg.

## Introduction

Spinal epidural hematoma, an accumulation of blood in the potential space between the dura and bone, is rare (5, 6). Without timely diagnosis and appropriate

treatment, permanent neurologic deficits or death can occur (5, 6). Treatment of spinal epidural hematomas becomes even more complicated when patients have comorbid conditions such as ankylosing spondylitis (AS) (3).

Methylprednisolone (Solu-Medrol®, Pfizer, Inc., NY, USA), 2000 mg IV, was administered followed by 500 mg IV every six hours for 24 hours. However, twelve hours later the patient reported weakness in his left leg. Magnetic resonance imaging (MRI) with gadolinium enhancement was performed 53 hours after admission which revealed a large epidural heterogeneous collection over the posterior aspect of the spinal canal, reaching from T12 to L4 (►Fig. 3). In addition, compression with effacement of the thecal sac from behind was noted (►Fig. 4). Diagnosis was a fracture of the L2 vertebral body with a mild wedge-shaped deformity and a large epidural hematoma over the posterior aspect of the spinal canal, from T12 to L4.

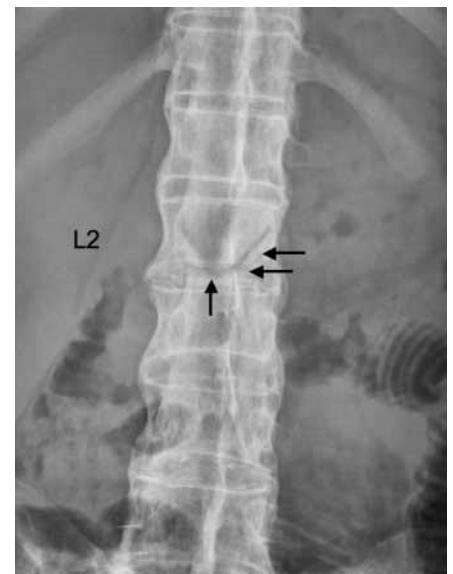
Approximately 70 hours after the trauma, motor examination revealed grade 1/5 (Medical Research Council grade) muscle power of the quadriceps, hamstring, anterior tibialis, and extensor hallucis longus. Neurological examination demonstrated decreased sensation to pin prick and light touch caudal to the inguinal region. Diminished rectal tone and perianal sensation were also noted and he could not void. A decision was made to perform emergent posterior decompression with L1 to L4 laminectomies and to evacuate the hematoma.

During surgery no obvious source of bleeding was found. The hematoma was evacuated and carefully removed from the laminectomy sites. The thecal sac expanded and gradually returned to its normal size. The fracture was fixed with an AO Universal Spine System (AO, USS) from L1 to L3. Posterior fusion was achieved by decortication of the fracture site and application of autogenous bone chips harvested from the laminectomy procedure.

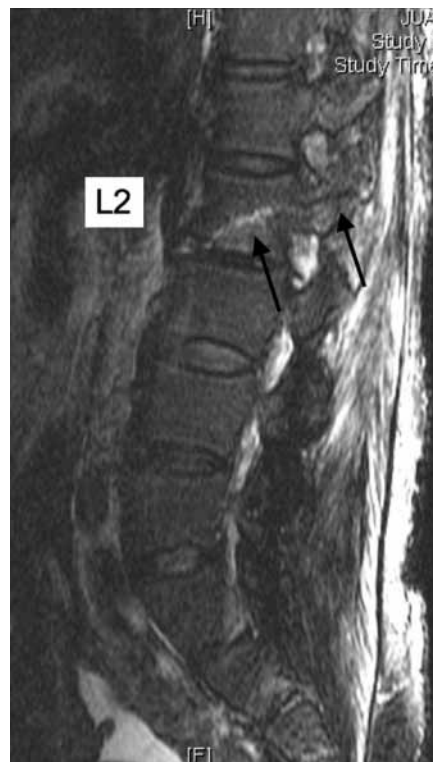
Postoperative radiographs showed fixation from L1 to L3 (►Fig. 5). On postoperative day (POD) 1, muscle power of the right leg had improved to 3/5 to 5/5 and the left leg to 5/5, with only mild residual numbness in the right thigh. On POD 2 the patient was able to walk with an extension brace and a walker and could void. By POD 5 all numbness and weakness of his legs had resolved without any complication. He was discharged uneventfully on POD 9. At 1-year follow-up he has no back pain and has resumed all normal activities.



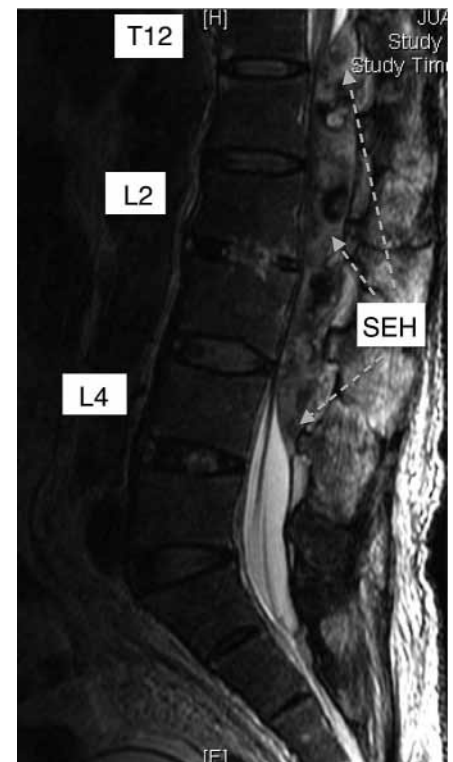
**Figure 1** Lateral view of the lumbar spine taken when the patient was first admitted to the emergency department. The black and white arrows indicate the fracture line at the posterior column at L2.



**Figure 2** Anteroposterior view of the lumbar spine taken when the patient was first admitted to the emergency department. The black arrows indicate the fracture of the L2 vertebral body.



**Figure 3** MRI T2-weighted image (paramedian sagittal view). The black arrows indicate the fracture line through the L2 vertebral body and pedicle.



**Figure 4** MRI T2-weighted image, median sagittal view. The black dotted arrow indicates a large epidural heterogeneous collection over the posterior aspect of the spinal canal from T12 to L4, which caused compression with effacement of the thecal sac from behind, compatible with a spinal epidural hematoma.

## Discussion

Traumatic spinal epidural hematoma is rare, and predisposing factors are coagulopathy and inflammatory spondyloarthropathy (1). The pathological changes associated with ankylosing spondylitis result in a weakened vertebral column with increased susceptibility to fractures and spinal cord injury, and is exacerbated by an increased incidence of spinal epidural hematoma (3). Most spinal hematomas are localized dorsally to the spinal cord in the cervicothoracic and thoracolumbar regions. Vertebral fractures are often initially missed in patients with AS.

Early diagnosis and treatment are essential because spinal epidural hematomas can develop quickly, and there is a high tendency to produce paralysis (5). One study compared patients diagnosed and treated at a central hospital within 3 to 48 hours after appearance of symptoms and patients transferred from community hospitals within 12 to 106 hours after appearance of symptoms. Most patients recovered after therapy, but those who were treated more rapidly had much better courses (6).

Computed tomography (CT) should be performed whenever a patient with AS presents with symptoms of new back or neck pain, no matter how trivial or minor the reported injury. CT is also useful for differentiating hematomas from adjacent fat and osseous structures (3). Like CT, MRI provides information on the localization and shape of the hematoma in the axial plane, however, the craniocaudal extent in the sagittal plane is better studied with MRI, and it also more readily ident-



**Figure 5** Postoperative radiograph shows fixation from L1 to L3.

ifies other common causes of spinal cord dysfunction. Thus, MRI is the preferred imaging modality to study spinal hematomas.

There appear to be no situations in which non-operative management of spontaneous spinal epidural hematomas is appropriate (2). Thus, the mainstay of treatment remains surgical decompression of the neural structures and removal of the hematoma. Although the length of the hematoma may be associated with spontaneous resolution that occurs in some cases, Groen concluded that hematoma length cannot be used to forecast prognosis (2). In a meta-analysis of 613 cases, Kreppel et al. found that the most important measure in recognizing patients at high risk of spinal hematoma is a thorough clinical history, the examination of first choice is MRI, and

the treatment of choice is surgical decompression (4). In that series, less severe preoperative symptoms and faster surgical decompression were associated with a great chance of complete recovery (4).

In summary, even mild trauma may result in a fracture and a spinal epidural hematoma in patients with AS. In this case, a massive epidural hematoma with neurological deficit occurred in a patient with AS following an automobile accident. Surgical decompression led to a favorable outcome. Closely monitoring neurological status for this type of patients is needed because of the possibility of delayed onset of serious neurological symptoms.

### Conflict of interest

The authors certify that there is no conflict of interest in relation to this article.

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