

## Spontaneous Spinal Epidural Hematoma in Pregnancy

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### ABSTRACT

Spinal epidural hematoma (SEH) is an uncommon condition. Spontaneous SEH, accounting for 0.3–0.9% of all spinal epidural space occupying lesions, instead is associated with risk factors (such as substantial soft trauma or coagulation abnormalities). The pathophysiology of spontaneous and idiopathic SEH is still under debate: There are only a few reports in literature of spontaneous evolving SEH with progressively increasing pain and neurological impairment.

Magnetic resonance imaging may be inconclusive for differential diagnosis. Here, we present a 38-years old female on the 2nd trimester of her pregnancy preset with spontaneous spinal epidural hematoma with a sudden onset of weakness and back pain followed by a sudden paraplegia. MR imaging showed high intensity irregular dotted lesion seen in the lower thoracic region (T12), in addition, MRI revealed an intervertebral disk prolapse with a cord compression between (L3-L4) (L4-L5).

The Surgical treatment of the case, the patient underwent laminectomy and an evacuation of the hematoma by the neurosurgical team allowed a correct diagnosis but still paraplegic. Our aim is to discuss the clinical and radiological features and the treatment options.

**Keywords:** spontaneous spinal epidural hematoma, epidural hematoma, pregnancy.

### INTRODUCTION

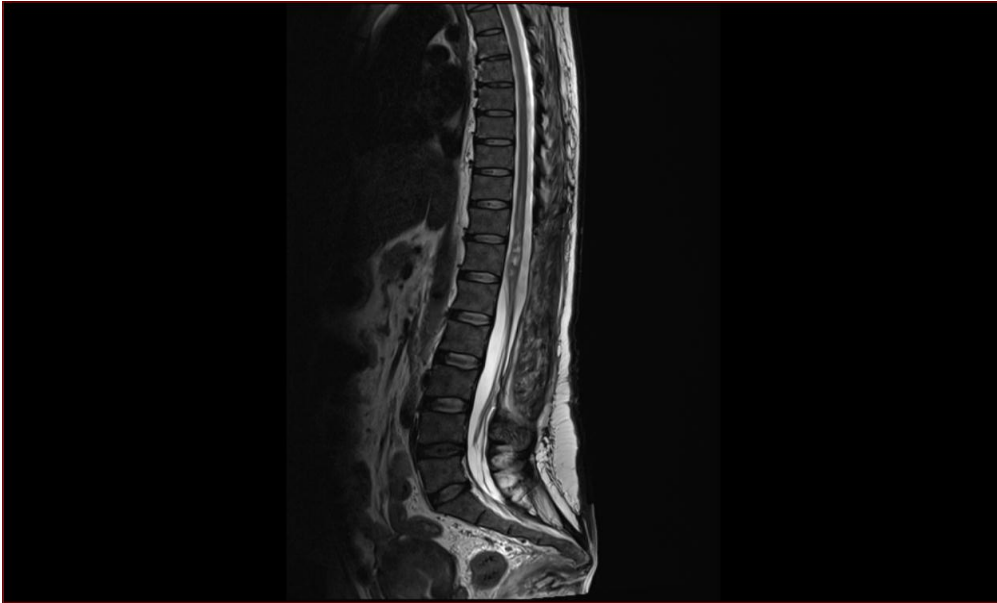
Spontaneous spinal epidural hematoma (SSEH) is an uncommon condition. Since the first- reported case by Jackson in 1869, around 400 cases of SSEH have been reported with only 11 cases happened through pregnancy <sup>[1]</sup>. The diagnosis of SSEH is difficult due to its atypical symptoms, rarity, and unclear etiology. Here, we describe a rare case of an acute SSEH during pregnancy and discuss the etiology, presentation and management.

### CASE REPORT

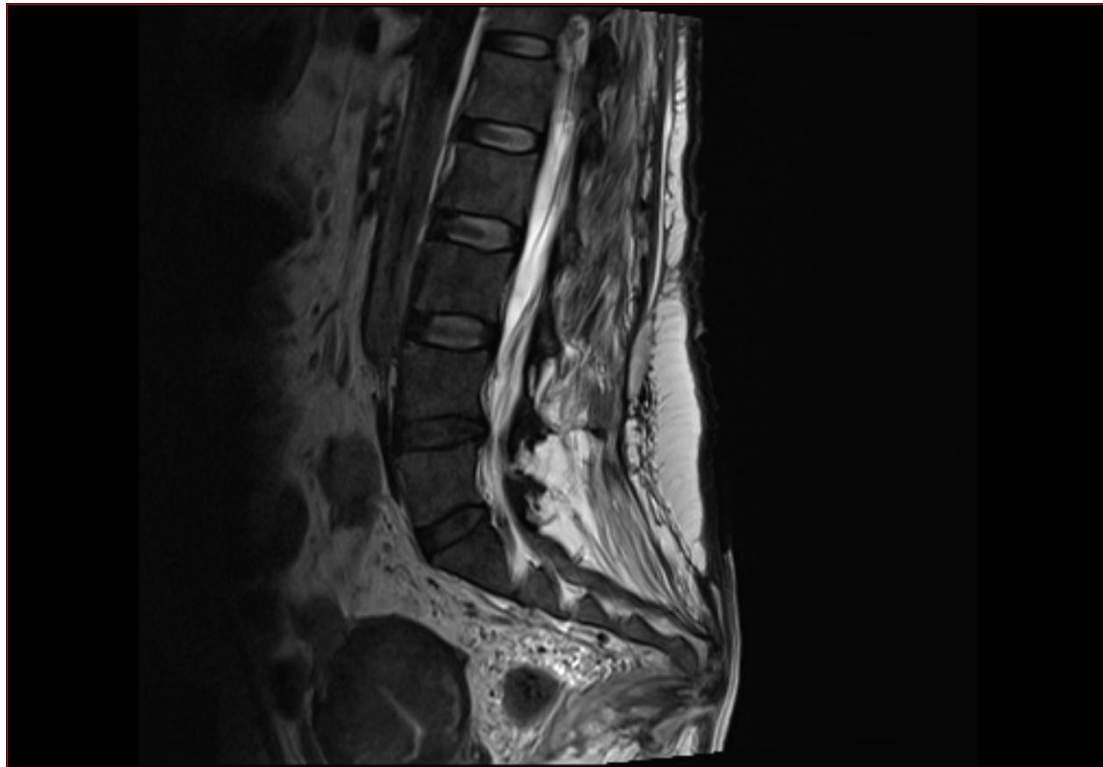
A 38-years old female on the 2<sup>nd</sup> trimester of her pregnancy referred from other hospital to our hospital after one week of undiagnosed spinal hematoma on the 6<sup>th</sup> of May 2016. She presented with a sudden onset of weakness and back pain followed by a sudden paraplegia and was diagnosed

with SSEH. She does not have any of the following chronic illnesses: hypertension, diabetes mellitus or coagulopathy. There was no history of trauma, headache or anti-coagulant treatment. On examination, the patient was conscious, oriented and alert but tachycardiac and tachypneic. Her blood pressure was 155/96 mmHg and the temperature was 38.3°C. The upper limb power was normal but the lower limb was bilaterally 0/5 with an absence of reflexes.

A magnetic resonance imaging (MRI) was requested and showed high intensity irregular dotted lesion seen in the lower thoracic region (T12) as shown in **Figure 1**. In addition, MRI revealed an intervertebral disk prolapse with a cord compression between (L3-L4) (L4-L5) (**Figure 2**).

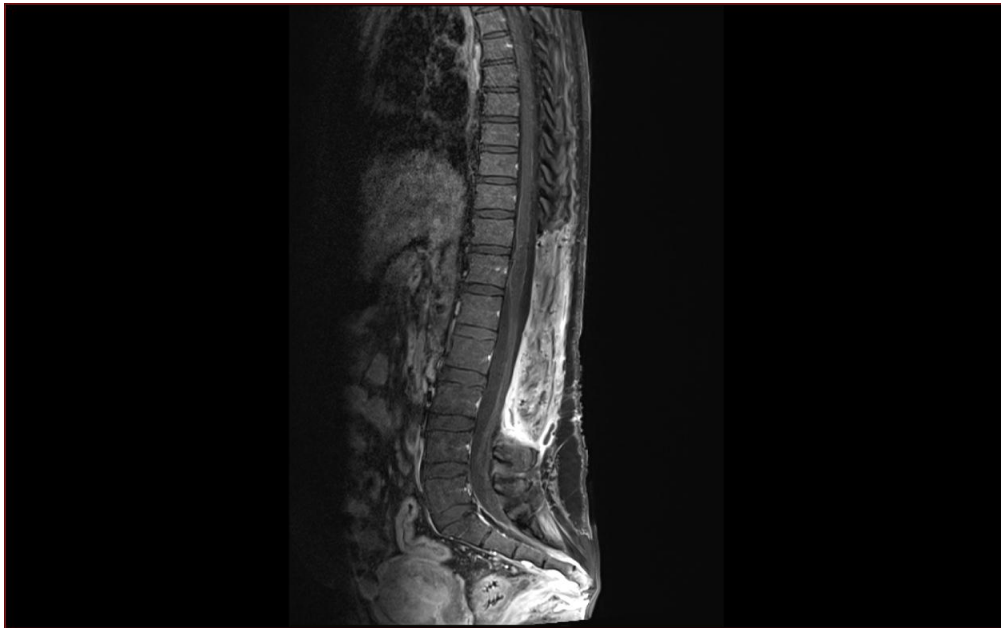


**Figure 1:** A spine MRI (T2-weighted) showing high intensity irregular dotted lesion corresponding with lower thoracic vertebra (T12).



**Figure 2:** A lumbar spine MRI (T2-weighted) showing intervertebral disk prolapse between (L3-L4) (L4-L5) with cord compression.

On the 7<sup>th</sup> of May 2015, the patient underwent laminectomy and an evacuation of the hematoma by the neurosurgical team. In **figure 3**, a post-operative MRI image (T1-weighted) shows hematoma in the lower thoracic region. One day after the surgery, the patient was stable but still paraplegic.



**Figure 3:** a post-operative MRI image (T1-weighted) showing the lower thoracic hematoma.

On the 16<sup>th</sup> of May 2015, the patient developed heavy bleeding which led to an abortion. Thus, she underwent evacuation and curettage by gynecology team .

On the 5<sup>th</sup> of July 2015, the patient was stable and discharged, but still paraplegic.

The study was approved by the Ethics Board of king Fahad University.

## DISCUSSION

SSEH is an uncommon condition with a significant neurological emergency that can cause a permanent deficit <sup>[2]</sup>. It represents around 40% of all spinal epidural hematomas (SHE) and about 0.3% to 0.9% of all epidural space-occupying lesion <sup>[3]</sup>.

Studies showed that SSEH can affect all age groups with high frequency after 40 years of age [5]. The male/female ratio for SSEH was shown to be 1.5:1 <sup>[4]</sup>. There are a number of predisposing factors for SSEH including anticoagulant therapy, hypertension, vascular malformation, trauma, glioma of spinal cord, hemophilia and pregnancy <sup>[1]</sup>. Furthermore, the pathophysiology of SSEH is not completely understood. The exact pathogenesis of epidural hematomas is still undecided.

One theory states that epidural hematomas are venous hemorrhage that caused by an increased pressure in the intrathoracic or intraabdominal region. This pressure is then transmitted directly to the veins in the epidural venous plexus, which subsequently compresses the vessels and rupture them . However, this theory has been doubted as the epidural venous plexus has low pressure and lacks valves. As a consequence, the venous hemorrhage would not cause a compression of the intradural region. Others suggest that epidural hematomas are actually arterial in origin which is caused by a rupture in the radicular arteries that run in the epidural space along with nerve roots<sup>[4]</sup>.

Rupture can occur as a result of trauma or abrupt movements, particularly in an individual with spondyloarthropathy <sup>[4]</sup>.

However, most published cases indicated that patients show epidural venous bleeding at the time of surgery, but with no arterial ruptures observed. Therefore, SSEH is broadly accepted as venous in origin <sup>[4]</sup>.

SSEH during pregnancy has been rarely reported. Only 11 cases have been reported between January 1966 – December 2009 as the PubMed English literature search for cases using the following terms “Spontaneous spinal epidural hematoma” and “Pregnancy” <sup>[1]</sup>

The etiology of SSEH during pregnancy in the majority of cases remains unknown and might be caused by several factors. However, the most broadly accepted hypothesis cause of SSEH is a venous bleeding. Since epidural veins are valveless, a change in the central venous pressure such as during coughing or straining can be spread from the visceral areas to the epidural veins <sup>[1]</sup>.

The clinical manifestations of SSEH include acute radicular neck or back pain. Depending on the spinal level and the degree of which nerves are compressed, pain can be associated with progressive neurological deficit <sup>[2,3]</sup>.

Benign lumbar epidural masses should be included in the differential diagnosis of chronic

SHE. These masses include epidural cavernous angiomas and synovial or ligamentum flavum cysts, which are susceptible to intralesional hemorrhage<sup>[3]</sup>. One of the most important prognostic factors for SSEH is the initial level of neurological impairment. Patients presenting with complete motor deficits at the onset displayed poorer outcomes, whereas patients with partial motor deficits such as hemiparesis and paraparesis) tend to have better outcomes.

The result of spinal cord operative decompression depends on the period of symptoms. Thus, time spent during diagnosis may have negative impact on patients' outcome<sup>[4]</sup>. Therefore, an accurate confirmation of the diagnosis by neuroradiological technique is needed. Previously, computed tomography (CT) scan and lumbar myelography were used for diagnosis. However, these procedures are inaccurate and nonspecific. They may result in an inaccurate hematoma size with false-negatives results.

Currently, the best diagnostic modality for SSEH is spinal MRI<sup>[6]</sup>. MRI is advantageous over the previously mentioned techniques for a number of reasons. MRI is a noninvasive tool that produces accurate findings. It can show both the position and the length of the hematoma along with the impact on the spinal cord<sup>[5]</sup>. The SSEH is mostly located in the thoracic region as shown in this case report. This is due to the prominence of epidural venous plexus the thoracic spine<sup>[1]</sup>.

The best treatment choice for the majority of SSEH patients is an immediate surgical decompression of the neural structure<sup>[6]</sup>. Furthermore, conservative management can be used depending on the surgical condition and the neurological status of the patient.

In regards to the treatment options for SSEH during pregnancy, cesarean delivery should be performed preceding the spinal decompression surgery if the fetal age permits delivery. This is due to the fact that early delivery of the fetus reduces the enlargement of epidural veins and allows for the decompression to take place. Otherwise, the spinal decompression procedure should be done first regardless of the fetus' age<sup>[1]</sup>.

Indications for conservative management include mild neurological deficit without progression and neurological improvement. In addition, risks of operation and/or co-existing serious coagulopathy may also be relative indications for treating SSEH conservatively. However, the method by which conservative treatment is carried out is still debated<sup>[6]</sup>.

As mentioned before, the neurological status of the patients is another factor that might affect the outcome. A literature review 1996 done by **Groen et al** around 330 cases of SSEH<sup>[7]</sup>. They showed that post-operative recovery has a correlation with the sensorimotor impairment prior to surgery<sup>[7]</sup>. Other studies showed that after decompressive laminectomy, a completely damaged of sensorimotor function might be recovered<sup>[5]</sup>. However, the infarction of the spinal cord after the decompressive laminectomy may impair the recovery<sup>[5]</sup>. Factors including sex, age, and the localization of hematoma did not show a correlation with the post-operative outcome<sup>[2]</sup>.

## CONCLUSION

We report an unusual clinical association with Spontaneous spinal epidural hematoma which is the pregnancy, we want to highlight that the most broadly accepted hypothetical cause of SSEH is a venous bleeding. the best diagnostic modality for it is spinal MRI and the best treatment choice for the majority of patients is an immediate surgical decompression of the neural structure.

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