

## Case Report

# Spinal Epidural Hematoma after Pain Control Procedure

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Spinal epidural hematoma is a rare complication associated with pain control procedures such as facet block, acupuncture, epidural injection, etc. Although it is an uncommon cause of acute myelopathy, and it may require surgical evacuation. We report four patients with epidural hematoma developed after pain control procedures. Two procedures were facet joint blocks and the others were epidural blocks. Pain was the predominant initial symptom in these patients while two patients presented with post-procedural neurological deficits. Surgical evacuation of the hematoma was performed in two patients while in remaining two patients, surgery was initially recommended but not performed since symptoms were progressively improved. Three patients showed near complete recovery except for one patient who recovered with residual deficits. Although, spinal epidural hematoma is a rare condition, it can lead to serious complications like spinal cord compression. Therefore, it is important to be cautious while performing spinal pain control procedure to avoid such complications. Surgical treatment is an effective option to resolve the spinal epidural hematoma.

**KEY WORDS :** Spinal epidural hematoma · Pain control procedure · Surgical evacuation

## INTRODUCTION

Spinal epidural hematoma is a rare complication of pain control procedures such as facet joint block, acupuncture, epidural injection, etc. It is also an uncommon cause of acute myelopathy which sometimes necessitates surgical evacuation<sup>20,27</sup>. Anatomical factors such as vertebral abnormalities, technical errors like traumatic spinal tap, multiple attempts at needle placement, and pharmacological factors such as use of anti-platelet and anticoagulant therapy may be implicated in the formation and progress of spinal epidural hematoma<sup>3,24</sup>. It may also occur rarely in patients with no history of coagulopathy and anticoagulative medications<sup>22</sup>.

We report four cases of spinal epidural hematoma as a complication of pain control procedure. In two patients, the hematoma developed after facet joint block and the others after epidural block.

## CASE REPORT

### Case 1

A 60-year-old man presented with complaints of pain in the both buttocks that radiated to his right thigh 5 days after an acupuncture procedure conducted in an oriental clinic and facet joint block in a pain clinic for his back pain from which he was suffering since one year prior to admission.

There were no other associated systemic problems and no history suggestive of coagulopathy. Laboratory values revealed that the platelet time, prothrombin time and activated partial thromboplastin time were within normal limits. No visible signs of coagulopathy were present. Initial T1- and T2-weighted magnetic resonance images demonstrated a localized epidural mass located at lumbosacral area, which compressed the thecal sac posteriorly (Fig. 1).

Laminectomy of L4, L5 and S1 was performed and the hematoma in spinal epidural space was removed. We observed post-procedure fibrous adhesive tissue in the surgical field. However, no obvious source of bleeding was noticed despite of careful exploration of surgical field.

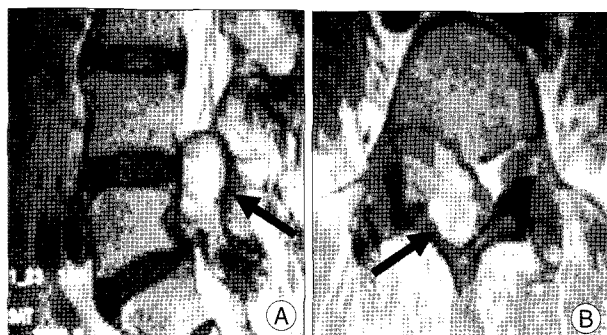
After 2 weeks of the surgery, the patient was relieved of the pain and discharged with complete recovery.

• Received : May 3, 2010 • Revised : June 4, 2010  
• Accepted : September 9, 2010  
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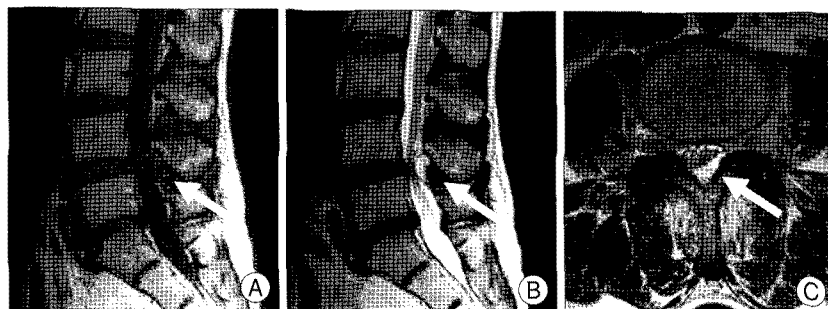
**Case 2**

A 41-year-old woman, in good health, was brought to the emergency department with an abrupt onset of severe low back pain radiating to her right leg 4 days after facet joint block. She had several facet joint blocks in a pain clinic for low back pain that persisted last 10 years.

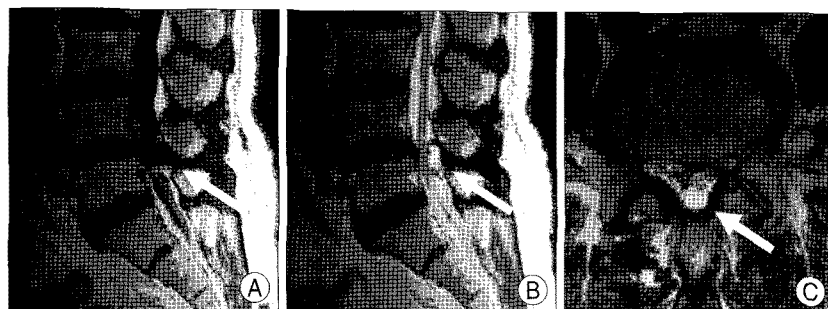
On physical examination, there was tenderness on low back, and motor weakness of both lower extremities. MRI demonstrated a posteriorly situated epidural mass extending from L4 to L5, compressing the thecal sac between L4 and L5. The mass showed low signal intensity on T1-weighted



**Fig. 1.** Spinal epidural hematoma at lumbosacral area on MRI. A : Noncontrast sagittal T1-weighted image shows a localized high signal intensity mass (arrow) at the L4, L5 and S1 body level. B : Axial T1-weighted image demonstrating an epidural collection (arrow) with severe thecal sac compression.



**Fig. 2.** Spinal epidural hematoma L4-L5 on MRI. A : Initial sagittal T1-weighted image demonstrating an epidural collection (arrow) at the L4 and L5 body level. B : Initial sagittal T2-weighted image shows that the hematoma (arrow) is hyperintense to the spinal cord. C : Axial T2-weighted image shows thecal sac compression by dorsal hematoma (arrow).



**Fig. 3.** Spinal epidural hematoma L4-L5 on MRI. A : Initial sagittal T1-weighted image shows hypointense mass (arrow). B : Sagittal T1-weighted image shows that the hematoma (arrow) is hyperintense in the dorsal part of spinal canal. C : Axial T2-weighted image shows hyperintense epidural hematoma (arrow) occupying the left posterolateral spinal canal.

images and hyperintensity on T2-weighted images (Fig. 2).

Laminectomy at L4-5 was first planned as an initial management. However, the clinical symptom showed progressive improvement in both of radiating pain and motor weakness. We changed our plan to a conservative management with close observation. The clinical course was uneventful. After 1 month, the patient showed full recovery both in motor and sensory functions.

**Case 3**

A 50-year-old man presented with complaints of progressive weakness of the left leg and tingling sensation in both the legs since one month following epidural block procedure and physical therapy several times in a pain clinic as a treatment for his chronic back pain.

No other systemic problems were reported. On physical examination, we found foot drop in the left side. The patellar tendon reflex was absent and hypoesthesia was found in the left leg. He also complained dysuria, which was developed recently. MRI demonstrated a localized high-intensity mass at the L4-5 body level, located posteriorly with spinal cord compression in both T1-and T2-weighted images (Fig. 3).

Laminectomy of L4-5 was performed. An organized encapsulated epidural hematoma was encountered and removed. No obvious origins of the bleed were recognized.

Almost 3 weeks after the operation, the patient regained improvement of motor and sensory functions; however, left-foot drop sign remained with slight improvement.

**Case 4**

A 58-year-old woman presented with pain in the both buttock regions and radiating pain to both lower leg since 3 days following a facet joint blocks in a pain clinic for her back pain which was present for 2 years.

There were no other systemic complaints. On physical examination, motor weakness in the lower extremities, and hypoesthesia of both lower extremities were present. Urgent magnetic resonance imaging scan demonstrated a posteriorly situated epidural mass extending from L1 to L2, causing spinal cord compression between L1 and L2. The mass was low intense on T1-weighted image and hyperintense on T2-weighted image (Fig. 4A, B, C).

Initially, operation was planned as a treatment modality but rapid improvement in motor power of lower extremities was observed. At 10 days after admission, the patient regained almost full motor power as well as sensory functions, and was discharged with full recovery. After 2 weeks of the admission, follow-up MRI showed that hematoma was resolved completely (Fig. 4D, E, F).

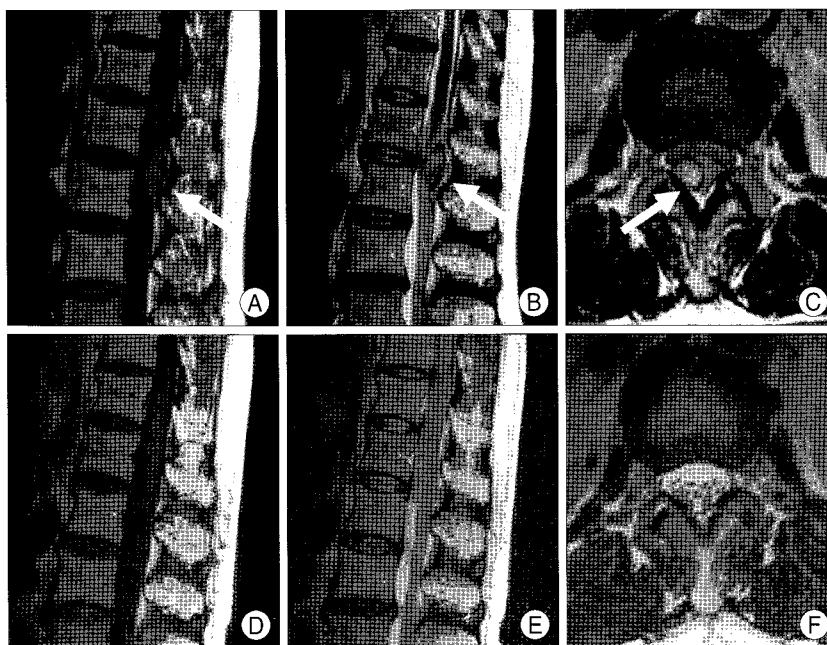
## DISCUSSION

Spinal epidural hematoma is a rare clinical entity in healthy patients without coagulopathy. Jackson<sup>11)</sup> described it in 1869 for the first time, and approximately 350 cases have been reported in the literature since then<sup>7,14)</sup>. The earliest estimate by Tryba<sup>23)</sup> suggested an incidence of 1 : 220,000 after a spinal block and 1 : 150,000 after an epidural block.

Spinal epidural hematoma is a space-occupying lesion caused by several cause. It has been reported after trauma, lumbar puncture, epidural anesthesia, operation, coagulopathy, vascular malformation, neoplasm, hypertension, diabetes mellitus, pregnancy, anticoagulative medication, etc.<sup>4,7,9,10,17,19,24)</sup>. Some authors reported spinal epidural hematoma without obvious cause as spontaneous epidural hematoma<sup>1,10)</sup>.

Previous reports demonstrated spinal epidural hematoma after pain control procedures such as epidural block and acupuncture. Some authors showed spinal epidural hematoma after an epidural block<sup>18,22,24,26,27)</sup>. Vandermeulen et al.<sup>24)</sup> reported 61 patients experiencing spinal epidural hematoma after epidural or subarachnoid block, although 87% of these patients had a coexisting coagulopathy or traumatic needle insertion. Kim et al.<sup>13)</sup> and Dougherty and Fraser<sup>6)</sup> reported spinal epidural hematoma after intraspinal injections of steroids. Also, there have been reports on spinal epidural hematoma after acu punctures<sup>12,28)</sup>. The epidural space is an area surrounded by a plexus of epidural veins, which has been historically implicated as the source of epidural hematoma. According to these anatomical features, blood vessel puncture is the most common cause of this complication that follows a pain control procedure<sup>5,8)</sup>.

In our study, we could not found any causes and risk factors of spinal epidural hematoma except previous history of pain control procedures. Therefore, we thought that pain



**Fig. 4.** Spinal epidural hematoma L1-L2 on MRI. A : Initial sagittal T1-weighted image shows that the hematoma (arrow) is hypointense in the dorsal part of spinal canal. B : Initial sagittal T2-weighted image shows that the hematoma (arrow) compress the thecal sac. C : Axial T2-weighted image shows thecal sac compression by dorsal epidural hematoma (arrow). D-F : 2 weeks after admission, epidural hematoma is resolved completely on T1, T2 sagittal and T2 axial MRI.

control procedures were the causes of hematoma. The third case, however, may be considered as spontaneous spinal epidural hematoma because of 1 month delay in onset of the disease. But, Tryba<sup>23)</sup> reported the similar delayed onset spinal epidural hematoma after spinal anesthesia in two cases.

The first clinical symptom of spinal epidural hematoma, in most of the cases, is sudden backpain or radicular pain, depending on the location of the bleeding. After hours to days of initiation of symptoms this insidiously progresses to a complete or partial paraplegia or even quadriplegia. The clinical course is so characteristic that it was called 'the syndrome of spinal epidural hematoma' by Markham et al.<sup>15)</sup>, and Rothfus et al.<sup>21)</sup>. The suspicion of spinal epidural hematoma should be made relatively early if this typical clinical course is observed. In our series, most patients complained back pain and radiating pain as initial symptoms and two patients showed motor weakness of lower extremities.

Radiological examination by CT-myelography or MRI is helpful to confirm the diagnosis of spinal epidural hematoma. In particular, the MRI signal characteristics of various stages of hemorrhage are relatively unique that can lead to a specific diagnosis than those obtained by CT myelography<sup>21)</sup>. With these advantages MRI imaging has replaced CT myelography as the first-choice diagnostic technique for the confirmation of spinal epidural hematoma. In the present study, MR Imaging of three out of four cases showed slightly high signal intensity on T1- and T2-weighted images. These findings

were consistent with a subacute stage of hematoma formation. In one case, the hematoma showed low signal intensity on T1-weighted image and high signal intensity on T2-weighted image, that were consistent with an acute stage of hematoma formation. The differential diagnosis for the patients with intense neck or back pain and progressive neurologic deficits are intradural hemorrhages, spinal cord compression due to presence of tumors, disc herniations, spine fractures, spinal cord infarction, and others<sup>2)</sup>.

Although spontaneous recovery of spinal epidural hematoma has been reported, immediate surgical decompression has been a standard treatment to prevent further deterioration of the neurologic deficits<sup>16,25)</sup>. The clinical factors that affect the neurologic prognosis are progression of clinical signs, grade of neurologic deficits, duration and location of spinal cord compression<sup>7,8,14)</sup>.

## CONCLUSION

Pain control procedures such as intraspinal block, facet joint block and acupuncture are being widely used for relieving of pain in all areas of the spine. Spinal epidural hematoma is a rare clinical entity in healthy patients without coagulopathy after pain control procedures. However, Pain control procedures may result in a complication of a spinal epidural hematoma causing myelopathy or radiculopathy. With the increasing access and use of pain clinic procedures for different chronic pain conditions such complications could be on the raise. The treatment in most cases is an urgent laminectomy and evacuation of the hematoma. If the patient shows progressive improvement, conservative treatment may be considered. In the present case study, all patients showed good clinical outcome.

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