CASE REPORT

J Korean Neurosurg Soc 38 : 481-483, 2005

Spontaneous Spinal Subdural Hematoma : Treatment with Lumbar Drainage

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We report a rare case of spontaneous spinal subdural hematoma(SSDH). A 63-year-old man presented with radicular pain and paraparesis on both legs for several months. On magnetic resonance images, SSDH was found in lumbar region. Electrodiagnostic report showed bilateral lumbosacral polyradiculopathy, such as cauda equina syndrome. SSDH was drained with lumbar drainage at L4-5 level without direct exploration. The patient improved after drainage of the hematoma and then he was able to walk independently.

KEY WORDS : Spontaneous spinal subdural hematoma · Cauda equina syndrome · Lumbar drainage.

Introduction

A spinal subdural hematoma(SSDH) is rare cause of spinal cord compression and is usually associated with a variety of predisposing factors. We report a patient who is not associated with known predisposing factors of SSDH and we had a good result with percutaneous lumbar drainage of the hematoma without direct exploration.

Case Report

A 63-year-old man presented with severe radicular pain and paraparesis as grade 3 on both legs. He had no trauma history except a knee problem prior to admission.

On physical examination, there was weakness involving both legs, the right weaker than the left. The deep tendon reflex was diminished on both legs. The babinski sign and ankle clonus were absent. There were vague sensory changes on the right leg. He complained mild symptom of cauda equina compression such as urinary retention. The hematologic studies were normal including bleeding and clotting times, platelet count, complete blood count and coagulation factor. He was not on anticoagulant therapy.

The plain radiographs showed multiple degenerative spondylosis of lumbar spine. Magnetic resonance(MR) images revealed spinal stenosis on L2-3 and a longitudinal space occupying lesion from L3 to S1 in the spinal canal. Diffuse high signal intensity was seen on T2-weighted images(Fig. 1), and slightly high signal intensity was seen on T1-weighted images (Fig. 2). And a well homogeneously enhanced lesion was also seen in the thecal sac at L2-3 level(Fig. 3). Electrodiagnostic report showed bilateral lumbosacral polyradiculopathy, such as cauda equina syndrome. The SSDH was drained with lumbar puncture at L4-5 level without direct exploration. So we assumed the location of hematoma was between dura mater and arachnoid membrane. The patient improved after

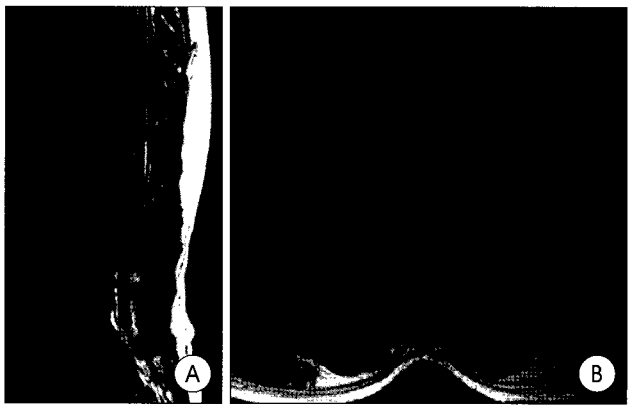

Fig. 1. T2-weighted magnetic resonance sagittal(A) and axial(B) images reveal homogeneous high signal intensity within the thecal sac in L3-S1. Severe spondylosis with central extruding disc herniation in L2-3. And marked degenerative change is seen in lumbar spine.

• Received : May 17, 2005 • Accepted : July 27, 2005

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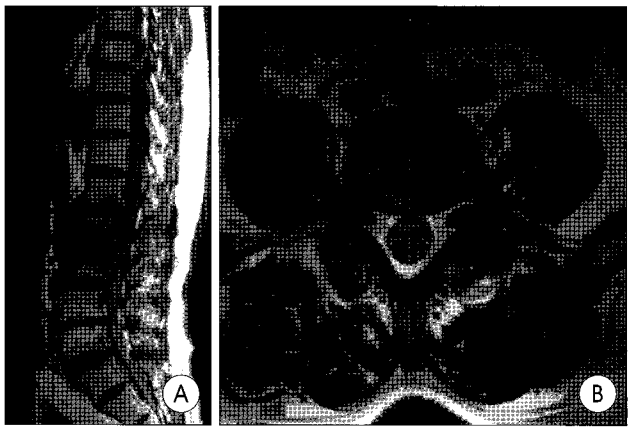

Fig. 2. T1-weighted magnetic resonance sagittal(A) and axial(B) images reveal slightly high signal intensity within the thecal sac at L3-S1.

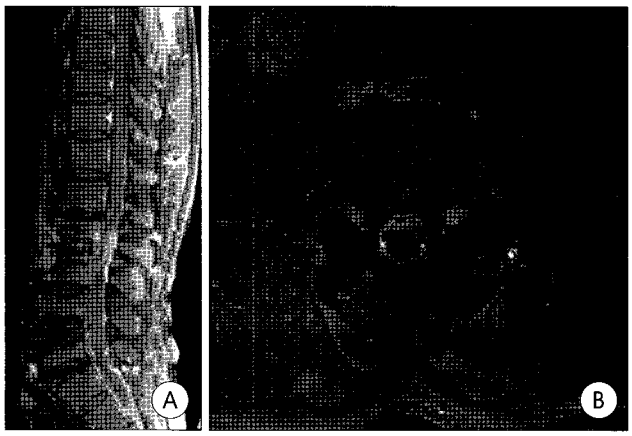

Fig. 3. Gadolium enhanced sagittal(A) and axial(B) images show a well homogeneously enhanced lesion in the thecal sac at L2-3.

drainage of the hematoma and he was able to walk independently.

Discussion

Subdural hematoma affecting the spinal cord is extremely rare. The presentation of SSDH is dramatic with paraplegia or paraparesis occuring in 39(93%) of 42patients in one study[17]. SSDH has been associated with several predisposing factors, including lumbar puncture[1,20], tumor[10], hemorrhagic disorder[11], anticoagulant therapy[5,12], head injury[4,15,19], and minor trauma[13,14,18,22]. It may occurred from a dural tear which occurred as a complication of microdiscectomy[2]. In a small number of cases, the so-defined spontaneous subdural hematoma, the primary etiology can not be detected. In a review of 58 cases of SSDH, Russell and Benoit[17] reported only five spontaneous cases.

Differentiation of epidural and subdural spinal hematoma may be difficult[11]. Epidural hematoma appears as a lentiform, biconvex, and clearly outlined mass with tapering superior and inferior margins on sagittal MR images. The dura mater can occasionally be seen as a curvilineal low signal structure separating the hematoma from the spinal cord. The axial scan is usually helpful in differentiating subdural and epidural hematoma. The subdural location is clear when the hematoma extends within the border of the dura mater. Since spinal epidural hematoma spread widely in the epidural space, the shape of the dura mater is often irregular. A subdural hematoma has a semicircular appear on axial scans, where as an epidural hematoma is more convex. Subdural hematoma may also show a convex appearance, but tend to be more crescentic on axial images. The shape of dura mater on MR images is smooth in spinal subdural hematoma. The lack of direct continuity with the adjacent bony structures points to a subdural location[16]. The black line between the spinal cord and the abnormal signal area is the edematous arachnoid[19]. The differentiation between a subdural and epidural hematoma will remain difficult and at times only surgical exploration will prove the exact location of the hematoma.

Unlike epidural hematoma of the spinal cord, SSDH is uncommon. The anatomical reasons for such a disparity in numbers are probably related to the relative larger and more vascular epidural fatty tissue[3,21]. Also, the spinal subdural space does not contain major vessels, but only a delicate network of vessels along the lateral margins of the dura. There are no veins bridging the subdural space. One theory of etiology is that the hemorrhage may originate primarily within the subarachnoid space. The spinal arachnoid membrane is a connective tissue membrane closely attached to the dura matter and reflected off the surface of the spinal cord to unsheath blood ve-

Table 1. Frankel Classification of Degree of Incompleteness*

Frankel Grade	Description	Motor and Sensory Sparing Below the Zone of Partial Preservation	Muscle Grades Below the Zone of Partial Preservation
A	Complete	Absent	0/5
B	Incomplete, preserved sensation only	Sensation only	0/5
C	Incomplete, preserved motor functional	Minimal voluntary motor function	Majority of key muscles less than 3/5
D	Incomplete, preserved motor functional	"Functionally useful" voluntary motor function	Majority of key muscles at least 3/5
E	Complete return	Complete return of all motor and sensory function. (Reflexs may be abnormal.)	5/5

*American Spinal Injury Association(1989)

ssels as they transverse the arachnoid space. In the case of a sudden rapid increase of abdominal or thoracic pressure, it could raise the pressure in the spinal vessels, particularly the valveless radiculomedullary veins because they cross the subdural and subarachnoid spaces[6,17]. If the pressure of the CSF cannot immediately neutralize this force, rupture of the vessels could ensure.

In our case, when we advanced the catheter more deeply after drain of dark blood beyond dura mater, clear CSF was gushed out. So we assumed the location of hematoma was between dura matter and arachnoid membrane conjunction with the magnetic resonance(MR) images.

Intraspinal hematoma can rapidly compromise the spinal cord or cauda equina, so early diagnosis and identification of the extent of a hematoma are necessary[19,22]. Extension of SSDH is variable. In our case, the extent of hematoma was about four vertebral segments. It is generally agreed that prompt evacuation should be performed before irreversible damage to the spinal cord occurs[7,17]. A laminectomy at several levels, the removal of the blood and an enlarging dura patch ensure the spinal decompression necessary for restoring neural function.

If it misses the opportunity of surgical intervention, permanent neurological deficits are inevitable. On the other hand, surgical intervention may increase the risk of iatrogenic spinal cord injury or excessive bleeding especially in those patients who have a hematologic disorder and are receiving anticoagulant therapy. Therefore, it has to be careful to determine when to treat surgically unless the source of bleeding is detected.

Maeda et al.[9] proposed that conservative management may be indicated when symptoms improve quickly during the acute phase with treatment of spinal edema and the severity of neurologic symptom initially is grade D or better on the Frankel grading scale of degree of incompleteness(Table 1).

Severe symptoms or clinical worsening are observed, surgical intervention should be applied. Some authors have suggested that spinal subdural hematoma confined to the lumbar level could be successfully managed by percutaneous drainage[7,8].

The present case emphasize that in SSDH we had a good result with lumbar drainage without surgical exploration such as multi-level laminectomy.

Conclusion

ASSDH, although rare, should be considered in the diagnosis of spinal compression syndrome[2,4,5,7,11,12,14,19,21,22]. Usually, SSDH necessitates an immediate surgical evacuation[7,8]. The prognosis for functional recovery is good if the condition is appropriately diagnosed and treated before development of irreversible paralysis. We present a patient who had spinal subdural hematoma, and we achieved a good result by drainage of the hematoma without direct exploration.

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