대 한 외 상 학 회 지
Vol. 19, No. 1, June, 2006

• 증 례 •

외상성 구개강내 출혈과 동반된 척추경막하 출혈; 요추 전자부 자연흡수

조선대학교 의과대학 신경외과학교실

이원태 · 김석원

— Abstract —

Traumatic Spinal Subdural Hematoma Accompanying intracranial hematoma: Spontaneous Resolution after Pumbar Puncture

Won Tae Lee, M.D., Seok Won Kim, M.D.

Department of Neurosurgery, College of medicine, Chosun University, Gwangju, Korea

A traumatic spinal subdural hematoma is a rare condition, and only nine cases have been reported until now. We report a rare case of concomitant intracranial hemorrhage and spinal subdural hematoma with a review of the literature. A 45-year-old man was referred to our institute after being stroke by a car. He complained of nausea, headache, back pain, and bilateral sciatica. Brain computed tomography and lumbar spine magnetic resonance images revealed both an intracerbral hemorrhage and a subdural hematoma in the L4 to S1 level. After performing a lumbar spinal puncture and draining the hemorrhagic cerebrospinal fluid (CSF), the intracranial and spinal hematomas were resolved completely without any neruologic deficits. (K Korean Soc Traumatol 2006;19:93-96)

Key Words: Traumatic spinal subdural hematoma, Intracranial hemorrhage

Ⅰ. INTRODUCION

Spinal subdural hematoma (SDH) is a rare entity associated with hemorrhagic disorder, anticoagulant therapy, lumbar puncture, spinal surgery, vascular malformation and trauma(1).

Traumatic spinal SDH is uncommon, and only nine cases have been reported in the literature until now(Table 1).

Including our patient, we found out that six of the ten patients with spinal SDH also had intracrainal hematoma. It is generally agreed that prompt evacuation should be performed before any irreversible damages to the spinal cord take place(1). However, three of the nine reported cases revealed that SDH resolved spontaneously without any operative treatment(2-4).

The following case shows a spontaneous resolution of intracrainal and SDH after spinal puncture and CSF drainage.

* Address for Correspondence : **SeokWon Kim, M.D.**
Department of Neurosurgery, School of medicine, Chosun University,
588, Seosuk-dong, Dong-gu, Gwangju-city, 501-717, Korea.
Tel : 82-62-220-3120, Fax : 82-62-227-4575, E-mail : chosunns@hanmail.net

접수일: 2006년 6월 16일, 심사일: 2006년 6월 16일, 수정일: 2006년 6월 30일, 승인일: 2006년 7월 21일

Ⅱ. CASE REPORT

A 45-year-old man with drowsy mental state was referred to our institute after a car stroke. As his head and back struck the ground, he lost consciousness. Two days later, he regained consciousness and complained of headache, nausea, back pain and bilateral sciatica.

Brain computed tomography (CT) scans revealed both frontal hemorrhagic contusion and intracerebral hemorrhage with brain swelling(Fig. 1A).

Initially, he was admitted to intensive care unit for close observation. Because of his serious lumbar radiculopathy, he was scheduled for a lumbar spine magnetic resonance imaging (MRI) study. Physical examination showed limitations in straight leg-raising test (30°/30°), limited dorsiflexion of left big toe and paresthesia of left L4-L5 dermatome.

MRI on the seventh day posttrauma showed a large fusiform mass in the dorsal part of subdural space extending from L4 to S1(Fig. 1B, C).

His coagulation profiles including platelet count, prothrombin time, and partial thromboplastin time were within normal range.

For differential diagnosis from other conditions and treatment of SDH, lumbar spinal puncture was performed.

Lumbar spinal puncture on the eighth day revealed red hemorrhagic fluid. Approximately 50 ml of hemorrhagic fluid was collected in a test tube within 15 minutes(Fig. 2).

Examination of the fluid acquired in the lumbar puncture bottle revealed 380000 red blood

Table 1. Summary of Cases With Traumatic Spinal Subdural Hematoma in the literature

Authou and year	Age (yrs) Sex	Level	Brain Lesion	Neurological Deficit	Injury to Admission	Surgery Level	Outcome	Reference
Zilkha, 1974	26, F.	L	None	Paraplegia	14 days	L2-L5	Good	10
Paredes, 1981	9, M	C	SAH, IVH	Quadriplegia	1 day	C	Poor	6
Juvonen, 1994	63, M	T	-	Paraplegia	4 days	None	Good	3
Rader, 1995	40, M	T	None	Monoplegia	5 yrs	T9-T1	Poor	7
Lee, 1996	15, M	L	SDH	Bilateral sciatica	7 days	None	Good	4
Shimada, 1996	68,7	T-S	SDH	Back pain	14 days	L1-L3,T8-T9	Good	8
Stewart, 1996	77,F	T	None	Paraplegia	3 mos	T3-T2	Poor	9
Chen, 2001	31,M	L-S	ICH	Cauda equina syndrome	14 days	L3-L5	Good	5
Hung, 2002	12,M	L1-L5	SDH	Left sciatica	1 day	None	Good	2
Kim	45,M	L4-S1	ICH, SDH	Bilateral sciatica	1 day	None	Good	This report

M=male; F=female; C=cervical; T=thoracic; L=lumbar; S=sacral; SAH=subarachnoid hemorrhage; IVH=intraventricular hemor-

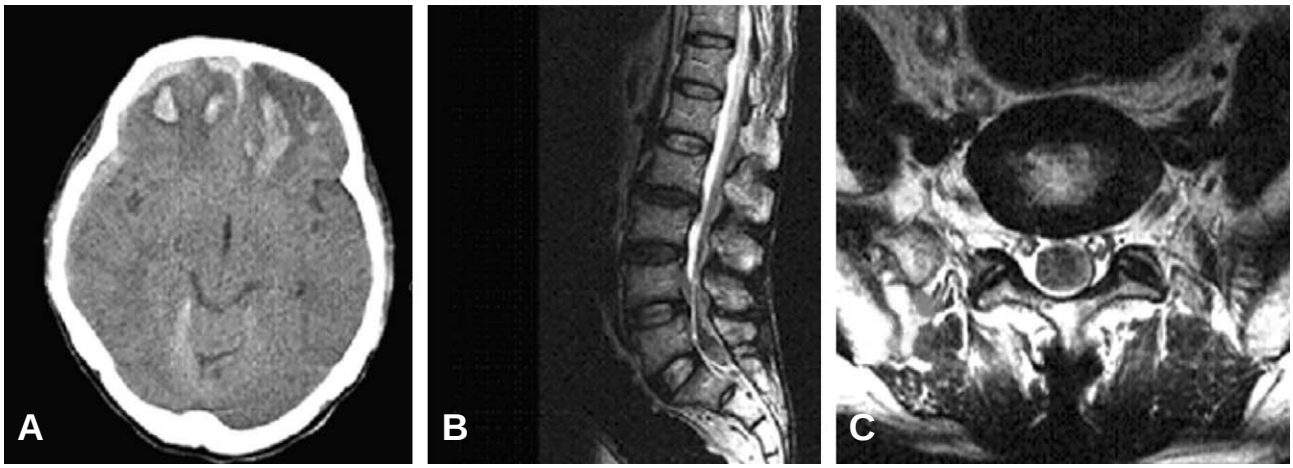

Fig. 1. (**A**) Computed tomography scan of the brain reveals both frontal hemorrhagic contusion and subdural hematoma, (**B**, **C**) Sagittal and axial T2-weighted magnectic resonance images show massive hypointensive lesions from L4 to S1 within the dural sac.

cells/mm^3 and 439 white blood cells/mm^3.

MRI on the 26th day posttrauma revealed that the intracranial and spinal SDH had resolved almost completely(Fig. 3).

The patient was discharged without any neruologic deficits 4 weeks after the trauma.

Ⅲ. DISCUSSION

Spinal subdural hematoma is a very rare disease entity that is usually associated with underlying hematological disorders or other predisposing conditions(1). Posttraumatic spinal subdural hematoma is considered less common, and only nine cases have been described in the literature(Table 1)(2-10). Among them, including our patient, we found out that six of the ten patients with traumatic spinal SDH also had intracranial hematoma simultaneously(2,4-6,8). If we exclude the three patients before the era of CT scanning, six of the seven cases with traumatic spinal SDH had head trauma with intracranial hematoma as well. This finding suggests that the mechanism of traumatic spinal SDH may be associated with intracranial events.

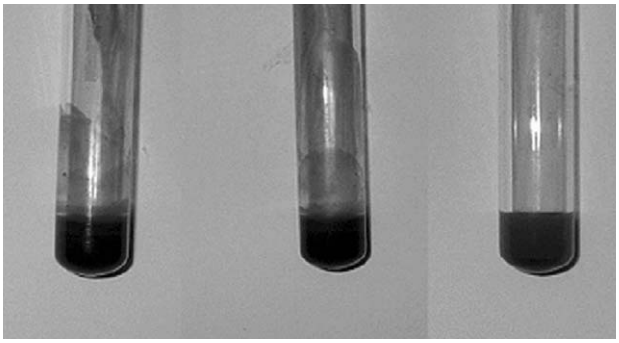

Fig. 2. hemorrhagic cerebrospinal fluid collected in a test tubes.

Does increased intracranial pressure play a role in the mechanism of traumatic spinal SDH? It is known that a rise in intracranial pressure may also increase shearing force between spinal subdural and subarachnoid spaces so that the inner dura may tear and bleed. This hypothesis can explain why over half of the reported patients with traumatic spinal SDH had intracranial hematoma simultaneously. Haines et al(11). investigated the mechanism of brain SDH and suggested that although the external dural layer is strong, the inner dural or meningeal dura layer is structurally weak and vulnerable to injury.

Spinal SDH can compromise the spinal cord or cauda equina, which result in paralysis or sensory loss in areas associatied with dermatomes. Therefore, early diagnosis and identification of the extent of the hematoma are necessary.

Unlike the epidural space, the spinal subdural space does not contain major blood vessels or bridging veins, so spinal epidural hematoma occurs more often than spinal SDH(12-14). Hence, it is important to differentiate spinal SDH from spinal epidural hematoma. Surgical outcomes of spontaneous spinal SDH were reported to be favorable in 25 fo 59 patients (42%) with spinal SDH(15). On the other hand, because of the limited number of reported cases, treatment of traumatic spinal SDH is not well established.

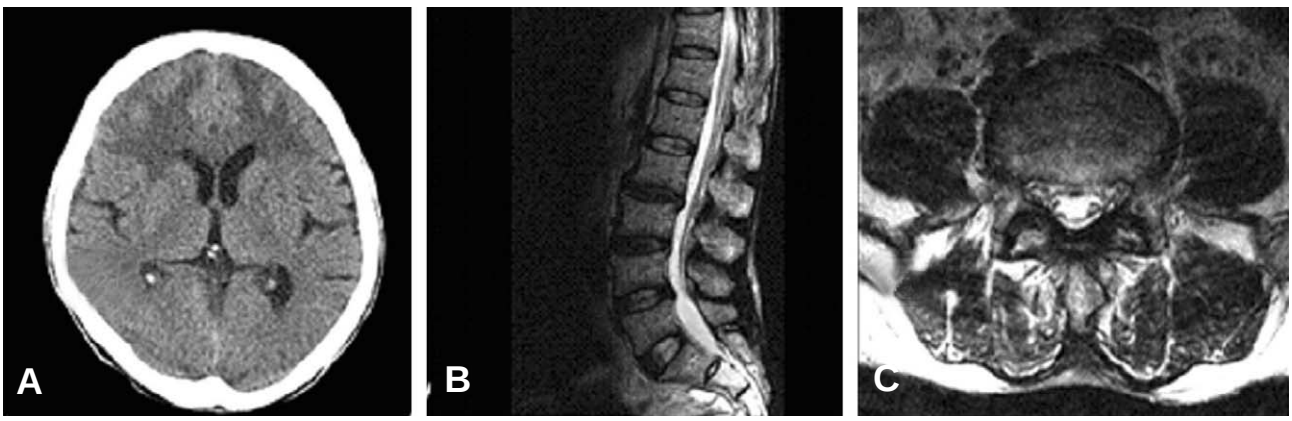

Fig. 3. Computed tomography scan of brain shows complete resolution of intracranial hemorrhage (**A**). Follow-up magnetic resonance images on 28th day posttrauma show that spinal subdural hematoma had resolved almost completely (**B**, **C**).

Surgical outcomes are related to the preoperative neurologic status of the paitent(15). It is generally agreed that prompt laminectomy with evacuation of hematoma should be performed before any irreversible damages to the spinal cord take place(7). However, three of the nine reported cases were described to have favorable outcomes in which traumatic spinal SDH resolved spontaneously with conservative treatment(2-4). Juvonen et al(3). reported a case on the successful conservative treatment of a 63-year-old man with traumatic thoracic SDH. The patient had recovered completely from paraplegia and right leg pain wihtin 2 months after the trauma. Lee et al(4). also reproted a case on the successful conservative treatment of lumbar puncture on a 15-year-old boy with traumatic lumbar SDH. Hung et al(2). proposed two important prognostic factors of traumatic spinal SDH. One is the location of spinal SDH, and the other factor is the duration of the symptoms. It was found that all of the three patients with poor prognosis have lesions in cervical or thoracic spine(6,7,9). Since there is no spinal cord in the lumbosacral region, the patients with lumbar SDH are more readily resolved conservatively whereas those with cervical or thoracic SDH are more critical to treat.

This case thoroughly illustrates the spontaneous resolution of traumatic SDH in both intracerebral and lumbar spine with lumbar puncture. We suggest a possible role of conservative managements of lumbar puncture for traumatic lumbar SDH, especially when the patients are in the stage of neurologic recoveries.

REFERENCES

1) Russell NA, Benoit BG. Spinal subdural hematoma. A review. Surg Neurol 1983;20:133-7.
2) Hung KS, Lui CC, Wang CH, Wang CJ, Howng SL. Traumatic spinal subdural hematoma with spontaneous resolution. Spine 2002;27:534-8.
3) Juvonen T, Tervonen O, Ukkola V, Klintrup HE. Widespread posttraumatic spinal subdural hematoma-imaging findings with spontaneous resolution: case report. J Trauma. 1994;36:262-4.
4) Lee JI, Hong SC, Shin HJ, Eoh W, Byun HS, Kim JH. Traumatic spinal subdural hematoma: rapid resolution after repeated lumbar spinal puncture and drainage. J Trauma 1996;40:654-5.
5) Chen HJ, Liang CL, Lu K, Liliang PC, Tsai YD. Cauda equina syndrome caused by delayed traumatic spinal subdural hematoma. Injury 2001;32(6):505-7.
6) Paredes ES, Kishore PR, Ward JD. Cervical spinal subdural hematoma. Surg Neurol 1981; 15:477-9.
7) RADER JP. Chronic subdural hematoma of the spinal cord: report of a case. N Engl J Med 1955; 253:374-6.
8) Shimada Y, Sato K, Abe E, Miyakoshi N, Tsutsumi Y. Spinal subdural hematoma. Skeletal Radiol 1996;25:477-80.
9) Stewart DH Jr, Watkins ES. Spinal cord compression by chronic subdural hematoma. Case report.J Neurosurg 1969;31:80-2.
10) Zilkha A, Nicoletti JM. Acute spinal subdural hematoma. Case report. J Neurosurg 1974;41:627-30.
11) Haines DE, Harkey HL, al-Mefty O. The "subdural" space: a new look at an outdated concept. Neurosurgery 1993;32:111-20.
12) Boukobza M, Haddar D, Boissonet M, Merland JJ. Spinal subdural hematoma: a study of three cases. Clin Radiol. 2001;56:475-80.
13) Levy JM. Spontaneous lumbar subdural hematoma. AJNR Am J Neuroradiol. 1990;11:780-1.
14) Nicholas DS, Weller RO. The fine anatomy of the human spinal meninges. A light and scanning electron microscopy study. J Neurosurg 1988;69:276-82.
15) Domenicucci M, Ramieri A, Ciappetta P, Delfini R. Nontraumatic acute spinal subdural hematoma: report of five cases and review of the literature. J Neurosurg (1 Suppl) 1999;91:65-73.