



Effect of Complex Korean Medical Treatment on Spinal Epidural Hematoma: A Case Report

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This paper presents the clinical outcome of an 82-year-old female who experienced sudden back pain combined with lower limb paresthesia and weakness after epidural steroid injection. The magnetic resonance imaging of the thoracolumbar spine showed a spinal epidural hematoma (SEH) extending from T8 to L4. She was treated non-operatively in the traditional Korean medicine (TKM) hospital. The patient's progress was assessed using the Numerical Rating Scale (NRS), American Spinal Injury Association (ASIS), Spinal Cord Independence Measure version III (SCIM III), and self-reported symptoms. During the 22-day hospitalization period, the NRS score decreased from 7 to 2 points, the motor score on the ASIS scale increased from 65 to 95 points. The subjective sense of lower extremities was felt by 1 increased to 8. The SCIM III score increased from 32 to 69 points. These results suggest that TKM could effectively reduce pain and aid the rehabilitation of patients with SEH.

Keywords: Acupuncture; Korean traditional medicine; Spinal epidural hematoma; Spinal injury

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INTRODUCTION

Spinal epidural hematoma (SEH) is a rare disease that causes acute spinal cord compression. SEH is caused by an idiopathic, spontaneous, arteriovenous malformation, trauma, lumbar puncture, or anticoagulant medication. Traumatic SEH accounts for 0.5–1.7% of all spinal injuries and at least 40% of all spontaneous SEH [1,2]. Specifically, epidural steroid injections are widely used for neck and pain or radiculopathy; however, various side effects have been reported. Transforaminal cervical and lumbar epidural steroid injections pose a potential risk of fatal vascular injury [3]. The clinical symptoms mainly include acute pain, paralysis, quadriplegia, paresthesia, sexual dysfunction, and intestinal and/or bladder dysfunction. These entail a high risk of neurological sequelae; therefore, early diagnosis and rapid treatment are needed. Magnetic resonance imaging (MRI) or computed tomography (CT) aid in its diagnosis. The treatment involves embolization or surgical evacuation of hematomas [4–6].

In traditional Korean medicine (TKM), vascular diseases of the spinal cord are categorized as “wilting disorders.” It is characterized by general weakness of the muscles of the extremities and limitation of free movements [4–7]. To our knowledge, no studies have addressed TKM treatments for spinal hematoma following epidural injections. In Korea, few studies have reported spontaneous epidural bleeding or subsequent anticoagulant ingestion [4,5]. Thus, this case report aimed to describe the effectiveness of TKM treatment in patients with SEH.

CASE REPORT

1. Patient

Lee OO (female, 82 years old).

1) Chief complaint

The chief complaint included low back pain, buttock pain, bilateral lower limb paresthesia, gait disturbance.

2) Past medical history

The patient had an old burst fracture of T12 and L1 bodies with vertebroplasty in 2021. She was diagnosed with rheumatoid arthritis, diabetes, and hyperlipidemia and was taking her prescribed medications.

3) Family history

None.

4) Present illness

The patient received epidural steroid injections three times for back pain at local hospital on January 27, and February 3 and 10, 2022. After the third injection, the patient noted unprecedented back pain, numbness, and paresthesia in both legs and inability to walk. On February 10–17, 2022, she was hospitalized at the local neurosurgery hospital, and from February 17 to March 4, 2022, she was hospitalized at the neurosurgery department of Soonchunhyang University Hospital, but surgery was not performed.

5) Treatment duration

The patient was hospitalized for 22 days from March 4–25, 2022.

6) Radiology

MR images of the thoracolumbar spine were obtained on February 17 and 22, 2022 (Figs. 1, 2).

7) Patient protection policy on patient information use

To protect the patient’s personal information, medical records were obtained from the Cheonan Korean Medicine Hospital of Daejeon University Institutional Review Board (No. DJUMC-2022-BM-09).

2. Treatments methods

1) Acupuncture

The acupuncture needles used were 0.25 × 30-mm stainless steel standardized and disposable needles (Eastern Acupuncture Equipment Manufacture, Boryeong, Korea). Acupuncture was performed twice daily for 15 minutes: bilateral BL23, BL24, BL25, and BL26; unilateral ST36, ST37, ST40, BL60, GB30, and GB34; and tender points on tissues, including the gluteus and piriformis muscles [8]. STN-110 (Stratek, Seoul, Korea), set with a stimulation frequency of 3 Hz, was used for electroacupuncture [9,10].

2) Pharmacopuncture

Pharmacopuncture was administered once daily from March 5 to 10, 2022. *Aconitum ciliare decaysne* pharmacopuncture (ACDP) (Korean Pharmacopuncture Institute, Seoul, Korea) was injected at BL23, BL24, BL25, or tender points around the hip. A dose of 0.1–0.2 mL was injected at each acupoint at a depth of 1–1.2 cm. The total dose administered per treatment was 1.0 mL, using a 1.0-mL disposable syringe with needle (30 G × 1.27-cm needle; Junggrim Medical, Seoul, Korea).

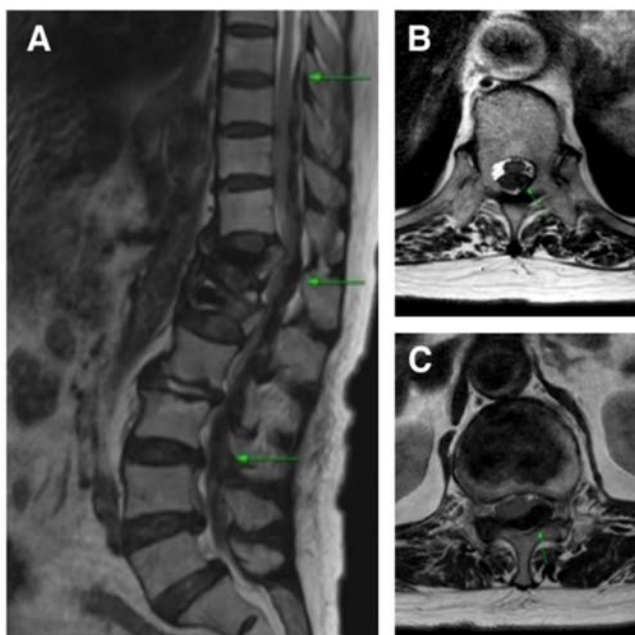


Fig. 1. T2-weighted magnetic resonance images of thoracolumbar spine showing an acute spinal epidural hematoma (SEH) performed on February 17, 2022. The image on the left (A) is the sagittal view with spinal cord compression at the T8–L4 level (green arrows). The image on the right side (B, C) is the axial view of the SEH. The image on the right upper side (B) is at the T9–10 level, and the right lower side (C) is at the T12–L1 level. The scan shows distended epidural space with low signal (green arrow).

3) Herbal medicine

The patient received herbal medicines three times daily. Whallak-tang, Sungihwalhyeol-tang, Gamiojeoksan, and Gwiwon-tang were prescribed (Table 1).

4) Physiotherapy

To reduce pain and relieve muscle tension, transcutaneous electrical nerve stimulation was applied once daily for 20 minutes to the lower back region.

5) Moxibustion treatment

Indirect electric moxibustion therapy (Technoscience, Seoul, Korea) was applied twice a day for 10 minutes at BL24, BL25, BL26, ST36, and GB34.

6) Rehabilitation training

Tilt training involves training in the standing posture by tilting the patient who cannot walk or stand independently. It was performed daily for 20 minutes four times a week from day 8 of hospitalization (March 11, 2022) for strengthening muscle in the lower extremities before practice walking [11].

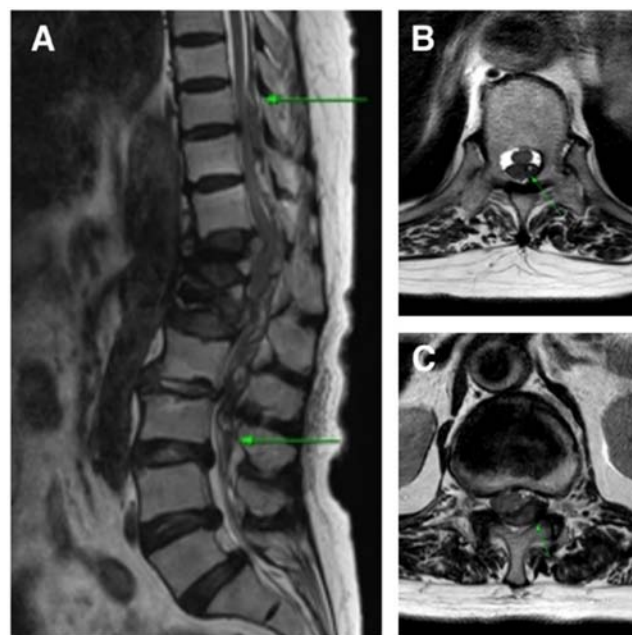


Fig. 2. T2-weighted magnetic resonance images of thoracolumbar spine showing an acute spinal epidural hematoma (SEH) performed on February 22, 2022. The (A) is the sagittal view with spinal cord compression at the T8–L4 level (green arrows). The (B, C) are the axial view of the SEH. The B image is at the T9–10 level, and the (C) is at the T12–L1 level. The scan shows distended epidural space with low signal (green arrow).

3. Evaluation

1) Numerical Rating Scale

A scale of 0–10 was used as an index to grade the subjective pain felt by the patient, where 0 and 10 indicated no pain and maximum pain, respectively (Fig. 3).

2) American Spinal Injury Association scale

The American Spinal Injury Association (ASIA) is a standardized examination tool that measures the sensation and muscle strength of both upper and lower limbs to neurologically and functionally classify spinal cord injuries [12,13]. The total score is 100 points, with 50 points each in the upper and lower extremities (Appendix A) (Fig. 4).

3) Spinal Cord Independence Measure version III

Spinal Cord Independence Measure version III (SCIMIII) is used to measure quadriplegia and lower extremity paralysis more sensitively in patients with spinal cord injury. It is divided into self-help skills, respiratory and sphincter control, and movements. The total score is 100 points, with a higher score indicating better performance [4,5,14] (Appendix B) (Fig. 4).

Table 1. Herbal composition of four herbal medications for daily dosage

Whallak-tang (2022.03.05–2022.03.07)	(g)	Sungihwalhyeol-tang (2022.03.09–2022.03.11)	(g)	Gamiojeoksan (2022.03.12–2022.03.14)	(g)	Gwiwon-tang (2022.03.15–2022.03.21)	(g)
<i>Chaenomeles fructus</i>	20	<i>Cyperus rhizoma</i>	16	<i>Atractylodes rhizoma</i>	16	<i>Longan arillus</i>	16
<i>Chelidonium herba</i>	20	<i>Linderae radix</i>	8	<i>Clematidis radix</i>	12	<i>Rehmanniae radix preparata</i>	16
<i>Corydalis tuber</i>	16	<i>Citri unshius pericarpium</i>	8	<i>Pinelliae tuber</i>	4	<i>Astragali radix</i>	16
<i>Osterici radix</i>	16	<i>Pinelliae tuber</i>	8	<i>Citri unshius pericarpium</i>	8	<i>Atractylodes rhizoma alba</i>	16
<i>Clematidis radix</i>	12	<i>Poria sclerotium</i>	8	<i>Poria sclerotium</i>	8	<i>Poria sclerotium</i>	16
<i>Angelicae pubescentis radix</i>	12	<i>Atractylodes rhizoma</i>	8	<i>Angelicae gigantis radix</i>	8	<i>Liriopsis seu ophiopogonis tuber</i>	16
<i>Angelicae gigantis radix</i>	12	<i>Cnidii rhizoma</i>	18	<i>Paeoniae radix alba</i>	8	<i>Angelicae gigantis radix</i>	8
<i>Rehmanniae radix siccus</i>	12	<i>Paeoniae radix rubra</i>	8	<i>Cnidii rhizoma</i>	8	<i>Cyperus rhizoma</i>	8
<i>Paeoniae radix rubra</i>	12	<i>Platycodonis radix</i>	8	<i>Ephedrae herba</i>	4	<i>Zizyphi spinosi semen</i>	8
<i>Atractylodes rhizoma</i>	8	<i>Aurantii fructus immaturus</i>	8	<i>Cinnamomi ramulus</i>	8	<i>Nelumbinis semen</i>	8
<i>Citri unshius pericarpium</i>	8	<i>Angelicae dahuricae radix</i>	6	<i>Aurantii fructus immaturus</i>	6	<i>Citri unshius pericarpium</i>	8
<i>Olibanum</i>	8	<i>Aucklandiae radix</i>	6	<i>Platycodonis radix</i>	6	<i>Amomi fructus</i>	8
<i>Myrrha</i>	6	<i>Glycyrrhizae radix</i>	6	<i>Zingiberis rhizoma</i>	6	<i>Polygoni multiflori radix alba</i>	8
<i>Carthami flos</i>	6	<i>Cinnamomi ramulus</i>	6	<i>Angelicae dahuricae radix</i>	6	<i>Ponciri fructus immaturus</i>	6
<i>Amomi fructus</i>	4	<i>Persicae semen</i>	6	<i>Zingiberis rhizoma recens</i>	6	<i>Pinelliae tuber</i>	6
<i>Glycyrrhizae radix</i>	8	<i>Carthami flos</i>	6	<i>Allii fistulosi bulbus</i>	8	<i>Aucklandiae radix</i>	4
<i>Crataegii fructus</i>	8	<i>Acori graminei rhizoma</i>	4	<i>Angelicae pubescentis radix</i>	8	<i>Chrysanthemi indicis flos</i>	4
<i>Galli stomachichum corium</i>	8	<i>Polygalae radix</i>	4	<i>Achyranthis radix</i>	8	<i>Menthae herba</i>	4
<i>Massa medicata fermentata</i>	8	<i>Angelicae gigantis radix</i>	10	<i>Dipsaci radix</i>	8	<i>Phyllostachyos caulis in taeniam</i>	4
<i>Hordei fructus germinatus</i>	8	<i>Zingiberis rhizoma recens</i>	4	<i>Osterici radix</i>	8	<i>Polygalae radix</i>	4
						<i>Coptidis rhizoma</i>	4
						<i>Glycyrrhizae radix</i>	4
						<i>Zingiberis rhizoma recens</i>	24
						<i>Zizyphi fructus</i>	16
						<i>Crataegii fructus</i>	8
						<i>Massa medicata fermentata</i>	8
						<i>Acanthopanax cortex</i>	8
						<i>Achyranthis radix</i>	8
						<i>Chaenomeles fructus</i>	8

4) Subjective sensory evaluation

When the patient was stimulated with a needle, if the level of normal sensation is 10, the level of sensory abnormality in the vertebral segments below L4 was measured on a scale of 0-10 (Fig. 5).

4. Patient's progress during treatment

The patient's pain, muscle strength, and subjective sensation improved during the inpatient treatment (Fig. 6). The Numerical Rating Scale (NRS) decreased from 7 to 2. The ASIA and SCIM III scores increased from 65 to 95 and from 32 to 69, respectively. The subjective sensory score increased from 1 to 8. On admission, the patient could not walk and had a Foley catheter inserted. At discharge, the patient could walk for approximately 10 minutes with assistance and could actively raise her legs up to 70°.

DISCUSSION

SEH is caused by hemorrhagic conditions, trauma to the spine, and vascular malformation and is prevalent in the thoracic region where the epidural space is best developed. Traumatic injuries include spinal fractures, lumbar puncture, and postoperative bleeding. The site and degree of bleeding affect the patient's condition and prognosis, and bleeding in the cervical and thoracic spine is more severe than that in the lumbar spine [5]. SEH can cause acute neurological and chronic lumbar spine symptoms. Pain, motor paralysis, and sphincter dysfunction may also occur [15]. Diagnoses are based on MRI or CT and indicate immediate surgical removal. MRI is the best diagnostic modality, visualizing several vertebral segments along the longitudinal axis. Delayed treat-

ment can result in neurological damage and poor prognoses [4-6,15].

The results of this study indicated that TKM treatment, including acupuncture, moxibustion, and herbal medicine, can improve spinal hematoma as a side effect of epidural steroid injection. Moreover, TKM treatment focuses on the communication of meridians, promotion of blood circulation and nerve function recovery, and replenishment of qi and blood. Through this, the flow of qi and blood reaching the lower limbs is stagnant because of hematomas in the thoracolumbar region, and it treats symptoms such as pain, muscle weakness, and decreased sensation caused by a lack of nutrition in the skin and muscles.

In TKM, "wilting syndrome," also called "Wei-syn-

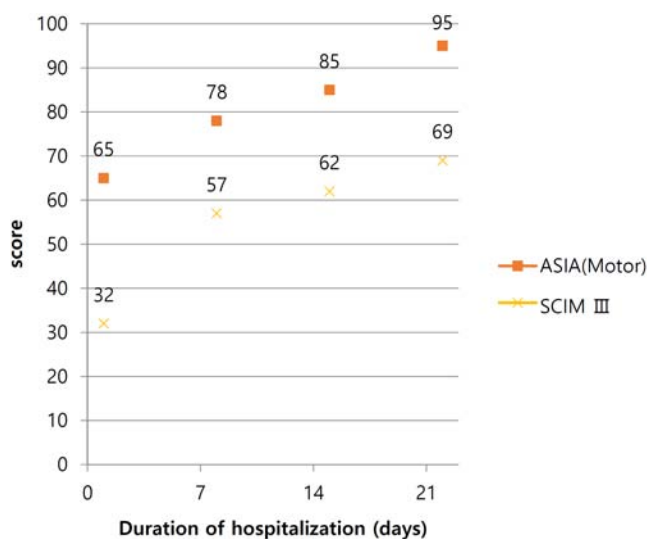


Fig. 4. Changes in the ASIA and SCIMIII score. ASIA, American Spinal Injury Association scale; SCIMIII, Spinal Cord Independence Measure version III.

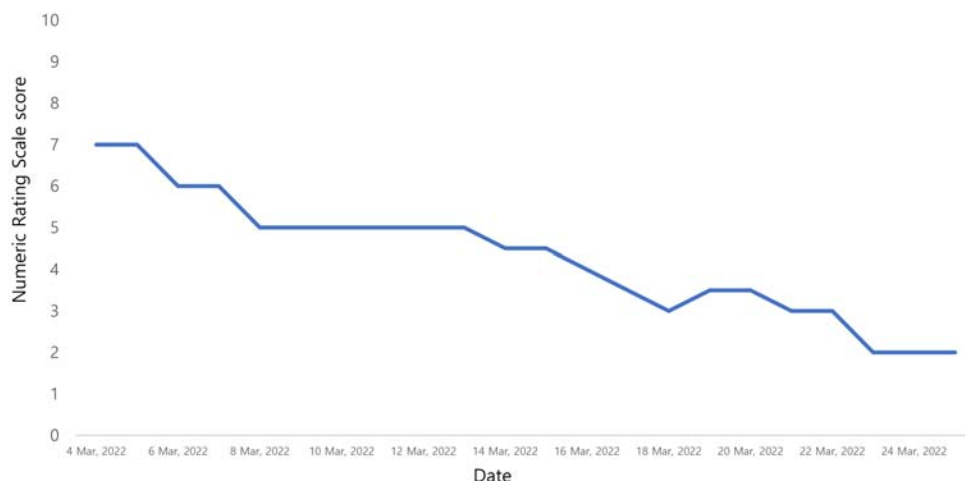


Fig. 3. Changes in the Numerical Rating Scale score from March 4, 2022 to March 25, 2022.

drome,” a spinal vascular disease, causes muscle weakness and thinness of the limbs [4,5,7]. Herbal medicine treatment focused on communicating the meridians, stimulating blood circulation, and then replenishing qi and blood. In this study, Whallak-tang was prescribed to alleviate severe pain and promote meridian. To relieve the patient’s complaints of nausea and abdominal distension, Sungihwalhyeol-tang was prescribed and Gamio-jeoksan was added to relieve dry cough, pain, and itch-

ing. Gwiwon-tang was prescribed to help the patient recover and regain her appetite (Table 1). Acupuncture, electroacupuncture, and ACDP were mainly applied for the treatment on the acupuncture point of the bladder meridian and stomach meridian, stimulating the dermal segment of the spine to recover senses and restore the contractility of the tibial muscle. Acupuncture promotes qi and blood circulation on Back-Shu points, which is the damaged area of the spinal cord, and restores the nerve through stimulation by selecting the acupoint at the location of the nerve in the paralyzed area [8]. Electroacupuncture increases the electrical activity of the muscles to treat paresthesia, and it is applied to the tibialis anterior and peroneus muscles of the lower extremities. ACDP helps reduce neuropathic pain [16], increase body temperature, improve peripheral blood circulation, and have anti-inflammatory effects [17].

Two studies have reported vascular diseases of the spinal cord treated by TKM. Lee et al. [4] reported two cases, and no surgery was performed. TKM was started 5–7 weeks after onset and was performed for 3–4 months. In this study, bee venom was injected into Back-Shu points to induce nerve cell activity and improve sensory impairment. In the first case, muscle strength was unchanged, and the sensory response of two segments was recov-

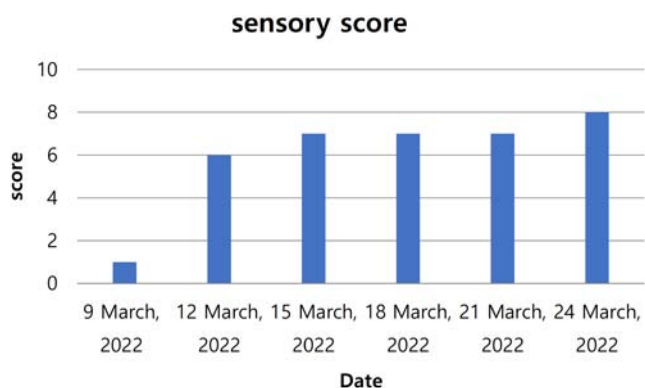


Fig. 5. Subjective evaluation of the patient during the hospitalization. The subjective senses of both lower extremities were evaluated by comparing them with other parts with normal sensations.

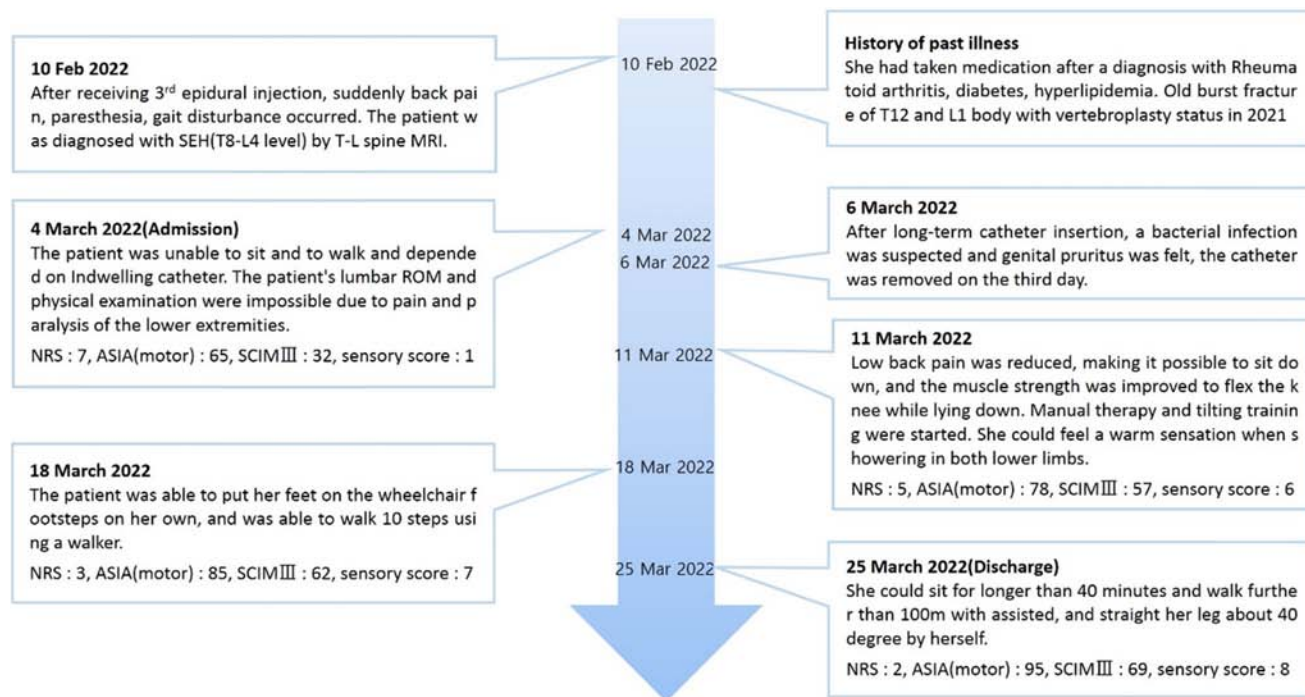


Fig. 6. Timetable of patient history and clinical symptoms. SEH, spinal epidural hematoma; MRI, magnetic resonance imaging; ROM, range of motion; NRS, Numerical Rating Scale; ASIA, American Spinal Injury Association scale; SCIMIII, Spinal Cord Independence Measure version III.

ered. In the second case, partial sensation was recovered and muscle strength was restored, enabling independent walking instead of using a cane. By contrast, the patient recovered her sensation after 3 weeks of conservative treatment. This study showed that TKM was effective in that the patient who could not walk initially could walk with reduced pain and had increased muscle strength. Oh et al. [5] reported a case that occurred during anticoagulant therapy. TKM was performed 3 months after surgery, and improvements were observed after 4 months of treatment. The same treatment interventions were used, and pharmacopuncture was also employed in our patient. Both studies are comparable in that the herbal medicine prescription was changed several times to reduce pain, restore energy, and improve abdominal discomfort in patients who mainly lie down after hematoma. Although the comparison is limited because of the different acute/chronic durations, the treatment was effective in a relatively shorter time than the general prognosis.

Treatment was terminated early because the patient had to be discharged because of coronavirus disease 2019; however, compared with the hospitalization period, she showed sufficient improvement from 7 to 2 on the NRS, 65 to 95 points on the ASIA, and 32 to 69 points on the SCIMIII.

To our knowledge, this is the first case of traumatic epidural hematoma following spinal epidural injections, and TKM could be effective in improving nerve recovery, muscle strength, and sensation in patients with epidural hemorrhage based on improvements in NRS, ASIA, and SCIMIII indicators. However, this study has a limitation for reporting only one case; thus, studies on a larger number of patients are warranted to comprehensively examine the effects of acupuncture, electroacupuncture, and herbal medicine treatment. Since the patient started receiving TKM treatment at this hospital 3 weeks after the symptom onset, the disease may have progressive healing naturally. Nevertheless, this study is meaningful because cases treated using TKM, with improvement in subjective and objective symptoms, are rarely reported.

AUTHOR CONTRIBUTIONS

Conceptualization: YYC, HL. Methodology: YYC. Formal investigation: YYC. Data analysis: YYC. Writing – original draft: YYC. Writing – review & editing: All authors.

CONFLICTS OF INTEREST

The authors have no conflicts of interest to declare.

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None.

ETHICAL STATEMENT

This study was exempt from the Cheonan Korean Medicine Hospital of Daejeon University Institutional Review Board (IRB No. DJUMC-2022-BM-09).

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Appendix A.

INTERNATIONAL STANDARDS FOR NEUROLOGICAL CLASSIFICATION OF SPINAL CORD INJURY (ISNCSCI)

ASIA **ISCOS**

Patient Name _____ Date/Time of Exam _____
 Examiner Name _____ Signature _____

RIGHT

UER (Upper Extremity Right)

LER (Lower Extremity Right)

(NAC) Voluntary Anal Contraction (Yes/No)

RIGHT TOTALS (MAXIMUM) (50) (56) (56)

MOTOR SUBSCORES
 UER + UEL = UEMS TOTAL (50)
 LER + LEL = LEMS TOTAL (50)

• Key Sensory Points

LEFT

UEL (Upper Extremity Left)

LEL (Lower Extremity Left)

(NAP) Deep Anal Pressure (Yes/No)

LEFT TOTALS (MAXIMUM) (50) (56) (56)

MOTOR SUBSCORES
 LTR + LTL = LT TOTAL (50)
 PPR + PPL = PP TOTAL (50)

NEUROLOGICAL LEVELS
 1. SENSORY R L
 2. MOTOR R L
 3. NEUROLOGICAL LEVEL OF INJURY (NLI)
 4. COMPLETE OR INCOMPLETE?
 5. ASIA IMPAIRMENT SCALE (AIS)

ASIA Impairment Scale (AIS)

Steps in Classification

Muscle Function Grading

- 0 = total paralysis
- 1 = palpable or visible contraction
- 2 = active movement, full range of motor (ROM) with gravity eliminated
- 3 = active movement, full ROM against gravity
- 4 = active movement, full ROM against gravity and moderate resistance in a muscle specific position
- 5 = (normal) active movement, full ROM against gravity and full resistance in a functional muscle position opposite from an otherwise unimpaired partner
- 5* = (normal) active movement, full ROM against gravity and sufficient resistance to be considered normal if identified inhibiting factors (i.e. pain, disease) were not present
- NT = not testable (i.e. due to immobilization, severe pain such that the patient cannot be graded, amputation of limb, or contracture of > 50% of the normal ROM)

Sensory Grading

- 0 = Absent
- 1 = Altered, either decreased/impaired sensation or hypersensitivity
- 2 = Normal
- NT = Not testable

When to Test Non-Key Muscles:
 In a patient with an apparent AIS B classification, non-key muscle functions more than 3 levels below the motor level on each side should be tested to most accurately classify the injury (differentiate between AIS B and C).

Movement

Movement	Root level
Shoulder: Flexion, extension, abduction, adduction, internal and external rotation	C5
Elbow: Supination	
Elbow: Pronation	C6
Wrist: Flexion	
Finger: Flexion at proximal joint, extension	C7
Thumb: Flexion, extension and abduction in plane of thumb	
Finger: Flexion at MCP joint	C8
Thumb: Opposition, adduction and abduction perpendicular to palm	
Finger: Abduction of the index finger	T1
Hip: Adduction	L2
Hip: External rotation	L3
Hip: Extension, abduction, internal rotation	L4
Knee: Flexion	
Ankle: Inversion and eversion	
Toes: MP and P extension	
Heel and Toe: DP and PP flexion and abduction	L5
Heel: Adduction	S1

A = Complete. No sensory or motor function is preserved in the sacral segments S4-5.

B = Sensory incomplete. Sensory but not motor function is preserved below the neurological level and includes the sacral segments S4-5 (light touch or pin prick at S4-5 or deep anal pressure) AND no motor function is preserved more than three levels below the motor level on either side of the body.

C = Motor incomplete. Motor function is preserved at the most caudal sacral segments for voluntary anal contraction (NAC) OR the patient meets the criteria for sensory incomplete status (sensory function preserved at the most caudal sacral segments (S4-5) by LT, PP or NAP), and has some sparing of motor function more than three levels below the ipsilateral motor level on either side of the body. (This includes key or non-key muscle functions to determine motor incomplete status.) For AIS C – less than half of key muscle functions below the single NLI have a muscle grade > 3.

D = Motor incomplete. Motor incomplete status as defined above, with at least half (half or more) of key muscle functions below the single NLI having a muscle grade > 3.

E = Normal. If sensation and motor function as tested with the ISNCSCI are graded as normal in all segments, and the patient had prior deficits, then the AIS grade is E. Someone without an initial SCI does not receive an AIS grade.

Using ND: To document the sensory, motor and NLI levels, the AIS impairment, Scale grade, and/or the zone of partial preservation (ZPP) when they are unable to be determined based on the examination results.

The following order is recommended for determining the classification of individuals with SCI.

- Determine sensory levels for right and left sides. The sensory level is the most caudal, intact dermatome for both pin prick and light touch sensation.
- Determine motor levels for right and left sides. Defined by the lowest key muscle function that has a grade of at least 3 (on a single testing), providing the key muscle functions represented by segments above that level are judged to be intact (graded as a 5). Note: In regions where there is no myoelectric test, the motor level is presumed to be the same as the sensory level, if testable motor function above that level is also normal.
- Determine the neurological level of injury (NLI). This refers to the most caudal segment of the cord with intact sensation and at least 5 (or more) muscle function strength, provided that there is normal (intact) sensory and motor function caudally respectively. The NLI is the most cephalad of the sensory and motor levels determined in steps 1 and 2.
- Determine whether the injury is Complete or Incomplete. (i.e. absence or presence of sacral sparing) If voluntary anal contraction = No AND all S4-5 sensory scores = 0 AND deep anal pressure = No, then injury is Complete. Otherwise, injury is Incomplete.
- Determine ASIA Impairment Scale (AIS) Grade:
 - Is Injury Complete? If YES, AIS=A and can record ZPP (lowest dermatome or myotome on each side with some preservation)
 - Is Injury Motor Complete? If YES, AIS=B (No-voluntary anal contraction OR motor function more than three levels below the motor level on a given side; if no patient has sensory incomplete classification)

Are at least half (half or more) of the key muscles below the neurological level of injury graded 3 or better?

NO → AIS=C
 YES → AIS=D

If sensation and motor function is normal in all segments, AIS=E
 Note: AIS E is used in follow up testing when an individual with a documented SCI has recovered normal function. If at initial testing no deficits are found, the individual is neurologically intact; the ASIA Impairment Scale does not apply.



Appendix B.

<p>SCIM – Spinal Cord Independence Measure (Version III, 2002-2011)</p>	<p>ADDRESSOGRAPH</p>
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Traumatic SCI NTSCI Level/AIS (if known) _____ Paraplegia Tetraplegia Complete Incomplete

Assessment Date:
Admission (A) _____ Re-Assessment (RA) _____ Discharge (DC) _____

Self Care

	Item Score		
	A	RA	DC
1. Feeding (cutting, opening containers, pouring, bringing food to mouth, holding cup with fluid)			
0. Needs parenteral, gastrostomy or fully assisted oral feeding			
1. Needs partial assistance for eating and/or drinking, or for wearing adaptive devices			
2. Eats independently; needs adaptive devices or assistance only for cutting food and/or pouring and/or opening containers			
3. Eats and drinks independently; does not require assistance or adaptive devices			
2. Bathing (soaping, washing, drying body and head, manipulating water tap)			
A. Upper body			
0. Requires total assistance			
1. Requires partial assistance			
2. Washes independently with adaptive devices or in a specific setting (e.g., bars, chair)			
3. Washes independently; does not require adaptive devices or specific setting (not customary for healthy people) (adss)			
B. Lower Body			
0. Requires total assistance			
1. Requires partial assistance			
2. Washes independently with adaptive devices or in a specific setting (adss)			
3. Washes independently; does not require adaptive devices (adss) or specific setting			
3. Dressing (clothes, shoes, permanent orthoses; dressing, wearing, undressing)			
A. Upper body			
0. Requires total assistance			
1. Requires partial assistance with clothes without buttons, zippers or laces (cwobzl)			
2. Independent with cwobzl; requires adaptive devices and/or specific settings (adss)			
3. Independent with cwobzl; does not require adss; needs assistance or adss only for bzl.			
4. Dresses (any clothes) independently; does not require adaptive devices or specific setting			
B. Lower Body			
0. Requires total assistance			
1. Requires partial assistance with clothes without buttons, zippers or laces (cwobzl)			
2. Independent with (cwobzl); requires adaptive devices and/or specific settings (adss)			
3. Independent with (cwobzl) without adss; needs assistance or adss only for bzl.			
4. Dresses (any clothes) independently; does not require adaptive devices or specific setting			
4. Grooming (washing hands and face, brushing teeth, combing hair, shaving, applying makeup)			
0. Requires total assistance			
1. Requires partial assistance			
2. Grooms independently with adaptive devices			
3. Grooms independently without adaptive devices			

Self Care Subtotal (0-20)			
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Appendix B. Continued

SCIM – Spinal Cord Independence Measure (Version III, 2002-2011)	
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Respiration and Sphincter Management

	Item Score		
	A	RA	DC
5. Respiration			
0. Requires tracheal tube (TT) and permanent or intermittent assisted ventilation (IAV)			
2. Breathes independently with TT; requires oxygen, much assistance in coughing or TT management			
4. Breathes independently with TT; requires little assistance in coughing or TT management			
6. Breathes independently without TT; requires oxygen, much assistance in coughing, a mask (e.g., peep) or IAV (bipap)			
8. Breathes independently without TT; requires little assistance or stimulation for coughing			
10. Breathes independently without assistance or device			
6. Sphincter Management - Bladder			
0. Indwelling catheter			
3. Residual urine volume (RUV) > 100cc; no regular catheterization or assisted intermittent catheterization			
6. RUV < 100cc or intermittent self-catheterization; needs assistance for applying drainage instrument			
9. Intermittent self-catheterization; uses external drainage instrument; does not need assistance for applying			
11. Intermittent self-catheterization; continent between catheterizations; does not use external drainage instrument			
13. RUV < 100cc; needs only external urine drainage; no assistance is required for drainage			
15. RUV < 100cc; continent; does not use external drainage instrument			
7. Sphincter Management - Bowel			
0. Irregular timing or very low frequency (less than once in 3 days) of bowel movements			
5. Regular timing, but requires assistance (e.g., for applying suppository); rare accidents (less than twice a month)			
8. Regular bowel movements, without assistance; rare accidents (less than twice a month)			
10. Regular bowel movements, without assistance; no accidents			
8. Use of Toilet (perineal hygiene, adjustment of clothes before/after, use of napkins or diapers)			
0. Requires total assistance			
1. Requires partial assistance; does not clean self			
2. Requires partial assistance; cleans self independently			
4. Uses toilet independently in all tasks but needs adaptive devices or special setting (e.g., bars)			
5. Uses toilet independently; does not require adaptive devices or special setting			

Respiration and Sphincter Management Subtotal (0-40)			
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Mobility (room and toilet)

	Item Score		
	A	RA	DC
9. Mobility in Bed and Action to Prevent Pressure Sores			
0. Needs assistance in all activities: turning upper body in bed, turning lower body in bed, sitting up in bed, doing push-ups in wheelchair, with or without adaptive devices, but not with electric aids			
2. Performs one of the activities without assistance			
4. Performs two or three of the activities without assistance			
6. Performs all the bed mobility and pressure release activities independently			
10. Transfers: bed-wheelchair (locking wheelchair, lifting footrests, removing and adjusting arm rests, transferring, lifting feet)			
0. Requires total assistance			
1. Needs partial assistance and/or supervision, and/or adaptive devices (e.g., sliding board)			
2. Independent (or does not require wheelchair)			
11. Transfers: wheelchair-toilet-tub (if uses toilet wheelchair: transfers to and from; if uses regular wheelchair: locking wheelchair, lifting footrests, removing and adjusting armrests, transferring, lifting feet)			
0. Requires total assistance			
1. Needs partial assistance and/or supervision, and/or adaptive devices (e.g., grab-bars)			
2. Independent (or does not require wheelchair)			

Appendix B. Continued

SCIM – Spinal Cord Independence Measure (Version III, 2002-2011)	
Mobility (indoors and outdoors, on even surface)	
	Item Score A RA DC
12. Mobility Indoors	
0. Requires total assistance	<input style="width: 30px; height: 15px;" type="text"/>
1. Needs electric wheelchair or partial assistance to operate manual wheelchair	
2. Moves independently in manual wheelchair	
3. Requires supervision while walking (with or without devices)	
4. Walks with a walking frame or crutches (swing)	
5. Walks with crutches or two canes (reciprocal walking)	
6. Walks with one cane	
7. Needs leg orthosis only	
8. Walks without walking aids	
13. Mobility for Moderate Distances (10-100 meters)	
0. Requires total assistance	<input style="width: 30px; height: 15px;" type="text"/>
1. Needs electric wheelchair or partial assistance to operate manual wheelchair	
2. Moves independently in manual wheelchair	
3. Requires supervision while walking (with or without devices)	
4. Walks with a walking frame or crutches (swing)	
5. Walks with crutches or two canes (reciprocal walking)	
6. Walks with one cane	
7. Needs leg orthosis only	
8. Walks without walking aids	
14. Mobility Outdoors (more than 100 meters)	
0. Requires total assistance	<input style="width: 30px; height: 15px;" type="text"/>
1. Needs electric wheelchair or partial assistance to operate manual wheelchair	
2. Moves independently in manual wheelchair	
3. Requires supervision while walking (with or without devices)	
4. Walks with a walking frame or crutches (swing)	
5. Walks with crutches or two canes (reciprocal walking)	
6. Walks with one cane	
7. Needs leg orthosis only	
8. Walks without walking aids	
15. Stair Management	
0. Unable to ascend or descend stairs	<input style="width: 30px; height: 15px;" type="text"/>
1. Ascends and descends at least 3 steps with support or supervision of another person	
2. Ascends and descends at least 3 steps with support of handrail and/or crutch or cane	
3. Ascends and descends at least 3 steps without any support or supervision	
16. Transfers: wheelchair-car (approaching car, locking wheelchair, removing arm and footrests, transferring to and from car, bringing wheelchair into and out of car)	
0. Requires total assistance	<input style="width: 30px; height: 15px;" type="text"/>
1. Needs partial assistance and/or supervision and/or adaptive devices	
2. Transfers independent; does not require adaptive devices (or does not require wheelchair)	
17. Transfers: ground-wheelchair	
0. Requires assistance	<input style="width: 30px; height: 15px;" type="text"/>
1. Transfers independent with or without adaptive devices (or does not require wheelchair)	
Mobility Subtotal (0-40)	
<input style="width: 30px; height: 15px;" type="text"/>	
TOTAL SCIM SCORE (0-100) Admission: _____ Re-Assessment: _____ Discharge: _____	
Clinician Signature: _____	Date: _____