

A Severe Cervical Spondylotic Myelopathy Patient Treated with Integrative Korean Medicine Including Acupuncture, Bee Venom Pharmacopuncture and Herbal Medicine: a case report

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Cervical spondylotic myelopathy (CSM) is common in elderly people and severe CSM patients are recommended to receive surgery. However, in some cases, surgery may fail to improve the patients' symptoms. An 80-year-old man diagnosed with CSM complained of right hemiplegia and right arm and leg pain with the presence of a Foley catheter, despite treatment with laminectomy and laminoplasty. Acupuncture, bee venom pharmacopuncture, and herbal medicine were administered for 129 days. As a result, manual muscle testing (MMT) and the Modified Barthel Index (MBI) improved, the pain in his right arm and leg decreased, and he was able to urinate by himself. This case report implies that integrative Korean medicine (IKM) can be an option for patients suffering from muscular weakness resulting from myelopathy.

Keywords: cervical spondylotic myelopathy, bee venom pharmacopuncture, integrative Korean medicine, a case report

INTRODUCTION

Cervical spondylotic myelopathy (CSM) is a common disease in elderly people [1]. The clinical presentation of CSM includes weakness, stiffness, increased urinary urgency, spasticity in extremities, and gait disturbance [2]. Although it is rare, CSM can cause hemiplegia [3]. If daily life is badly affected by severe symptoms such as severe pain or limitation of movements, surgery is recommended for those patients [2]. However, sometimes surgery does not improve the symptoms of severe stenosis. As a dual medical system involving both Western medicine and Korean medicine, many patients seek Integrative Korean medicine (IKM), which includes acupuncture, pharmacopuncture, herbal medicine, and Chuna manipulation [4]. IKM can be an option for treating CSM patients after surgery but reports of its effectiveness and safety are limited. This case study reports a patient suffering from right hemiplegia and right arm and leg

pain despite treatment with surgery, who showed improvement in his condition after taking IKM, including acupuncture, bee venom pharmacopuncture, and herbal medicine.

1. Consent statement

Written informed consent was obtained from the patient for the use of magnetic resonance imaging (MRI) data and the publication of this study.

CASE REPORT

1. Clinical features

An 80-year-old man visited our hospital with right hemiplegia, right arm and leg pain, and dysuria. His right arm pain began on September 3rd, 2021, and on September 7th, 2021

he developed a slight weakness in his right arm and leg but was able to work. On September 10th, 2021, the weakness in his right arm and leg deteriorated, so he visited a hospital in Seoul. He was admitted to the hospital and a brain, cervical, and lumbar spine MRI; blood tests; and cerebrospinal fluid analysis were performed. After examination, he was diagnosed with severe CSM. He was not able to urinate by himself, so a Foley catheter was inserted on September 11th, 2021. A C-spine MRI showed cervical spine myelopathy in C3-7, right neural foraminal stenosis of C3-4, and C4-5 cord compression due to a bulging disc (Fig. 1). He received C3-4 laminectomy and C4 laminoplasty on September 29th, 2021. On October 5th, 2021, he was discharged, although his condition did not improve. He requested IKM for treating his symptoms, so he visited our hospital and was admitted on the same day. He had a history of hypertension, hearing difficulty, and total knee replacement

surgery for both knees.

2. Treatment

We used 0.3 × 25 mm aseptic and stainless-steel acupuncture needles manufactured by Sejin medical (Seoul, South Korea). Body needles were inserted at a standard angle and depth and manipulated until a de qi sensation was achieved. The chosen acupuncture points for this patient were BL62, SI3, GV20, ST36, LI11, GB39, LI4, and LR3. During the Foley catheter state, CV3 and CV4 were added. The needles penetrated the skin vertically to a depth of 3–8 mm. The patient received acupuncture twice on weekdays, and once on weekends. Each treatment lasted for 20 minutes.

Bee venom pharmacopuncture was applied on weekdays, 6 weeks after laminectomy and laminoplasty. After a skin test for

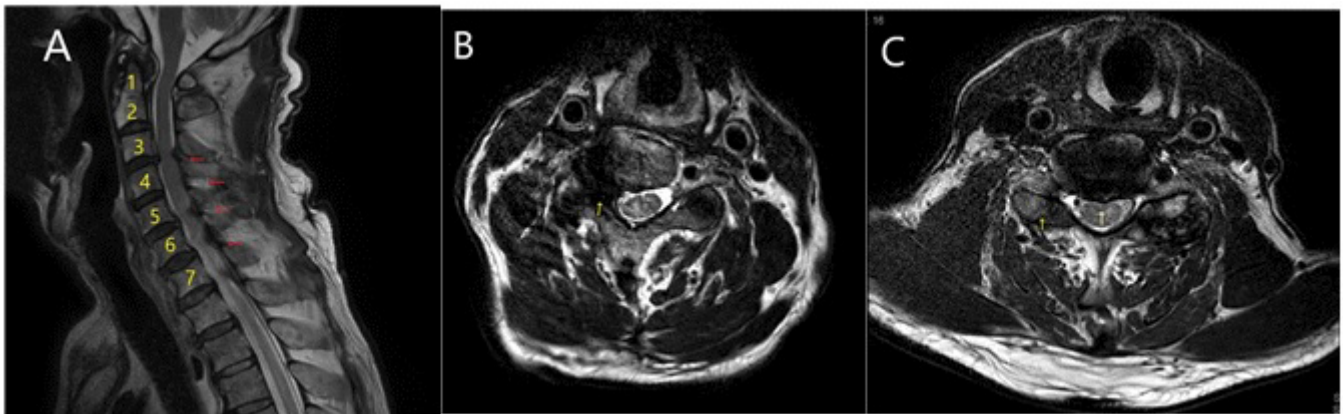


Figure 1. Pre-operative magnetic resonance imaging (MRI) of the patient (A) T2-weighted Dixon sagittal of the spine shows cervical spine myelopathy in C3-7. (B) T2-weighted axial MRI shows right neural foraminal stenosis of C3-4. (C) T2-weighted axial MRI shows C4-5 cord compression due to bulging disc.

Table 1. Change of MMT (manual muscle testing)

	21/10/05	21/10/18	21/11/05	21/12/15	22/01/25	22/02/09
Shoulder	1	1	2-	2	2	2
Elbow	1	2-	2-	2	2	2
Wrist	1	2-	2+	2+	2+	2+
Finger	2	1	3	3+	3+	4
Hip	1	1	2-	3+	3+	4
Knee	1	2-	2	3	3+	4
Ankle	2	2-	2	3	3+	3+
Toe	1	2	3-	3	3+	3+

1: No visible movement, 2-: Moves through partial ROM gravity eliminated, 2: Able to move through full ROM gravity eliminated, 2+: Moves through partial ROM against or moves through complete ROM gravity eliminated and hold against pressure, 3-: Gradual release from test position, 3: Holds test position against gravity, 3+: Holds test position against slight resistance, 4: Holds test position against moderate resistance.

allergic reactions, a single 1 mL dose of 1:30,000 bee venom was administered using a 1 mL disposable syringe (Sungshim medical, Bucheon, South Korea) to the posterior neck regions (EX-B2 at the C3-C7 level, bilaterally).

Based on the patient's condition, different types of herbal medicine were used in each treatment. The patient received 120 mL three times a day after each meal. The most frequently used herbal medicine was Taklisodok-um (托裏消毒飲).

The patient also performed physical therapy once per day, applied a hot pack on his right arm and leg for 20 minutes, and received transcutaneous electrical nerve stimulation on his right arm and leg for 15 minutes.

For controlling pain and helping with digestion, he took medicine such as a Cetamado tablet (Acetaminophen 325 mg + Tramadol Hydrochloride 37.5 mg) and Motilitone tablet (Corydalis tuber and Pharbitis seed 50% Ethanol Extract 30 mg) three times a day after each meal. For treating hypertension, he took a Dichlozid tablet (Hydrochlorothiazide 25 mg) one time after breakfast.

3. Clinical outcomes

During the 129 days of IKM treatment, a Korean medicine doctor evaluated outcomes from manual muscle testing (MMT) of his right arm and leg, the Modified Barthel Index (MBI), and a numeric rating scale (NRS) of the right arm and leg pain. MMT showed that the power of his shoulder and elbow increased from 1 to 2, his wrist joint increased from 1 to 2+, and his finger joint increased from 2 to 4. The power of his hip and knee joint increased from 1 to 4, his ankle joint increased from 2 to 3+, and his toe increased from 1 to 3+ (Table 1). He was in a bed-ridden state when he first arrived at our hospital, but he was able to walk with minimal assistance after treatment. He was not able to move his arm at first, but he was able to

write using his own right hand after treatment. After 105 days of treatment, the Foley catheter was removed, and he was able to urinate by himself. IKM treatment improved his daily living conditions. The MBI increased from 10 to 51 (Fig. 2) and the NRS of his right arm and leg pain decreased from 7 to 4 (Fig. 3).

No severe adverse effects were observed during the treatment. Results from the liver function test and renal function test revealed that taking herbal medicine did not have any significant effects on his liver and renal function (Table 2). The whole timeline of this case is summarized in Fig. 4.

4. Patient perspective

2021-10-05

The patient said, "I am not able to move my right arm and leg, and I feel distressed due to my right wrist and ankle pain, so I cannot sleep." He used a diaper to defecate and a Foley catheter to urinate. His daughter-in-law said, "Suddenly, he said that he has no strength in his right arm, and we went to one of the largest hospitals in Seoul and he had a series of tests. We were told that his condition may not get better even though his

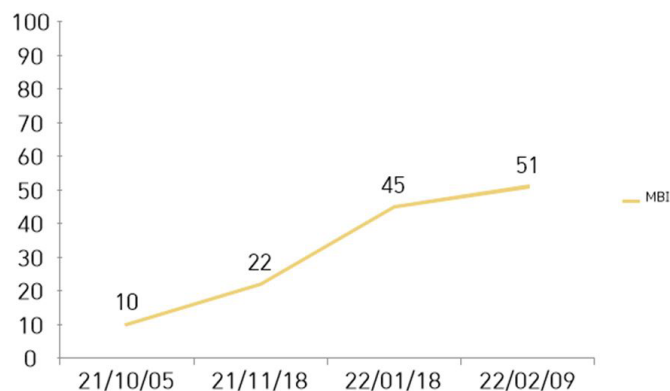


Figure 2. Change of MBI. MBI, the modified barthel index.

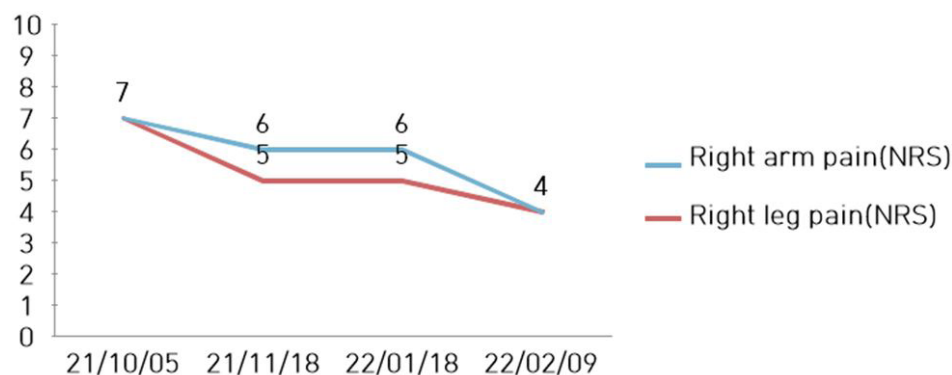


Figure 3. Change of NRS of right arm and leg pain. NRS, numeric rating scale.

Table 2. Change of liver function test and renal function test

	21/10/05	21/10/19	21/11/11	21/11/26	21/12/15	22/01/20	22/02/10	Normal range
BUN	24.5	9.5	8.1	11.5	9.8	14	10.1	8-20 mg/dL
CRE	0.73	0.69	0.61	0.58	0.59	0.69	0.51	0.7-1.3 mg/dL
AST	14	15	24	18	17	15	15	8-38 U/L
ALT	27	13	23	21	16	8	10	4-44 U/L

BUN, blood urea nitrogen; CRE, creatinine; AST, aspartate aminotransferase; ALT, alanine aminotransferase.

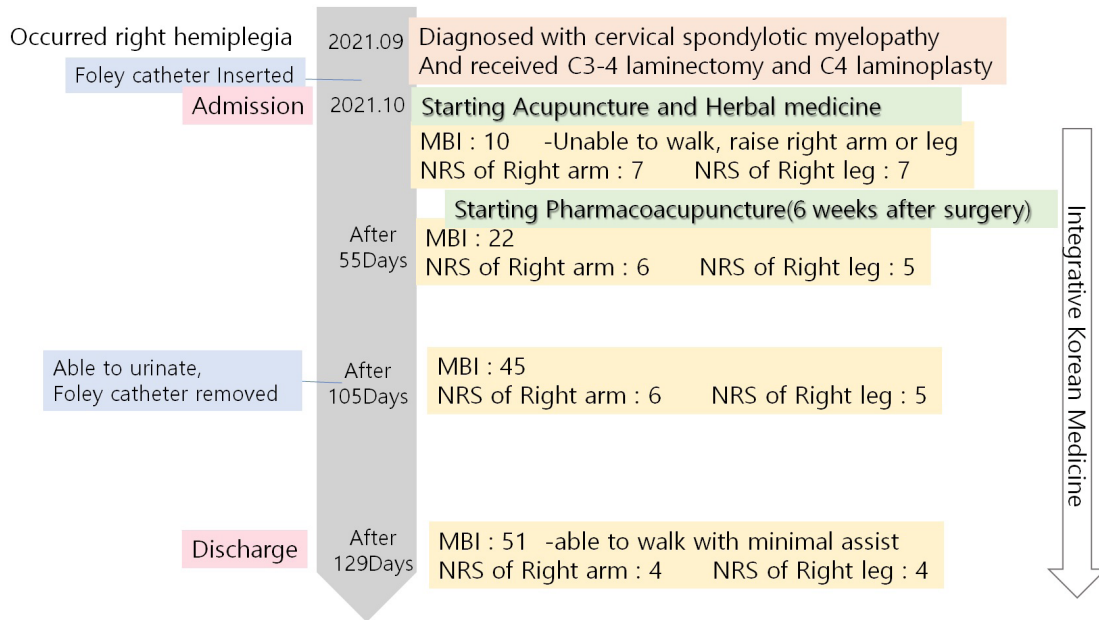


Figure 4. Timeline of treatment.

surgery went well. We were upset that he may spend the rest of his life in bed.”

2021-10-08

The patient said, “I can move my right finger from this morning but it’s not enough to use my hand to have a meal.” The caregiver said, “He has to use a diaper and keep the Foley catheter.”

2021-10-18

The patient said, “I can move my right ankle but cannot raise my right leg. I feel pain in my right arm and leg. But I can sleep and do not feel pain during the night.”

2021-10-27

The patient said, “I was told that I have a fever, but I do not feel any discomfort. I can raise my right leg when I lie down. But I cannot raise my right arm, so I still have to use my left

arm to have a meal.”

2021-11-11

The patient said, “I can move my right toes, but I feel heavy when I move my toes. My right leg hurts me, especially laterally.”

2021-11-17

The patient said, “I can move my right lower arm like this (horizontally) but cannot vertically. My right arm still hurts.”

2021-12-01

The patient said, “I can stand up with both hands on a holder. But I cannot stand on my own. The caregiver must grip my pants, then, I can stand. My right wrist still hurts me.”

2022-01-18

The patient said, “I can write my name with my right hand,

but I cannot use my chopstick to have a meal.” He used a urine case to urinate. He wanted to go to a toilet but was banned due to the risk of falling.

2022-02-10

The patient said, “I am very happy to be discharged. I am able to walk with my caregiver’s help. I was not able to grip anything with my right hand, but now I can grip a cane or walker, so I can walk, even though I still have trouble raising my right arm. Although my right arm and leg pain does not hurt me as much as before, I sometimes feel numbness and pain in my right thigh.”

DISCUSSION

CSM is the main cause of spinal cord dysfunction, causing disability in elderly people [1]. CSM causes neck stiffness, arm and shoulder pain, clumsiness, or weakness in the hands and legs [1]. The clinical presentation and natural history can vary from stepwise decline to rapid neurological deterioration [2]. Spinal cord compression with aging and spinal cord ischemia may play an important role in developing CSM [1], but the exact mechanism causing CSM is unknown [2]. Whether conservative treatment rather than surgical treatment is a better choice remains controversial; however, surgery is recommended for moderate to severe CSM patients [2]. The surgical approaches include anterior versus posterior or combined depending on the location and severity of the spinal cord compression, sagittal alignment, and patient comorbidities [2].

It is crucial to exclude other diagnoses such as multiple sclerosis, amyotrophic lateral sclerosis (ALS), tumors, spinal cord infarction, etc when a patient is suspected of having CSM [1].

In our case, the patient had been hospitalized for about 30 days before visiting our hospital. During hospitalization, he underwent a series of imaging tests, including a brain, cervical, and lumbar spine MRI; cerebrospinal fluid analysis; and blood tests. The brain MRI data did not explain his clinical symptoms and the C-spine MRI showed severe myelopathy in C3-7. Anti-neutrophil cytoplasmic antibody (ANCA) and fluorescent anti-nuclear antibody (FANA) were negative. Deep tendon reflexes were absent at the right arm and knee and decreased at the left arm and leg. Both his arms and legs showed muscle atrophy. Finally, the neurology and neurosurgery medical team diagnosed him with severe CSM.

He had no choice but to undergo surgery, as it is recom-

mended for severe myelopathy patients, even if there is a risk of getting worse [2].

IKM, including acupuncture, bee venom pharmacopuncture, and herbal medicine, was applied to this CSM patient. Although the exact mechanism by which IKM treats CSM is unclear, previous studies may help to determine how each treatment can help relieve symptoms and improve neurological function in CSM patients. A systematic review showed that acupuncture was useful for pain control and was effective for functional recovery and bladder dysfunction in spinal cord injury [5]. Furthermore, compared with decompression surgery alone, acupuncture combined with decompression was proven to be more effective in treating spinal cord injury [6]. An experimental study showed that bee venom pharmacopuncture can reduce neuroinflammation and induce recovery in spinal cord injury compression by reducing interleukin-6 and increasing interleukin-10 [7].

Recent studies have shown that acupuncture can help increase bladder function by improving the expression of nerve growth factors and promoting the recovery of damaged nerves [8]. CV3 and CV4 were chosen for treating urinary disability, as it is known that CV3 is the Mu point (募穴) of the bladder meridian and CV4 is a proven key point for treating urinary problems [9].

The herbal medicine mostly used in this study was Taklisodok-um. Experimental studies showed that Taklisodok-um has antioxidant and anti-inflammatory effects by inhibiting NF- κ B activity [10]. It is composed of *Lonicerae Flos*, *Citri Pericarpium*, *Trichosanthis Radix*, *Astragalus membranaceus*, *Platycodi Radix*, *Angelica sinensis*, *Saposhnikovia Radix*, *Angelicae Dahuricae Radix*, *Gleditsiae Semen*, *Cnidii Rhizoma*, *Toosendan Fructus*, and *Magnoliae Cortex*. *Astragalus membranaceus* has a neuroprotective effect on spinal cord injury by decreasing the aquaporin-4 expression [11]. *Lonicerae Flos* has anti-inflammatory, anti-oxidative, and neuroprotective effects [12]. *Citri Pericarpium* may be effective for protecting the nucleus pulposus cells against apoptosis [13]. *Trichosanthis Radix* has anti-oxidative effects [14], while *Platycodi Radix* and *Saposhnikovia Radix* have anti-inflammatory effects [15, 16]. *Angelicae Dahuricae Radix* inhibits the expression of inducible nitric oxide (NO) synthase and NO production, resulting in anti-inflammatory effects [17]. *Angelica sinensis* has anti-inflammatory effects by down-regulation of COX-1, which is constitutively expressed in spinal cord injury [18]. In other words, Taklisodok-um can be effective in improving muscular

weakness caused by myelopathy as it is a combination of herbal medicines which have anti-inflammatory and neuroprotective effects.

In this study, an 80-year-old man with myelopathy who was not able to walk and urinate himself showed that he was able to walk with minimal assistance and urinate himself after receiving IKM for 129 days. However, this case is rare since hemiplegia is a rare clinical presentation of CSM [3] and there are no reports that show the efficacy of IKM in treating severe CSM patients who have symptoms even after surgery. Additionally, as acupuncture, bee venom pharmacopuncture, herbal medicine, western medicine, and physical treatment were administered simultaneously, the effect of each therapy remains unclear. Also, there was no follow-up study of the condition of the patient after discharge. Nonetheless, this case shows that IKM can be an option for patients suffering from severe CSM even after receiving surgery. Furthermore, it is necessary to study the effects of acupuncture, bee venom pharmacopuncture, and herbal medicine on CSM in better-designed and controlled studies in the future.

CONCLUSION

An 80-year-old man diagnosed with severe CSM complained of persisting right hemiplegia, right arm and leg pain, and difficulty urinating by himself, despite receiving a laminectomy and laminoplasty. The combined treatment of acupuncture, bee venom pharmacopuncture, and herbal medicine was administered for 129 days, and the patient was able to walk with minimal assistance and urinate by himself. However, since this study is a single case report, it is necessary that further studies on the effects of related interventions should be implemented in the future.

CONFLICT OF INTEREST

The authors declare that there are no conflicts of interest.

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