



## Case Report

# Combined Korean Medicine Treatment of a Rare Case of Burst Fracture in an Elderly Patient with Kissing Spine



Eun-Young Park<sup>1,\*</sup>, Jong-Ho Choi<sup>1</sup>, Hoo-In Jo<sup>1</sup>, Soo-Kyung Lee<sup>1</sup>, June-Haeng Lee<sup>1</sup>, Sun-Woo Kang<sup>1</sup>, Yoon-Jae Won<sup>1</sup>, Sung-Ryul Choi<sup>2</sup>, Yu-Jin Cho<sup>3</sup>

<sup>1</sup> Department of Acupuncture and Moxibustion, Jaseng Hospital of Korean Medicine, Seoul, Korea

<sup>2</sup> Department of Oriental Neuropsychiatry, Jaseng Hospital of Korean Medicine, Seoul, Korea

<sup>3</sup> Department of Oriental Obstetrics and Gynecology, Jaseng Hospital of Korean Medicine, Seoul, Korea

## ABSTRACT

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A burst fracture refers to the fracture of the anterior and middle vertebral columns which are moving into the spinal canal causing neurological impairments, generally requiring surgical treatment. We herein report a rare case of burst fracture with kissing spine in a 90-year-old man who had severe lower back pain that worsened during back extension. Considering the surgical treatment risk, he was hospitalized at a Korean medicine hospital for 85 days and underwent combined Korean medicine treatments including pharmacopuncture, herbal medicine, chuna, deep-fascia meridian therapy, walking practice, and abdominal breathing. Based on patient-reported scales, his pain was alleviated, and his physical function improved. Furthermore, his range of motion and walking time increased. This case report suggests that combined Korean medicine treatments could be an effective alternative for patients with burst fracture who have surgery risks.

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## Introduction

Other than a typical form of compression fracture that involves damage of the anterior vertebral column [1,2], a burst fracture is a fracture of the posterolateral part of the vertebral body caused by the damage of anterior and middle vertebral columns moving into the spinal canal, causing neurological impairments [3].

Kissing spine is a joint malformation caused by close contact between adjacent spinous processes, leading to increased back pain during extension [4]. Kissing spine syndrome can be caused by stenosis, resulting in lumbar spine instability, and could be related to fractures in the vertebral body [4,5].

Compression fractures are treated surgically or nonsurgically (such as acupuncture and herbal medicines) [1]. In an unstable burst fracture, surgical treatment can be detrimental to the patient however, treatments with Korean medicine for this condition

are rarely studied [6]. In particular, the use of Korean medicine treatment in patients with concomitant burst fracture and kissing spine is unreported.

This case report presents a patient who was diagnosed with burst fracture with kissing spine who was at high risk for surgical treatment and was treated with Korean medicine for approximately 3 months.

## Case Report

### Medical history

A 90-year-old male was admitted to a Korean medicine hospital, with pelvic pain, severe lower back pain (LBP) and leg weakness which began in April 2019. He had an X-ray at a local anesthesia-pain medicine clinic and was diagnosed with “vertebral fracture”

\*Corresponding author. Eun-Young Park  
Jaseng Hospital of Korean Medicine, 536 Gangnam-daero, Gangnam-gu, Seoul 06110, Korea  
E-mail: [pey330@snu.ac.kr](mailto:pey330@snu.ac.kr)

ORCID: Eun-Young Park <https://orcid.org/0000-0001-9280-3238>, Jong-Ho Choi <https://orcid.org/000-0003-1046-5541>, Hoo-In Jo <https://orcid.org/0000-0001-5459-6549>, Soo-Kyung Lee <https://orcid.org/0000-0003-1319-1494>, June-Haeng Lee <https://orcid.org/0000-0002-0262-8112>, Sun-Woo Kang <https://orcid.org/000-0003-4844-6696>, Yoon-Jae Won <https://orcid.org/0000-0002-7141-7597>, Sung-Ryul Choi <https://orcid.org/0000-0003-2370-4329>, Yu-Jin Cho <https://orcid.org/0000-0002-0029-2651>

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but advised that surgery was risky because of his age and physical therapy was pursued. However, the pain persisted, making daily life difficult. On June 18<sup>th</sup>, 2019, the patient visited Jaseng Hospital of Korean Medicine and was hospitalized the next day.

### Radiography and magnetic resonance imaging results

On April 23<sup>rd</sup>, 2019, the patient underwent an L-SPINE X-ray, which showed compression deformity at L4 body, sclerotic change at L3/4 spinous process, and disc space narrowing at L1/2/3/4/5 (Fig. 1). On June 18<sup>th</sup>, 2019, he underwent L-SPINE magnetic resonance imaging, which showed an L3 body compression



Fig. 1. Lumbar spine X-ray (April 23<sup>rd</sup>, 2019). The image shows compression deformity at L4 body and sclerotic change at L3/4 spinous process (arrow), with disc space narrowing at L1/2/3/4/5.



Fig. 2. Magnetic resonance imaging (June 18<sup>th</sup>, 2019). L3 body compression fracture, L4 body burst fracture [arrow (A, B)] with kissing spine at L3/4 [arrow (C)], and severe central canal stenosis.

fracture, an L4 body burst fracture (suggestive of recent benign fracture with kissing spine at L3/4), and severe central canal stenosis at L3/4/5 (Fig. 2).

### Treatment methods

#### Acupuncture/pharmacopuncture therapy

Standardized (0.25 × 40 mm) sterilized stainless steel disposable needles were used for the acupuncture and pharmacopuncture treatment. These needles inserted at the tender points of the iliopsoas muscle, at GB30, BL54, GB29, and BL40 to reduce tension in the femoral and gluteal parts. Furthermore, electroacupuncture at 1 Hz was performed twice daily for 15 minutes at BL24 and BL25 where the patient felt pain and indicated the fracture sites.

The patient also received Shinbaro 2 pharmacopuncture injections totaling 4 mL per day, using insulin syringes (1 mL) with a disposable needle [29 gauge × 13 mm (1/2 inches)] inserted at 1 cm depth which were performed twice a day with 0.5-1 mL dose per acupoint through both facet joints between the 3<sup>rd</sup>, 4<sup>th</sup>, and 5<sup>th</sup> lumbar discs (EX-B2; Table 1).

#### Herbal medicine administration

Shinbaro herbal medicines Chungpa-jeon and Chungwoonbaro-hwan were prescribed 3 times per day (Table 2) [7].

#### Chuna therapy

Chuna therapy was provided once a day. He underwent myofascial release and muscle energy technique in the lumbar, pelvis, and pubis area, with hip joint articulation.

#### Rehabilitation therapy

To activate the abdominal muscle, the patient executed abdominal breaths for 5 minutes per hour for 12 hours. He also undertook walking exercises using a wheeled walker fitted with an abdominal band. In addition, deep-fascia meridian therapy was performed using a steam pack of herbal medicine. This herbal medicine fumigation therapy delivered the effects of herbal medicine to the core, through the meridian, enabling functional control of the viscera, which allowed the simultaneous benefits of both the medicine and steaming. The therapy lasted for 30 minutes and was performed once a day at the abdomen and right hip in lateral position (Table 3).

### Assessment

#### Patient-reported scales

The patient's overall subjective degree of pain was determined using the numeric rating scale (NRS) [8]. In assessing his functional

Table 1. Pharmacopuncture Administered to the Patient.

Pharmacopuncture prescription	Herbal medicine components (g/mL)	Administered	Daily dose
SJ3-SBO Shinbaro 2	Paeonia lactiflora (0.0027) Ostericum koraenum (Max) Kitagaw (0.0013) Aralia continentalis (0.0013) Cortex Eucommiae (0.0013) Achyranthis Radix (0.0013) Rhizoma Cibotii (0.0013) Radix Ledebouriellae (0.0013) Acanthopanax Cortex (0.0013) Scolopendra subspinipes mutilans (0.0013)	Day 1 to Day 85	2 vials (2 mL/vial)

Table 2. Herbal Medicine Prescriptions Administered to the Patient.

Herbal prescription	Herbal medicine components (g/pouch)	Administered	Daily dose
JG120H Chungpa-jeon	Acanthopanax Cortex 5.000 Eucommiae Cortex 5.000 Ledebouriellae Radix 5.000 Achyranthis Radix 5.000 Cibotii Rhizoma 5.000 Atractylodis Rhizoma 2.500 Amomi Semen 2.500 Geranium thunbergii 2.500 Zingiberis Rhizoma 1.250 Ledebouriellae Radix 0.250 Glycyrrhiza uralensis 1.667 Lasiosphaera Seu Calvatia 7.500	Day 1 to Day 85	3 pouches
JHHF101 Chungwoonbaro-hwan	Cibotii Rhizoma 0.341 Eucommiae Cortex 0.341 Achyranthis Radix 0.182 Ledebouriellae Radix 0.182 Acanthopanax Cortex 0.182 Atractylodis Rhizoma 0.091 Bubalus bubalis L. 0.091 Chungwoogbaro powdered extract 1.500	Day 1 to Day 85	3 pouches

Table 3. Herbal Medicine Prescriptions for Deep-fascia Meridian Therapy Administered to the Patient.

Prescription	Herbal medicine components (g/pack)	Administered	Area
Deep fascia meridian therapy	Rhei Rhizoma 50 Asiasari Radix 50 Angelica dahurica 50 Salviae miltiorrhizae Radix 50 Ledebouriellae Radix 40 Carthami Flos 30 Paeoniae Radix Rubra 30 Angelica gigas 25 Aconiti Lateralis Preparata Radix 20 Saussureae Radix 15	5 ×/wk, during 12 mo hospitalization	abdomen, right hip

disability, the Oswestry disability index (ODI) was used [9].

#### Range of motion and special provocative tests

The movement of a specific joint or body part can be measured by range of motion (ROM). In this case, patient's movement of flexion, extension, lateral bending, and rotation of the lumbar part was assessed [10].

To confirm a hip or lumbar problem, special provocative tests such as straight leg raise test and Patrick's test were performed [11].

#### Walking time

The patient's walking time without pain was measured with the aid of a walker. Each evaluation was performed 5 times (admission, 2 weeks, 1 month, 2 months, and discharge).

#### Ethics statement

The patient's personal information and medical records were obtained from the Institutional Review Board of Jaseng Korean medical hospital (IRB file no.: 2020-09-010).

#### Progress note

On the day of admission, the patient had severe LBP, pelvic

pain, and leg weakness which resulted in a slight difficulty in walking. The patient's LBP worsened when he straightened his back. At night, he could hardly sleep because of this pain. His NRS score was 6, and his ODI score was 74 (Figs. 3 and 4). The special provocative tests could not be performed on the day of admission.

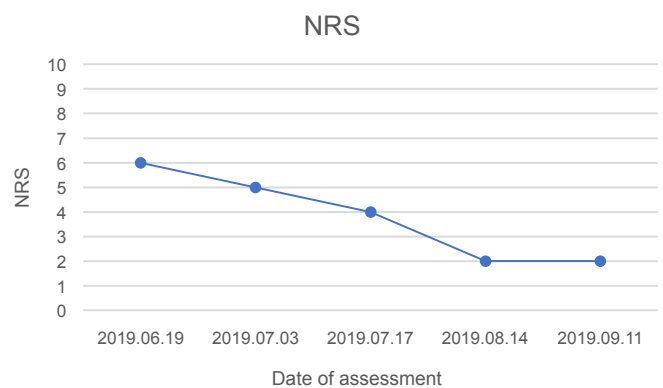


Fig. 3. Changes in the NRS score of lower back pain over time. NRS, numeric rating scale.

After 15 days of hospitalization, the overall pain started to reduce (NRS 5), and the patient could walk with the aid of a walker for 5 minutes, although he experienced leg weakness during walking (Fig. 5). The special provocative tests could not be performed on Day 15. After 1 month of hospitalization, the patient's overall physical function and walking time increased to 10 minutes (ODI 70). The special provocative tests and ROM tests could be carried out (Table 4). The patient experienced a considerably reduced level of nocturnal pain. After 2 months, the level of pain reduced further (NRS 2). On the day of discharge, the patient reported minimal pain and better overall physical function (NRS 2, ODI 60). When performing routine activities, he felt less pain and could already walk for more than 25 minutes. In addition, the ROM and special provocative tests specifically straight leg raise tests, showed improvement.

**Discussion**

Generally, treatments for burst fractures are determined by fracture stability, and surgical treatments are usually recommended [12]. Various case reports of Korean medicine treatment for compression fractures and spinal cord injury have been reviewed [1]. Reportedly, adhesion of fractures can be accelerated by herbal

medicine prescription [13].

There has been a case study of Korean medicine treatment for a burst fracture in a patient with diabetes [14], and another case of needle-embedding treatment for a patient with a burst fracture [15]. However, case studies on the combined Korean medicine treatment for patients with a burst fracture, especially with symptoms of kissing spine, are currently lacking. Moreover, most studies of burst fractures have shown a decrease in pain but have not shown increased movement or motion range.

In this case study the patient underwent acupuncture to relieve tension in the gluteal, abdominal, and hamstring muscles, and electroacupuncture on the lumbar region. To achieve anti-inflammatory and cartilage-protective effects, Shinbaro 2 pharmacopuncture was performed at EX-B2. Shinbaro 2 inhibits prostaglandin E2 in the presence of anti-collagen 2 antibodies to reduce inflammation and also controls inflammatory substances such as inducible nitric oxide synthase and cyclooxygenase-2 [16]. Moreover, Shinbaro herbal medicine has been used for its antinociception, and osteoblast growth effects [17]. Chuna therapy was performed to relieve hamstring and gluteal muscle tension, and to treat pelvic and pubic malposition. In addition, abdominal breathing was used to aid stabilization in the lumbar vertebra by increasing the abdominal pressure to create tension in the core

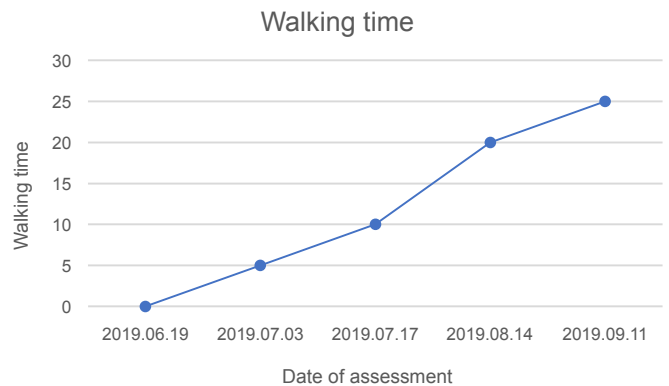
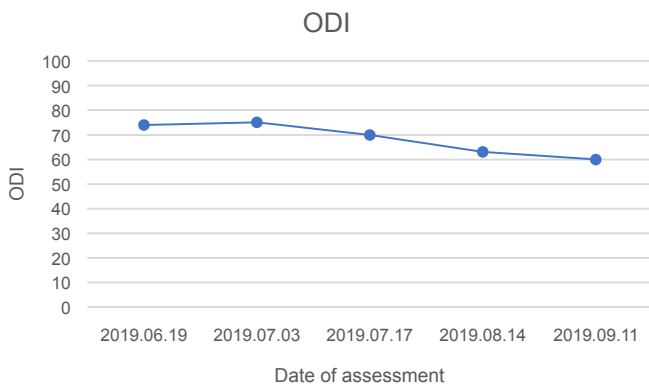


Fig. 4. Changes in the ODI score over time. ODI, Oswestry disability index.

Fig. 5. Changes of walking times over time.

Table 4. Changes in Range of Motion and Special Provocative Tests.

	ROM						Special Tests			
	Flexion	Extension	Lat. Rt.	Lat. Lt.	Rot. Rt.	Rot. Lt.	SLR Rt.	SLR Lt.	Patrick Rt.	Patrick Lt.
Day 1	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC
Day 15	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC
Day 29	10	0	3	3	10	10	10	10	+	+
Day 57	50	5	8	8	15	15	40	50	+	+
Day 85	60	5	10	10	20	20	65	65	+	+

ROM, range of motion; Lat, lateral; Rot, rotation; Rt, right; Lt, left; SLR, straight leg raising; UC, unclear.

muscles [18]. Furthermore, the patient underwent deep-fascia meridian therapy to relieve tension and LBP. Additionally, walking therapy rehabilitation was performed, and the patients walking time gradually (considering the reduced level of pain and muscle strength) increased.

Given the age of this patient, he presented as extremely high risk for surgery; thus, he opted for combined Korean medicine treatments. A radiological image showed his recent burst fracture with kissing spine (Fig. 2). After 85 days of hospitalization, the NRS score decreased from 6 to 2, the ODI decreased from 74 to 60, and lumbar extension increased from 0 to 5. In addition, his walking time increased from 0 minutes to 25 minutes, and his overall physical function had improved.

This study had some limitations. Firstly, it was a study of 1 case of burst fracture with kissing spine treated with combined Korean medicine. Secondly, it was impossible to assume that the outcome of this study was due to the treatment effect because there was not a control group. Thirdly, this study cannot confirm the effect of a single Korean medicine intervention. However, this case report is meaningful because it is the first study to report combined Korean medicine treatments (passive and active) for burst fractures with kissing spine. Considering that kissing spine can cause instability, structural instability may be related to fracture occurrence in this patient [5].

Burst fracture cases should be reviewed. Moreover, randomized controlled trials (with a control group, surgical, and nonsurgical treatment groups) are needed to confirm the effectiveness of both independent and combined Korean medicine treatments for burst fractures.

## Conclusion

In conclusion, the patient's overall level of pain and physical functions improved with combined Korean medicine treatments suggesting that this could be an effective, alternative treatment for patients with a burst fracture who are deemed at risk for surgery.

## Conflicts of Interest

The authors have no conflicts of interest to declare.

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