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CASE REPORT
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Intractable Pain Management by Combined Korean Medicine Treatment Including Acupotomy in Lumbar Disc Herniation: A Case Report

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한방복합치료로 난치성 통증을 동반한 요추 추간판탈출증이 호전된 증례보고

최현규 · 이영록 · 차현지 · 성기정 · 김범석 · 김민주 · 이예지 · 전주현 · 김영일

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A 57-year-old female diagnosed with L5-S1 lumbar intervertebral disc herniation, suffering from severe pain despite taking tapentadol received combined Korean medicine treatment, including acupotomy, acupuncture, pharmacopuncture, and herbal therapies for 53 days. To assess pain, Numeric Rating Scale (NRS) and lumbar range of motion (ROM) were checked daily from the day of admission. Moreover, the Oswestry Disability Index (ODI) and European Quality of Life-5 Dimensions (EQ-5D) were used to evaluate function and quality of life. After combined Korean medicine treatment, reabsorptioin of intervertebral disc was confirmed by radiological examination; pain reduced from NRS 5~7 to NRS 1~2; lumbar ROM in extention increased from 20° to 30°; and function and quality of life improved. The results suggest the possibility that a combined Korean medical treatment, including acupotomy, can be used as an alternative to opioids for pain management of lumbar vertebral disc herniation.

Key words : opioid, lumbar intervertebral disc herniation, acupotomy, combined Korean medicine treatment

Introduction

Lumbar disc herniation (LDH) is a degenerative disease, in which the nucleus pulposus in the intervertebral disc of the lumbar spine is displaced because of the damage to the annulus fibrosus[1]. The first radiographic sign is disc space stenosis due to intervertebral disc degeneration, and MRI shows that the disc is displaced out of the vertebral space. Typical clinical features include sudden-onset back pain, radiating pain in the lower extremities, or paresthesia in the lower extremities, but back pain could not appear[2].

LDH treatment is divided into surgical and conservative treatment[3]. For drug treatment, which is one of the conservative treatments, nonsteroidal anti-inflammatory drugs

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are effective for chronic low back pain as first-line drugs[4], and if they are not effective, opioids are used, which are reported to be effective for nociceptive or neuropathic pain[5]. However, the long-term use of opioids can cause various problems with side effects, including tolerance, withdrawal, addiction, and hyperalgesia[6]. A report revealed that abuse occurs in about 21%~29% of patients taking opioids for chronic pain relief and that 8%~12% of the cases develop into an addiction disorder[7].

Lately, in the United States, acupuncture has been recommended as an alternative to acute and chronic pain treatment to avoid opioid abuse[8,9]. As a conservative treatment for LDH, the effects of acupuncture, acupotomy, pharmacopuncture, and herbal medicine have been widely reported[10-12], while the effect of using combined Korean medical treatment in patients with LDH taking opioids because of failure of pain control using conventional analgesic drugs has not been reported. Thus, to the best of our belief, this is the first case report that presents this case with a patient who was taking opioids; had low back pain, lower limb pain, and standing and walking restrictions due to LDH; and showed significant improvement after acupotomy and combined Korean medicine therapy.

This study was exempt from Korean Medicine Hospital of Daejeon University IRB deliberation (IRB No.: DJDSKH-21-E-18-1).

Case

1. History taking

The participant was 57 year old female, whose principal complaints were low back pain, left lower limb pain, and restriction of standing and walking, which occurred for the first time in 2016, with no specific cause. In 2016, the patient first presented with the symptoms and was treated by an orthopedic surgeon with injection. Since 2018, the pain has repeatedly occurred, and the patient received periodic injections and treatment every 8 months at the local hospital until 2021. On February 9, 2021, the pain suddenly worsened. Lumbar spine MRI showed an L5-S1 disc herniation, and afterward, she underwent nerve block twice while receiving inpatient treatment. Tapentadol hydrochloride (HCl)-based opioids were prescribed because of the extreme pain, and the patient was hospitalized at the Korean Medicine Hospital on March 24, 2021 (Table 1).

2. Physical examination

The physical examination revealed the following (Right side/Left side):

SLR test 80°/40° (+)
Milgram test 5 seconds
Flexion 50° (+)
Lateral bending 35°/35°
Rotation 45°/45°

3. MRI findings

Lumbar spine MRI (2021.02.09): L5-S1 Extrusion (Fig. 1)

4. Rule out

The patient complained of the pain not only of low back area but lower limb area as well. And the lower limb pain increased through leg raising motion at supine position. The radiating pain ran through left gluteal region and posterior, lateral lower limb, and reached to left foot region. By the result of physical examination and MRI finding we concluded

Table 1. Case report timeline

	2016.05	2018.03	2021.02	2021.03
Clinical findings	- Sudden outbreak of the pain of lower back and Rt. lower limb region	- Recurrence of the pain - Progressive clinical deterioration	- L5-S1 HNP Dx. (MRI findings)	- Hospitalization
Treatment	- Orthopedic surgeon with injection	- Orthopedic injections and treatment every 8 months	- Spinal nerve block injection and Tapentadol HCL	- Tapentadol HCL (First 4 days) and Combined Korean medicine treatment

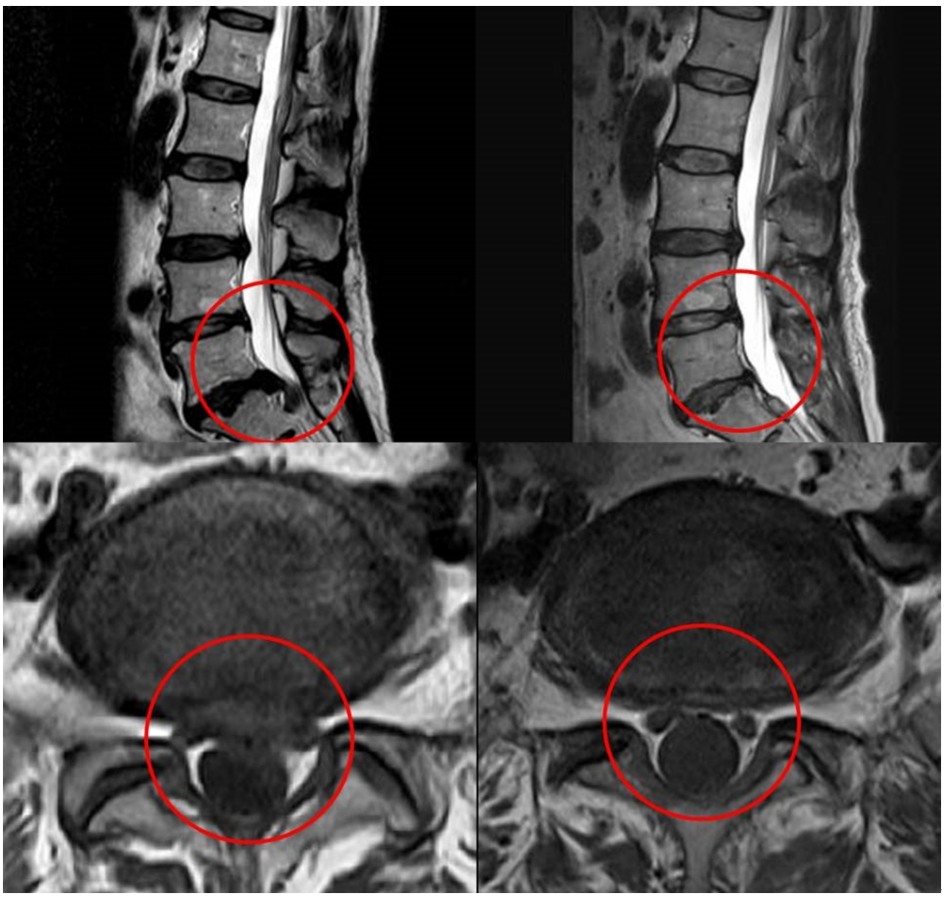

Fig. 1. L-spine MRI (Lt. - 2021.02.09, Rt. - 2021.06.17, Upper - Sagittal view, Lower - Transverse view).

the patient's diagnosis as LDH.

5. Treatment methods

1) Acupotomy: Acupotomy was performed by an acupuncture specialist with >5 years of experience in acupotomy treatment. Before the treatment, the patient was informed about the effects and side effects of acupotomy and provided a consent form. During 53 days of hospitalization, from March 24, 2021, to May 15, 2021, she underwent 5 sessions of acupotomy per week, which is 39 sessions in total. The performer wore disposable surgical gloves and mask, and disinfected the treatment area of the patient with alcohol swabs and povidone stick swabs. Disposable acupotomy needle was used to the acupoints, including BL21, BL22, BL23, BL24, BL25, and BL26 (Fig. 2). During the treatment, needle was slid in and out, and then taken out without retention.

2) Acupuncture: Acupuncture was performed twice a day using disposable sterilized needles (DONGBANG Medical Co., Ltd., Boryeong, Korea, 0.20 × 30 mm). The needle retention time was 15 minutes per session. The acupoints used were located in the lumbar vertebral area (BL21, BL22, BL23, BL24, BL25, and BL26) and the distal area (SI3, BL62, TE3, GB39, GB34, BL40, ST36, and BL60)[10].

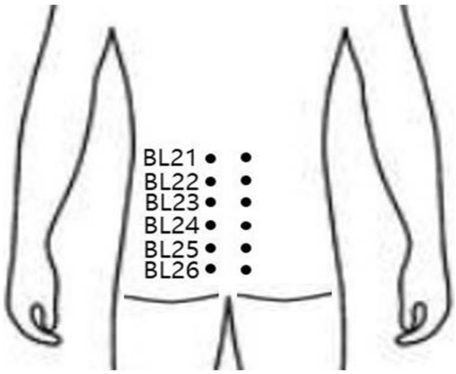

Fig. 2. Acupotomy points.

3) Pharmacopuncture: Pharmacopuncture was performed daily. Bee venom pharmacopuncture (BVP, Korean Pharma-

copuncture Research Institute) was performed five times a week and Soyeom pharmacopuncture (SYP) twice a week. BVP is formulated with purified 99.9% pure melittin 0.10 mg/ml. The patient was informed about precautions and side effects. Afterward, we obtained informed consent and confirmed no adverse reactions through a skin reaction test. The formula was subcutaneously injected into the acupoints on both sides of the lumbar area (BL22, BL23, BL24, BL25, and BL26), 0.1 mL per point, 1 mL in total, using a 13-mm 30 G needle[10].

4) Herbal medicine: For the first 6 days of hospitalization, the patient took Modified-Hwallaktang1, and for the next 28 days, she took Modified-Hwallaktang2 with the modified drug composition. On the 34th day of admission, Modified-Mangeumtang was prescribed. She took the medicine three times a day, 30 minutes after meals. Table 2 presents the composition and daily dose of the above prescription.

6. Clinical outcome

During hospitalization, lumbar ROM and Numerical Rating Scale (NRS)[13] were evaluated every day. Additionally, on the day of admission, after 14, 28, and 42 days from the day of admission, and on the discharge day, the patient completed the Oswestry Disability Index (ODI)[14] and the 5-level European Quality of Life-5 Dimensions (EQ-5D) questionnaire[15] to be conducted into evaluation and comparison. The Korean version of the ODI questionnaire, whose validity had been verified, was used, and the EQ-5D-5L was also calculated by applying quality weights to the status of the Korean standard population.

7. Clinical course

After the treatment, a significant improvement was observed in radiological examination, NRS, lumbar ROM, ODI, and EQ-5D scores. Table 3 shows the enhancement of lumbar ROM, ODI, and EQ-5D scores, and Fig. 3 shows the reduction of NRS scores in the lower back area and left lower limb.

The patient was taking opioids twice a day due to the severe pain from before the first day to the fourth day of hospitalization, and in the morning of the fifth day, the pain

Table 2. Composition and daily dose of the herbal medicine

Modified-Hwallaktang1 (2021.03.24～2021.03.30)		Modified-Hwallaktang2 (2021.03.30～2021.04.26)		Modified-Mangeumtang (2021.04.27～2021.05.15)	
Chaenomelis Fructus	32 (g)	Chelidonii Herba	18 (g)	Rehmanniae Radix Preparata	24 (g)
Chelidonii Herba	16	Achyranthis Bidentatae Radix	18	Dipsaci Radix	12
Corydalis Tuber	16	Chaenomelis Fructus	18	Poria Sclerotium	12
Osterici seu Notopterygii Radix et Rhizoma	16	Acanthopanacis Cortex	16	Achyranthis Radix	12
Clematidis Radix	12	Corydalis Tuber	16	Angelicae Gigantis Radix	12
Araliae Continentalis Radix	12	Zingiberis Rhizoma Crudus	12	Ginseng Radix	12
Angelicae Gigantis Radix	12	Jujubae Fructus	12	Eucommiae Cortex	8
Rehmanniae Radix	12	Atractylodis Rhizoma	6	Saposhnikoviae Radix	8
Paeoniae Radix	12	Angelicae Gigantis Radix	6	Cinnamomi Ramulus	8
Atractylodis Rhizoma	12	Rehmanniae Radix	6	Cnidii Rhizoma	8
Citri Unshius Pericarpium	8	Paeoniae Radix	6	Araliae Continentalis Radix	8
Olibanum	8	Clematidis Radix	6	Forsythiae Fructus	8
Myrrha	8	Araliae Continentalis Radix	6	Glycyrrhizae Radix et Rhizoma	8
Carthami Flos	6	Citri Unshius Pericarpium	6	Asiasari Radix et Rhizoma	4
Amomi Fructus	6	Olibanum	6	Scorpio	4
Glycyrrhizae Radix et Rhizoma	4	Myrrha	6		
Scolopendra	4	Cinnamomi Cortex	6		
Eucommiae Cortex	4	Zingiberis Rhizoma	6		
		Glycyrrhizae Radix	4		
		Aconiti Lateralis Radix Preparata	4		
		Aconiti Kusnezoffii Tuber	4		
		Carthami Flos	4		
		Amomi Fructus	4		

Table 3. Lumbar ROM and ODI and EQ-5D scores before and after treatment

	Admission (2021.03.24)	After 14 days	After 28 days	After 42 days	Discharge (2021.05.15)
ROM					
Flexion	50°	50°	50°	50°	50°
Extension	20°	20°	30°	30°	30°
Lateral bending	35°/35°	35°/35°	35°/35°	35°/35°	35°/35°
Rotation	45°/45°	45°/45°	45°/45°	45°/45°	45°/45°
ODI	39	21	18	12	9
EQ-5D (subscore)	0.206 (4-4-4-5-4)	0.604 (3-2-3-3-2)	0.593 (3-3-3-3-3)	0.613 (2-2-3-3-2)	0.663 (2-2-2-2-2)

ROM : Range of motion, ODI : Oswestry Disability Index, EQ-5D : European Quality of Life-5 Dimensions.

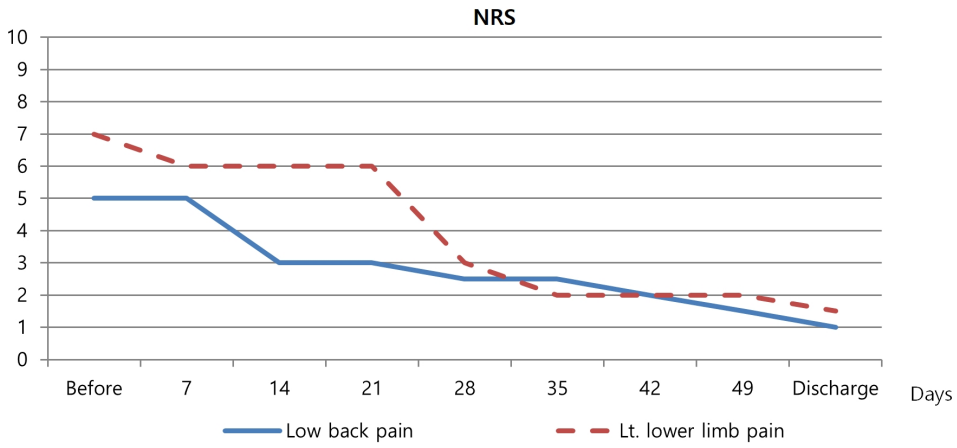

Fig. 3. NRS before and after treatment.
NRS : Numerical Rating Scale.

Table 4. Medication before and after treatment

	0~4 days	5~14 days	15~29 days	30~43 days	After 44 days
Tapentadol HCl 58.24 mg	(1-0-1)	-	-	-	-
Acetaminophen 325 mg Tramadol HCl 37.5 mg		(1-1-1)	(1-0-1)	Intermittent	-
Eperisone HCl 50 mg		(1-1-1)	(1-0-1)	Intermittent	-

Prn : Pro re nata, Bid : Bis in die.

improved, and the patient voluntarily tried not taking opioids. Not as much pain as before the fifth day but residual pain was still remained, so from the 6th to the 14th day of hospitalization, an analgesic containing acetaminophen and tramadol and a muscle relaxant containing Eperisone HCl were prescribed, and she took them three times a day. From the 15th day, the number of doses was reduced to twice a day, and from the 30th day, the dose was taken 1~2 times a day only when the pain was severe. On the 44th day, the analgesic was completely stopped (Table 4).

Discussion

Acupotomy, acupuncture, pharmacopuncture, and herbal medicine treatment were administered for 53 days, from March 24, 2021, to May 15, 2021, to a patient with LDH, who was taking opioids for severe pain. NRS and ROM were evaluated to assess the lumbar pain and function of the patient, and daily living performance was measured by ODI and EQ-5D, and an improvement was observed. The patient had to use a walker to walk, complaining of restriction of standing and walking by herself at the time of admission, but

she could walk on her own and did not need to use it by the time of discharge. And through MRI examination, we confirmed the improvement in radiology as well. Furthermore, the patient stopped taking opioids, due to the reduce of pain, only after 4 days of treatments.

Disc herniation is a disease in which the nucleus pulposus prolapses and compresses the dura mater or nerve root, causing neurological symptoms. The conservative Korean medicine treatment for LDH includes acupotomy, acupuncture, pharmacopuncture, and herbal medicine[10]. In our case, a complex treatment was performed for the quick recovery of the patient.

Acupotomy is a new type of acupuncture treatment that removes pain and restores the original dynamic state by exfoliating, incision, or cutting of soft tissue adhesions, to reduce the pressure inside the tissue and release the induration of the deep muscles of the lumbar vertebrae. It improves the surrounding blood circulation disorder through microtrauma and regenerates the lesion tissue into normal tissue by causing an inflammatory reaction[16]. In our case, this treatment mechanism of acupotomy was considered to be involved in pain control.

Pharmacopuncture is another new acupuncture method that combines acupuncture and drug therapy in the form of injecting pharmacopuncture solutions into acupoints using a syringe[10]. Furthermore, various types are used depending on the indication; for our case, we used BVP[17] and SYP[13], which have been reported to be effective for patients with LDH.

Herbal medicines were prescribed to relieve pain from the 1st day to the 33rd day of admission and improve general fatigue and restore systemic functions from the 34th day until discharge[18]. In our case, since the herbal medicine was changed according to the progress of the patient, more studies are needed to confirm the single effect of herbal medicine on LDH.

The abuse of opioids used for chronic pain management is proliferating worldwide, and it was reported that 3 million US citizens and 16 million people worldwide experience opioid use disorders[19]. Many of those were due to opioid overdose, and 35.8% of the US opioid-related drug abuse deaths in 2017 were patients prescribed them for pain management[20].

This case suggests the possibility that a combined Korean medical treatment, including acupotomy, can be used as an alternative to opioids for LDH accompanied by extreme pain. Nonetheless, this study has a limitation in that this is a single case study, and determining which factors contributed to what extent is difficult since multiple treatments were performed. Thus, large-scale clinical studies on more patients are needed in the future to prove the effectiveness of using the Korean medicine treatment as an alternative to opioids.

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Data availability

The authors can provide upon reasonable request.

Conflicts of interest

The authors have declared that no conflicts of interest exists.

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