

Korean Medical Treatment for Improving Symptoms of Four Patients Diagnosed with Grade II Lumbar Spondylolisthesis

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[Abstract]

Objectives : To investigate the clinical results of patients who were diagnosed with grade II spondylolisthesis treated with Korean medicine of relaxative *Chuna* and *Gangchuk* herbal medicine.

Methods : We reviewed medical records of four patients diagnosed with grade II spondylolisthesis. Each patient has taken intensive Korean medical admission treatment at Mokhuri Hospital. All patients received treatments of *Gangchuk* herbal medicine, relaxative *Chuna* and acupuncture during admission period. Before treatment and every after 7-day treatment the patient's pain and walking distance without pain were assessed. The zero minimum to ten maximum pain numeric rating scale(NRS) was used to determine the degree of pain.

Results : Average admission duration was 23 days. All the patients' NRS decreased from median figure of 7.5[the minimum 7 to the highest 8] to median figure of 1[the minimum 0 to the highest 2]. Walking distance without pain increased from a median of 55 m[the minimum 20 m to the highest 100 m] to median of 165 m[the minimum 100 m to the highest 250 m].

Conclusions : Intensive conservative korean medical treatment was effective in reducing pain and functional improvement for grade II lumbar spondylolisthesis patients.

Key words :
 Spondylolisthesis;
 Relaxative *Chuna*;
Gangchuk herbal
 medicine

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I. Introduction

Spondylolisthesis is a forward dislocation of the upper vertebra, in comparison to the lower vertebra. Spondylolisthesis can be classified as isthmic or degenerative. Isthmic spondylolisthesis involves a defect in the pars interarticularis. Degenerative spondylolisthesis is caused by an extension of the pars interarticularis without defect. It can also be caused by weakness of spinal ligaments, muscles and annulus fibrosus of intervertebral disc¹⁻³. Pars defect with weak ligaments can cause the instability at the lumbar joint and backward dislocation of below vertebra can cause compression of hind located spinal cord with symptom of walking difficulty and severe low back pain⁴.

Most patients with spondylolisthesis are managed by conservative therapies such as orthosis, exercise, or physical therapy^{5,6}, very few are treated by surgery⁷. But surgery might end up with further complication and pains due to excessive muscle incision and adjacent segmental degeneration(ASD)⁸⁻¹⁰.

In Korean medicine, spondylolisthesis is viewed as low back pain(腰痛), sciatica(腰脚痛), numbness, tinglings or dysesthesia(痺證). The lumbar expresses the kidney's condition. Every meridian goes through the kidney and connects to lumbar vertebra, which is the reason for kidney deficiency occurring after internal(*Yang* deficiency(陽虛), phlegm-retained fluid(痰飲) and external damage(wind(風), cold(寒), dampness(濕)). As a consequence of aging, blood(血) and Qi(氣) of kidney decrease. It can reduce blood and qi supply for back muscles and spinal vertebra. So low back pain should be diagnosed and treated based on the differentiation of symptoms. In case of patients with low back pain, components of the back such as muscles and ligaments can be stiff and rigid. Furthermore, motion of back muscles can be restricted¹¹⁻¹³.

Various conservative treatments were implemented such as acupuncture, herbal medicine, physical therapy, cupping, electro-acupuncture and burning acupuncture. Although these treatments produced significant therapeutic results, there were not

enough recent cases of grade II spondylolisthesis patients being treated with Korean medicine¹⁴⁻¹⁶.

In this study, four grade II spondylolisthesis patients with severe low back pain are treated with vertebra augmenting medicine, relaxative *Chuna* and acupuncture. We are going to evaluate the improvement of walking distance and pain numerical rating scale(NRS) during hospitalization treatment.

II. Methods

A. Subject of study

Female patients diagnosed via radiology specialist with grade II spondylolisthesis and admitted for more than 2 weeks in Mokhuri Hospital between January to May 2013.

B. Treatment

1. *Chuna* therapy(relaxative manual stretching manipulation)

Each patient received *Chuna* therapy for 15 minutes, 5 times each week using Ergo Style™ FX.-5820 Table(Chattanooga Group. USA). Patients laid on the table in prone position while rigid muscles near the vertebra were pulled and pushed(latissimus dorsi, rhomboid, quadratus lumborum, gluteus medius & minimus, paraspinal muscles, etc) using COX method (20 times per minute with 5~15° angle). This relaxes each muscle a little above to possible range of movement.

2. Herbal medicine

Each patient received 120 g of *Gangchuk* decoction(*Qiángjǐ-tang*) or *Gangchukjetong* decoction(*Qiángjǐchútòng-tang*) and 4 g of *Gangchu* pill(*Qiángtuī-hwan*) three times a day, 30 minutes after each meal. Main components of herbal medication include 8 g of *Geranii herba* and *Sorbus commixta*,

4 g of *Archyranthos radix*, *Cibotii rhizoma*, *Acanthopanax sessiliflorum seeman*, *Ledebouriella seseloides*, *Eucommia ulmoides* Oliver, *Atractylodes macrocephala* Koidzumi, *Aralia continentalis* Kitagawa, *Rehmannia glutinosa* for hueichingensis, 1.5 g of *Carthamus tinctorius*.

3. Pharmacopuncture

Each patient received *Hwangryunhaedok* decoction pharmacopuncture 7 times a week on ligaments between L4, L5, S1 spinous process and UB₂₃ · UB₂₄ · UB₂₅ · UB₂₆ · UB₅₁ · UB₅₂, 0.1 cc in each point. *Hwangryunhaedok* decoction pharmacopuncture which consists of *Coptidis Rhizoma*, *Scutellariae Radix*, *Phellodendri Cortex*, *Gardeniae Fructus* is made by steam distillation. Using *Hwangryunhaedok* decoction pharmacopuncture is available for reducing pain rapidly, alleviating inflammation of an affected part effectively¹⁷⁾.

4. Acupuncture

Each patient received acupuncture therapy 13 times a week (2 times a day, 1 time on Sunday) using 0.25 × 30 mm stainless steel needles on UB₆₀ · UB₄₀ · GB₃₄ · UB₂₃ · UB₂₄ · UB₂₅ · UB₂₆ · UB₅₁ · UB₅₂, for 15 minutes.

5. Physical therapy

Each patient received physical therapy 6 times a week mainly on the lower lumbar, buttock, and sacroiliac joints. Microwave therapy (5 minutes), muscle low frequency therapy (10 minutes), electromagnetic therapy (10 minutes) and hot pack (10 minutes) were applied mainly on both quadratus lumborum, gluteus medius & minimus, piriformis, iliolumbar ligament and sacroiliac ligament.

C. Method of evaluation

1. NRS¹⁸⁾

Patients subjectively score their current pain intensity, 0 being absence of pain and 10 being the

most severe pain.

2. Walking distance (m)

Measure patient's pain-free walking distance.

III. Case report

A. Case 1 : Mrs Goo

1. Sex/age

Female/50

2. Chief complaint

- a. Low back pain
- b. Lt buttock pain
- c. Lt leg numbness

3. Onset

January 2013

4. Diagnosis

Spondylolisthesis of L4 on L5, grade II

5. Past history

Appendectomy (1992)

6. Family history

None specific

7. Social history

None specific

8. Present illness

She was diagnosed with spondylolysis and spondylolisthesis from other hospital by X-ray in May 2011. She was treated by injection and physical therapy. But symptom wasn't alleviated that she was told to take surgery that she refused surgery and self admitted to Mokhuri Hospital.

9. Findings

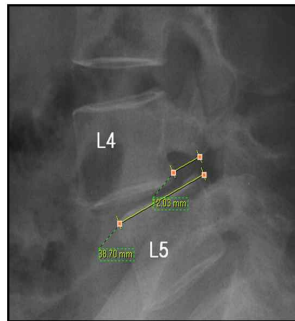


Fig. 1. L-spine lat
Meyerding's scale : 31.08 %.
Grade II (25~50 %).
Spondylolisthesis of L4 on L5, grade II.



Fig. 2. L-spine flexion & extension
Segmental Instability at L4/5.

There is no significant evidence of spinal stenosis in lumbar MRI findings.

10. Admission duration

February 25, 2013 ~ March 12, 2013(sixteen days)

11. Progress

a. February 25, 2013(day admitted)

Low back pain, Lt buttock pain(NRS 7) and Lt leg numbness(antero lateral side of lower leg). Pain occurred after 80 m of walking.

b. March 04, 2013(1 week after admission)

Low back pain and Lt. buttock pain during walking has decreased(NRS 4). Intermittant Lt leg numbness. Pain occurred after 80 m of walking. Complained of leg weakness.

c. March 04, 2013(discharged)

Low back pain and Lt buttock pain while walking has decreased dramatically(NRS 1). Lt leg numbness was almost gone. Walked more than 160 m without pain three times a day.

B. Case 2 : Mrs Haam

1. Sex/age

Female/55

2. Chief complaint

- Low back pain
- Both buttocks pain
- Both legs numbness

3. Onset

February 2013

4. Diagnosis

Spondylolisthesis of L5 on S1, Gr. 2

5. Past history

Pancreatitis(2011), hypertension(2003)

6. Family history

None specific

7. Social history

None specific

8. Present illness

She was diagnosed with L5 spondylolysis from other hospital by X-ray and CT in February 2011. She refused to take operation and was treated by injection and western medicine. Patient self admitted to Mokhuri Hospital.

9. Findings

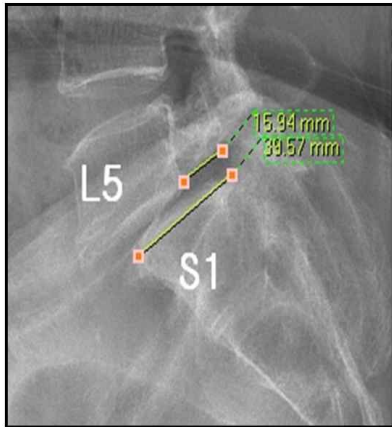


Fig. 3. L-spine lat

Meyerding's scale : 40.28 %.

Grade II (25~50 %).

Spondylolisthesis of L5 on S1, grade II.

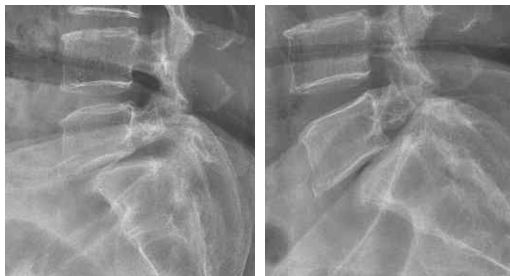


Fig. 4. L-spine flexion & extension

Segmental Instability at L5/S1.

There is no significant evidence of spinal stenosis in lumbar MRI findings.

10. Admission duration

March 28, 2013 ~ April 26, 2013(thirty days)

11. Progress

a. March 28, 2013(day admitted)

Low back pain, Both buttocks pain(NRS 7)and both legs numbness(posterior aspect of lower leg). Could not walk more than 20 m with walker.

b. April 04, 2013(1 week after admission)

Low back pain and both buttocks pain decreased considerably(NRS 6). Could walk 30 m with walker

and felt more comfortable walking compared to day of admission. Could not walk more than 30 m due to remaining pain in both legs.

c. April 11, 2013(2 weeks after admission)

Low back pain and both buttocks pain decreased considerably(NRS 3). Could walk 80 m with walker. Both legs numbness decreased.

d. April 18, 2013(3 weeks after admission)

Low back pain and both buttocks pain decreased dramatically(NRS 1). Could walk 60m without walker 3 times a day. Both legs numbness decreased considerably.

e. April 26, 2013(discharged)

Could walk 100 m more than 3 times a day without walker. Low back pain and both buttocks pain have continually decreased(NRS 1).

C. Case 3 : Mrs Joh

1. Sex/age

Female/79

2. Chief complaint

- a. Low back pain
- b. Lt leg pain
- c. Both feet numbness

3. Onset

March 02, 2013

4. Diagnosis

Spondylolisthesis of L4 on L5, Gr. II

5. Past history

Hypertension(HTN), diabetes mellitus(DM)

6. Family history

DM(father)

7. Social history

None specific

8. Present illness

She was diagnosed with spondylolisthesis from other hospital by X-ray. Patient was treated by injection in Local neurosurgery(NS) on 2011. In March 2013, at a local hospital, patient was again treated by injection, as well as physical therapy. And she was diagnosed spondylolisthesis(11.5 mm) from other hospital by X-ray on April 05, 2013 and self admitted to Mokhuri Hospital.

9. Findings

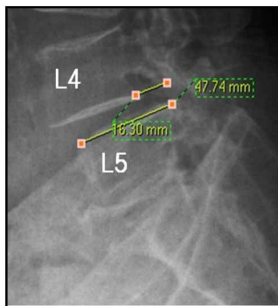


Fig. 5. L-spine lat
Meyerding's scale : 34.14 %.
Grade II (25~50 %).
Spondylolisthesis of L4 on L5, grade II.



Fig. 6. L-spine flexion & extension
Segmental Instability at L4/5.

There is a little relative evidence of spinal stenosis in lumbar MRI findings(diameter of L4-5 level spinal canal was 12 mm).

10. Admission duration

April 12, 2013 ~ May 09, 2013(twenty eight days)

11. Progress

a. April 12, 2013(day admitted)

Walking 20 m with walker, low back pain and Lt. leg pain occurs from first step(NRS 8). Both feet numbness existed consistently.

b. April 19, 2013(1 week after admission)

All conditions were recovered, reducing back and Lt leg pain(NRS 5). Patient started exercise treatment and can walk 50 m without walker.

c. April 26, 2013(2 week after admission)

Low back pain and Lt leg pain reduced(NRS 4). Walking distance increased. Walking about 75 m without pain, without walker, three times a day.

d. May 03, 2013(3 week after admission)

Low back pain and Lt. leg pain reduced(NRS 2). Walking about 125 m without pain three times a day.

e. May 09, 2013(discharged)

Low back pain and Lt. leg pain disappeared(NRS 0). Both feet Numbness was reduced. Walking distance without pain increased about 150 m and patient was discharged.

D. Case 4 : Mrs Pyo

1. Sex/age

Female/57

2. Chief complaint

- a. Low back pain
- b. Lt leg numbness

3. Onset

2005

4. Diagnosis

Spondylolisthesis of L4 on L5, Gr. II

5. Past history

None specific

6. Family history

None specific

7. Social history

None specific

8. Present illness

She was diagnosed with a severe condition in lumbar spine based on lumbar MRI findings. Patient was treated by injection, p.o.med at other hospital in 2005. Patient was diagnosed with spondylolisthesis and stenosis from other hospital by X-ray. She refused surgery and got p.o.med and injection at other hospital on 2012. And she was self admitted to Mokhuri Hospital.

9. Findings

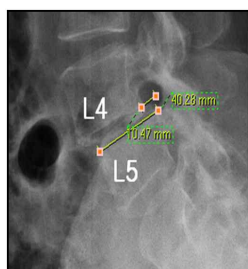


Fig. 7. L-spine lat
Meyerding's scale : 25.99 %.
Grade II (25~50 %).
Spondylolisthesis of L4 on L5, grade II.



Fig. 8. L-spine flexion & extension
Segmental Instability at L4/5.

There is no significant evidence of spinal stenosis in lumbar MRI findings.

10. Admission duration

March 11, 2013 ~ March 30, 2013(twenty days)

11. Progress

a. March 11, 2013(day admitted)

Complained of low back pain(NRS 8) and Lt leg numbness(lateral side of lower leg). Can walk about 100 m without pain.

b. March 18, 2013(1 week after admission)

Complained of both low back pain and Lt leg tension while lying in bed. Complained of intermittent Lt. hip joint pain(NRS 6). Walking about 200 m without pain.

c. March 25, 2013(2 week after admission)

Low back pain and Lt leg numbness reduced(NRS 4, reduced over 50 %). Walking about 250 m without pain.

d. March 30, 2013(discharged)

Low back pain and Lt leg numbness reduced(NRS 2). Walking about 250 m without pain. Complained of severe pain when maintaining a sitting position for about ten minutes before hospitalization. Patient can maintain a sitting position for about 30 minutes. Low back pain and Lt. leg numbness improved but patient complained of severe dizziness. Patient was discharged for other hospital treatment.

IV. Result

In the above cases, all four patients were diagnosed with grade II isthmic spondylolisthesis by X-ray. They complained of low back pain with lower extremity numbness while walking. Certain daily life activities were disrupted due to intense pain and gait disturbance. The average hospitalization period was 23 days and the average NRS was 7.5 and decreased to 1 after treatment. Average walking distance which was 55 m increased to 165m after treatment. By *Gangchuk* drug and relaxative-*Chuna*, the pain reduced about

80 % and the walking distance more than twice increased.

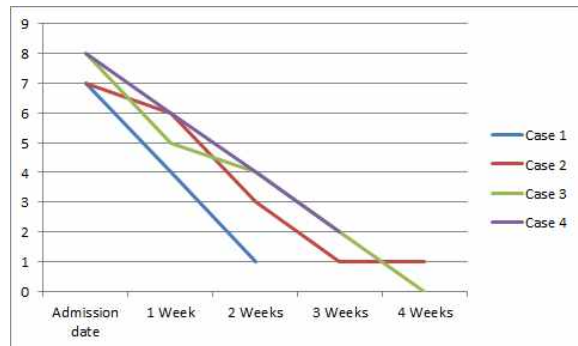


Fig. 9. Comparison of NRS before and after treatment for all patients

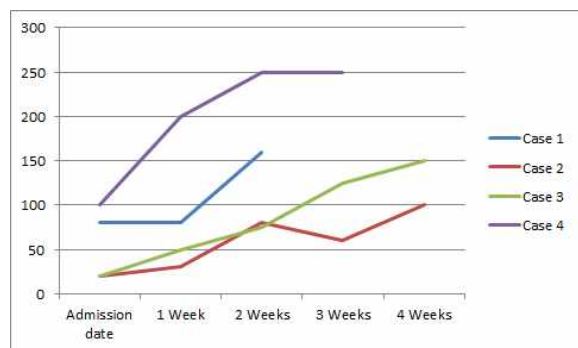


Fig. 10. Comparison of walking distance before and after treatment for all patients

V. Discussion

Spondylolisthesis is classified as congenital(dysplasia of articular process), isthmic(pars interarticularis defect), degenerative(degeneration of facet joint), post-traumatic(neural arch fracture), pathologic (weakness of neural arch), or iatrogenic(intense resection of the bone in decompression)^{7,19}. Especially, isthmic spondylolisthesis commonly occurs in women over the age of 40, with prevalence being 6 %. The main symptoms are intermittent low back pain and a waddling gait. In degenerative spondylolisthesis, the persistence of instability causes degenerative changes in the intervertebral disc, causing a slip. Early stages of degen-

eration of the intervertebral disc, spondylolisthesis characterized by a greater than 10 mm slide or a 25 % sliding proportion, sliding located at the L4 level or in the pars interarticularis with spondylolysis can significantly increase the risk of early degeneration. The natural progress in 0~10 % of slip is equal to normal person's condition. But 10~25 % slip can increase the frequency of low back pain and sciatica. Over 25 % slip significantly increases the high risk of symptoms. Disc herniation at defect site, fibrous cartilage mass, and radiating pain due to nerve distraction(radicular pain) can occur²⁰.

Patients with dysplasia or defect of pars interarticularis mainly complain of low back pain and lower extremity pain at L5 or S1 dermatome. Nerve root compression is rare in this type. In the degenerative type, low back pain is caused by spinal segmental instability. Claudicational pain is caused from the sliding of vertebral body result into spinal stenosis. Lower extremity pain is caused by neuropathy occurring in the foraminal stenosis¹.

Generally, the Korean medical treatment of spondylolisthesis includes conservative methods, such as physical therapy, initial bed rest, *Chuna* treatment, acupuncture treatment, and exercise therapy. These treatments are performed to reduce pain, to extend range of motion and to strengthen and relieve surrounding muscles^{21,22}. Conservative treatments are known to improve symptoms effectively. Margaret L observed patients treated with exercise treatments alone or in combination with other treatments, have a positive effect on low back pain due to spondylolysis and spondylolisthesis. The patients in which conservative treatment failed and continue to have severe pain or neurological disorder or slip progresses over 40 % should undergo surgery, such as spinal body fusion^{8,9}. Surgery is indicated for patients who do not respond to conservative treatment lasting more than 1 year, who suffer from persistent pain and neurological symptoms, children who show over 50 % slip, children with an increasing 33 % slip and persistent symptoms, adults with accompanied disc herniation, patients with occurring adjacent degenerative stenosis and adult patients with spondylolisthesis

occurring at the L4–5 level¹⁰).

Screw repair, bony fusion, and decompression are standard treatments for severe instability in patients with constant pain. The recovery of sagittal view, boost of stability and retention of spine are advantages of treatment by surgery. However, surgery can cause various complications such as ASD and muscular or neural adhesion. Due to certain risks associated with surgery, such as pseudoarthrosis, loss of motion segment, further slippage, neurological deficit, residual deformity, blood loss that occurred by surgery, further study about conservative treatment must be needed^{8–10,23}.

In Korean medicine spondylolisthesis can belong to low back pain(腰痛) or sciatica(腰脚痛). Also kidney's condition is important clue to measure low back pain. Because every meridian goes through kidney and connected to lumbar vertebra¹¹. In *GeumGweoryak*(《金櫃要略》), stiffness of back muscles and inner visceral disorder can cause low back pain and restrict the range of motion. The condition of kidney including internal damage(yang deficiency(陽虛), phlegm-retained fluid(痰飲) or external damage(wind(風), cold(寒), dampness(濕)) can also cause low back pain. So warming *Yang*(溫陽), harmonizing *Qi*(和氣), extinguishing wind(去風) and eliminating dampness(除濕) were suggested to treat low back pain¹². In *HwangJe-NaeGyeong*(《黃帝內經·素問》), kidney supervises bone. Kidney condition affects exuberance and debilitation(盛衰) of male, female's *Qi* and blood(氣血)¹³.

In *Gangchuk* drug, the taste of Geranii Herba is known to be pungent(辛), bitter(苦) and bland(平). It contains properties to dispel wind and eliminate dampness(祛風除濕). It can also alleviate diarrhea, increase circulation, strengthen muscle and bone, and improve flow in collateral vessels. Animal experimentation results revealed that not only is Sorbus commixta an antioxidant and anti-inflammatory, it also has been proven to prevent arteriosclerosis and vascular inflammatory disease^{24,25}.

Relaxative-*Chuna* is similar to *Kyungkuen-Chuna* rather than Orthopaedic Manual-*Chuna*. A highly skilled specialist releases the hardened and

strained muscles or ligaments by one's hand. Relaxative-*Chuna* is also similar to the flexion & extension technique. Because it uses the COX table. The flexion & extension technique(屈伸延法) is already known for aiding in the correction of disarrangement in the lumbar spine and for decompressing the facet joint. The technique helps to restore normal functioning of ligaments and intervertebral discs by manipulating the muscle attached to the spine. This can help restore the normal mobility of the spine and reduce the pain^{3,26}. In addition, relaxative-*Chuna* stretched hardened and strained peripheral muscles or ligaments of the spine. The COX technique increases local circulation and encourages the recovery of damaged tissue. It also aids in increasing circulation of synovial, increasing pain threshold by proper stimulation, and can reduce pain. Also, we can frequently observe the phenomenon that chronic left low back pain can be the origin of right low back pain, or lumbar muscle strain can be the origin of abdominal muscle strain. By relaxative-*Chuna*, we can improve or recover the dynamic imbalance of the muscle, thus eliminating or reducing pain^{3,27}.

Obtaining quantitative results was difficult because of the differences in the length of hospitalization period(16~30 days), the limited patient sample size(n=4), and the difference in pain area(lumbar, buttock, lower extremity). Also the indicators of pain was limited to NRS, and we could not obtain post-treatment X-ray image.

VI. Conclusion

Relaxative *Chuna* and *Gangchuk* herbal medicine showed positive effects for alleviating pain and symptoms caused by grade II lumbar spondylolisthesis. These effects can be achieved by *Qi*(氣)/blood(血) circulation improvement and relaxation of stiffened muscles. In addition, most patients had adjuvant benefits: forward curved back have been manipulated to stand straight up after the treatment.

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