



# Effect of Traditional Korean Medicine Treatments on the Discoid Meniscus of Knee Joint: Two Clinical Cases

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The discoid meniscus is an innate modified form of the meniscus, characterized by middle hypertrophy and a larger than the regular diameter, leading to an absence of the characteristic “C” arrangement. Previously, no study has reported the traditional Korean medicine treatment of knee pain mainly due to discoid meniscus. Here, we report two cases of a discoid meniscus of the knee as the cause of knee pain. Patients were diagnosed with magnetic resonance imaging for discoid meniscus and received traditional Korean medicine treatments, including pharmacopuncture, acupuncture, herbal medicine, and chuna. The pain was alleviated when assessed by patient-reported pain scale scores, and the general knee condition was improved. Thus, traditional Korean medicine treatments could be effective for patients who had discoid meniscus of the knee joint in this case report.

**Keywords:** Case report; Korean traditional medicine; Meniscus

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## INTRODUCTION

Menisci are C-shaped fibrocartilaginous structures with a triangular cross-section. The main roles of the meniscus are shock absorption, load transmission, joint stability improvement, proprioception sense, and articular cartilage nourishment and lubrication [1].

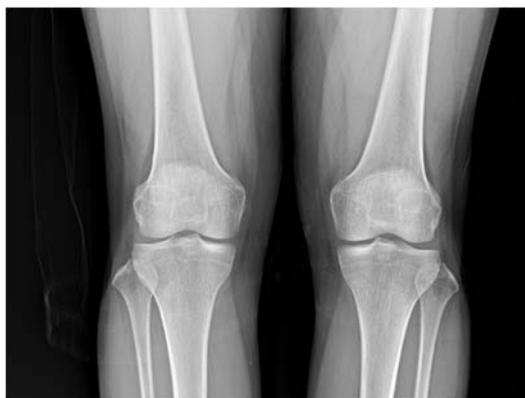
A discoid meniscus is an abnormal congenital variant of the lateral meniscus and embraces vagaries in the stability and shape of the meniscal tissue [2]. The prevalence of lateral discoid meniscus is calculated as 0.4–17%, whereas the incidence of the medial discoid meniscus is relatively low (0.1–0.3%) [3].

Conservative treatment of discoid meniscus includes strengthening and stretching of the hamstring and quadriceps muscles. However, surgical treatment is required in cases of significant disabilities [2]. Traditional Korean medicine treatment for discoid meniscus has never been reported. This case report demonstrates the results of a patient diagnosed with discoid meniscus and treated with traditional Korean medicine at the Jaseng Hospital of Korean Medicine.

## CASE REPORT

### 1. Case presentation

Two patients were hospitalized at the Jaseng Hospital of Korean Medicine with knee pain complaints. They were hospitalized in Jaseng Hospital of Korean Medicine and received traditional Korean medicine treatments. The treatment revealed clear beneficial effects in terms of average pain and general knee function.



**Fig. 1.** X-ray scans of both knees (March 16, 2021) of case 1. The image shows no significant bony abnormality.

### 2. Medical history

#### 1) Case 1

Case 1 was a 54-year-old female. Her pain worsened upon walking for >10 minutes, accompanied by severe pain upon bending the knee that started on December 15, 2020. She was not taking any medicine, had no family medical history or underlying diseases, and had not received any treatment for knee pain after the recent onset. She was hospitalized during her first visit on March 16, 2021, and was discharged on April 24, 2021.

#### 2) Case 2

Case 2 was a 51-year-old female. Her major complaint was pain that occurred upon walking downstairs that started on July 15, 2020, and she received one injection in the knee to relieve the pain. She was taking painkillers to manage the pain, but ceased after the admission, and had no family history or underlying diseases. She was hospitalized on November 2, 2020, and was discharged on November 7, 2020.

### 3. Magnetic resonance imaging and radiography

An X-ray scan for both knees conducted on both cases (case 1 on March 16, 2021, case 2 on November 3, 2020) showed no remarkable findings (Figs. 1, 2). However, magnetic resonance imaging (case 1 on March 16, 2021, case 2 on November 3, 2020) showed discoid meniscus without evidence of tear in the lateral meniscus (Figs. 3, 4) on both case patient's left knee. Both patients were diagnosed with pain caused by discoid meniscus, as there was no other articular disease.



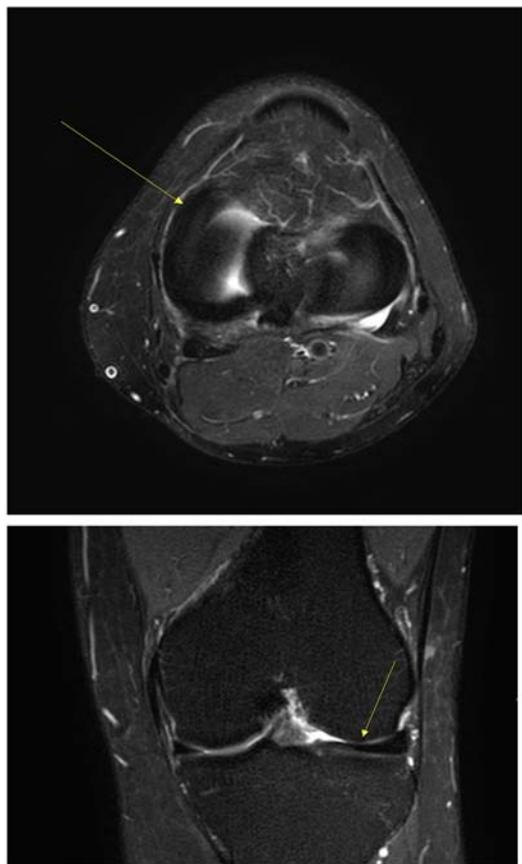
**Fig. 2.** X-ray scans of both knees (November 3, 2020) of case 2. The image shows no significant bony abnormality.

4. Treatment

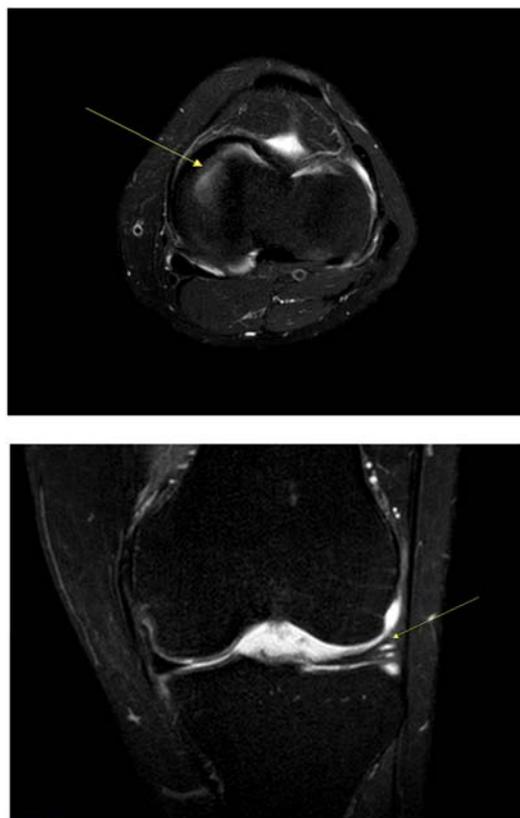
1) Acupuncture/pharmacopuncture therapy

Standardized (0.25 × 40 mm) and sterilized disposable stainless-steel needles were utilized for acupuncture and electroacupuncture treatment. The needles were applied at tender points of the left knee, which penetrated Neix-

iyuan (EX-LE4) and Waixiyuan (EX-LE5) and the area around the lateral meniscus. Additionally, electroacupuncture was applied for 15 minutes twice a day at the intensity of 2 Hz at the left knee's EX-LE4 and EX-LE5, which is the spot where the patients felt pain. Moreover, these patients were administered Shinbaro 2 at 1 mL pharmacopuncture injections twice a day using 1-mL insulin syringes with a throwaway needle (29 gage × 13



**Fig. 3.** Left knee magnetic resonance imaging (MRI) (March 16, 2021) of case 1. Axial and coronal images show the discoid meniscus on the lateral meniscus. Upper MRI image shows meniscus shaped like a disc, intruding towards the middle side (arrow). Lower MRI image shows the meniscal segment crossing the lateral tibial spine (arrow).



**Fig. 4.** Left knee magnetic resonance imaging (MRI) (November 3, 2020) of case 2. Axial and coronal images show the discoid meniscus on the lateral meniscus. Upper MRI image shows meniscus shaped like a disc, intruding towards the middle side (arrow). Lower MRI image shows the meniscal segment crossing the lateral tibial spine (arrow).

**Table 1.** Pharmacopuncture

Pharmacopuncture prescription	Herbal medicine components (g/mL)	Administered (d)	Daily dose
Shinbaro 2	<i>Paeonia lactiflora</i> (0.0027) <i>Ostericum koreanum</i> (Max.) Kitagaw (0.0013) <i>Aralia continentalis</i> (0.0013) <i>Cortex Eucommiae</i> (0.0013) <i>Achyranthis Radix</i> (0.0013) <i>Rhizoma Cibotii</i> (0.0013) <i>Radix Ledebouriellae</i> (0.0013) <i>Acanthopanacis Cortex</i> (0.0013) <i>Scolopendra subspinipes mutilans</i> (0.0013)	1-40	2 vials (2 mL/vial)

mm). The needle was inserted 1 cm deep with a 0.5–1 mL dose per point around the left lateral meniscus. The components, schedule, and daily doses of Shinbaro 2 pharmacopuncture are presented in Table 1.

## 2) Herbal medicine

Herbal medicines, including Chungpajeon-H, Chungsinbaro-hwan, and Gwanjeolgo, were prescribed three times a day for treating severe knee pain in case 1. Mabalgwanjeol-tang and Gwanjeolgo were prescribed three times a day in case 2. The daily doses, herbal components, and schedule are described in Tables 2 and 3.

## 3) Chuna therapy

These patients received chuna therapy once daily to alleviate muscle tension as well as muscle energy technique therapy and myofascial release around the hamstring muscle and knee joint.

## 5. Assessments

All the listed assessments were used to evaluate the patients on the hospitalization day, the 14th day of admission, and the day of discharge. Only the data on the day of admission and discharge were available for case 2 because the hospitalization period was shorter than 14 days.

### 1) Patient-reported scales

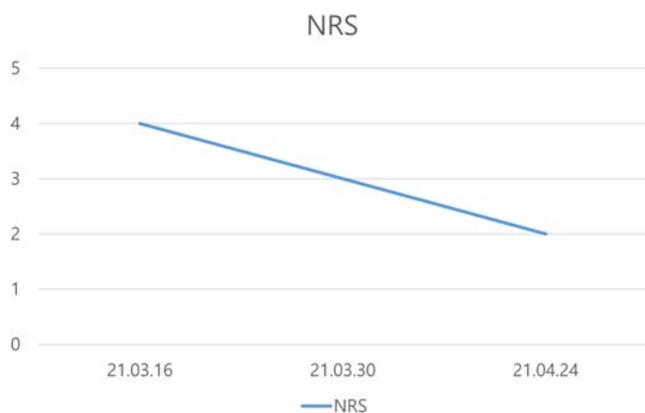
The patients' subjective general grade of pain was assessed using the numeric rating scale (NRS). The Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) was used to estimate functional disability of the knee joint. Further, the European Quality of Life Five Dimensions (EQ-5D) was used to evaluate their quality of life.

**Table 2.** Herbal medicine prescriptions (case 1)

Herbal prescription	Herbal medicine components (g/pouch)	Administered (d)	Daily dose
Chungpa-jeon	<i>Acanthopanax Cortex</i> (5.000) <i>Eucommiae Cortex</i> (5.000) <i>Ledebouriellae Radix</i> (5.000) <i>Achyranthis Radix</i> (5.000) <i>Cibotii Rhizoma</i> (5.000) <i>Atractylodis Rhizoma</i> (2.500) <i>Amomi Semen</i> (2.500) <i>Geranium thunbergii</i> (2.500) <i>Zingiberis Rhizoma</i> (1.250) <i>Ledebouriellae Radix</i> (0.250) <i>Glycyrrhiza uralensis</i> (1.667) <i>Lasiosphaera Seu Calvatia</i> (7.500)	1–40	100 mL, 3×/d
Chungsinbaro-hwan	<i>Poria cocos (Schw.) Wolf</i> (0.156) <i>Ginseng Radix Alba</i> (0.078) <i>Achyranthes bidentata Bl.</i> (0.052) <i>Asini Gelatinum</i> (0.019) <i>Rehmanniae Radix</i> (0.623) <i>Cervi Cornus Colla</i> (0.065) <i>Mel</i> (0.312) <i>Cibotii Rhizoma</i> (0.052) <i>Eucommiae Cortex</i> (0.026) <i>Saposhnikovia Radix</i> (0.013) <i>Acanthopanax Cortex</i> (0.013) <i>Scolopendra Corpus</i> (0.013) <i>Atractylodis Rhizoma Alba</i> (0.052) <i>Bovis Fel.</i> (0.026)	1–40	3 pouches/d
Gwanjeolgo	<i>Rehmannia glutinosa</i> (3.268) <i>Wolfiporia extensa</i> (1.634) <i>Apis cerana Fabricius</i> (1.634) <i>Ginseng Radix Alba</i> (0.817) <i>Achyranthes bidentata</i> (0.204) <i>Asini Corii Collas</i> (0.102) <i>Cervus nippon Temminck</i> (0.340)	1–40	3 tablets/d

**Table 3.** Herbal medicine prescriptions (case 2)

Herbal prescription	Herbal medicine components (g/pouch)	Administered (d)	Daily dose
Mabalgwanjeol-tang	<i>Lasiosphaera seu Calvatia</i> (12) <i>Ginseng Radix</i> (8) <i>Achyranthis Radix</i> (8) <i>Glycyrrhizae Radix</i> (4) <i>Hordei Fuctus Germinatus</i> (4) <i>Osterici Radix</i> (4) <i>Plastrum testudinis</i> (4) <i>Saposhnikoviae Radix</i> (4) <i>Amomi fructus</i> (4) <i>Astragali Radix</i> (4) <i>Angelicae pubescentis Radix</i> (4) <i>Aconiti tuber</i> (2.8)	1-6	100 mL, 3x/d
Gwanjeolgo	<i>Rehmannia glutinosa</i> (3.268) <i>Wolfiporia extensa</i> (1.634) <i>Apis cerana Fabricius</i> (1.634) <i>Ginseng Radix Alba</i> (0.817) <i>Acyranthes bidentata</i> (0.204) <i>Asini Corii Collas</i> (0.102) <i>Cervus nippon Temminck</i> (0.340)	1-6	3 tablets/d



**Fig. 5.** Changes in the Numeric Rating Scale (NRS) of left knee pain of case 1.

2) Range of motion and special provocative test

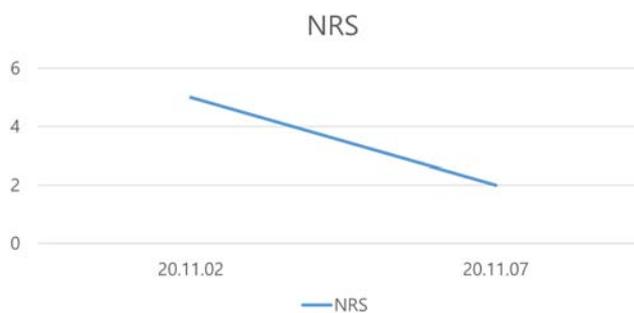
The range of motion (ROM) was measured to evaluate knee joint movements. Knee flexion, extension, and lateral bending movements we measured in these cases. Additionally, the stress valgus test and stress varus test was conducted to check for other knee disorders.

**6. Ethics statement**

The patient’s medical records and personal information were obtained from the Institutional Review Board of Jaseng Hospital of Korean Medicine (IRB file No. 2022-09-012).

**7. Progress note**

The NRS score of case 1 was 4, 3, and 2 upon hospi-



**Fig. 6.** Changes in the Numeric Rating Scale (NRS) of left knee pain of case 2.

talization, after 14 days, and at discharge, respectively (Fig. 5), and it also decreased from 5 to 2 in case 2. WO-MAC of case 1 was 53, 42, and 29 upon hospitalization, after 2 weeks, and at discharge, respectively, and it also decreased from 43 to 12 in case 2 (Fig. 6). The EQ-5D of case 1 measured 0.455, 0.659, and 0.722 upon hospitalization, after 2 weeks, and at discharge, respectively, and it also increased from 0.331 to 0.77 in case 2. ROM and special test results were normal at all times for both cases (Tables 4, 5). No side effects arose during hospitalization for both case.

**DISCUSSION**

Several systematic reviews and case reports about the medical treatment of discoid meniscus were presented, but studies conducted on the use of traditional Korean

**Table 4.** ROM and special provocative tests (case 1)

Date	ROM								Special test			
	Flexion (°)		Extension (°)		Lateral bending R (°)		Lateral bending L (°)		Stress varus (°)		Stress valgus (°)	
	R	L	R	L	R	L	R	L	R	L	R	L
21.03.16	135	135	0	0	5	5	5	5	-	-	-	-
21.03.30	135	135	0	0	5	5	5	5	-	-	-	-
21.04.24	135	135	0	0	5	5	5	5	-	-	-	-

ROM, range of motion; R, right; L, left.

**Table 5.** ROM and special provocative tests (case 2)

Date	ROM								Special test			
	Flexion (°)		Extension (°)		Lateral bending R (°)		Lateral bending L (°)		Stress varus (°)		Stress valgus (°)	
	R	L	R	L	R	L	R	L	R	L	R	L
20.11.02	135	135	0	0	5	5	5	5	-	-	-	-
20.11.07	135	135	0	0	5	5	5	5	-	-	-	-

ROM, range of motion; R, right; L, left.

medicine as a treatment method are limited. Hence, we report traditional Korean medicine therapy, consisting of pharmacopuncture, acupuncture, and herbal medicine, which relieved pain and enhanced the physical function of the patient during hospitalization.

Acupuncture provides effective and safe pain relief and is appropriate for different types of musculoskeletal pain [4]. Pharmacopuncture is a mixture of herbal medicine and acupuncture that benefits from both mechanical and chemical stimuli. It is used in the treatment of many diseases, especially musculoskeletal diseases [5]. Shinbaro 2 is associated with the inhibition of inflammatory mediators, proinflammatory cytokines, and neurotrophic factors [6]. It supposedly suppresses inflammation, relieves pain, and improves general function when injected into knee joints [7]. Case 1 was prescribed Chungpa-jeon upon hospitalization, which is broadly prescribed in Asia for the treatment of inflammatory and neuropathic diseases [8]. Case 2 was prescribed Mabal-gwanjeol-tang, which is well known for its recovery effect in musculoskeletal disease [9]. Chuna, which is a Korean version of musculoskeletal manipulation [10], is expected to improve knee joint function by giving mobility and relieving the tension of the connective tissues around the knee.

This study has a few limitations despite its strength. First, only two patients were studied and the degree of evidence acquired is not high. Second, whether the study

results were caused by the particular treatment received by the patient remained uncertain, because no control group was included. However, to our best knowledge, this is the first study indicating the positive results of traditional Korean medicine treatment of pain caused by the discoid meniscus. The results indicate that traditional Korean medicine can be helpful for patients with the discoid meniscus. However, further study is needed to consolidate the study findings.

In conclusion, we described the efficacy of traditional Korean medicine treatments utilized to treat discoid meniscus of the knee joint. Traditional Korean medicine treatments enhanced the general knee condition and decreased the patients' pain. Therefore, combined traditional medicinal treatments can be a reliable treatment option for patients diagnosed with discoid meniscus of the knee joint.

### AUTHOR CONTRIBUTIONS

Conceptualization: YJW, SWK. Data curation: MYY, JJH. Formal analysis: YJW, JJH. Investigation: YJW, GBL. Methodology: SWK, MYY. Project administration: JJH, JSK. Resources: HWC, GBL. Software: YJW, GBL. Supervision: MYY, JJH. Validation: YJW. Visualization: YJW. Writing – original draft: YJW. Writing – review & editing: All authors.

## CONFLICTS OF INTEREST

The authors have no conflicts of interest to declare.

## FUNDING

None.

## ETHICAL STATEMENT

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