

Nonsurgical integrative Korean Medicine treatment of discal cyst

A case report and a retrospective chart review analysis

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Abstract

Rationale: Discal cysts are rare lesions characterized by pain caused by neurogenic compression with similar symptoms as those of disc herniation. This study aims to report the spontaneous regression of discal cyst achieved through nonsurgical integrative Korean Medicine treatment and the clinical epidemiological features of discal cyst cases collected from 4 institutions.

Patient concerns: A 31-year-old woman had low back pain and radiating pain equivalent to a numeral rating scale (NRS) of 8 and had limitations in daily work and activities.

Diagnoses: The patient was diagnosed as having discal cysts that compressed the left S1 based on findings of L-spine magnetic resonance imaging (MRI) performed at our hospital.

Interventions: The patient received nonsurgical Korean Medicine treatment and after 24 days of treatment in the hospital, she underwent 16 additional treatments as an outpatient.

Outcomes: Spontaneous regression was confirmed in the L-spine MRI follow-up at 36 days and 99 days after the initial test, and the patient underwent once-a-week follow up to examine NRS, Oswestry Disability Index (ODI), EuroQoL-5 Dimensions (EQ-5D), and fear-avoidance beliefs questionnaire (FABQ) after 4 weeks, and 2, 3, and 6-month follow-ups after that. The patient was discharged in a painless condition, and she was able to carry on for 5 months without increased pain.

Lessons: Discal cysts are more rapid progress than disc herniation, it seems valid to attempt nonsurgical treatment. Epidemiologically, this is the first study to present the clinical epidemiological characteristics of discal cysts, it would provide valuable information to clinicians who treat and study discal cysts.

Abbreviations: EQ-5D = EuroQoL-5 Dimensions, FABQ = fear-avoidance beliefs questionnaire, MRI = magnetic resonance imaging, NRS = numeral Rating Scale, ODI = Oswestry Disability Index.

Keywords: discal cyst, epidemiology, nonsurgical Korean Medicine treatment, spontaneous regression

1. Introduction

There are various forms of cystic lesions, such as perineural cysts, extradural arachnoid cysts, and synovial cysts, in the spinal canal. These occur as frequently as extruded disc fragments and are known as a cause of low back pain and radiculopathy.^[1] There is also a type called discal cysts, which are highly

rare intraspinal extradural cysts that communicate with the intervertebral disc and are also difficult to distinguish from other diseases.^[2,3]

Because discal cysts were defined in 2001 with not many cases to date, most relevant studies have been case reports and case series.^[4-5] Aydin et al investigated the epidemiological features of 50 patients based on previous studies on discal cysts, but because this study is a collection of previously published cases, it is highly vulnerable to bias and also lacks information about incidence rates.^[6]

Thus, we report 1 case of spontaneous regression of discal cyst through nonsurgical Korean Medicine treatment and the results of clinical epidemiological study of patients diagnosed with discal cysts based on magnetic resonance imaging (MRI) in 4 Korean medical spine centers.

1.1. Consent statement

Written informed consent was obtained from the patients for the use of MRI data and the publication of this study.

2. Case report

2.1. Clinical features

A 31-year-old woman presented to our hospital with low back pain and radiating pain in the left lower limb that had begun 27

Editor: N/A.

The authors report no conflicts of interest.

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Medicine (2019) 98:27(e16189)

Received: 15 January 2019 / Received in final form: 29 April 2019 / Accepted: 4 June 2019

<http://dx.doi.org/10.1097/MD.00000000000016189>

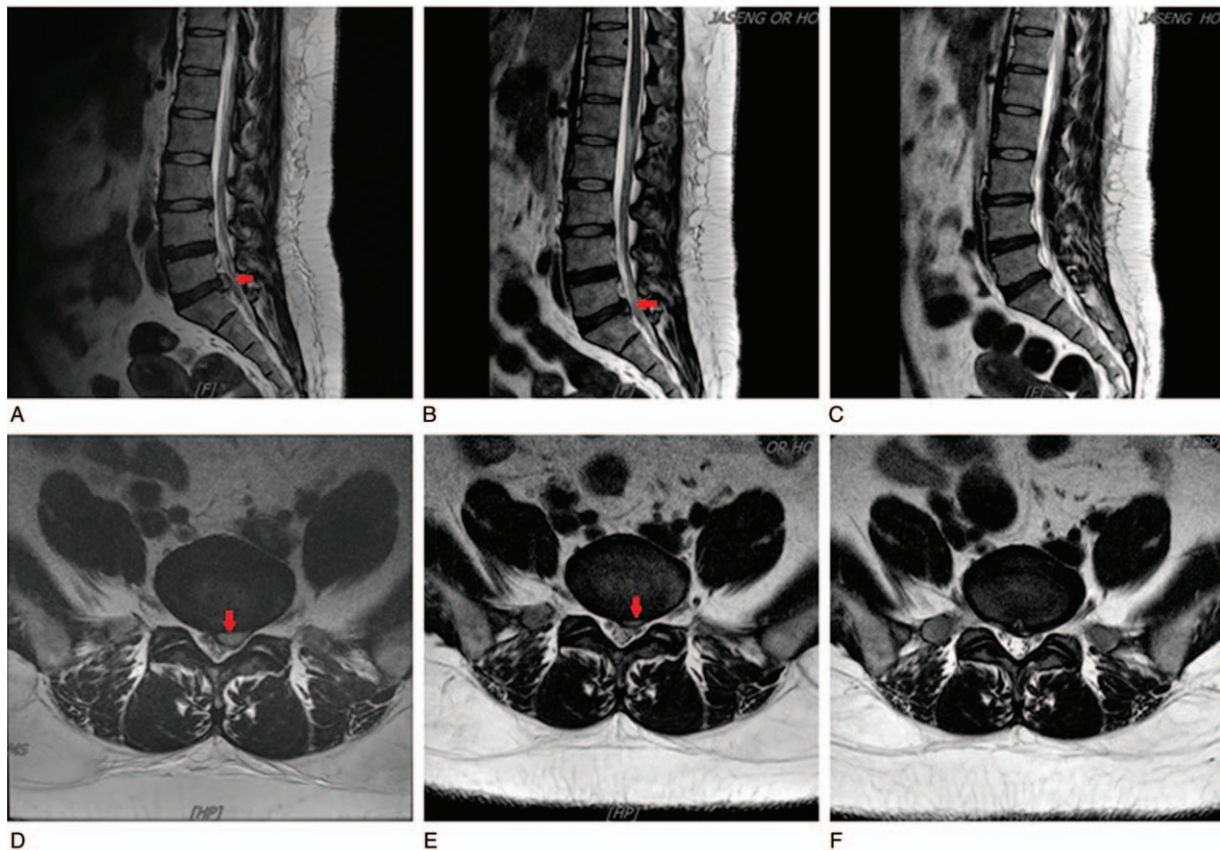


Figure 1. Process of discal cyst resorption shown on T2-weighted MRI [A, D]. Confirmed that presence of discal cyst at L5-S1 is compressing the left S1 nerve root at initial Examination [B, E]. Confirmed remarkable spontaneous regression at first f/u on day 36 [C, F]. Confirmed resorption of discal cyst at second f/u on day 99. MRI = magnetic resonance imaging.

days earlier. The patient had received pain injections and physical therapy and came to our hospital 27 days later due to persistent symptoms. She had radiating pain in the left thigh and posterior aspect of the calf, with a range of motion (ROM) of 60° flexion, 10° extension, 20° right flexion, and 20° left flexion. SLR test showed 60° in the right and 60° in the left, with normal muscle strength, sensation, and DTR. Lumbar spine MRI confirmed discal cysts compressing the S1 between L5-S1 in the left side (Fig. 1 A and B).

2.2. Treatment

The patient underwent 24 days of inpatient treatment and 16 sessions of outpatient treatment over 70 days. Treatment consisted of nonsurgical integrative Korean Medicine treatment and physical therapy, and the treatment process was as follows (Table 1).

2.3. Clinical outcomes

The patient was assessed using Numeral rating scale (NRS), Oswestry Disability Index (ODI), EuroQol-5 Dimensions (EQ-5D), and fear-avoidance beliefs questionnaire (FABQ) at the initial examination, once a week during the 24-day hospital stay, and at 1-, 2-, 3-, and 6-month f/u. EQ-5D and FABQ results improved more slowly than pain, but the patient was able to

return to normal activity after discharge without pain and limitations. Lumbar spine MRI follow-up was performed at 36 days and 99 days after beginning treatment. At the first f/u, a remarkable spontaneous regression was confirmed, and at the second f/u on day 99, the discal cyst was confirmed to be completely absorbed (Fig. 2).

3. Multicenter epidemiological survey

To examine the clinical epidemiological features of discal cysts, initially examined, insurance-covered patients who took a C-spine MRI or L-spine MRI at the Jaseng Hospital of Korean Medicine in Gangnam, Daejeon, Bucheon, and Haeundae between January 1, 2012 and December 31, 2016 were selected (Fig. 3). From patients who were diagnosed with a discal cyst or in those where discal cysts were ruled out by a radiologist, 31 patients who meet the MRI diagnostic criteria presented by Lee et al^[3] and Chiba et al^[4] were identified and examined for incidence of discal cyst, age, sex, level of discal cyst, pain, whether discal cyst is the major cause of pain, surgical history, and history of nerve block (Table 2).

4. Discussion

This study confirmed spontaneous regression of discal cysts through nonsurgical integrative Korean Medicine treatment and

Table 1
Patient timeline and intervention.

Treatment date and duration	Treatment details and frequency	Diagnostic imaging
First medical examination 2017.10.30	1 session of outpatient treatment 1. Korean medicine treatment ● Electroacupuncture,* Pharmacopuncture,† Infrared therapy (IR), Cupping, Chuna‡ ● Herbal medicine§ (Chungpa-jun, Cheongungbaro (Pill) / a including variations) 2 × /days 2. Conventional medicine treatment¶ ● Mobic Cap. 7.5 mg, Sirdalud Tab. 1 mg, Albis Tab. 2x/ 1days	1st MRI : 2017.10.30
Inpatient stay 2017.11.01 ~ 2017.11.08	Daily sessions of inpatient treatment: 1. Korean medicine treatment ● Electroacupuncture, Pharmacopuncture, IR, Cupping, Chuna ● Herbal medicine (Chungpa-jun, Cheongungbaro (Pill) / a including variations) 3 × /days 2. Physical therapy ● Ultrasound, Interferential current therapy (ICT), Laser Therapy	
2017.11.09 ~ 2017.11.24	Daily sessions of inpatient treatment: 1. Korean medicine treatment ● Electroacupuncture, Pharmacopuncture, IR, Cupping, Chuna ● Herbal medicine (Chungpa-jun, Cheongungbaro (Pill) / a including variations) 3 × /days 2. Physical therapy ● Ultrasound, ICT, Laser Therapy, Manipulation	
Outpatient visit 2017.11.27 ~ 2018.02.05	Total 16 visit in periods 1. Korean medicine treatment ● Electroacupuncture, Pharmacopuncture, IR, Cupping, Chuna ● Herbal medicine (Chungpa-jun, Cheongungbaro (Pill) / a including variations) 2 × /days 2. Physical therapy ● Manipulation	2nd MRI : 2017.12.04 (36th day F/U) 3rd MRI : 2018.02.05 (99th day F/U)
2018.04.30	6th month F/U	

* Acupuncture was mainly administered at BL23, BL40, BL60, SP6, GB39, KI13 points with electroacupuncture during the 15-minute needle retention time.
 † Shinbaro2 pharmacopuncture: Herbal medicine (Cibotium barometz, Saposhnikovia divaricata, Eucommia ulmoides, Acanthopanax sessiliflorus, Ostericum koreanum, Angelica pubescens, Achyranthes japonica, Paeonia albiflora, Scolopendra subspinipes) is purified (by decocting and freeze drying, then mixing the prepared powder with normal saline and adjusting for acidity and pH) and injected into the Huatuo Jiaji point (EX B2) in the left side L5-S1 using a syringe ((CPL, 2cc, 26G x 1.5 syringe, Shinchang medical co. Korea).
 ‡ The Korean medical doctor performs the below technique after assessment (spine & joint manipulation therapy, joint distraction therapy, Muscle energy techniques - hamstring, iliopsoas, tensor fasciae latae).
 § Cheongpajeon- main herbal ingredients: Ostericum koreanum, Eucommia ulmoides, Acanthopanax sessiliflorus, Achyranthes bidentata, Psoralea corylifolia, Saposhnikovia divaricata, Cibotium barometz, Lycium chinense, Boschniakia rossica, Cuscuta chinensis, Glycine max, and Atractylodes japonica.
 ¶ Conventional medicine treatment - Mobic Cap. 7.5 mg; Meloxicam 7.5 mg / Nsaids, Sirdalud Tab. 1 mg; Tizanidine Hydrochloride 1.14 mg / skeletal muscle relaxant, Albis Tab.: antipeptic ulcer drug.

also examined the clinical epidemiological features of discal cysts based on multicenter data of patients diagnosed with discal cysts. Discal cysts were first identified by Toyama et al^[7] in 1997 as a phenomenon characterized by communication between cystic lesions and intervertebral disc, and it became distinguishable from herniated disc or other cystic lesions as Chiba et al^[4]

proposed the definition and features of discal cysts in 2001. Regarding the pathogenesis of discal cysts, they were defined as a cystic hematoma or perimembranous hematoma formed in the epidural space but their specific pathogenesis has not been identified.^[4,8] They are also defined as a focal degeneration of the intervertebral disc with fluid production or a subsequent change

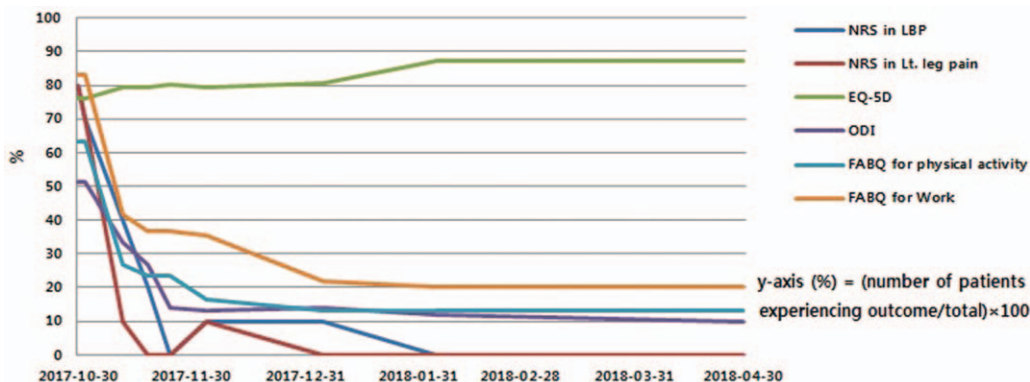


Figure 2. Clinical outcome timeline with assessment indices presented as percentages. EQ-5D=EuroQoL-5 Dimensions, FABQ=fear-avoidance beliefs questionnaire, LBP=low back pain, Lt=left, NRS=numeral rating scale, ODI=Oswestry Disability Index.

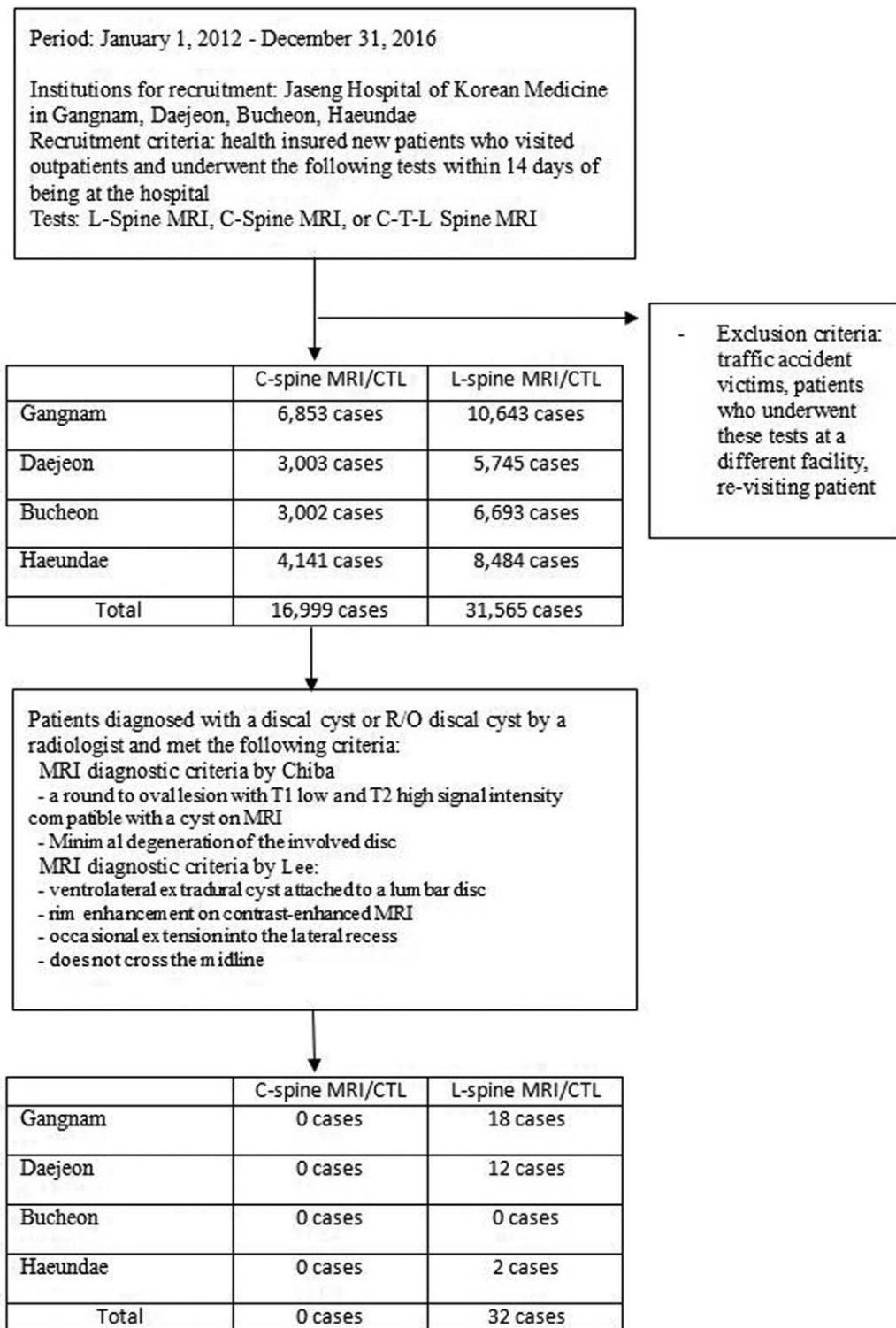


Figure 3. Flow chart of a multi-center clinical epidemiological survey.

of a herniated disc, as opposed to a vascular change.^[9-10] Furthermore, although Chiba et al defined it as having clinical symptoms of a unilateral single nerve root lesion, there have been reports of bilateral cysts, and studies are still ongoing.^[4,11]

Because discal cysts are highly rare, most relevant studies have been either case reports or case series.^[12] The most widely used

treatment is surgical resection, including discectomy, with other treatments including percutaneous CT-guided aspiration, epidural injection, selective nerve root block, and conservative therapy.^[5,9,13-16]

The woman in our case had severe low back pain and radiating pain equivalent to an NRS 8 pain and limitation of normal

Table 2	
Characteristics of patients with discal cyst from 2012 to 2016.	
Characteristics	Mean \pm SD or N (%) or N/Total
Mean age (yrs)	40.52 \pm 11.81
Gender	
Male	20 (64.52%)
Female	11 (35.48%)
Discal cyst level	
L2–3	2 (6.45%)
L3–4	6 (19.35%)
L4–5	14 (45.13%)
L5–S1	9 (29.03%)
Pain	
Back pain and radiculopathy	25 (80.65%)
Back pain	5 (16.13%)
Radiculopathy	1 (3.23%)
Discal cyst is the direct cause of pain	
Yes	18 (58.07%)
No	13 (41.94%)
Surgical history	
Yes	3 (9.68%)
No	28 (90.32%)
History of nerve block	
Yes	5 (16.13%)
No	26 (83.87%)
Etiological analysis	
Incidence (L-spine)	0.1% (31/31,565)
Incidence (C-spine)	0% (0/16,999)

activities of daily living within 23 days of onset. However, her low back pain and radiating pain improved to an NRS 4 and 1, respectively, after 12 days of treatment (1 outpatient treatment/10 days of inpatient treatment), and she was discharged on day 26 of treatment with both decreased low back pain and radiating pain. However, improvements in EQ-5D, which assesses general health-related quality of life, or fear-avoidance beliefs questionnaire, which assesses limitation of physical activities and work due to fear or negative thoughts about pain, made slower progress than that observed for pain.^[17–18] The patient showed improvement without an elevation of pain after returning to work and continued to undergo outpatient treatment, and the improved condition was maintained without changes in pain or other indices at the 6-month *f/u*.

Cheongpajeon, the herbal medicine mainly used for the patient, in this case, is a GCSB-5 that has been proven to be effective and clinically non-inferior to celecoxib in safety and efficacy, with nerve- and joint-protective effects and anti-inflammatory effects.^[19–22] We attempted to stimulate the discal cyst using pharmacopuncture, where the purified herbal medicine is injected into the Huatuo Jiayi point (EX B2) in the left side L5-S1 at the with a syringe. In addition, integrative treatment consisting of electroacupuncture, Chuna therapy, cupping, physical therapy, and manual therapy used as treatment for disc diseases has been reported to induce absorption of herniated disc.^[23–27] We confirmed a case in which this treatment led to the resorption of discal cysts using this treatment regimen.

In line with pain loss on day 26 of treatment, there were evident signs of absorption on L-spine MRI on day 36 of treatment, and regression of the discal cyst on L-spin MRI on day 99 day of treatment. Regarding previous reports of MRI *f/u* after conservative treatment of discal cysts, Chung et al found in their study on postoperative discal pseudocyst (PDP), it took an

average of 77.8 days (range, 20–225 days) until symptoms improved and 82.7 days (range, 23–240 days) to observe near total or total regression on MRI in 6 cases involving analgesics and physical therapy.^[28] In addition, Prasad et al reported that it took 5 months until pain subsided after caudal epidural injection.^[29]

Many studies on discal cyst treatment involved discectomy with partial or complete resection of the lamina, as opposed to conservative treatment.^[5] Although surgical treatment produces successful outcomes, it is associated with structural defects when lamina is removed and possibility of PDP after disc surgery.^[28] Although there are fewer cases of conservative treatment, it led to quick relief of pain and quicker spontaneous regression of cyst lesions compared to the time it takes for resorption of sequestrated lumbar disc herniations (9.27 \pm 13.32 months), which is known to have a high resorption rate.^[28–30] Hence, clinicians should consider performing conservative treatment before surgical treatment for patients for whom a discal cyst causes severe neurogenic pain after differentiating discal cyst with disc herniation and understanding the differences in the outcomes.

Aydin's review article on 50 cases of discal cysts is the only existing study investigating the demographic features of the disease.^[6] In this study, the mean age of patients was 33.5 \pm 12.6 years, and most (91%) patients were men. Discal cyst most commonly occurred at the L4–5 (48%) and Asians have a high risk for the disease. However, this study is limited in that it only involved cases in which discal cyst was the direct cause of pain, lacked information about incidence, and most cases were reported in Japan and Korea.

The present study was the first to shed light on the incidence rate of discal cyst among patients who were confirmed to have discal cyst based on MRI. Discal cysts were not observed in the C-spine and were most common at the L4–5 (45.131%). Further, most patients had back pain and radiculopathy, which was in line with Aydin's findings.^[6] In contrast with Aydin's study, where women only accounted for 9%, they accounted for 35% in our study, and discal cysts were not observed in the C-spine MRI but were observed in the L-spine MRI (0.0982%). Furthermore, there was a high percentage of cases in which discal cysts occurred naturally without any invasive treatment on the spine, and discal cysts were not the direct cause of pain in 41.94% of the cases.

This study has a few limitations. First, only 1 case was studied, so it is difficult to confirm the efficacy of nonsurgical integrative treatment. As a demographic survey, the size of the population was too small to represent the group. However, findings of relatively quick improvement of pain and delayed resorption was achieved with nonsurgical integrative treatment as well as information and that there are quite a few cases of spontaneously occurring discal cysts, as opposed to PDP occurring after invasive spinal treatment or surgery, as well as about information about the incidence and demographic features of discal cysts would provide valuable information for researchers and clinicians who treat discal cysts.

5. Conclusion

We were able to confirm quick alleviation of pain and spontaneous regression (within 3 months based on MRI) of discal cyst, a highly rare disease, using nonsurgical integrative Korean Medicine treatment. Because the time it takes for pain alleviation or spontaneous regression is shorter than that

required for nerve compression caused by disc herniation, it seems valid to attempt nonsurgical treatment before surgical treatment. We hope the demographic features identified in this study would be useful in establishing treatment protocol for discal cyst.

Author contributions

Conceptualization: Hee-Seung Choi.

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