

Effects of Heat Fumigation with Hai Tong Pi Decoction and Chinese Bone-Setting Manipulation on Patients with Lumbar Disk Herniation

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Abstract: *Objective:* To investigate the effects of heat fumigation with Hai Tong Pi decoction and Chinese bone-setting manipulation on patients with lumbar disk herniation. *Methods:* 126 patients with lumbar disk herniation who visited the orthopedic department of our hospital from January 2022 to May 2023 were included and divided into two groups of 63 cases each according to the method of randomized numerical table. Conventional lumbar traction treatment was applied in the control group, while in the study group, heat fumigation with Hai Tong Pi decoction and traditional Chinese bone-setting manipulation were adopted in addition to conventional lumbar traction treatment. The total effective rate was compared between the groups, and the lumbar spine mobility, lumbar spine function scores, and symptom scores were compared between and within the groups. *Results:* After treatment, the total effective rate in the study group was higher than that in the control group ($P < 0.05$). The lumbar spine mobility and lumbar spine function scores after treatment were significantly higher in both groups compared with those before treatment, while lumbar spine mobility and lumbar spine function scores were higher in the study group than in the control group ($P < 0.05$). After treatment, the scores of symptoms such as lumbar back pain, radiating pain in the lower limbs, and urinary and defecation disorders were significantly lower in both groups compared with those before treatment, while the scores of each symptom in the study group were lower than those in the control group ($P < 0.05$). *Conclusion:* In the treatment of patients with lumbar disk herniation, the combined application of heat fumigation of Hai Tong Pi decoction and Chinese bone-setting manipulation can enhance the treatment effectiveness, improve the lumbar spine function, lumbar spine mobility, and lumbar back pain.

Keywords: Orthopedics and traumatology; Lumbar disk herniation; Lumbar traction; Hai Tong Pi decoction; Traditional Chinese medicine heat fumigation; Chinese bone-setting manipulation

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1. Introduction

Lumbar disk herniation is a common chronic degenerative spinal lesion in orthopedics, with a high incidence in the elderly and a high morbidity rate^[1]. After the onset of lumbar disk herniation, patients experience low back pain, lumbar dysfunction, limited lumbar spine activities, and recurrent episodes during the long course of the disease,

causing serious interference in the patient's daily life and declined quality of life [2]. Clinical practices advocate for an active approach to treating lumbar disk herniation. The treatment of lumbar disk herniation in Western medicine typically involves lumbar traction, utilizing negative gravity to apply traction to the lumbar spine, which can correct vertebral body alignment to a certain extent [3], but some patients may not achieve optimal results with this single lumbar traction treatment. In recent years, clinical research reports on the application of traditional Chinese medicine techniques in the treatment of lumbar disk herniation have increased, and traditional Chinese medicine techniques such as heat fumigation of traditional Chinese medicines and bone-setting manipulation have achieved certain effects in the treatment of lumbar disk herniation. This study investigated the effects of heat fumigation with Hai Tong Pi decoction and Chinese bone-setting manipulation treatment on lumbar disk herniation patients.

2. Materials and methods

2.1. General information

126 cases of patients with lumbar disk herniation who visited the orthopedic department of the hospital from January 2022 to May 2023 were included and divided into two groups of 63 cases each according to the method of randomized numerical table. There were 41 males and 22 females in the control group, with a minimum age of 60 years and a maximum age of 84 years, with a mean of 71.35 ± 6.02 years; there were 43 males and 20 females in the study group, with ages ranging from 60 to 86 years, with a mean of 71.68 ± 5.94 years. The data on gender and age were compared between the groups, and it was found that the difference between the data was not statistically significant ($P > 0.05$), which indicated that the general information of the two groups was comparable. This study was approved by the hospital ethics committee. The patients and their families were given an explanation of this study and their consent was obtained.

Inclusion criteria included lumbar disk herniation diagnosed by symptom observation and imaging examination; elderly not less than 60 years old; patients awake and conscious during the treatment period, who did not have consciousness disorder.

Exclusion criteria were patients with lumbar disk herniation combined with spinal fracture, spinal tuberculosis, or spinal tumor; patients with cardiovascular and cerebrovascular diseases; patients with cognitive impairment; the presence of systemic infection.

2.2. Methods

In the control group, conventional lumbar traction was implemented. The patients received traction therapy in a prone position on the traction bed, with the initial traction load value set at 35 kg. The subsequent load value was adjusted according to the patient's specific conditions. Lumbar spine traction was performed once per day for 30 minutes each time, continuously for 2 weeks.

In the study group, in addition to conventional lumbar traction treatment, heat fumigation with Hai Tong Pi decoction and Chinese bone-setting manipulation were adopted, and the specific steps were as follows.

- (1) Heat fumigation with Hai Tong Pi decoction: 30g safflower, 30g rhizoma *Ligusticum chuanxiong*, 30g Cortex Eucommiae, 30g parasitic *Loranthus*, 30g *Clematis chinensis*, 30g *Turbinaria*, 30g *Lycopodium clavatum*, 30g Hai Tong Pi, 30g *Gentiana macrophylla*, 30g *Ramulus mori*, 30g *Notopterygium* root, 30g cinnamon twig, 30g Cortex Acanthopanax, 20g *Radix sileris*, 30g *Spatholobi caulis*, 15g *Boswellia*, and 15g myrrh were crushed to coarse material using a pulverizer, which was then placed on pillows and put in a steam pot for 60 minutes of continuous heat fumigation. During the treatment, a thick towel was placed on the affected area, pillows were placed onto the towel for heat fumigation treatment for 30 minutes, once a day, and continued for 2 weeks.

(2) Chinese bone-setting manipulation: The patient was instructed to lie down on the treatment bed, placing one pillow below the chest, specifically in the iliac front part of the patient, ensuring that the lumbar region maintained an over-extension position. The physician stood on the patient's right side and pushed downward with both thumbs from 2–3cm beside the patient's spinous process with even force for 8–12 times, and then the physician continued to press the patient's spinous process and high protruding parts with his right elbow with the help of his body weight for about 2 minutes, followed by pressing and kneading the patient's dorsal acupuncture acupoint, pincer spine acupoint, Changqiang acupoint, Feiyang acupoint, Jinmen acupoint, and Tao Dao acupoint until the localized area became warm. Bone-setting manipulation was performed once a day for 2 weeks, with each session lasting about 1 hour.

2.3. Observation indicators

The total effective rate was compared between the groups; the lumbar spine mobility, lumbar spine function score, and symptom scores were compared between and within the groups.

Efficacy: Evaluation of the treatment efficacy was carried out according to the relief of symptoms and the improvement of lumbar spine function after treatment, such as the disappearance of symptoms and full recovery of lumbar spine function, i.e., cured; the relief of symptoms and partial improvement of lumbar spine function, i.e., improved; the symptoms were not relieved and no improvement of lumbar spine function, i.e., ineffective. The cured and improved cases were categorized as effective, and the sum of the percentages of these two classes of cases was counted, i.e. the total effective rate.

Lumbar spine function score: The lumbar spine function of the patients was evaluated using the Japanese Orthopaedic Association (JOA) scale as an assessment tool, with a maximum score of 29 and a minimum score of 0. The final score obtained was proportional to the lumbar spine function.

Symptom scores: Regarding the assessment of the severity of symptoms after the onset of lumbar disk herniation, Likert's 4-grade scoring method was applied to score the severity of symptoms such as lumbar back pain, radiating pain in the lower extremities, and urinary and defecation disorders. The score range was set to be 0–3, and the higher the score obtained, the higher the severity of the symptom.

2.4. Statistical methods

The data obtained in this study were analyzed statistically using SPSS22.0 software. The count data were compared with the χ^2 test, and the measured data were normally distributed, and the *t*-test was used for comparison, with $P < 0.05$ indicating a statistically significant difference.

3. Results

3.1. Comparison of total effective rate between two groups

After treatment, the total effective rate in the study group was higher than that in the control group ($P < 0.05$), as shown in **Table 1**.

Table 1. Comparison of total effective rate between the two groups [n (%)]

Group	Cases	Cured	Improved	Ineffective	Total effective rate
Control group	63	32 (50.79%)	23 (36.51%)	8 (12.70%)	55 (87.30%)
Study group	63	38 (60.32%)	24 (38.10%)	1 (1.59%)	62 (98.41%)*

* $P < 0.05$ vs. control group

3.2. Comparison of lumbar spine mobility and lumbar spine function scores between the two groups

After treatment, lumbar spine mobility and lumbar spine function scores in both groups were significantly higher compared with those before treatment, while lumbar spine mobility and lumbar spine function scores in the study group were higher than those in the control group, both $P < 0.05$. The results are presented in **Table 2**.

Table 2. Comparison of lumbar spine mobility and lumbar spine function scores between the two groups (mean \pm standard deviation)

Group	Time	Lumbar spine mobility (°)				Lumbar spine function score (points)
		Forward bend	Posterior extension	Lateral flexion	Rotation	
Control group (n = 63)	Before treatment	47.29 \pm 4.16	12.51 \pm 1.14	14.19 \pm 1.06	13.29 \pm 1.17	16.58 \pm 2.19
	After treatment	52.37 \pm 4.94 [#]	14.69 \pm 1.58 [#]	16.43 \pm 1.87 [#]	15.07 \pm 1.46 [#]	19.37 \pm 2.65 [#]
Study group (n = 63)	Before treatment	47.53 \pm 4.08	12.63 \pm 1.06	14.30 \pm 1.03	13.39 \pm 1.12	16.74 \pm 2.03
	After treatment	60.46 \pm 5.32 ^{#*}	17.05 \pm 1.97 ^{#*}	18.97 \pm 2.14 ^{#*}	17.12 \pm 1.85 ^{#*}	22.09 \pm 2.71 ^{#*}

[#] $P < 0.05$ vs. before treatment, * $P < 0.05$ vs. control group

3.3. Comparison of symptom scores between the two groups

After the treatment, the scores for the symptoms of low back pain, radiating pain of lower limbs, and urinary and defecation disorders were significantly reduced in both groups compared to the pre-treatment period, while the scores of each symptom in the study group were lower than those in the control group, all $P < 0.05$. The data are shown in **Table 3**.

Table 3. Comparison of symptom scores between the two groups (mean \pm standard deviation, points)

Group	Time	Low back pain	Radiating pain in the lower extremities	Urinary and fecal problems
Control group (n = 63)	Before treatment	2.13 \pm 0.42	2.05 \pm 0.40	2.19 \pm 0.47
	After treatment	1.58 \pm 0.43 [#]	1.52 \pm 0.48 [#]	1.61 \pm 0.45 [#]
Study group (n = 63)	Before treatment	2.15 \pm 0.45	2.03 \pm 0.44	2.21 \pm 0.54
	After treatment	1.17 \pm 0.39 ^{#*}	1.06 \pm 0.31 ^{#*}	1.16 \pm 0.40 ^{#*}

[#] $P < 0.05$ vs. before treatment, * $P < 0.05$ vs. control group

4. Discussion

For lumbar disk herniation, clinical practices advocate the implementation of active treatment after the onset of the disease. Western medicine typically recommends lumbar traction therapy, utilizing traction beds in weight-bearing traction mode. Gravity is used to complete the traction for the lumbar vertebrae and disks, promoting the recovery of the patient's lumbar disk position and alleviating compression on the cauda equina nerve. This helps achieve relief from lumbar and sciatic nerve pain. Lumbar spine exercise is considered beneficial not only for strengthening but also for expanding the range of motion in the lumbar spine [4]. Conventional lumbar traction therapy can play a certain therapeutic role for patients with lumbar disk herniation, but some patients fail to achieve the optimal therapeutic effect with single lumbar traction therapy, and its therapeutic efficacy requires improvement.

In recent years, the application of Chinese medicine in the treatment of lumbar disk herniation has increased. Lumbar disk herniation belongs to the category of "paralysis" in Chinese medicine, the pathogenesis of which

is the insufficiency of kidney qi, the invasion of wind, cold, and dampness, damage to yang qi, paralysis of the tendons and veins, and impaired circulation of qi and blood in the meridians and channels, and the resulting pain from the poor circulation. Therefore, the principle of Chinese medicine for lumbar disk herniation is to warm channel and disperse cold, dispel wind and dampness, enhance blood circulation and remove blood stasis, and activate qi circulation to relieve pain^[5,6]. Chinese medicine heat fumigation and Chinese bone-setting manipulation are two Chinese medicine techniques that are commonly used in the treatment of lumbar disk herniation. Among these, Chinese bone-setting manipulation belongs to Chinese medicine physiotherapy, which is mainly guided by the theory of Chinese medicine meridians and collaterals and bone-setting manipulation as a means to remove the blood stasis through bone-setting manipulation of the patient's lumbar spine, thereby prompting the qi, balancing yin and yang qi in the body, and effectively improving the local blood circulation to reduce the pain caused by the poor local blood circulation. It can effectively improve local blood circulation, reduce nerve edema and adhesion caused by poor local blood circulation, and loosen the muscles of the lumbar spine to further reduce pain^[7,8]. Heat fumigation of traditional Chinese medicine is a kind of traditional Chinese medicine treatment method in addition to the internal treatment of traditional Chinese medicine, and this approach allows drugs to act directly on the affected area through steam without metabolizing through the liver and kidney, which can improve the safety of treatment^[9,10]. The prescription of heat fumigation of traditional Chinese medicine in this study is Hai Tong Pi decoction, in which safflower can invigorate blood circulation and remove blood stasis, *Ligusticum chuanxiong* can invigorate blood circulation and promote qi, dispel wind, and relieve pain. Cortex Eucommiae and parasitic *Loranthus* can replenish the liver and kidney, and strengthen the tendons and bones, and *Clematis chinensis* can dispel wind-dampness, and improve the channels and meridians. *Turbinaria*, *Lycopodium clavatum*, and Hai Tong Pi can dispel wind and dampness, soothe the tendons and enhance blood circulation, dissipate blood stasis, reduce swelling, and relieve pain. *Gentiana macrophylla* can dispel wind-dampness, remove dampness and heat, and relieve paralysis and pain. *Ramulus mori* can dispel wind-dampness and improve the joints, while *Notopterygium* root can dissipate cold and relieve pain, and dispel wind-dampness. Cinnamon branches can warm the channels, *Radix sileris* can dispel paralysis and cold, and wind-dampness. Cortex Acanthopanax can dispel wind-dampness, tonify liver and kidneys, and strengthen the muscles and bones, while *Spatholobi caulis* can invigorate blood circulation and remove blood stasis, and invigorate the channels. *Boswellia* and myrrh can dissipate blood stasis and relieve pain, eliminate swelling, and regenerate muscle. The combination of these herbs can enhance blood circulation and eliminate blood stasis, move qi and relieve pain, remove paralysis and dissipate cold, and dispel wind and dampness.

In this study, it was found that the total effective rate of the study group was higher than that of the control group, the lumbar spine mobility and lumbar spine function scores of the study group were higher than that of the control group, and the scores on each symptom of the study group were lower than that of the control group, all of which were statistically significant ($P < 0.05$). These indicated that heat fumigation of Hai Tong Pi decoction combined with bone-setting manipulation of traditional Chinese medicine can better improve the lumbar spine function and lumbar spine mobility of lumbar disk herniation patients and alleviate lumbar back pain, lower limb radiating pain, and other symptoms with remarkable efficacy.

5. Conclusion

To summarize, in the treatment of patients with lumbar disk herniation, the combined application of heat fumigation of Hai Tong Pi decoction and bone-setting manipulation can enhance the therapeutic effect, improve the lumbar spine function and lumbar spine mobility, and reduce lumbar back pain.

Disclosure statement

The author declares no conflict of interest.

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