

# Observation on therapeutic effect of acupuncture at abdomen acupoints plus tuina for lumbar intervertebral disc herniation

## 针刺腹部穴位加推拿治疗腰椎间盘突出症疗效观察

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### Abstract

**Objective:** To observe the clinical efficacy of acupuncture at abdomen acupoints plus tuina for lumbar intervertebral disc herniation (LIDH).

**Methods:** A total of 70 patients with LIDH were randomized into an observation group and a control group, with 35 cases in each group. The observation group was treated with acupuncture at abdomen acupoints plus tuina, while the control group was treated only with tuina treatment. The clinical efficacy was observed after one course of treatment.

**Results:** The cure rate and the total effective rate of the observation group were 83.3% and 96.7%, respectively. The cure rate and the total effective rate of the control group were 39.4% and 78.8%, respectively. There were significant differences in the cured rate and the total effective rate between the two groups (both  $P < 0.05$ ). There was no significant difference in Japanese Orthopedic Association (JOA) score between the two groups before treatment ( $P > 0.05$ ). After treatment, the JOA scores of both groups increased significantly, and the intra-group differences were statistically significant (both  $P < 0.05$ ); the JOA score of the observation group was significantly higher than that of the control group ( $P < 0.05$ ).

**Conclusion:** Acupuncture at abdomen acupoints plus tuina has a better therapeutic effect than tuina alone in the treatment of LIDH.

**Keywords:** Acupuncture Therapy; Points, Chest & Abdomen; Tuina; Massage; Low Back Pain; Intervertebral Disc Displacement; Pain Measurement

**【摘要】目的:** 观察针刺腹部穴位加推拿治疗腰椎间盘突出症的临床疗效。**方法:** 将70例腰椎间盘突出症患者随机分为观察组和对照组, 每组35例。观察组采用针刺腹部穴位加推拿治疗, 对照组仅采用推拿治疗。治疗1个疗程后观察疗效。**结果:** 观察组痊愈率和总有效率分别为83.3%和96.7%, 对照组痊愈率和总有效率分别为39.4%和78.8%, 两组痊愈率及总有效率差异均有统计学意义(均 $P < 0.05$ )。治疗前, 两组JOA评分差异无统计学意义( $P > 0.05$ )。治疗后, 两组JOA评分均明显升高(均 $P < 0.05$ ), 与本组治疗前差异均有统计学意义(均 $P < 0.05$ ); 治疗组JOA评分高于对照组, 组间差异有统计学意义( $P < 0.05$ )。**结论:** 针刺腹部穴位加推拿治疗腰椎间盘突出症的临床疗效优于单独推拿治疗。

**【关键词】** 针刺疗法; 穴位, 胸腹部; 推拿; 按摩; 腰痛; 椎间盘移位; 疼痛测评

**【中图分类号】** R244.1 **【文献标志码】** A

Lumbar intervertebral disc herniation (LIDH) refers to rupture of the annulus fibrosus due to trauma or degenerative changes and subsequent outward or backward protrusion of the nucleus pulposus, which in turn compresses the nerve root, leading to a series of

symptoms including low back pain and leg pain. As a common and frequently encountered medical condition in young and middle-aged population, LDH can greatly affect the patients' daily living and work and the burden extends to the society. Many LIDH patients may tend to surgical treatment; however, some may not respond well or experience postoperative complications. It is therefore essential to explore a conservative but effective therapy for LIDH<sup>[1]</sup>. We treated LIDH patients with needling abdominal points plus tuina and used tuina alone as the control. The results are now summarized as follows.

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## 1 Clinical Materials

### 1.1 Diagnostic criteria

The diagnosis of LIDH referred to the *Lumbar Disc Herniation*<sup>[2]</sup> and the imaging diagnosis key points in *An Evidence-based Clinical Guide Line for the Diagnosis and Treatment of Lumbar Disc Herniation with Radiculopathy* published by North American Spine Society (NASS)<sup>[3]</sup>: ① pain occurs mostly in the lower back, and radiates towards lower limbs; ② has topical tender points; ③ positive straight-leg raising test and augmentation test; ④ skin sensation, muscle strength and tendon reflex changed; ⑤ spine posture changed; ⑥ antero-posterior and lateral radiographs of lumbar spine suggest scoliosis or physiologic curvature of lumbar vertebrae disappeared; ⑦ CT or MRI examination confirms the disc herniation. LIDH can be diagnosed if patient meets items ①-③, and any one item of ④-⑦.

### 1.2 Inclusion criteria

Those who had a confirmed diagnosis of LIDH by CT or MRI examination; met the syndrome differentiation criteria of blood stasis syndrome in Chinese medicine; with an acute attack within one week or the first attack no more than one week; had no relevant therapy one week before the treatment; agreed to participate in this clinical trial and signed informed consent.

### 1.3 Exclusion criteria

Pregnant or parturient or breast-feeding women; those with diseases of cardiovascular, liver, kidney, or hematopoietic systems; neurological dysfunction or dysfunction of urinary bladder and rectum; systemic and immune diseases; with incomplete clinical data; unable to cooperate with treatment.

### 1.4 Elimination and shedding criteria

Those had significant changes during the treatment; with poor compliance that affected efficacy and safety evaluation; those presenting with severe adverse events, complications and/or special physiological changes that were unsuitable to continue the trial; dropped out during the treatment.

### 1.5 Suspension criteria

Those had severe adverse reactions during the treatment; those presenting with complications, or rapid deterioration of the disease.

### 1.6 Statistical methods

All data were statistically analyzed by the SPSS version 20.0 statistical software. Measurement data were expressed as mean  $\pm$  standard deviation ( $\bar{x} \pm s$ ). Independent sample *t*-test was applied to the comparison between groups. Paired sample *t*-test was applied to the comparison of intra-group data. Chi-square test was applied to the comparison of

counting data.  $P < 0.05$  was considered to indicate a statistically significant difference.

### 1.7 General data

A total of 70 LIDH patients were enrolled from our hospital, between July 2017 and March 2018. All patients were randomly divided into two groups by randomization method used for supplementation, with 35 cases in each group. During the treatment, 5 patients in the observation group dropped out (4 patients in violation of the trial protocol and 1 patient quitted), and 2 patients in the control group dropped out (in violation of the trial protocol). A total of 63 patients finished the study, with 30 cases in the observation group and 33 in the control group. There were no significant differences in the general data between the two groups before treatment (all  $P > 0.05$ ), indicating that the two groups were comparable (Table 1).

**Table 1. Comparison of general data between the two groups**

Group	n	Gender (case)		Average age ( $\bar{x} \pm s$ , year)	Average duration ( $\bar{x} \pm s$ , year)
		Male	Female		
Observation	30	13	17	48.6 $\pm$ 4.1	3.6 $\pm$ 0.7
Control	33	17	16	48.6 $\pm$ 4.0	3.4 $\pm$ 0.7

## 2 Treatment Methods

### 2.1 Observation group

#### 2.1.1 Tuina

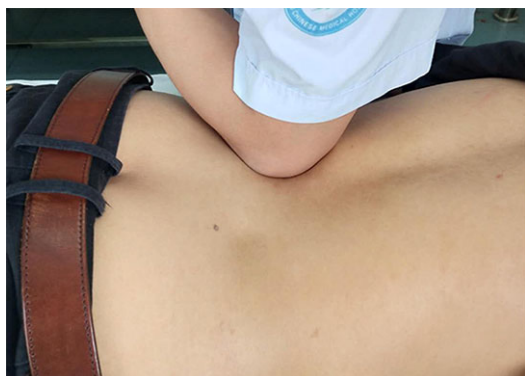
The first step was to relax the lumbar muscles. The patient took a prone position. The physician An-pressed and Rou-kneaded the lumbar muscles on both sides and the relevant acupoints by the right palm or thumb (Figure 1), and Dian-digital pressed and An-pressed tender points along the affected lumbar spine by thumb or the tip of elbow. Pain could be radiated to the buttocks, the back of the thigh, or the calf and foot when pressed. The pressing force changed from light to heavy, and gradually deepened for 1-2 min. The physician then Dian-digital pressed and An-pressed Shenshu (BL 23) (Figure 2), Dachangshu (BL 25) (Figure 3), Qihai (BL 24), Huantiao (GB 30) (Figure 4), Fengshi (GB 31), Weizhong (BL 40) (Figure 5), Yanglingquan (GB 34), Chengshan (BL 57), Chengjin (BL 56) and Kunlun (BL 60) on the affected side. For patients with lumbar curvature absence or kyphosis, the waist could be pressed down with folded palms to restore the lumbar spine physiological curvature. Finally, the physician parting Tui-pushed along the lumbar spine with both hands, from the waist to the lumbosacral region for several times to relax the bilateral sacral muscles.



**Figure 1. Rou-kneading manipulation with palm**



**Figure 2. Dian-digital pressing and An-pressing Shenshu (BL 23) by the thumb**



**Figure 3. Dian-digital pressing and An-pressing Dachangshu (BL 25) by the tip of elbow**



**Figure 4. Dian-digital pressing and An-pressing Huantiao (GB 30) by the thumb**



**Figure 5. Dian-digital pressing and An-pressing Weizhong (BL 40) by the thumb**

The second step was Yao-shaking, traction, and Ya-compressing manipulations to reset. The patient took a prone position. The physician Tui-pushed and Yao-shook patient's waist repeatedly with both hands so that the waist was rotated around. The force gradually increased so that the deep tissue of the waist and the lumbar joints would be relaxed (Figure 6). Then waist traction was applied. The physician held the patient's ankles with both hands to tract against the patient himself (Figure 7).

The third step was straight-leg raising and stretching. The patient was told to straighten the affected limb, and raise it as much as possible, then bend over the affected limb (repeated several times), and then bend the hips and knees. The physician held the ankles to Yao-shake (Figure 8) to relax the waist. And Rou-kneading manipulation was applied to relax the waist and leg muscles.

Cautions: The patients were told to sleep on a hard bed, wear a lumbar support during the day, and avoid bending and heavy manual work.

#### 2.1.2 Acupuncture

Acupuncture was performed after tuina treatment.

Major points: Zhongwan (CV 12), Xiawan (CV 10), Qihai (CV 6) and Guanyuan (CV 4).

Adjunct points: Hegu (LI 4) and Taichong (LR 3).



**Figure 6. Tui-pushing and Yao-shaking the waist**



Figure 7. Waist traction



Figure 8. Yao-shaking the lower limbs

**Methods:** The patient took a supine position. The physician stood on the right side of the patient, examined the patient's lumbar flexion, extension and rotation, and the activity of the affected lower limb, and recorded. The physician perpendicularly punctured acupoints from the healthy side to the affected side using Hwato Brand disposable acupuncture needles of 0.25 mm in diameter and 40 mm in length after the patient's abdomen was fully exposed and routinely disinfected. The major points were deep punctured, and the adjunct points were shallow punctured, with mild twirling and slow lifting-thrusting method. Acupuncture at abdomen should avoid the pores and blood vessels, and be performed gently and slowly. The patient was not required to have feeling of soreness, numbness, distension or heaviness. The needles were retained for 30 min after the physician had a tight feeling under the hand.

The tuina and acupuncture treatments were both performed once a day, for continuous 6 d, at an interval of 1 d. The efficacy was assessed after 3 weeks.

## 2.2 Control group

The control group only received the same tuina treatment as the observation group. The manipulation, location and treatment course were the same as those in the observation group.

## 3 Observation of Curative Efficacy

### 3.1 Observation items

Modified Japanese Orthopedic Association (JOA) low back pain scale<sup>[4]</sup>: including subjective symptoms (0 to 9 points), clinical signs (0 to 6 points), daily activity limitations (0 to 14 points) and bladder function (–6 to 0 points). The total score is 29 points, and the lower the score, the more obvious the dysfunction.

The integral improvement rate was calculated based on the total score of JOA before and after treatment. Integral improvement rate = (JOA score after treatment – JOA score before treatment) ÷ JOA score before treatment × 100%.

### 3.2 Criteria of curative efficacy

According to the *Criteria of Diagnosis and Therapeutic Effect of Disease and Syndromes in Traditional Chinese Medicine*<sup>[5]</sup> and integral improvement rate, the curative efficacy of this study was assessed.

**Cure:** The symptoms of low back pain and radiation pain in the lower limbs disappeared, and the waist functional activity returned to normal. The straight leg elevation was above 70°. The integral improvement rate was ≥75%.

**Improvement:** Low back pain and radiation pain in the lower limbs were obviously relieved, and the lumbar movement returned to normal basically. The integral improvement rate was ≥50%, but <75%.

**Effective:** Low back pain and radiation pain in the lower limbs were relieved, and the lumbar movement partially recovered. The integral improvement rate was ≥30%, but <50%.

**Failure:** The clinical signs, symptoms, and lumbar functional activities were not improved compared with those before treatment. The integral improvement rate was <30%.

## 3.3 Results

### 3.3.1 Clinical efficacy

The cure rate and total effective rate of the observation group were 83.3% and 96.7%, respectively. The cure rate and total effective rate of the control group were 39.4% and 78.8%, respectively. There were significant differences in the cured rate and total effective rate between the two groups (both  $P < 0.05$ ), indicating that the efficacy of observation group was superior to that of the control group (Table 2).

**Table 2. Comparison of clinical efficacy between the two groups (case)**

Group	<i>n</i>	Cure	Improvement	Effective	Invalid	Cure rate (%)	Total effective rate (%)
Observation	30	25	2	2	1	83.3 <sup>1)</sup>	96.7 <sup>1)</sup>
Control	33	13	6	7	7	39.4	78.8

Note: Compared with the control group, 1)  $P < 0.05$

### 3.3.2 JOA score

There was no significant difference in JOA score between the two groups before treatment ( $P > 0.05$ ). After treatment, the JOA scores of both groups increased significantly (both  $P < 0.05$ ), and the JOA score of the observation group was significantly higher than that of the control group ( $P < 0.05$ ), (Table 3).

**Table 3. Comparison of JOA score between the two groups before and after treatment ( $\bar{x} \pm s$ , point)**

Group	<i>n</i>	Before treatment	After treatment
Observation	30	10.73 $\pm$ 2.12	24.13 $\pm$ 2.21 <sup>1)2)</sup>
Control	33	10.64 $\pm$ 2.10	18.85 $\pm$ 1.77 <sup>1)</sup>

Note: Compared with the same group before treatment,

1)  $P < 0.05$ ; compared with the control group after treatment,

2)  $P < 0.05$

## 4 Discussion

There are many effective methods for LIDH in traditional Chinese medicine (TCM), such as tuina, acupuncture, and moxibustion<sup>[6-8]</sup>. Song XG, *et al*<sup>[9]</sup> treated LIDH with Chinese medicine plus tuina, and the effective rate was 94.7%. Wu CY, *et al*<sup>[10]</sup> used abdominal tuina plus electric traction to treat LIDH, and the effective rate was 88.9%. He X, *et al*<sup>[11]</sup> used abdominal tuina combined with Chinese medicine to treat LIDH, the effective rate was 93.9%. Yang BW<sup>[12]</sup> performed tuina manipulation plus other non-surgical treatment for LIDH, and the effective rate was 95.0%. He XT, *et al*<sup>[13]</sup> performed acupuncture at the original point combined with tuina to treat LIDH, and the effective rate was 94.6%. Tan HR, *et al*<sup>[14]</sup> used abdominal acupuncture, box moxibustion and massage to treat LIDH, and the effective rate of 85.0%. Su J, *et al*<sup>[15]</sup> performed abdominal and wrist-ankle acupuncture in treating LIDH, in which the visual analog scale (VAS) score and Oswestry disability index (ODI) of both groups after 3 treatments and the result of the treatment showed significant improvement. Li SQ<sup>[16]</sup> used abdominal acupuncture and ginger-partitioned moxibustion to treat LIDH, and the effective rate was 92.3%.

In Chinese medicine, LIDH falls under the category of 'low back pain' or 'Bi-impediment syndrome'. There are

three major contributing factors: internal dysfunctions, mainly kidney deficiency or constitutional weakness; exposure to exogenous pathogens, such as wind or cold that obstructions meridians and causes qi stagnation and blood stasis; and traumatic injuries that result in retention of stagnant blood<sup>[17-18]</sup>. In summary, LIDH occurs when wind, cold, damp or stasis obstructs the flow of qi and blood. Alternatively, it may also occur as a result of deficiency of qi and blood or insufficiency of the liver and kidney. The treatment strategies are to remove wind, resolve dampness, supplement qi, circulate blood, tonify the liver and kidney, unblock meridians and alleviate pain.

Abdominal acupuncture is based on the theory of TCM, with the regulating system taking Shenque (CV 9) as the core<sup>[19]</sup>, and theories of Zang-fu organ and meridians as the guide. The meridians at the abdomen include the Conception Vessel, Kidney Meridian, Stomach Meridian, Liver Meridian, Gallbladder Meridian, Belt Vessel, Thoroughfare Vessel, Yin Heel Vessel and Yin Link Vessel, covering yin and yang meridians. Furthermore, the Belt Vessel is around the waist and connected with the Governor Vessel and Bladder Meridian on the back. The Thoroughfare Vessel, Yin Heel Vessel and Yin Link Vessel also run through the lower or anterior abdomen, which provides a wider way for qi and blood to transmit and distribute all around the body. Therefore, acupuncture at acupoints of these meridians can regulate Zang-fu organs, qi and blood, and can dredge the meridians and collaterals.

Tuina can expand the capillaries and accelerate metabolism, which benefits the recovery of tissues. It can also accelerate lymphatic drainage and promote the absorption of exudate, help improving the dislocation of joints, and to relieve muscle spasm<sup>[20-21]</sup>. The severity of LIDH may change now and then. During the treatment, the patient should sleep on a hard bed constantly, avoid standing for a long time, and pay attention to correct the bad posture.

In this study, acupuncture at abdomen acupoints plus tuina was applied for LIDH, together with acupuncture at Hegu (LI 4) and Taichong (LR 3) on both sides. The treatment can tonify the kidney, strengthen the sinew and bone, and regulate qi and blood. The results of the study indicated that this treatment for LIDH had a reliable efficacy.



### Conflict of Interest

The authors declared that there was no potential conflict of interest in this article.

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### Statement of Informed Consent

Informed consent was obtained from all individual participants or their relatives in this study.

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