

REHABILITATION TREATMENT BY EAR SQUEEZE WITH WAIST EXERCISE FOR ACUTE LOW BACK PAIN

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ABSTRACT

Objective: This study aims to evaluate the treatment effects of auricular point acupressure with waist exercise in the rehabilitation of patients with simple acute lower-back pain.

Methods: Acupressure of *semen coicis* at the junction point of the antihelical crura of each auricular with waist exercise was employed to treat patients with acute lower-back pain between the period of 2006 to 2014. The visual analogue scale (VAS) on pain was used to evaluate the effects of the treatment.

Results: This study included 210 patients (82 males/128 females, mean age: 47.5 years, disease duration: four hours to three weeks). After the first office-visit treatments, acute pain and the limited movement of all patients ($n=210$) were significantly relieved. Most of these cases recovered and returned to work after one week of self-treatment. Among the 193 cases that were followed-up, low-back pain disappeared after one, two and three weeks of treatments in 110 (57%), 60 (31%) and 14 (7.3%) cases, respectively. Furthermore, nine (4.7%) cases became chronic low-back pain, in which acute low-back pain occurred within two weeks of their first office-visit and treatment.

Conclusion: Auricular point acupressure with waist exercise is an effective treatment for acute low-back pain rehabilitation. Early treatment ascertains better rehabilitative effects. This treatment would most likely replace the dislocated spine joints and stimulate endogenous anesthetic effects.

Keywords: auricular acupressure, waist exercise, acute lower-back pain, *semen coicis*, junction point of antihelical crura, anesthetic effects.

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Introduction

Lower-back pain is an extremely common clinical problem that affects at least 80% of all individuals at some point in their lifetime, and comprises one-third of all out-patients in orthopedics clinics^(1,2). Lower-back pain is second to upper respiratory problems as a symptom-related reason for visits to a physician⁽³⁾. Acute lumbago has become a medical and health problem not only in labor-intensive countries including China, but also in technology-developed nations. As a leading cause of personal activity limitation and work absence throughout much of the world, lower-back pain results in a huge economic burden on individuals, families,

communities, industries and governments^(4,5). In 1998, total incremental direct healthcare costs attributed to lower-back pain in the United States are estimated at 26.3 billion⁽⁶⁾. In China, lower-back pain leads to approximately 11.5% of morbidity patients, while the proportion of patients with acute lumbago has gradually increased in recent years⁽⁷⁾. With the purpose of evaluating an effective treatment for this common clinical problem, the author summarized the cases of acute lower-back pain treated by auricular point acupressure with waist movement for the past eight years.

One of the *semen coicis* (seeds) was placed on the junction point of the antihelical crura (superior antihelical crus and inferior antihelical crus) of each

auricular of the patients, where the smooth surface of the semen coicis faced the auricular skin; and this was fixed with adhesive tape, as shown in Figure 1. The semen coicis were pressed by physician hands from the back of the patients. Acupressure degree was adjusted based on whether the patient felt mild pain on his/her ears. After acupressure for five minutes, the patient was asked to stand up and gently move and rotate his/her waist from left to right, and front and back, respectively (Figure 2A). Once pain was relieved with continues auricular acupressure, the patient was requested to increase the rotation range, and was also instructed to squat for several times.



Fig. 1: Auricular acupressure of semen coicis.

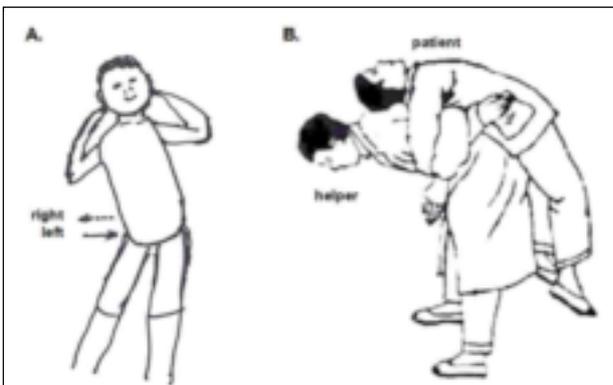


Fig. 2: Waist exercise. **A.** Waist exercise with auricular acupressure by patient. **B.** Back-to-back waist exercise.

Methods

Patients

As summarized in Table 1, 82 male and 128 female patients with acute lower-back pain were admitted for treatment in the Second People’s Hospital of Kunshan from 2006 to 2014. The age of these patients ranged from 17 to 78 years old, with an average age of 47.5 years old. These patients had acute lower-back pain for four hours to three weeks. The major cause of acute lower-back pain is mechanical injury, including the carrying of heavy

items, long-time seating, suddenly getting up from a flat lying position, waist twisting, long-time waist bend, and intensive waist movements.

The most and chief complaint from these patients (>90%) was the cracking sound from the waist, and major symptoms consist of pain in the lumbosacral portion on both sides, which could radiate to the buttocks and one lower extremity. Most of them had serious pain on one side of the waist, and mild pain on the other side. In the first office visit, more than 95% of these patients could not do the following activities: turn over their bodies, stretch or bend their lower limbs, and change their body position when going to or getting up from the bed. In addition to those mentioned above, these patients acted slowly and sit down unharmoniously, as if they were afraid of going to bathroom. During physical examination, the patients walked very slowly with a stiff waist (100%), could not even walk by themselves (40%), and laid flat on a cart or wheelchair.

Male, n (%)	82 (39)
Female, n (%)	128 (61)
Age (yrs, mean)	17-78 (47.5)
Duration of disease	
4 hrs to 2 wks, n (%)	188 (89)
2-3 wks, n (%)	22 (11)
Causes of disease	Mechanic injury:
	lifting heavy
	long time seating
	sudden getting up
	waist twisted
	long time bending
	intensive rotation

Table 1: Characteristics of 210 patients with acute low-back pain accepted the auricular point acupressure with waist exercise.

It was found that all patients were positive in the pick-up test and straight-leg raise (SLR, Lasègue’s sign), while they were negative in the leg strength test. The routine anterioposterior, as well as the lateral X-ray films of the lumbar, were taken for all patients to exclude fractures and tumors; although these had limited values for the diagnosis of acute lower-back pain⁽⁸⁾. Among these, 27 cases (13%) had lumbar scoliosis in routine X examination. CT scan was conducted on

patients after they were examined in clinic to further exclude other diseases, including lumbar fracture, tumor and olisthe.

Auricular point acupressure with waist exercise

One of the semen coicis (seeds) was placed on the junction point of the antihelical crura (superior antihelical crus and inferior antihelical crus) of each auricular of the patients, where the smooth surface of the semen coicis faced the auricular skin; and this was fixed with adhesive tape, as shown in Figure 1. The semen coicis were pressed by physician hands from the back of the patients. Acupressure degree was adjusted based on whether the patient felt mild pain on his/her ears. After acupressure for five minutes, the patient was asked to stand up and gently move and rotate his/her waist from left to right, and front and back, respectively (Figure 2A). Once pain was relieved with continues auricular acupressure, the patient was requested to increase the rotation range, and was also instructed to squat for several times.

After syndromes were substantially improved, patient was asked to press the semen coicis by him/her, and gradually laid on the back of another person (usually a family member) with assistance, as shown in Figure 2B. Then, the patient bent and stretched his/her waist when another person bent and walked. After the pain was substantially relieved, the patient was dismissed with the semen coicis on his/her ears, and was prescribed to perform acupressure with semen coicis by him/her for five minutes before going to and getting up from bed, respectively, every day, for three days.

In the meantime, the patient was also instructed to exercise the function of their erector spinae muscles (lying down on bed and rising up for 30-50 times every day) and recheck after three days. In addition, patients were advised to perform long-term exercise of the function of their erector spinae muscles, even when the syndromes of their acute lower-back pain disappeared.

Supplemental therapy

Non-steroidal anti-inflammatory drugs (NSAID) were given within three days after the treatment of auricular point acupressure with waist exercise. This supplement was cautiously prescribed to patients with stomach diseases.

Evaluation of treatment effects and follow-up

The Visual Analogue Scale (VAS) method and straight-leg raise test were used to evaluate the treatment effects, which were mainly the feeling of patients themselves.

Results

On the day of first office visit, all 210 cases (100%) felt that pains on their lower-back were relieved after auricular point acupressure with waist exercise (Table 2). Short-term follow-ups (three weeks) were conducted on 193 patients, and most patients (170 cases) recovered to work or normal life in approximately one week after treatment.

	Lumbar pain	Movement limitation
Office visits	(+++++)	(+++++)
<u>Day 1</u>		
Degree change	++	+
Cases, n (%)	210 (100)	210 (100)
<u>Follow-up (n=193)</u>		
<u>Day 7</u>	+/-	+/-
Degree change	110 (57)	110 (57)
Cases, n (%)		
<u>Day 14</u>	+/-	+/-
Degree change	60 (31)	60 (31)
Cases, n (%)		
<u>Day 21</u>	+/-	+/-
Degree change	14 (7.3)	14 (7.3)
Cases, n (%)		
<u>> than 3 wks</u>		
Degree	+++	++
Cases, n (%)	9* (4.7)	9* (4.7)

Table 2: 2Treatment effects of auricular point acupressure with waist exercise in patients with acute low-back pain (n=210). The plus signs (+++++) indicate the degrees of lumbar pain or movement limitation of patients before treatment in the first office visit (Day 1). * their first treatments were given after three wks of their back pain.

Among the 193 cases under follow-up, 110 patients (57%) felt that the pain had completely disappeared in one week, 60 patients (31%) felt that the pain disappeared in two weeks, and 14 patients

(7.3%) felt pain disappeared in three weeks. In nine cases (4.7%) who accepted the first treatment, after three weeks of lower-back pain, their syndromes lasted more than three weeks and became chronic lower-back pain (Table 2). The outcome of these treatments (Table 2) indicates that the sooner the auricular acupressure with waist exercise is started, the sooner the lumbar symptoms would be diminished. If patients could not see a doctor within three weeks, which is the gold standard time for treatment, pain on the lower-back would last longer than three or four weeks.

Typical case 1

A 47-year old female suddenly heard loud cracking on her back when she got up at night. After that, pain occurred on both sides of her waist, and the left-side was more severe than the right side. Severe pain confined her lying flatly on bed for three days, even when eating and relieving bowels. After three days, more severe pain limited any position change, preventing her from eating or drinking; and she was sent by other people for emergency care.

Physical examination revealed that she was lying with her face upward, refused examinations on her waist, and could not turn over by herself due to severe pain and muscle spasm on both sides of the lower-back. She felt worse pressed pain on the right side than on the left side of her waist, and the waist pain deteriorated when moving her hip joints. It was positive in the straight-leg raise test (Lasègue's sign), but was negative in the leg strength test. The lumbar extruded to the left side, but the centrams were normal in the X-ray films.

Auricular acupressure was performed, as described above (Figure. 1), when she was lying on the flat bed. After five minutes of pressure by the physician, she felt that the back pain subsided to 60%, and got off the bed to conduct waist exercise following the physician's guidance while the physician continued the acupressure (Figure 2A). The exercise range of the lower-back increased with the decrease in pain relieved. After a while, she was placed on her husband's back, and he squatted and walked with her on her back in a couple minutes to help her waist stretch and exercise with acupressure by herself (Figure 2B). The patient was asked to continue pressing the semen coicis by herself for another 10 minutes after the mentioned actions.

After primary treatment in the first office visit, the patient herself felt that the pain substantially

relieved and was able to walk a couple steps with help. The set semen coicis was kept for additional three days, and the patient was prescribed to self-perform auricular acupressure for three to five minutes before going to and getting out of bed every day. After three days, she came for outpatient appointment by herself and mentioned that the pain on the lower-back had obviously relieved; and that she could take care of her own life by herself without help from other people. Then, she was advised to conduct more exercises to improve erector spinae muscles function. After one week of treatment, she recovered and went back to work.

Typical case 2

A 40-year old male suddenly felt pain on his lower-back and heard a loud cracking sound while playing badminton. Then, this fierce pain knocked him down on the ground, and he was unable to stand up or move. He was sent to the hospital while using the back of another person for support. After examination, he was treated with auricular acupuncture with waist exercise, as mentioned above (Figures 1 and 2), for 10 minutes. Then, he walked out of the treatment room by himself.

Discussion

It was estimated that more than 65% of individuals have a history of acute pain on the lower back in their lifetime, but most of them were not being treated⁽⁸⁾. If effective treatments are not conducted, many cases of acute lower-back pain would become chronic back pain and limit a person's life and work, which would burden the patient himself and our society. In countries with advanced health-care, it is recommended to control these symptoms and restore function while dealing with acute lower back pain. These treatments consist of having rest, treating with drugs, massage, functional exercise and physiotherapy. However, rest while lying on bed during the acute phase may result in side effects such as amyotrophy, declined functions of the heart and lung, thromboembolism, and loss of bone mass^(2, 9). It is suggested that active and initiative treatment is the first-choice for patients with acute pain on the lower back, even though some experts continue to consider that the temporary stop of movement is also important and necessary⁽¹⁰⁾. Massage, acupuncture, nerve block and traditional Chinese medicine are often used in clinic in China⁽¹¹⁾. However, there is still no standardized effective treatment for acute lower-back pain.

Simple acute lower-back pain, which is the most common, has been believed to be caused by lumbar muscle fascia damage and joint partial dislocation^(12,13). We did assess this, but no distinctive evidence could be found from ultrasound and CT examinations for fascia muscular rupture. Furthermore, we found that partial joint dislocation of the lumbar vertebra might be the major cause of acute lower-back pain, as evidenced by the significantly asymmetric joint space in the CT scan (Fig. 3A). It is well-known that dislocation of the shoulder joints or elbow results in severe pain, dysfunction, flexible fixing, malformation and empty joints⁽¹⁴⁾.

After restoration, the pain on the joints and surrounding tissues immediately disappeared or was relieved^(7,14). Patients with acute lower-back pain are always accompanied with syndromes including serious pain on the lumbosacral portion, stiff body position, scoliosis, disappeared protrusion, and spine dysfunction (being unable to bend to both sides, and front and back). After a CT scan was performed on these patients before treatment, we found that three cases had asymmetric joint space changes (gapping) (Figure 3A). It was reported that gapping is an indicator of spine point dislocation^(15,16).



Fig. 3: Zygapophysial joint space. CT spine examination indicates an asymmetric alteration, left zygapophysial joint space is disappeared in patient (Typical case 1?) of acute lower-back pain before treatments.

Different degrees of back pain on both sides, as well as tense waist muscle in patients with acute lower-back pain, are likely caused by the partial (or complete) dislocation of the spine joints, because these small joints of the spine are linked together on both sides. Interestingly, we found that these asymmetric joint spaces in patients with relieved back pain were recovered to symmetric after auricular acupressure with waist exercise (Fig. 3B).

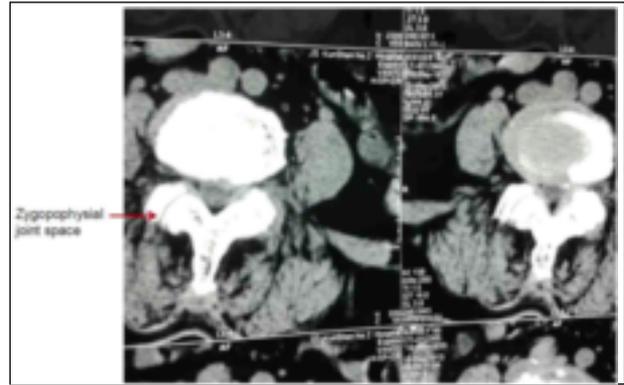


Fig. 4: Zygapophysial joint space. Left, CT spine examination indicates recovered left zygapophysial joint space. Right, an asymmetric alteration.

It is most likely that the effects of auricular acupressure with waist exercise include both pain relief and the relocation of spine points. Auricular acupressure of *semen coicis* could first make waist muscles loose and temporarily relieve pain, and combining this with waist exercise would allow the dislocated joints to return to its normal positions.

Previous studies have shown that auricular acupressure is able to trigger the release of endogenous opioids, including endorphins; which can activate opioid receptors to result in analgesic effects and diminish anxiety⁽¹⁷⁻¹⁹⁾. Endogenous opioids released in body fluid can raise pain threshold and loosen muscle tension in spasm⁽¹⁷⁻¹⁹⁾. Auricular point acupressure can activate corresponding locations in the central nervous system, which would react with the impulse transmitted from the painful part, and thereby relieving pain. Therefore, acupressure primarily relieves pain and reduces muscle spasm in the waist. Following that, waist exercise conducted together with back-to-back traction of the waist of the patient should be performed to restore the dislocation of the zygapophysial joints. Based our observation, after treatment, in day 1, patients should continuously conduct auricular acupressure with waist exercise for a minimum three days and long-term functional exercise of erector spinae muscles. In this way, the treatment would be effective for acute lower-back pain and prevent it from becoming chronic.

In summary, auricular point acupressure with waist exercise is an effective and simple treatment for simple acute lower-back pain. Our study suggests that this new combined treatment should be advised to patients with acute lower-back pain. However, there are some limitations in our research. The technical level and experience of

auricular acupoint extrusion combined with waist movement are very high, so it is difficult to be widely used. At the same time, the recurrence rate of long term low back pain after extrusion exercise is high. The symptoms of low back pain are difficult to get radical cure.

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