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**Clinical Study**

# Therapeutic observation of needle embedding for constipation after thoracolumbar vertebral fracture

## 埋针治疗胸腰椎骨折后便秘疗效观察

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**Abstract**

**Objective:** To observe the clinical efficacy of point needle embedding in treating constipation after thoracolumbar vertebral fracture.

**Methods:** By random number table based on the admission sequence, 85 patients with constipation after thoracolumbar vertebral fracture were randomized into an observation group of 43 cases and a control group of 42 cases. The observation group was intervened by point needle embedding with intradermal needles, while the control group was by point application with Chinese medication. The clinical efficacies were compared between the two groups after intervention.

**Results:** After treatment, the initial defecation time and bowel movement condition were compared. Despite the residual feeling in the initial defecation, the initial defecation time and bowel movements of the observation group were significantly superior to those of the control group ($P<0.05$, $P<0.01$); the total effective rate was 90.7% in the observation group versus 73.8% in the control group, and the difference was statistically significant ($P<0.05$).

**Conclusion:** Point needle embedding can produce a better therapeutic efficacy than Chinese medicinal application in treating constipation after thoracolumbar vertebral fracture; besides, it's easy-to-operate.

**Keywords:** Embedding Therapy; Intradermal Needle Therapy; Acupoint Sticking Therapy; Constipation; Spinal Fractures

**【摘要】目的：**观察穴位埋针治疗胸/腰椎骨折后便秘的临床疗效。**方法：**将 85 例胸/腰椎骨折后便秘患者，按入院先后顺序采用随机数字表法分为观察组(43 例)和对照组(42 例)，观察组采用揿针穴位埋针治疗，对照组采用中药穴位贴敷,治疗完成后比较两组临床疗效。**结果：**治疗后,两组患者首次排便时间及排便情况比较。除首次排便有残留感外，观察组首次排便时间及排便情况均明显优于对照组，组间差异有统计学意义($P<0.05$，$P<0.01$)；观察组总有效率为 90.7%，对照组总有效率为 73.8%，观察组总有效率显著高于对照组($P<0.05$)。**结论：**穴位埋针治疗胸/腰椎骨折后便秘临床疗效优于中药敷贴，且操作简便。

**【关键词】**埋藏疗法；皮内针疗法；穴位贴敷法；便秘；脊柱骨折
**【中图分类号】**R246.2　　**【文献标志码】**A

Thoracolumbar vertebral fracture is commonly encountered in clinic of orthopaedics and traumatology. Local hemorrhage may cause retroperitoneal hematoma, which in turn stimulates autonomic nerves and subsequently results in abdominal bloating and slow peristalsis[1]. Absolute bed resting after fracture, along with the change of defecation ways and environment, may inhibit the defecation reflex and consequently cause constipation. It's reported that the incidence rate of constipation after thoracolumbar vertebral fracture reaches to over90.5%[2]. Mild constipation may affect patient's diet and sleep, while severe cases may have difficulty breathing due to elevated diaphragm, and even lower deep venous thrombosis because of increased intra-abdominal pressure and inferior vena cava occlusion, which can aggravate the patient's condition and affect the treatment and recovery of the fracture[3]. Therefore, it's of great significance to keep smooth defecation in patients with thoracolumbar vertebral fracture. Between January and May of 2015, the Department of Orthopaedics and Traumatology in our hospital adopted point needle embedding to treat 43 cases of abdominal bloating and constipation after thoracolumbar vertebral fracture. The report is given as follows.

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## 1 Clinical Materials

### 1.1 Diagnostic criteria

Thoracolumbar vertebral compression fracture confirmed by X-ray examination or CT scan; pain in the upper or lower back that affected daily life, with complete posterior wall of the affected vertebrae, and without manifestations of damaged spinal cord or nerve

root[4]; conforming to the diagnostic criteria of constipation from the *Criteria of Diagnosis and Therapeutic Effects of Diseases and Syndromes in Traditional Chinese Medicine*[5]; without organic injuries in abdominal cavity or damage of spinal nerve; no organic intestinal diseases prior to the fracture.

**1.2 Inclusion criteria**

In accordance with the diagnostic criteria of thoracolumbar vertebral fracture, with only the fracture of vertebral body, without injuries of spinal cord; a clear trauma history, without a constipation history before the happening of trauma; constipation and abdominal bloating occurred during bed-resting period after fracture, tympany detected by percussion, reduced bowel sounds by auscultation, positive abdominal tenderness, negative rebound tenderness, no shifting dullness; having signed the informed consent form.

**1.3 Exclusion criteria**

Chronic functional constipation, habitual constipation, constipation after cerebral stroke, and constipation due to spinal cord injury, organic intestinal diseases, or hemorrhagic diseases; transverse spinal injury; paraplegia.

**1.4 Statistical method**

The data were analyzed by the SPSS 17.0 version statistical software. Between-group comparison of enumeration data was performed by Chi-square test, while the measurement data were expressed by mean ± standard deviation ($\bar{x} \pm s$) and analyzed by *t*-test. $P<0.05$ indicated a statistical significance.

**1.5 General data**

The 85 eligible subjects were recruited between January and May of 2015 from the Department of Orthopaedics and Traumatology of our hospital. By the random number table, the subjects were randomized into an observation group (43 cases) and a control group (42 cases). There were no significant differences in comparing the data of gender, age, location of fracture, and duration of constipation (all $P>0.05$), indicating the comparability (Table 1) .

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

| Group | *n* | Gender (case) | | Average age ($\bar{x} \pm s$, year) | Constipation duration ($\bar{x} \pm s$, day) | Fracture location (case) | | |
|---|---|---|---|---|---|---|---|---|
| | | Male | Female | | | Thoracic vertebrae | Lumbar vertebrae | Thoracic-lumbar vertebrae |
| Observation | 43 | 19 | 24 | 47.5±13.1 | 4.3±1.2 | 11 | 23 | 9 |
| Control | 42 | 20 | 22 | 44.9±12.3 | 4.1±1.0 | 10 | 24 | 8 |

## 2 Treatment Methods

Patients in both groups received conventional nursing care: nice environment, protection during defecation; emotional care such as avoiding noxious stimulation and guiding the patients to adopt self-regulating emotional methods; in-bed defection training was given as soon as possible, and scheduled defecation time was set up; self-abdominal-massage; diet caring, including proper food selection, high fiber foods, foods can regulate qi, and drinking plenty of water.

**2.1 Observation group**

The observation group was intervened by point needle embedding. The operators must meet two requirements: registered nurse who had passed the systematic training test of traditional Chinese medicine theories and skills for nurses; having passed the specific test of point needle embedding technique.

Points: Bilateral Tianshu (ST 25).

Operation: The patient took a supine posture. After sterilization with 75% alcohol for the to-be-treated areas, pin-like intradermal needles of 0.25 mm in diameter and 0.25 mm in length (manufactured by Hangzhou Yuanli Medical Appliance Co., Ltd., China) were perpendicularly inserted into the points, and then pressed and fixed. The needles were retained for 3 d and then replaced by new ones, 2 sessions as a treatment course, totally for 6 d. Patients were guided to press and knead the needles 3-4 times a day, 1-2 min each time.

**2.2 Control group**

The control group was intervened by Chinese medicinal application.

Point: Shenque (CV 8).

Method: *Da Huang* (*Radix et Rhizoma Rhei*) 3 g was ground into powder and mixed with white vinegar into paste, and then filled into empty plasters for stand-by. After sterilization for the point, the medicinal plaster was applied to Shenque (CV 8) and removed 4 h later. The plaster was applied each day, 6 d as a treatment course.

The initial defecation time and bowel movement condition were recorded, and the therapeutic efficacies were evaluated at the end of the intervention.

## 3 Treatment Results

**3.1 Criteria of therapeutic efficacy**

Based on the criteria of therapeutic efficacy of constipation from the *Criteria of Diagnosis and Therapeutic Effects of Diseases and Syndromes in Traditional Chinese Medicine*[5].

Recovery: Defecation once within 2 d, stool became soft, bowel movements were smooth, and constipation

 

didn't relapse during the intervention.

Improved: Defecation once within 3 d, stool became soft, but bowel movements were not smooth.

Invalid: Defecation once over 3 d, stool was dry, bowel movements were not smooth, other treatments were needed, and constipation relapsed when medications were terminated.

### 3.2 Observation of therapeutic efficacy

#### 3.2.1 Comparison of clinical efficacy

In the observation group, 27 subjects had bowel movements within the first 2-day treatment, without adverse reactions such as red skin rash; 4 subjects discharged dry stool after 4-day treatment after the use of glycerin, and thus were considered failed in the treatment. Twenty-one subjects in the control group were cured. The following 11 subjects were considered failed in the treatment: 3 subjects were treated by drinking *Fan Xie Ye* (*Folium Sennae*) tea instead of medicinal application because of skin allergy; 4 cases were additionally treated with *Fan Xie Ye* (*Folium Sennae*) tea for defecation; 4 subjects got relapse of constipation when the treatment was terminated and were then given glycerin to have bowel movements.

The total effective rate was 90.7% in the observation group, significantly higher than 73.8% in the control group ($P<0.05$), indicating that the clinical efficacy of the observation group should be superior to that of the control group (Table 2).

#### 3.2.2 Comparison of initial defecation time and bowel movement condition

Despite the residual feeling in the initial defecation, the initial defecation time and bowel movement condition of the observation group were significantly superior to those of the control group ($P<0.05$, $P<0.01$), (Table 3).

**Table 2. Comparison of therapeutic efficacy (case)**

| Group | *n* | Recovery | Improved | Invalid | Total effective rate (%) |
|---|---|---|---|---|---|
| Observation | 43 | 27 | 12 | 4 | 90.7[1)] |
| Control | 42 | 21 | 10 | 11 | 73.8 |

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

**Table 3. Comparison of initial defecation time and bowel movement condition**

| Group | *n* | Initial defecation time (case) | | | | Bowel movement condition (case) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 24 h | 2 d | 3 d | >3 d | Dry stool | Use of laxatives | Residual feeling | Normal bowel movement |
| Observation | 43 | 16 | 18 | 6 | 3 | 12 | 4 | 5 | 22 |
| Control | 42 | 7 | 9 | 14 | 12 | 20 | 11 | 11 | 0 |
| $x^2$ value | | 4.543 | 4.092 | 4.435 | 6.818 | 8.640 | 5.701 | 2.949 | 28.990 |
| *P* value | | 0.033 | 0.043 | 0.035 | 0.009 | 0.003 | 0.017 | 0.086 | 0.000 |

## 4 Discussion

### 4.1 Causes of constipation after thoracolumbar vertebral fracture

Modern medicine holds that RH after thoracolumbar vertebral fracture will stimulate the peripheral nerve fibers, causing vegetative nerve dysfunction and hyperactive sympathetic nerves, subsequently leading to reduced gastrointestinal peristalsis and alterations of functions of abdominal organs, finally presenting abdominal bloating, abdominal pain, and constipation[6-7]. According to traditional Chinese medicine (TCM), thoracolumbar vertebral fracture mainly damages the Governor Vessel and the Bladder Meridian, causing blood stagnation, blocked qi activities in meridians and collaterals, dysfunction of Zang-fu organs in transmission, and stagnated qi in Fu organs, and consequently manifesting as abdominal bloating and constipation.

### 4.2 Action mechanism of *Da Huang* (*Radix et Rhizoma Rhei*) application at Shenque (CV 8)

Raw *Da Huang* (*Radix et Rhizoma Rhei*) is cold in nature and bitter in taste, and functions to descend and release heat, expel stagnation and unblock the meridians. Point application with this herb can release heat and promote bowel movement, clear stomach and intestines, unblock the qi activities in intestines, and make bowel movement smooth. Shenque (CV 8) is a crucial point of the Conception Vessel, and it is right located at umbilicus. As the final closure area in peritoneum in the development of embryo, umbilicus has the thinnest horny layer of epiderm without sub-cutaneous fat, and thus the skin and fascia are directly connected. Therefore, medicinal application at Shenque (CV 8) can more efficiently absorb the medicines and produce a better therapeutic efficacy due to the high sensitivity and penetration ability[8]. However, successive treatments with medicinal application may

cause skin allergy because of the thin horny layer of epiderm, which affects the application of this treatment.

### 4.3 Action mechanism of point needle embedding

Acupuncture-moxibustion can promote intestinal peristalsis and thus improve the symptoms of constipation[9-10]. Its action mechanism is possibly related to the regulation of sympathetic and parasympathetic nerves, promotion of the balance of the body, and modulation of intestinal movements[11]. Tianshu (ST 25) is the Front-Mu point of large intestine, and diseases of the six Fu organs are often treated with the Front-Mu points. Acupuncture at Tianshu (ST 25) acts to unblock meridians and collaterals, harmonize qi and blood, ascend the clear and descend the turbid, and clear the triple energizers, and thus it can regulate the gastrointestinal function. It's reported that acupuncture at Tianshu (ST 25) can significantly promote the intestinal peristalsis[12]. It's also reported that intradermal needle with the needles retained and pressed for 1-3 d can produce a long-term effect[13].

Intradermal needle is a special acupuncture tool, but it's made from the same materials as that for filiform needles. Point needle embedding with intradermal needle can produce a continuing and stable stimulation, working to evoke the healthy qi in human body and constantly produce the treatment effect. Without affecting the activities of daily life, this treatment can work better to strengthen the effect in promoting the qi-blood flow, and unblocking meridians and collaterals[14-18]. In this study, over 70% of the patients who received point needle embedding showed effect within 2-day treatment and there were no adverse reactions such as red skin rash.

In summary, the study results suggest that point intradermal needle embedding can produce a good effect in treating abdominal bloating and constipation after thoracolumbar vertebral fracture; moreover, it's easy-to-operate, painless, without skin allergy, and easily accepted by patients. Therefore, it's worth promotion in clinic.

**Conflict of Interest**

There was no potential conflict of interest in this article.

**Statement of Informed Consent**

Informed consent was obtained from all individual participants included in this study.

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