Original Article

Application of TCM nursing techniques to reduce the pains and complications, improve joint function and quality of life of patients with pelvic fracture

Zaiju Tong1, Zhaohui Wang1, Daiqi Jiang1, Zhenghui Jiang1, Chongbin Fang1, Fenfen Yuan2

1Hand and Foot Surgery, 2Department of Orthopedic Trauma, The First People's Hospital of Wenling, Wenling, Zhejiang, China

Received December 9, 2019; Accepted January 13, 2020; Epub April 15, 2020; Published April 30, 2020

Abstract: Objective: The purpose of this study was to analyze the positive contributions of TCM nursing techniques in the improved nursing effects on patients with pelvic fracture. Methods: 89 patients with pelvic fracture admitted to the Department of Orthopaedics of our hospital from August 2018 to July 2019 were included and divided into the control group (CG, n=44) and the observation group (OG, n=45) by double-blind random lottery. Patients in the CG were nursed routinely, while those in the OG were nursed by TCM nursing techniques. The two groups were compared for effect indicators such as pain intensity, incidence of complications, joint function, and quality of life. Results: (1) Upon and 2, 4, and 8 weeks after discharge, patients in the OG reported lower VAS score (P<0.05) and higher Majeed score for joint function than the CG (P<0.05); (2) The incidence of complications and nursing satisfaction were 11.11% and 95.56% in the OG, 29.55% and 81.82% in the CG (P<0.05). (3) 2 months after discharge, patients in the OG yielded higher scores for PH, PS, EN and SR as a part of the quality of life (P<0.05). Conclusion: The application of TCM nursing techniques in patients with pelvic fracture can reduce pains and complications, improve joint function and quality of life, and shall be publicized.

Keywords: Pelvic fracture, TCM nursing techniques, pain, complications, joint function, quality of life

Introduction

As a serious orthopedic trauma, pelvic fracture has an incidence between 2.3% and 3% in all possible fractures, and is a result of direct force working on pelvis, for example, a car crash or dropping from a height [1, 2]. In addition, aging, to a certain degree, will increase its incidence, and the reduced bone quality and mass in the elderly are responsible for a higher incidence of osteoporosis, which is associated with a higher proportion of fractures arising therefrom [3].

Given the emergent conditions, patients with pelvic fracture, in most of the cases, will be directly performed with an operation. The progress in medical technique has effectively ensured the quality of operation. However, most of the pelvic fracture cases are accompanied with complications such as shock, pain, urethral injury, limb movement disorder, constipation, nerve injury, urinary tract infection [4]. On the basis of operative treatment, nursing is also stressed. Thanks to the further study on TCM in clinic, TCM methods are gradually and extensively applied in treatment and nursing. In TCM nursing, emphasis is laid to the correspondence between man and universe, adaptation to patients' local condition as well as the time. It is always performed by putting patients in the center and in a discriminative manner, and pays sufficient respects to patients' personalities, dignity and privacy, with improved comfort and acceptance to patients as the major goals [5].

General TCM nursing techniques include acupuncture, moxibustion, cupping, cutaneous scraping, point massage, auricular-plaster therapy with seeds, hot application of medicine, fuming and washing, TCM retention enema, etc. [6], which fully embody the TCM concept of people oriented, and the TCM characteristics of
Effects of TCM nursing techniques on patients with pelvic fracture

concision, simplicity, effectiveness and low cost. Those methods can alleviate the pains patients suffer and improve their quality of life [7]. This study selected 89 patients with pelvic fracture admitted to our hospital from August 2018 to July 2019 to explore the application values of TCM nursing techniques in nursing so as to find more effective methods for the clinical intervention of patients with pelvic fracture.

Materials and methods

Materials

89 patients with pelvic fracture admitted to the Department of Orthopaedics of our hospital from August 2018 to July 2019 were included and divided into the CG (n=44, age range: 50-76) and the OG (n=45, age range: 48-77) by double blind random lottery. According to the types of pelvic fracture, the cases fell into categories of pure pelvic fracture, stable pelvic fracture, and unstable pelvic fracture. Reasons leading to fracture included car crash, dropping from height, and concurrent injuries were comprised of abdominal injury, fracture of extremities, head injury, thoracic injury and urinary infection. (1) Inclusion criteria: patients who complied with the diagnosis criteria of pelvic fracture [8] as evidenced by CT examination, communicated normally and adapted to the expected TCM nursing techniques were included and provided their informed consent to participate in the study which has been approved by the ethics committee of our hospital. (2) Exclusion criteria: some patients were excluded as they had serious organ diseases, mental disorder, or extremely low nursing compliance resulting in little guarantee of successful nursing, or as they failed in follow-up as scheduled.

Methods

Patients in the CG were only routinely nursed, including health education, basic skin and oral nursing, scientific diets and psychological counseling.

Patients in the OG were applied with TCM nursing techniques, whose specific contents are as follows: Emotional TCM nursing: most fracture cases happen suddenly with the patients unprepared mentally, so they may experience obvious emotional fluctuations. Consistent adverse emotions will affect the effects of treatment and nursing, and as a consequence, the prognosis. For this purpose, medical staffs carried out emotional nursing from following aspects to avoid any stimulation: ward cleaning, instructions on patients for correct visit, and suspension of visit during first aid so as to avoid negative stimulation on patients. Heart-to-heart talk: medical staffs were required to exchange with patients positively to learn about how they think and what they know about the disease, based on which, rational counseling services were provided to drive away the unhealthy emotions in patients. Mental adjustment: medical staffs were required to comfort, persuade, guide and encourage patients to maintain a peaceful attitude, and to inform patients the advantages of maintaining good mental status, such as improve the Qi and blood functions of internal organs, and accelerate the remission.

TCM auricular-plaster therapy with seeds: acupuncture points in the ears, such as large intestine, trijiao, sympathia, lower rectal segment, and Shenmen were selected and sensitive points were identified with a probe, at where, the seeds of cowherb were reserved and slowly pressed by medical staffs with finger pulps slowly and clockwise to cause sore numbness at the ears. The whole process repeated 2 times a day, 3 minutes each time. 3 days later, the same procedures were applied to the same acupuncture points in the other ear.

Hot application of medicine: coarse salt, evodia rutaecarpa (60 g), perillaseed (60 g), semen brassicae (60 g), and semen raphani (60 g) were bagged, heated to 65°C around and then applied on the navel to cover the Qihai, Tianshu and Shenque. Each application lasted 20 minutes and repeated 2 times a day. The bag can be reused, and replaced when a scorched flavor came out from the TCMs in the bag during heating.

Moxibustion: acupuncture points such as Tianshu (2 inches by the side of the lineae mediana of horizontal Qizhong), Zhongwan (4 inches above the Qizhong), Qihai (1.5 inches below the umbilicus). After acupuncture, a moxa stick
was tied to the needle tail and burned for 20 minutes. The whole process repeated once every morning and night.

**Point massage:** Aupoints included the Sanyin and the Sanyang at the upper limbs. After pressing for about 4 minutes, the Jianjing, Quchi, Hegu, and Shousanli were massaged for 30 s, followed by finger rolling, finger joint traction, shaking of elbow, shoulder and wrist joints, bending and stretching of upper limbs. After the upper limbs, the lower limbs were massaged inside and outside at aupoints such as Zusali, Fenglong, Xuanzhong, Fenshi, Futu, Yongquan, Xuehai, Yanglingquan, etc. for 10 minutes respectively. Each aupoint was massaged for 30 s. The heels were knocked for 10 times, and the hip, knee and ankle joints were massaged.

**Observation indicators**

1. **Pain intensity:** by VAS [9], patients were evaluated upon, and 2, 4 and 8 weeks after discharge, and followed up for 2 months. They were required to select a number on a scale between 0 and 10 points to represent their subjective pain intensity. 0 indicates no pain and 10 a severe and unbearable pain. 2. **Joint function:** Majeed functional assessment criteria [10] were used to judge patients’ pelvis functions, including quality of sexual life, stand, sit, pains and working capacity, which correspond to 4 points, 36 points, 10 points, 30 point and 20 points. The total point is 100. A higher point indicates better joint function. Patients were followed up for 2 months and evaluated upon, and 2, 4 and 8 weeks after discharge. 3. **Complications:** the two groups were compared for the incidences of complications such as abdominal distension, deep vein thrombosis of lower extremities, pressure injury, and hypostatic pneumonia. 4. **Quality of life:** the WHQOL-BREF [11] consisting of 4 fields such as PH, PS, EN and SR was used to evaluate patients after 2-month follow-up and upon admission and 2 months after discharge. The 4 fields correspond to 6, 6, 7 and 7 questions graded between 1 and 5, and scored between 6 and 30 for the first 2, 7 and 35 for the last 2. A higher score indicates better quality of life. 5. **Nursing satisfaction:** upon discharge, patients were required to evaluate their satisfaction to nursing in terms of communication, information, service convenience, skills of nurses, effects, service attitudes and sense of responsibility for work based on their subjective feeling during nursing. The satisfaction is valued between 0 and 10. Complete satisfaction is defined as a point between 9 and 10, partial satisfaction between 6 and 8, and dissatisfaction between 0 and 5. The nursing satisfaction = complete satisfaction + partial satisfaction.

**Statistical analysis**

Statistical analysis was performed with SPSS22.0. In case of numerical data expressed as mean ± standard deviation, intergroup and intragroup comparison studies were carried out through independent-samples T test. In case of nominal data expressed as [n (%)], intergroup and intragroup comparison studies were carried out through $X^2$ test. For intragroup comparison at multiple points, ANOVA was adopted for analysis. For all statistical comparisons, significance was defined as P<0.05.

**Results**

**General materials**

No obvious difference was observed between the two groups in terms of proportions of male and female patients (P>0.05), average age (P>0.05), proportions of fracture types (P>0.05) and fracture reasons (P>0.05) (Table 1; Figure 1).

**Pain intensity**

The VAS scores were 7.52±1.19, 5.02±1.13, 4.88±1.04, 4.02±0.68 and 2.37±0.42 in OG, 7.50±1.23, 6.21±1.22, 5.57±1.16, 4.87±0.73, and 3.02±0.53 in the CG for VAS scores at admission, upon, 2, 4 and 8 weeks after discharge. Upon admission, no significant difference was demonstrated between the OG and the CG (P>0.05). Upon, 2, 4 and 8 weeks after discharge, the VAS scores gradually reduced in both groups, and were obviously lower in the OG (P<0.05, Figure 2).

**Joint function**

The Majeed scores for joint function were 50.26±3.38, 60.39±6.39, 67.45±6.59, 75.19±
Effects of TCM nursing techniques on patients with pelvic fracture

Table 1. Comparison between OG and CG for general materials (x±sd)/[n (%)]

<table>
<thead>
<tr>
<th>Materials</th>
<th>CG (n=44)</th>
<th>OG (n=45)</th>
<th>t/X²</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Male</td>
<td>21 (47.73)</td>
<td>23 (51.11)</td>
<td>0.102</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>23 (52.27)</td>
<td>22 (48.89)</td>
<td></td>
</tr>
<tr>
<td>Age (y)</td>
<td></td>
<td>65.23±6.82</td>
<td>66.19±7.01</td>
<td>0.655</td>
</tr>
<tr>
<td>Fracture type</td>
<td>Pure pelvic fracture</td>
<td>19 (43.18)</td>
<td>21 (46.67)</td>
<td>0.853</td>
</tr>
<tr>
<td></td>
<td>Stable pelvic fracture</td>
<td>17 (38.64)</td>
<td>17 (37.78)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unstable pelvic fracture</td>
<td>8 (18.18)</td>
<td>7 (15.56)</td>
<td></td>
</tr>
<tr>
<td>Fracture cause</td>
<td>Car crash</td>
<td>20 (45.45)</td>
<td>18 (40.00)</td>
<td>1.053</td>
</tr>
<tr>
<td></td>
<td>Dropping from a height</td>
<td>15 (34.09)</td>
<td>16 (35.56)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Injury by a crashing heavy object</td>
<td>9 (20.45)</td>
<td>11 (24.44)</td>
<td></td>
</tr>
</tbody>
</table>

Figure 1. Comparison between OG and CG for fracture causes. No significant difference was observed between CG and OG for the number of patients injured in cash crashes (P>0.05), dropping from a height (P>0.05), and injury by a crashing heavy object (P>0.05).

Figure 2. Comparison between OG and CG for pain scores. The OG demonstrated obviously lower VAS scores than the CG upon, 2, 4 and 8 weeks after discharge (P<0.05). But, upon admission, the 2 groups showed no significant difference (P>0.05). *indicates P<0.05 when the 2 groups were compared at the same time point.

7.21 and 82.69±7.55 in the OG, 50.49±3.51, 54.19±5.27, 62.34±5.27, 70.58±6.86 and 75.31±6.94 at admission, upon, 2, 4 and 8 weeks after discharge. Upon admission, the Majeed scores for joint function were significantly different between the two groups (P>0.05). Upon, 2, 4 and 8 weeks after discharge, both groups experienced a gradual rise, which was more obvious in the OG (P<0.05, Figure 3).

Complications

After application of TCM nursing techniques, there were 2 cases of abdominal distension, 1 case of deep venous thrombosis of lower extremities, 1 case of pressure injury, and 1 case of hypostatic pneumonia in OG, with the
Effects of TCM nursing techniques on patients with pelvic fracture

complication incidence of 11.11%, while in CG, the corresponding complications and incidence were 4, 2, 4, 3 and 29.55%, respectively. The incidence of complications in the OG was significantly lower than that in the CG, and the difference was statistically significant (P<0.05, Table 2).

Quality of life

For PH, PS, EN and SR upon and 2 months after discharge, the scores were 13.65±2.19, 15.29±3.62, 16.98±3.52, 17.81±4.02, 24.56±3.56, 25.31±3.62, 30.28±3.66, 29.86±3.55 in the OG, 13.71±2.26, 15.41±3.69, 17.21±3.56, 17.86±4.12, 20.07±2.76, 21.19±3.51, 26.84±2.94 and 26.12±3.24 in the CG. The two groups demonstrated no significant difference upon admission (P>0.05) but 2 months after discharge, those scores were higher in the OG as compared with those in the CG (P<0.05, Figure 4).

Nursing satisfaction

In the OG, there were 20 patients completely satisfied, 23 partially satisfied, and 2 unsatisfied, while in the CG, there were 16 patients completely satisfied, 20 partially satisfied, and 8 unsatisfied. The nursing satisfaction in the OG was 95.56%, significantly higher than that of 81.82% in the CG, and the difference was statistically significant (P<0.05, Table 3).

Discussion

Two groups were more vulnerable to pelvic fracture, the young adults because they are the main laborers shouldering a high activity amount in the society, and often suffer from accidents such as dropping from a height or car accidents [12], and the elderly because they are challenged by a high risk of osteoporosis due to reduced bone mass and quality, which is known as a major hazard related to fracture. In the elderly, pelvic fracture generally takes place as a result of low-energy trauma [13].

After operation, patients with pelvic fracture will have various complications, including intestinal injury, nerve injury, urethral injury, urinary infection, uroschesis, shock, deep venous thrombosis of lower extremity, pressure sore, constipation, abdominal distension, pain, nausea and vomiting [14]. According to the studies of Molière et al [15], after the operation of pelvic fracture, almost all patients will experience pains to various degrees at a serious level and long duration. In addition, it will also produce obvious trauma, high blood, and high risk of hypovolemic shock [16]. In the study by Aprato et al [17], it is found that patients with bone fracture are threatened by a high risk of complications such as deep vein thrombosis of lower extremities, pressure sore, constipation, and uroschesis since it is a long process to recover that they have to lie in bed for a long period of time. In this study, by application of TCM nursing techniques, the OG reported lower VAS scores upon, 2, 4 and 8 weeks after discharge as compared with the CG subject to routine nursing, indicating that the TCM nursing techniques work on reducing fracture-related pains.

TCM nursing techniques are based on the theories of internal organs and focus on the theory of channels and collaterals. By stimulat-
Effects of TCM nursing techniques on patients with pelvic fracture

Table 2. Comparison between OG and CG for the incidence of complications [n (%)]

<table>
<thead>
<tr>
<th>Group</th>
<th>Abdominal distension</th>
<th>Deep venous thrombosis of lower extremities</th>
<th>Pressure injury</th>
<th>Hypostatic pneumonia</th>
<th>Incidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>OG (n=45)</td>
<td>2 (4.44)</td>
<td>1 (2.22)</td>
<td>1 (2.22)</td>
<td>1 (2.22)</td>
<td>5 (11.11)*</td>
</tr>
<tr>
<td>CG (n=44)</td>
<td>4 (9.09)</td>
<td>2 (4.55)</td>
<td>4 (9.09)</td>
<td>3 (6.82)</td>
<td>13 (29.55)</td>
</tr>
</tbody>
</table>

\[X^2\] 4.686  
\[P\] 0.030

Note: compared with the incidence of GC, *P<0.05.

In TCM, ear acupoints are the specific sites the auricle epidermis connects with all body organs, main and collateral channels. They can reflect any pathological change of any disease [22]. Kurath-Koller et al [23] have certified that the auricular-plaster therapy with seeds can stimulate and send information to internal organs for the purposes of regulating internal organs, soothing meridians, relaxing veins, and improving the retardance of Qi and blood movement so as to eliminate the cause of disease. Lu et al [24] also observed that the auricular-plaster therapy with seeds can relieve abdominal distension and pain patients suffer due to fracture. Furthermore, in the study of medicine, moxibustion, and point massage. The results revealed that, compared with the patients in the CG who received routine nursing, the OG reported obviously higher Majeed scores for joint function upon and 2, 4 and 8 weeks after discharge, higher scores of PH, PS, EN, and SR as a part of the quality of life 2 months after discharge (P<0.05), representing that the application of TCM nursing techniques can more obviously improve the pelvic function of patients with pelvic fracture and their quality of life. The emotional nursing implemented in TCM nursing technology can help patients correctly understand the disease and treatment, maintain good compliance, and lay a good foundation for the implementation of other nursing measures. In addition, emotional nursing, auricular-plaster therapy with seeds, hot application of medicine, moxibustion, and point massage can promote local blood circulation, improve blood stasis, and improve the symptoms of patients from different aspects and different ways of action, thus accelerating the joint function. The improvement of joint function makes the patients less affected in the daily life, so that the quality of life can be significantly improved.

Figure 4. Comparison between OG and CG for quality of life 2 months after discharge. For PH, PS, EN and SR as a part of the quality of life 2 months after discharge, the OG reported higher scores than the CG (P<0.05). *indicates P<0.05 as compared between the 2 groups for the same indicator.
Effects of TCM nursing techniques on patients with pelvic fracture

designed by Yeo et al [25], the joint application of auricular-plaster therapy with seeds at various acupuncture points can effectively relieve patients from syndromes of insomnia, constipation, and pain. In this study, the results of nursing techniques applied in the OG indicated an incidence of complications of 11.11%, lower than that of the CG of 29.55% after routine nursing (P<0.05). According to the analysis, it is because acupuncture Shenmen, Zhen and Sympathia in auricular-plaster therapy with seeds help to relieve pain and sedation, and acupoints triple-jiao, Large Intestine, and Internal Secretion help to accelerate intestinal peristalsis, improve bowel function, and reduce the degree of abdominal distension in patients, thus reducing the complications significantly [26]. 95.56% of the patients in the OG were satisfied, while in the CG, it was only 81.82% (P<0.05), indicating that the application of TCM techniques in the nursing of pelvic fracture can improve safety, reduce postoperative complications and factors affecting recovery. As a result, patients recovered more quickly with reduced pain and medical expenses. The therapy and nursing were more acceptable to patients.

In conclusion, the application of TCM nursing techniques in patients with pelvic fracture deserve publicity as they can relieve pains and complications, improve joint function and quality of life. However, the study included small number of study objects, and failed to comprehensively analyze the results, due to which, the conclusions are somehow bias. Furthermore, the incomprehensive application of TCM techniques resulted in insufficient highlight of their values, and the working mechanism of each specific technique is not elaborated in details. Therefore, in the future studies, more attention shall be paid to in-depth studies based on larger sample sizes, from more aspects, and around the working mechanisms of TCM nursing techniques so as to obtain more scientific and representative conclusions to provide more guides for the development of clinical nursing in patients with pelvic fracture.

Acknowledgements
This work was supported by Taizhou Science and Technology Plan Project (No. 1902ky161).

Disclosure of conflict of interest
None.

Address correspondence to: Fenfen Yuan, Department of Orthopedic Trauma, The First People's Hospital of Wenling, No. 333, Chuan'an South Road, Chengxi Street, Wenling, 317500, Zhejiang, China. Tel: +86-13858642883; E-mail: afenfenn@163.com

References


Table 3. Comparison between OG and CG for satisfaction to nursing [n (%)]

<table>
<thead>
<tr>
<th>Group</th>
<th>Completely satisfied</th>
<th>Partially satisfied</th>
<th>Unsatisfied</th>
<th>Satisfaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>OG (n=45)</td>
<td>20 (44.44)</td>
<td>23 (51.11)</td>
<td>2 (4.44)</td>
<td>43 (95.56)*</td>
</tr>
<tr>
<td>CG (n=44)</td>
<td>16 (36.36)</td>
<td>20 (45.45)</td>
<td>8 (18.18)</td>
<td>36 (81.82)</td>
</tr>
<tr>
<td>X^2</td>
<td></td>
<td></td>
<td></td>
<td>4.210</td>
</tr>
<tr>
<td>P</td>
<td></td>
<td></td>
<td></td>
<td>0.040</td>
</tr>
</tbody>
</table>

Note: compared with the satisfaction of CG, *P<0.05.
Effects of TCM nursing techniques on patients with pelvic fracture


