

Preventing Lower Extremity Deep Vein Thrombosis After Hip Fracture Surgery in Elderly Patients by Acupoint Application Combined with Pneumatic Compression Therapy

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Abstract: *Objective:* To investigate and analyze the long-term clinical effects of acupoint application combined with pneumatic compression therapy in the prevention of deep venous thrombosis after hip fracture surgery among the elderly. *Methods:* Sixty elderly patients who had undergone hip fracture surgery from February 2021 to February 2022 were selected as the research subjects. The patients were divided into two groups via drawing lots. Both the groups received nursing care, but the patients in the observation group were treated with TCM acupoint application combined with pneumatic compression therapy, whereas the control group received pneumatic compression therapy. The evaluation indicators included the patients' quality of life and complications. *Results:* The incidence of lower extremity deep vein thrombosis in the observation group was more than twice (0.3%), whereas the incidence of lower extremity complications in the control group was more than 6 times (20%). There was a significant difference between the two groups ($p < 0.05$). *Conclusion:* Traditional Chinese medicine acupoint application combined with pneumatic compression therapy is beneficial for the prevention of postoperative lower extremity deep vein thrombosis among elderly patients. In addition, the patients' overall quality-of-life scores in both physiological and psychological aspects improved significantly, which carries significant clinical reference value.

Keywords: Acupoint application; Traditional Chinese medicine; Pneumatic compression therapy; Minimally invasive surgery for hip fracture in elderly patients; Lower extremity deep vein thrombosis

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1. Introduction

In the prevention of lower extremity deep vein thrombosis after hip fracture surgery among the elderly, pneumatic compression therapy alone cannot meet the actual clinical needs, which will affect the prognosis of patients. In recent years, with the continuous development and clinical application of traditional Chinese medicine (TCM), acupoint application has emerged ^[1], which is more favorable to the prevention of postoperative complications when paired with pneumatic compression therapy for targeted nursing. This study analyzed the use of acupoint application combined with pneumatic compression therapy to explore its treatment and nursing effects.

2. Data and methods

2.1. Clinical data

Sixty elderly patients who had undergone hip fracture surgery from February 2021 to February 2022 were selected as the research subjects. The patients were divided into two groups via drawing lots. In the control group, the proportion of men to women was 13:17, their age ranged from 61 to 76, and the median age was 68.5 ± 2.28 years old; in the observation group, the proportion of women to men was 11:19, their age ranged from 62 to 77, with a median age of 60 ± 2.36 years old. The baseline data of the investigated patients had no significant difference ($p > 0.05$).

2.2. Methods

The control group received pneumatic compression therapy and nursing, which were carried out according to the following steps: upon stabilization, initiate pneumatic compression; the pressurization method of treating the lower limbs through pneumatic therapy involves applying inflation pressure to the lower limbs of the patient and gradually applying pressure to the medial side and root of the whole thigh from the sole; set the pressurization method as intermittent pressurization; the maximum inflation pressure at the pressurized part should be controlled at 180~200 mmHg; each chamber should be pressurized for 10 seconds, once in the morning and once before going to bed; the duration of each pressurization should be half an hour, and the treatment cycle should be about 10 days.

The pneumatic compression therapy received by the patients in the observation group was the same as that of the control group. On this basis, acupoint application was added to the treatment according to the following steps: first, prepare Panax notoginseng powder, pangolin, radix bupleuri, Sichuan dome, safflower, wood fragrance, Angelica sinensis, rhubarb wine, licorice, peach kernel, and trichosanthin; mix and grind the aforementioned prepared substances; mix the powdered form with alcohol and an appropriate amount of sesame oil to produce a paste that can be easily applied; place and fix the paste at the middle part of the acupoint plasters, and stick the plasters onto five acupoints (Xuanzhong, Yanglingquan, Sanyinjiao, Zusanli, and Huantiao); repeat the process each time the plasters are given to the patients; the application time should be 6 hours, and used twice a day; the cycle should be about 10 days.

During the treatment, it is important to observe the patients, especially for any systemic skin allergy, after sticking on the plasters. If there is anaphylactic shock, it needs to be removed immediately.

All the patients received the same postoperative care: (1) psychological intervention; most of the patients are elderly patients, in which after surgical treatment, they tend to stay in bed for a long time, thus affecting their limb function to a certain extent; therefore, patients often develop anxiety and other negative emotions; the attending nurses need to boost their confidence in rehabilitation, which will be conducive to their rapid recovery; (2) after surgical treatment, the nursing staffs need to regularly observe the changes in the patients' blood pressure, heart rate, and other parameters as well as conduct rounds where the patients are located at to prevent accidents; (3) since the patients' movements are restricted and their limbs are unable to function normally after the surgery, the postoperative nursing staffs need to observe the recovery of their lower limbs; they should also role the patients over and pat their backs as well as massage the patients' lower limbs, so as to reduce the incidence of lower extremity deep vein thrombosis; at the same time, patients should be informed to drink sufficient water every day; during their spare time, the nurses can assist in the recovery of the patients' respiratory function through deep breathing exercises; on the premise of following the doctor's advice, patients can be given low molecular weight heparin to avoid complications; it is worth noting that if a patient has leg swelling with non-pitting edema and an abnormal rise in temperature, it is necessary to determine whether the patient has complications of lower extremity deep vein thrombosis as soon as possible and inform the attending physician for appropriate treatment; (4) it is necessary to prepare an early rehabilitation training plan for each patient; after the surgery, it is

important to observe whether the patients' condition is stable, and then assist them in carrying out early training; at the beginning, functional activities such as standing on the hospital bed and limb flexion and extension should be encouraged, but with the recovery and improvement of the patients' lower limb, they should be encouraged to jog or walk upright, so as to promote the rehabilitation process.

2.3. Observation indicators

By using the quality-of-life score, the overall quality of life scores of the two groups of patients were observed and evaluated. The domains include the level of psychological, physiological, and social functions as well as the overall average mental state of each patient.

2.4. Statistical analysis

The statistical form of percentage (%) was adopted in this paper to directly replace the counting data, and the chi-square (X^2) values were given. The physiological function, social function, psychological function, and mental state of the patients were reflected by ($\bar{x} \pm s$). SPSS 21.0 was used to carry out the analysis, in which the chi square values, t values, and p values were analyzed. p less than 0.05 indicates statistically significant data.

3. Results

Through comparing and analyzing the complications and average quality-of-life scores of the patients in both groups, it was found that the average incidence of lower extremity deep vein thrombosis in the observation group was more than twice (0.3%), while the incidence of lower extremity complications in the control group was more than six times (20%). There was a significant difference between the two groups ($p < 0.05$). The overall quality-of-life scores of the patients in the two groups are shown in **Table 1**.

Table 1. Comparison of the quality-of-life scores between the two groups

Group	Number of cases	Psychological function	Physiological function	Social function	Mental state
Control group	30	74.12±5.35	78.45±4.52	73.33±5.24	76.43±5.54
Observation group	30	85.35±6.76	87.33±5.27	83.61±6.52	86.78±6.86
t		7.1348	7.0054	6.7313	6.4290
p		0.0000	0.0000	0.0000	0.0000

4. Discussion

Clinically, elderly hip fractures are often treated via surgery, and the symptoms can improve quickly. However, after surgery, patients often stay in bed for a long time, which increases the probability of lower extremity deep vein thrombosis [2]. However, pneumatic compression therapy alone cannot effectively prevent the occurrence of lower extremity deep vein thrombosis. This understanding has attracted great attention in clinical practice. According to traditional Chinese medicine [3], on the basis of pneumatic compression therapy, acupoint application can better prevent complications from occurring and promote the improvement of patients' quality of life. Under the combined treatment and nursing, the prognosis of patients is better [4]. This paper showed that with combined treatment and nursing, the patients' overall quality-of-life score improved significantly, which is helpful for the prevention of complications.

In short, TCM acupoint application combined with pneumatic compression therapy in the rehabilitation of postoperative elderly hip fractures and the prevention of lower extremity deep vein thrombosis has a significant value, which is worthy of clinical reference and application.

Disclosure statement

The authors declare no conflict of interest.

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