Postprint of a Case Report on the Therapeutic Effect of Traditional Chinese Medicine Wet Compress Combined with Rehabilitation Guidance for Type I CRPS after Rotator Cuff Injury Surgery

Authors: Kong Hua, Xing Liang, Zhang Pan, Yang Ruxin, Xing Liang

Date: 2022-12-05T18:10:16+00:00

Abstract

Complex Regional Pain Syndrome (CRPS) represents one of the rare complications following shoulder surgery. This paper summarizes the nursing experience of employing traditional Chinese medicine wet compress combined with rehabilitation guidance in the clinical care of a patient with type I CRPS following rotator cuff repair surgery. Through technical modifications of traditional Chinese medicine wet compress procedures to maintain constant herbal temperature and enhance patient comfort, combined with personalized rehabilitation protocols, this approach ameliorates symptoms including pain and limited joint mobility in type I CRPS following rotator cuff repair surgery, thereby improving patient quality of life.

Full Text

Preamble

Clinical Archives of Integrative Medicine · Integrated Chinese and Western Medicine Clinical Cases · Observation on the Application Effect of Traditional Chinese Medicine Wet Compress Combined with Rehabilitation Guidance in a Case of Type I CRPS After Rotator Cuff Repair Procedure

KONG Hua, XING Liang, ZHANG Pan, YANG Ruxin

Fourth Department of Joints, Wangjing Hospital, Chinese Academy of Chinese Medical Sciences, Beijing 100102

Abstract

Complex regional pain syndrome (CRPS) is a rare complication following shoulder surgery. This article summarizes the nursing experience of using traditional Chinese medicine (TCM) wet compress combined with rehabilitation guidance in the clinical care of a patient with Type I CRPS after rotator cuff repair. Based on conventional TCM wet compress techniques, technical improvements were implemented to maintain a constant temperature of the herbal medicine, thereby enhancing patient comfort. Combined with personalized rehabilitation guidance programs, this approach effectively alleviated pain and limited joint mobility symptoms in the patient with Type I CRPS after rotator cuff repair, ultimately improving quality of life.

Keywords: complex regional pain syndrome; nursing; traditional Chinese medicine wet compress; rehabilitation guidance

Introduction

Complex regional pain syndrome (CRPS) is a syndrome characterized by persistent localized pain that typically manifests after trauma or surgery, often disproportionate in duration or intensity to any known trauma or other pathology [1]. For orthopedic postoperative patients with Type I CRPS, residual symptoms include pain, swelling, thin skin, muscle atrophy, and joint stiffness with limited flexion and extension [2]. In traditional Chinese medicine, these manifestations belong to the category of bone fracture and tendon injury, with a pathogenesis of damaged limb meridians and vessels. As the surgical approach emphasizes external treatment, TCM wet compress represents one of the integrative nursing methods widely applied to alleviate postoperative pain and swelling in orthopedic patients [3].

Currently, the pathogenesis of Type I CRPS remains unclear, and there is no unified, recognized standard for clinical treatment [4]. Physical and occupational therapy constitute a critical component of the rehabilitation process for CRPS patients and are generally recommended as first-line treatment [5]. This article summarizes the nursing experience of TCM wet compress combined with rehabilitation guidance in a patient with Type I CRPS after rotator cuff repair, exploring the application effects of this combined approach.

1. Case Data

The patient, Li, female, was admitted to the hospital. Admission vital signs: temperature 36.5°C, pulse 78 beats/min, respiration 18 breaths/min, blood pressure 135/85 mmHg. Chief complaint: "Right shoulder and upper arm pain with limited mobility for over 3 months following right rotator cuff suture repair." Past medical history: hypertension for over 10 years; lumbar disc herniation for 5 years. No history of food or drug allergies. Present symptoms: The patient was diagnosed with Type I CRPS following right rotator cuff repair.

2. Nursing Interventions

2.1 Pain Assessment

After admission, medical staff used the Visual Analogue Scale (VAS) to assess the patient's pain condition, where 0 points indicated no pain, 5-7 points indicated moderate pain, and 8-10 points indicated severe pain. This patient scored 7 points on admission, indicating severe pain, with persistent pain in the right shoulder and upper arm muscles, mildly limited passive movement of the right shoulder, and poor recovery of active movement. Since onset, the patient had no abnormal chills or fever, normal appetite, poor sleep, and regular bowel movements and urination.

Traditional Chinese medicine examination revealed: The patient was conscious with natural expression and moist complexion, medium build, and comfortable posture. Speech was clear, loud, and forceful with no abnormal odors detected. The tongue coating was thin and white, tongue body was moderate in size without teeth marks, moved freely, sublingual vessels were red without tortuosity, and pulse was wiry and thin. Specialized physical examination: The patient walked into the ward independently with a right shoulder abduction brace. The right shoulder showed abnormal pain with mild swelling. Passive range of motion: abduction 90°, forward flexion 90°, external rotation 30°. Active range of motion: abduction 45°. The patient met the clinical diagnostic criteria for "Complex Regional Pain Syndrome in Adults" updated in 2018 by the Royal College of Physicians [6]: persistent pain disproportionate to the primary noxious event.

Admission diagnosis: Traditional Chinese medicine diagnosis: tendon injury disease with qi stagnation and blood stasis syndrome; Western medicine diagnosis: Type I CRPS following rotator cuff repair.

2.2 Shoulder Function Assessment

Shoulder function was evaluated using the Shoulder Function Assessment Scale [7], which comprises five components: pain, shoulder range of motion, muscle strength, daily activity ability, and local morphology, with a total score of 100 points. Higher scores indicate better shoulder function. The patient's initial assessment results on admission are shown in Table 1.

Shoulder Function Assessment Scale

2.3 Nursing Care Plan

Based on the patient's right shoulder pain and mobility status, a personalized nursing plan was developed as shown in Table 2.

Patient Nursing Care Plan

2.4 Pain Management Nursing Measures

An improved TCM wet compress method was implemented to alleviate the patient's pain symptoms. The specific formula and usage were as follows: Rheum palmatum 30g, Saposhnikovia divaricata 20g, Clematis chinensis 20g, Erythrina variegata bark 20g, Speranskia tuberculata 20g, Frankincense and Myrrh 15g each, Corydalis yanhusuo 20g, Lycopodium japonicum 20g, Peach kernel and Safflower 15g each. The decoction was prepared by the hospital pharmacy. Nurses placed the decoction in a constant-temperature warming device, heated it to 40°C, and maintained this fixed temperature. The warmed herbal medicine was poured into a treatment tray, and medical cotton pads were fully soaked and applied to the affected area. Two cotton pads were used alternately, changed every 5 minutes. The wet compress was applied once daily for 30 minutes, with a two-week treatment course.

2.5 Self-Care Deficit Nursing Measures

Based on the patient's shoulder condition, a personalized rehabilitation plan was developed in two phases. The first phase was the first week after admission, with the goal of restoring normal scapulohumeral rhythm below 90° and gradually resuming low-intensity daily activities below 90°. The second phase was the second week, with the goal of strengthening shoulder muscle training and continuing to enhance stability of peri-shoulder muscles.

Phase 1 Rehabilitation Guidance: Using a wooden stick or cane with assistance from the healthy arm, the patient performed active movements including forward flexion, abduction, and external rotation, holding each movement at maximum range for 10 seconds, 3 sets daily with 10 repetitions per set. In supine position, small-weight dumbbells were used for elbow flexion and extension exercises to strengthen biceps and triceps muscles. Daily practice involved pressing a balloon downward at a 45° angle for 10 repetitions, maintaining pressure for 10 seconds while keeping the body stable, 3 sets daily. This activated the trapezius, deltoid, and serratus anterior muscles. During sleep, the patient was positioned on the healthy side or supine to avoid pressure on the affected side. When standing, a cervical sling was worn to maintain the shoulder in neutral abduction position. Combing hair from front to back was practiced for one minute each time, three times daily, to improve daily living abilities.

Phase 2 Rehabilitation Guidance: Resistance bands were used for shoulder flexion, abduction, external rotation, and internal rotation stretching exercises, holding each movement at maximum range for 10 seconds, 3 sets daily with 15 repetitions per set. For muscle stability training, the patient performed horizontal balloon pressing exercises for 3 minutes while maintaining body stability, 3 sets daily with 10 repetitions per set.

3. Results

After two weeks of TCM wet compress and rehabilitation guidance, the patient's shoulder pain was significantly relieved. The VAS score comparison is shown in Table 3.

VAS Score Comparison

After two weeks of intervention, the patient's shoulder function showed significant improvement compared to admission. The Shoulder Function Assessment Scale comparison is shown in Table 4.

Shoulder Function Assessment Scale Comparison

4. Discussion

Postoperative CRPS complicates postoperative management and severely impacts patient rehabilitation. CRPS is often considered a complication of fracture and surgery [8], with an incidence of only 2-5%. Due to its low incidence and complex, diverse clinical manifestations, the misdiagnosis and missed diagnosis rates are high [9]. CRPS complications are relatively rare after rotator cuff surgery. Timely and effective rehabilitation and nursing care help alleviate postoperative soft tissue swelling, muscle atrophy, osteoporosis, limited joint mobility, and tendon adhesion, shortening the recovery process and improving postoperative quality of life. Therefore, clinical nursing requires individualized, multidisciplinary, and integrative Chinese and Western medicine approaches to achieve pain relief [10].

Traditional Chinese medicine holds that after limb bone fracture and tendon injury, meridians and vessels are damaged, leading to impeded qi and blood flow. Over time, this causes qi stagnation and blood stasis at the injury site, resulting in pain due to blockage. Extravasated blood spills out of vessels, causing swelling. Prolonged external injury damages vital qi, and qi deficiency fails to move blood, making swelling difficult to resolve. Qi and blood coagulation obstructs collaterals, causing thin, atrophic skin and nails due to loss of nourishment. Prolonged injury leads to insufficient defense, allowing cold evil to invade joints, causing stiffness and limited flexion-extension. Patient activity is limited by post-fracture and postoperative pain, and prolonged immobilization leads to muscle atrophy and joint stiffness. As stated in *Medical Origins and Developments*, "In surgery, external treatment is most important." TCM wet compress offers convenient administration, easy cleaning of application sites, and allows timely discontinuation when adverse reactions occur, avoiding gastrointestinal stimulation from oral medication and pain or infection risk from injections [11].

Our department uses the "Juanbi Lotion" for wet compress, formulated based on the "Sanhuang Decoction" from *Qianjin Yifang* combined with the "Xianzheng Powder" wash from *Xianshou Lishang Xuduan Mifang* and modified "Haitongpi Decoction" from *Golden Mirror of Medical Orthodoxy*. Although the original formulas were primarily for internal use, as stated in *Li Yue Pian Wen*, "The

principle of external treatment is the same as internal treatment; the medicine for external treatment is the same as internal treatment; only the method differs." Using the efficacy theory of internal administration to guide external application stimulates local pathological tissue to achieve blood circulation activation and pain relief. The formula consists of Rheum palmatum, Scutellaria baicalensis, and Coptis chinensis. Rheum is bitter and cold, with functions of clearing heat, purging fire, stopping bleeding, detoxifying, and activating blood circulation. Scutellaria and Coptis are also bitter and cold, assisting Rheum to clear pathogenic evils, eliminate heat toxins and dampness, and unblock collaterals. Angelica sinensis nourishes blood, regulates menstruation, and relieves pain. Angelica dahurica dispels wind and relieves pain, reduces swelling, and drains pus. Saposhnikovia dispels dampness, relieves pain, and stops spasms. Additionally, the wash formula includes Erythrina variegata bark, Lycopodium japonicum, Speranskia tuberculata, and Liquidambaris fructus to relax tendons and unblock collaterals; Frankincense, Myrrh, Ligusticum wallichii, and Safflower activate blood and relieve pain; Schizonepeta and Atractylodes dispel wind and cold. Combined, these herbs effectively activate blood, resolve stasis, and relieve pain.

Modern pharmacological studies show Rheum has anti-infective, anti-allergic effects, reduces local capillary permeability and fragility, and hemostatic effects. Research also demonstrates Scutellaria decoction has a broad antibacterial spectrum in vitro. Besides broad antibacterial effects, Coptis can enhance leukocyte phagocytosis, relax vascular smooth muscle, and has sedative and analgesic effects [12]. Therefore, combined use of the three Huang herbs synergistically relieves pain, and enhanced leukocyte phagocytosis can accelerate elimination of inflammatory mediators in CRPS-affected areas, thus speeding recovery. Angelica sinensis, Angelica dahurica, and Saposhnikovia all have antipyretic, analgesic, anti-inflammatory effects, and dilate capillaries, with particularly notable effects in Saposhnikovia and Angelica dahurica extracts in vitro [13]. In CRPS, the affected area's epidermis, sympathetic nerves, and pain receptor nerve endings produce antipyretic and analgesic effects after acting with TCM components.

TCM wet compress is one of the TCM nursing techniques promoted by the State Administration of Traditional Chinese Medicine. This case report describes technical improvements to this method in clinical practice. Using a constant-temperature warming device to maintain the medicine at 40°C and employing more absorbent cotton pads instead of gauze reduced medication spillage. Simultaneously, cotton pads were changed every 5 minutes. These improvements successfully overcame the disadvantage of uncontrollable temperature in traditional TCM wet compress methods, effectively maintaining medication temperature to dilate capillaries, increase metabolic rate, promote absorption and metabolism of inflammatory mediators in affected areas, accelerate tissue recovery, and improve patient comfort.

In summary, this case innovatively improved the traditional TCM wet com-

press technique. Combined with personalized rehabilitation guidance, it demonstrated effectiveness in improving Type I CRPS after rotator cuff repair by reducing pain and enhancing patient comfort based on a human-centered nursing philosophy, expanding the therapeutic scope of TCM wet compress. Type I CRPS following rotator cuff repair is extremely rare and challenging to treat, generally resulting in poor quality of life. This case represents the first application of improved TCM wet compress combined with rehabilitation guidance in clinical nursing, achieving certain therapeutic effects. However, this nursing plan has limitations. The personalized rehabilitation program is highly specific and not applicable to conventional rehabilitation protocols for most post-rotator cuff repair patients at this stage, requiring syndrome differentiation based on individual postoperative conditions.

Patient Informed Consent: Publication of this case report was approved by the patient.

Conflict of Interest Statement: This article has no conflicts of interest.

References

[1] CUTTS S, GANGOO S, SRINIVASAN SH, et al. Complex regional pain syndrome: an evolving perspective[J]. Postgrad Med J, 2020.

[2] ZANGRANDI A, ALLEN DEMERS F, SCHNEIDER C. Complex regional pain syndrome. A comprehensive review on neuroplastic changes supporting the use of non-invasive neurostimulation in clinical settings[J]. Front Pain Res, 2022.

[3] GOH EL, CHIDAMBARAM S, MA DQ. Complex regional pain syndrome: a recent update[J]. Burns Trauma, 2022.

[4] GOEBEL A, BARKER C, BIRKLEIN F, et al. Standards for the diagnosis and management of complex regional pain syndrome: results of a European Pain Federation task force[J]. Eur J Pain, 2023.

[5] HALICKA M, VITTERSØ AD, PROULX MJ, et al. Neuropsychological changes in complex regional pain syndrome (CRPS)[J]. Behav Neurol, 2022.

[6] Yang Xiaoting, Ma Xiaoqin. Bibliometric analysis of clinical nursing application of traditional Chinese medicine wet compress method[J]. Journal of Nurses Training, 2021.

[7] Li Qiaoping, Wang Xiaoyu, Li Xiaoxia, et al. Clinical observation of Huoxue Tongluo decoction wet compress combined with continuous compression cold therapy in treating limb fracture swelling[J]. Massage and Rehabilitation Medicine, 2022.

[8] GOEBEL A. Complex regional pain syndrome in adults[J]. Rheumatology (Oxford), 2022.

[9] Qu Yi. Clinical efficacy observation of An-dong therapy in treating scapulohumeral periarthritis[J]. World Latest Medicine Information, 2020.

[10] SHIM H, ROSE J, HALLE S, et al. Complex regional pain syndrome: a narrative review for the practising clinician[J]. Br J Anaesth, 2023.

[11] Wang Jiabin, Li Qingzhong, Jiang Dequan, et al. Analysis of 15 cases of complex regional pain syndrome[J]. People's Military Surgeon, 2021.

[12] Cong Yangyang, Qiu Xiao, Gao Tianhao, et al. Rehabilitation treatment of a patient with complex regional pain syndrome after rotator cuff injury surgery[J]. Shanghai Medical & Pharmaceutical Journal, 2022.

[13] Sun Huaiqing. Analysis of the effect of traditional Chinese medicine wet compress combined with lymphatic massage in relieving postoperative upper limb lymphedema in breast cancer patients[J]. Journal of Medicine Theory and Practice, 2021.

[14] Yuan Hongwang, Liu Hua, Zhang Xing. Observation on the effect of Compound Sanhuang decoction wet compress in treating type 2 diabetes complicated with lower limb erysipelas[J]. Journal of Clinical Medicine in Practice, 2022.

[15] Liu Keshun, Jiang Wei, Hu Na, et al. Experimental study on Saposhnikovia divaricata combined with Angelica dahurica in treating sores (acute subcutaneous inflammation)[J]. Northwest Pharmaceutical Journal, 2021.

[16] Liu Jia. Study on effective substances of Angelica sinensis decoction for prevention of inflammation-related colorectal cancer and construction of multiple drug delivery system[D]. Beijing: Beijing University of Chinese Medicine, 2022.

Note: Figure translations are in progress. See original paper for figures.