

Retraction

Retracted: Clinical Observation on the Treatment of Rotator Cuff Injury with Modified Buyang Huanwu Decoction and Rotator Cuff Repair

Journal of Healthcare Engineering

Received 5 December 2023; Accepted 5 December 2023; Published 6 December 2023

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This article has been retracted by Hindawi, as publisher, following an investigation undertaken by the publisher [1]. This investigation has uncovered evidence of systematic manipulation of the publication and peer-review process. We cannot, therefore, vouch for the reliability or integrity of this article.

Please note that this notice is intended solely to alert readers that the peer-review process of this article has been compromised.

Wiley and Hindawi regret that the usual quality checks did not identify these issues before publication and have since put additional measures in place to safeguard research integrity.

We wish to credit our Research Integrity and Research Publishing teams and anonymous and named external researchers and research integrity experts for contributing to this investigation.

The corresponding author, as the representative of all authors, has been given the opportunity to register their agreement or disagreement to this retraction. We have kept a record of any response received.

References

- [1] G. Hu, Z. Li, H. Li, and H. Guan, "Clinical Observation on the Treatment of Rotator Cuff Injury with Modified Buyang Huanwu Decoction and Rotator Cuff Repair," *Journal of Healthcare Engineering*, vol. 2021, Article ID 3088160, 8 pages, 2021.

Research Article

Clinical Observation on the Treatment of Rotator Cuff Injury with Modified Buyang Huanwu Decoction and Rotator Cuff Repair

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Received 6 September 2021; Accepted 9 October 2021; Published 25 October 2021

Academic Editor: Rahim Khan

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In this paper, we have evaluated the clinical efficacy of rotator cuff surgery combined with Chinese medicine Buyang Huanwu Decoction (adding medicine) in the treatment of patients with rotator cuff injury. For this purpose, sixty patients with rotator cuff injury and shoulder arthroscopic surgery were selected in this hospital (where 57 cases were finally screened). The patients were divided into a control group (28 cases) and a study group (29 cases) by the envelope method. The control group received conventional treatment after the operation, whereas the study group was combined with Buyang Huanwu Decoction after the operation. The clinical efficacy of the two groups, particularly after treatment, was compared in terms of self-care ability and Constant–Murley scores before and after treatment, that is, 4 w, 8 w, and 12 w. The total effective rate of treatment in the study group was significantly higher than that of the control group after 4 weeks of treatment ($P < 0.05$). There was no significant difference in the FIM self-care scores of the two groups before treatment ($P > 0.05$). In the study group patients, after treatment for 4 w and 8 w, the FIM self-care score was significantly improved ($P < 0.05$). The FIM self-care score of the patients in the study group, after 12 w of treatment, had no significant difference compared with the control group ($P > 0.05$). The Constant–Murley scores of the two groups were compared before treatment where no significant difference is observed ($P > 0.05$) and the Constant–Murley score of the study group patients was significantly higher than that of the control group, after 4 w and 8 w treatment ($P < 0.05$). Additionally, Constant–Murley score of the study group was not significantly higher than that of the control group after 12 w of treatment difference ($P > 0.05$). The proposed combined treatment program has value of promotion and implementation in the clinical treatment of patients with rotator cuff injury.

1. Introduction

The rotator cuff is a cuff-like muscle-like structure formed by four groups of tendons with similar functions of the supraspinatus, infraspinatus, teres minor, and subscapularis around the front, upper, and back of the humeral head. The main function of the rotator cuff is to pull the humeral head towards the glenoid during upper arm abduction and maintain the normal fulcrum of the humeral head and glenoid. Rotator cuff injury will affect this function of the shoulder joint. The structure of the rotator cuff plays a very important role in maintaining the stability and mobility of the shoulder joint. At present, rotator cuff injury is one of the most common diseases that cause shoulder pain and

shoulder joint dysfunction. Data shows that the incidence of rotator cuff injury among middle-aged and elderly people over 60 years old is about 40%, and it increases with age. The incidence rate will gradually increase [1, 2].

Rotator cuff injury is a common clinical disease at present as shown in Figure 1. Because of the atypical symptoms of patients, it is often easy to cause misdiagnosis, missed diagnosis, and so on, delay the condition, affect early treatment and intervention, and even leave more serious sequelae. Therefore, with the treatment of rotator cuff disease, the understanding continues to deepen, and the study of its etiology has been paid more and more attention in the diagnosis and treatment process. With the increase of age, the degenerative changes of the rotator cuff tissue, and its

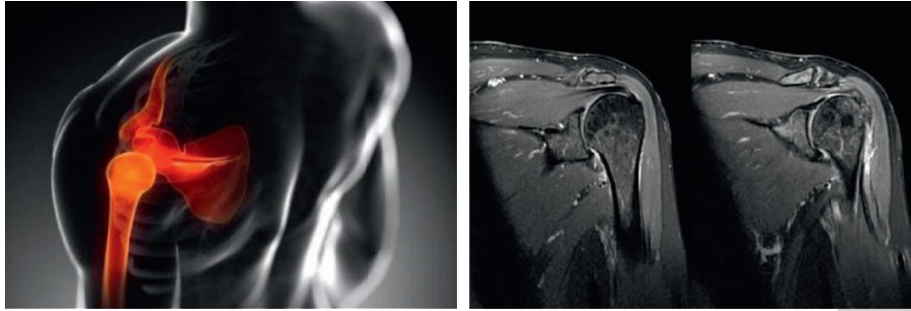


FIGURE 1: Schematic diagram of rotator cuff injury.

own shortcomings in the anatomical structure of the hypovascular risk zone, further external factors, such as trauma and impact, accelerate the occurrence of rotator cuff degeneration and rupture. Therefore, the injury of the rotator cuff is the result of a variety of comprehensive factors, and not a single factor can cause it alone. The key factors should be analyzed based on specific conditions. Therefore, in clinical practice, we should make more use of modern science and technology and scientific research methods to conduct more extensive and in-depth research on the cause mechanism. With the understanding of the concept of “preventing disease,” clinical first-line physicians are treating rotator cuff diseases. At the same time, more emphasis should be placed on guiding patients to prevent the recurrence and aggravation of rotator cuff injury and to a certain extent improve patients’ awareness of rotator cuff injury, as well as the dependence on diagnosis and treatment and the quality of life of patients [3–6].

Because rotator cuff injury currently has a high incidence, and the clinical symptoms are mainly pain and limited mobility, which affects the patient’s quality of life. Therefore, with the deepening of understanding of rotator cuff disease and clinical symptoms of rotator cuff injury, research is increasing year by year, and treatment methods are also showing diversified development. Most patients with rotator cuff injury require surgical intervention, especially for patients with full-thickness tears. Gradually enlarged, it may eventually lead to serious adverse consequences, such as tendon retraction, irreversible muscle atrophy, and fat infiltration [7]. Open rotator cuff repair has been a classic surgical method for clinical treatment of rotator cuff injuries in the past. However, with the rapid development of arthroscopy technology, arthroscopy has been widely used in various clinical surgical treatments in recent years. In the past, arthroscopic-assisted small incision rotator cuff injury repair was the main method for the treatment of rotator cuff injuries. It was once considered the gold standard for the treatment of rotator cuff injuries. In recent years, arthroscopic technology has advanced, and arthroscopy has the advantages of small trauma and quick recovery. It is widely used in the treatment of rotator cuff injuries. However, some scholars have included arthroscopic treatment in the category of palliative care. They believe that the scope of treatment is limited, and it is difficult to repair the rotator cuff reliably and comprehensively and fundamentally solve the injury. The clinical application of arthroscopy in rotator cuff injury disease has not yet reached unanimous approval.

In this paper, the clinical efficacy of total arthroscopy and arthroscopy-assisted small incision rotator cuff repair in the treatment of rotator cuff injuries is presented and a thorough evaluation of these clinical efficacies is provided. It is clinically found that patients often need other rehabilitation measures after conventional surgical treatment [8–11]. Traditional Chinese medicine treatment is an effective treatment commonly used after surgery for this disease [12, 13]. The main purpose of the study is to explore the clinical efficacy of combined Chinese medicine Buyang Huanwu Decoction in the treatment of patients with rotator cuff injury after rotator cuff surgery. For this purpose, sixty patients are selected from different hospitals and are divided into two groups, that is, control and study group. The behaviors and recovery ratio of these patients are compared particularly before and after the treatment is carried out. The main contributions of this paper are as follows:

- (i) A mechanism to ensure clinical efficacy of total arthroscopy and arthroscopy-assisted small incision rotator cuff repair in the treatment of rotator cuff injuries in various patients
- (ii) A thorough investigation of improvement of clinical efficacy of combined Chinese medicine Buyang Huanwu Decoction in the treatment of patients with rotator cuff injury after rotator cuff surgery
- (iii) Partitioning of patients in groups, particularly control and study, and their expected behaviors before and after the treatment

The remainder of the paper is organized as follows. In Section 2, detailed and thorough analysis of the existing schemes, specifically those which are related to the proposed mechanism, is presented. Section 3 presents a comprehensive description of methods and datasets, followed by results in Section 4. In Sections 4 and 5, a detailed analysis of the various results and their impact on the proposed system are provided. Lastly, concluding remarks and future directives are given in Section 6.

2. Literature Review

Cod-Mantiq has reported that in the rotator cuff repair operation, as reported in various studies presented in literature since 1911, an open surgery can obtain excellent functional improvement (70%–95%) and pain reduction

(85%–100%) [14]. With the development of related repair techniques, in order to reduce postoperative pain and restore function as soon as possible, a small incision technique that preserves the deltoid stop point is gradually being applied clinically. This technique allows the surgeon to perform surgery under direct vision. It is easier to be accepted by many surgeons in the smart healthcare systems. Levy [15] was equivalent to the first report in 1990 of an arthroscopic-assisted mini-open technique (arthroscopic-assisted mini-open), which laid the cornerstone for the future arthroscopic rotator cuff repair technique. Reports show that compared with traditional open repair, it has 80%–90% excellent results [16]. Since the 1970s and 1980s, with the rapid development of arthroscopic technology, the trend of rotator cuff repair is developing towards full arthroscopic repair. Although more and more surgeons choose to repair the rotator cuff under the full scope, there has been controversy about the surgical effect of open (small incision) repair and full arthroscopic repair. After a systematic analysis of more than 10 related literatures, Lindley Pil et al. concluded that there is no significant difference between the two surgical methods in ASES and UCLA scores after rotator cuff repair, postoperative recovery pain, and the integrity of rotator cuff repair. However, after a 2-year clinical follow-up study of 400 patients by Walton [17], it is believed that after microscopic repair surgery, less severe pain can be obtained than open surgery, and the strength and range of motion of the shoulder joint can be restored earlier. The rate of retear is related to the size of the rotator cuff tear and repair skills but has nothing to do with open or microscopic surgery. So far, the related controversy continues. There is no clear conclusion about which of these two surgical methods is better, and further clinical research is needed.

Single-row screw fixation, fixing the anchor line along the sagittal plane of the rotator cuff, is the earliest suture fixation technique applied under arthroscopy. It is suitable for patients with small or partial tears. In 2002, Habermeyer [18] et al. proposed an improved Mason-Alien cross suture repair technique, which uses double-thread anchor nails to reconstruct the stop point of the rotator cuff. The two tail threads of the other thread pass through the area of the rotator cuff mattress suture to fix the rotator cuff to the outside. It has the advantages of relatively simple operation and biomechanical stability. Lichtenberg [19] et al. performed arthroscopic Mason-Alien suture repair on 53 patients with rotator cuff injury. The postoperative follow-up results showed that the retear rate was 24.5%, and the satisfaction of the postoperative patients was improved to a certain extent. Since the concept of the rotator cuff footprint area has been proposed, more and more scholars have realized the importance of repairing the tendon-bone contact area of the rotator cuff. Since the single-row repair technique cannot be perfect from the tendon-bone contact area, rotator cuff repairs with moderate tears and above are gradually transitioning to double-row technique.

In 2002, Fealy [20] and others first reported the use of double-row anchors to suture the rotator cuff. The enlarged

tendon-bone contact area is highly praised by many surgeons. Lehtinen et al. found that the anchor near the cartilaginous edge of the humeral head had the strongest pullout force, and the closer to the outer side of the greater tubercle, the worse the strength. Therefore, when double-row fixation or even multirow fixation is used, the inner row and the front side anchors should be fixed first [21]. Since the invention of the double-row repair technology, a large number of studies have carried out a detailed analysis of the single-row and double-row repair technology in terms of clinical effects, biomechanics, and footprint area reconstruction. Cabonel [22] et al. randomly divided 160 patients with full-thickness rotator cuff injury into 2 groups and received single-row and double-row techniques for repair. The advantage is more obvious when the crack is larger than 3.0 cm. Shah [23] et al. used single-row and double-row techniques to repair rotator cuff injuries with a simulated tear size of 1.5 cm on human shoulder joint specimens and performed cyclical load tests on the specimens. The test results showed that these two techniques have no significant difference in cycle load and dynamic external rotation of the shoulder joint. At present, most surgeons believe that the double-row technique has a larger tendon-bone contact interface than the single-row technique, and better reconstruction of the footprint area can be obtained. It is highly likely that these mechanisms gradually replace single-row technology in the hospital systems.

3. Material and Method

In this section, a detailed description of various material and methods used to evaluate the effectiveness of the traditional Chinese treatment and combined Chinese medicine Buyang Huanwu Decoction in the treatment of patients with rotator cuff injury after rotator cuff surgery, before and after treatment, is presented. In subsequent section, clinical observation is presented.

3.1. Clinical Information. From March 2020 to February 2021, sixty (60) patients with rotator cuff injury and shoulder arthroscopic surgery were selected in the hospital. These patients were divided into a control group (30 cases) and a study group (30 cases) through the envelope method. Among these patients, two (2) cases were torn again due to the rotator cuff, and 1 case stopped gastrointestinal reaction after taking Chinese medicine. Finally, 28 cases were included in the study group and 29 cases in the control group. The control group finally included 17 males and 11 females. The age distribution of the patients was 31–64 (46.81 ± 4.27) years, and the duration of the disease was 3 months to 6 years, with an average of (3.72 ± 1.09) years. The final list of patients in the study group included 18 males and 11 females within the same age limit as described above. The age distribution of the patients was 31–66 (46.93 ± 4.23) years. The duration of the disease was 3 months to 7 years, with an average of (3.83 ± 1.24) years. There was no significant difference in the clinical data of the included two groups of patients.

3.2. Diagnosis and Acceptance Criteria. The potential acceptance criteria for the diagnosis, which is carried out during the proposed work, is based on the guidelines which are provided in the clinical practice for the rotator cuff diseases in various patients. Diagnosis criteria are depicted in the following.

Diagnostic criteria are as follows: the selected patients with rotator cuff injury meet the diagnostic criteria of the "Clinical Practice Guidelines for Rotator Cuff Diseases" formulated by the American Association of Orthopaedic Surgeons (AAOS) in 2010 and the "Guiding Principles for Clinical Research of New Chinese Medicines (Trial)" for the treatment of Qi deficiency and blood stasis [24].

Selection criteria are as follows. The patients who meet the above diagnostic criteria of Chinese and Western medicine and all of those who received shoulder arthroscopic repair surgery in the underlined hospitals were selected. Initially, surgical treatment given to these patients was successful and has effectiveness as described by their concerned doctors in the hospitals. Additionally, every selected patient signed the right to know consent form before being enrolled to the proposed evaluation program. The research content was approved by the hospital's medical ethics committee.

Unfit criteria are as follows: we have excluded those patients who have serious complications during the treatment and cannot be included in the treatment analysis and, additionally, those who do not agree to be part of the proposed evaluation study. Likewise, we have not selected those patients who voluntarily withdraw in the middle of the treatment and cannot determine the curative effect. Apart from those, we have excluded the patients who are lost to follow-up after treatment or having serious organ dysfunction or immune system diseases. Similarly, we have not selected those patients who have other joint diseases or cognitive dysfunction as these patients cannot be successfully treated with surgery. Lastly, but more importantly, we have excluded breastfeeding and pregnant women due to the crucial conditions or noncooperation to take part in the evaluation process of the proposed study.

3.3. Proposed Methodology for the Selected Patients. Both groups of patients pass through or undergo the same shoulder arthroscopic surgery and are treated with general anesthesia under tracheal intubation, assisted them in lateral decubitus position, kept the affected side up, and extended the limbs at 30° for traction. A posterior arthroscopic approach was carried out to accomplish these tasks. After inserting an arthroscopy during the operation, the condition of the subscapular muscle and glenohumeral ligament was understood. A radiofrequency knife was inserted into the anteromedial entrance of the coracoid process, and the subacromial sac and hyperplastic synovium were cleaned under arthroscopy. We organize the subscapular muscle stop point and the greater tuberosity supraspinatus muscle stop point to determine the type of rotator cuff tear and then treat it symptomatically.

Patients in the control group were treated with Celebrex (National Medicine Standard: J20140072; Pfizer Pharmaceutical Co., Ltd.) based on their symptoms after surgery, 100 mg/time, 2 times/d. It is to be noted that selected patients in this group were treated continuously for 4 weeks in the concerned hospital.

Patients in the study group were treated with Chinese medicine Buyang Huanwu Decoction on the basis of the treatment of the control group. Buyang Huanwu Decoction group received the following: *Astragalus* 40 g, peach kernel 10 g, earthworm 10 g, soil turtle 10 g, vinegar myrrh 10 g, vinegar frankincense 10 g, bran-fried *Atractylodes* 15 g, *Codonopsis* flakes 15 g, red peony root 15 g, chuanxiong 15 g, *Angelica* flakes 15 g, Safflower 5 g, and licorice flakes 5 g, decocted in water, 1 dose/d were advised the morning and evening. Furthermore, after 1 w of medication, the vinegar frankincense, soil beetle and vinegar myrrh were removed, plus 30 g mulberry parasite, 15 g *Eucommia ulmoides*, 10 g *Corydalis*, 15 g *Dipsacus*, decocted in water, 1 dose/d, morning and evening; the patients in this group continued treatment for 4 w in the hospital.

3.4. Evaluation or Observation Index of the Proposed Approach. The clinical efficacy of patients, preferably both groups as described above, before and after treatment was compared. Additionally, scores of self-care ability before treatment, 4 w, 8 w, and 12 w, were observed and then the proposed combined approach was treated. We have evaluated the efficacy of patients after treatment according to the scoring standard of "Guiding Principles for Clinical Research of New Chinese Medicines." For the main and minor symptoms before and after treatment, a 4-level score is adopted:

- (i) level 0 means asymptomatic
- (ii) level 1 means mild symptoms
- (iii) level 2 indicates the presence of moderate symptoms
- (iv) level 3 points indicate the presence of severe symptoms

In this system, score is directly proportional to symptoms score; that is, the higher the total score, the more severe the patient's symptoms. The curative effect is divided into cure, marked effect, improvement, and ineffective, which are described as follows:

- (i) Cure: after treatment, the point reduction rate is $\geq 90\%$
- (ii) Marked effect: after treatment, the point reduction rate is $\geq 60\%$ and $< 90\%$
- (iii) Improvement: after the treatment, the point reduction rate is $\geq 30\%$ and $< 60\%$.
- (iv) Ineffective: the point reduction rate after treatment is $< 30\%$ and the total effective rate of treatment = cure rate + apparent rate + improvement rate

The functional independence measurement scale (FIM) was used to assess the patient's self-care ability before

treatment, 4 w, 8 w, and 12 w, and after treatment either in hospital or at home, whichever is applicable and feasible. The scoring items of this scale include grooming, going up and down, moving, dressing, eating, and bathing. For the self-care ability, the full score of the scale is 42 points. The higher the score, the better the self-care ability of the patient. The Constant–Murley scores of the shoulder joint scores of patients were compared before treatment and 4 w, 8 w, and 12 w of treatment. The scores mainly include pain, daily living functions, shoulder joint strength, and shoulder joint mobility. The total score is 0–100 points, with the improvement of the score. It means that the patient’s shoulder joint movement is better.

3.5. Statistical Processing and Observation of the Proposed Study. The data is analyzed and processed by using a well-known software solution S26.0 software. The clinical efficacy data is described in the form of percentage, and the comparison between groups is tested by χ^2 value; the scale scoring index is used in the form of $(x \pm s)$ to describe the data. The comparison before and after and between groups was performed by t test, and $P < 0.05$ represents that the data comparison result is statistically significant.

4. Experiment

In this section, a comprehensive description of the various experimental results, which are collected through the proposed treatment methods to various patients (preferably selected in this case) and its effects on improving health status of patients, belongs to both groups, that is, control and study group. For this purpose, we have selected sixty potential patients with the cuff injury, which are divided into two groups. Furthermore, effectiveness of the proposed combined method and traditional Chinese methods were evaluated using experimental data collected through the close observation of those patients while those treatments were applied. A detailed analysis of various experimental results and observation that are collected through those experiments are presented as follows.

4.1. Comparison of Clinical Efficacy after Four Weeks of Treatment. The total effective rate of treatment in the study group, particularly after 4 weeks, was significantly higher than that of control group ($P < 0.05$) as shown in Figure 2. The collected data and results are shown in Table 1 and Figure 2, where CG and SG are used to represent control group and study group, respectively. ER is used to represent effective rate of treatment in various groups of patients.

4.2. Comparison of FIM Self-Care Scores. There was no significant difference in FIM self-care scores before treatment ($P > 0.05$). FIM self-care scores in the study group increased after 4 w and 8 w of treatment ($P < 0.05$) and FIM self-care scores in the study group after 12 w of treatment compared with the control group. We observed that there was no significant difference ($P > 0.05$). The data results are

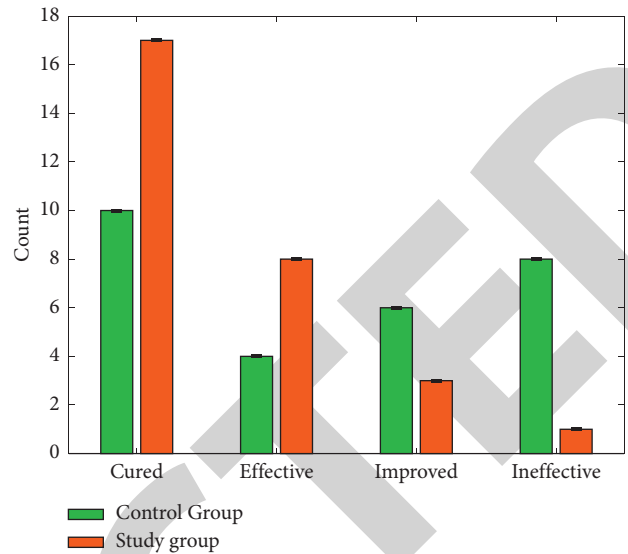


FIGURE 2: The histogram of the clinical efficacy comparison after 4 weeks of treatment.

TABLE 1: Comparison of clinical efficacy after 4 weeks of treatment.

Group	n	Cured	Effective	Improved	Ineffective	ER
CG	28	10	4	6	8	71.43%
SG	29	17	8	3	1	96.55%
χ^2	—	—	—	—	—	4.626
P	—	—	—	—	—	0.031

shown in Table 2 and Figures 3 and 4 where variable BT is used to represent before therapy.

4.3. Comparison of Constant–Murley Score. We have evaluated performance of both techniques in terms of Constant–Murley score, which is one the common evaluation metric. We observed that there was no significant difference in the Constant–Murley score between the two groups of patients before treatment ($P > 0.05$). The Constant–Murley score of the patients in the study group was significantly higher than the control group after 4 w and 8 w of treatment ($P < 0.05$), and the patients in the study group were treated for 12 w; the Constant–Murley score was not significantly different from the control group ($P > 0.05$). The data results are shown in Table 3 and Figures 5 and 6.

5. Effectiveness of the Proposed Mechanisms

Rotator cuff injury is a type of musculoskeletal disease commonly seen in surgery. The disease is more likely to occur in the elderly and athletes. Clinically, patients with rotator cuff injuries are mostly treated with shoulder arthroscopy, which is a common approach used to cure these diseases in both patients. The intraoperative and postoperative bleeding is relatively small, and the intraoperative surgical field is clearer than the traditional surgical method, which can fully clarify the cause and determine the degree of the patient’s rotator cuff injury, and the speed of postoperative recovery is

TABLE 2: Comparison of FIM self-care scores.

Group	n	BT	4 w	8 w	12 w
CG	28	18.77 ± 1.93	31.05 ± 2.08	33.58 ± 2.14	37.02 ± 2.41
SG	29	18.82 ± 1.89	37.14 ± 2.23	38.79 ± 1.93	39.23 ± 1.59
T	—	0.099	10.653	9.659	4.100
P	—	0.921	0.000	0.000	0.000

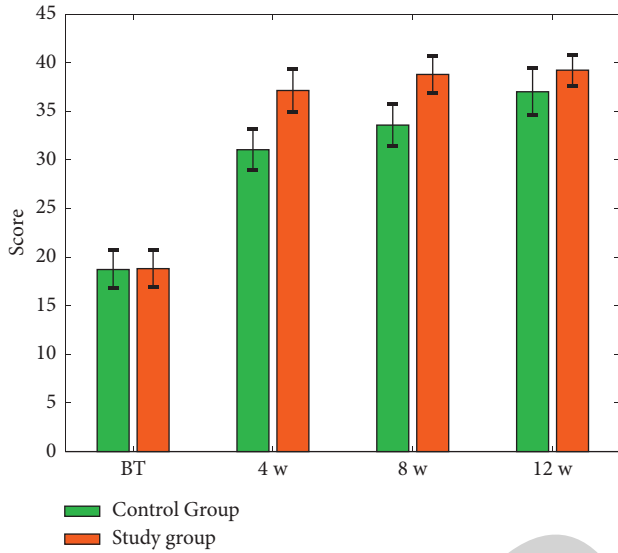


FIGURE 3: Comparison histogram of FIM self-care score.

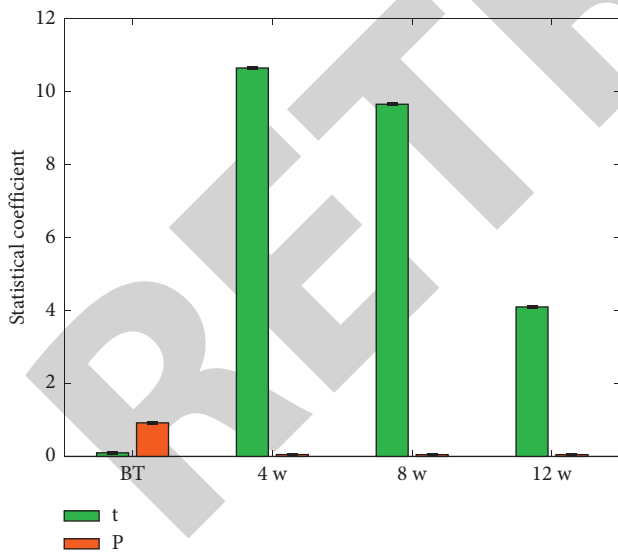


FIGURE 4: Comparison histogram of statistical coefficient.

TABLE 3: Comparison of Constant–Murley score.

Group	n	BT	4 w	8 w	12 w
CG	28	53.31 ± 3.42	78.15 ± 2.49	82.14 ± 1.36	90.07 ± 1.02
SG	29	52.82 ± 3.61	84.04 ± 2.27	86.77 ± 2.23	90.43 ± 1.26
T	—	0.526	9.339	9.422	1.183
P	—	0.601	0.000	0.000	0.242

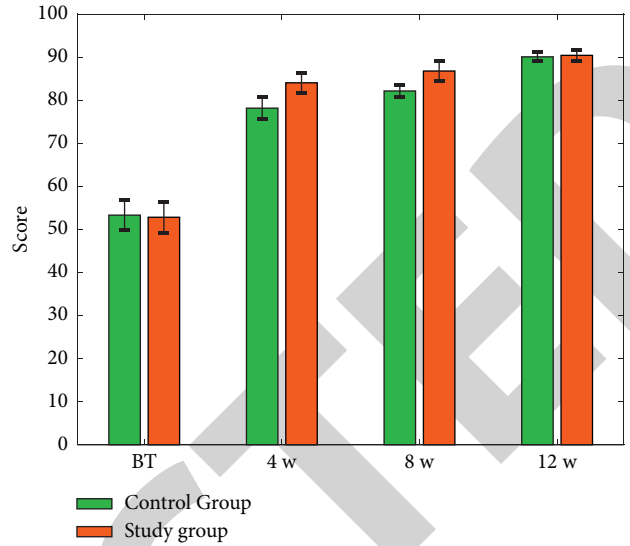


FIGURE 5: Comparison histogram of FIM Constant–Murley score.

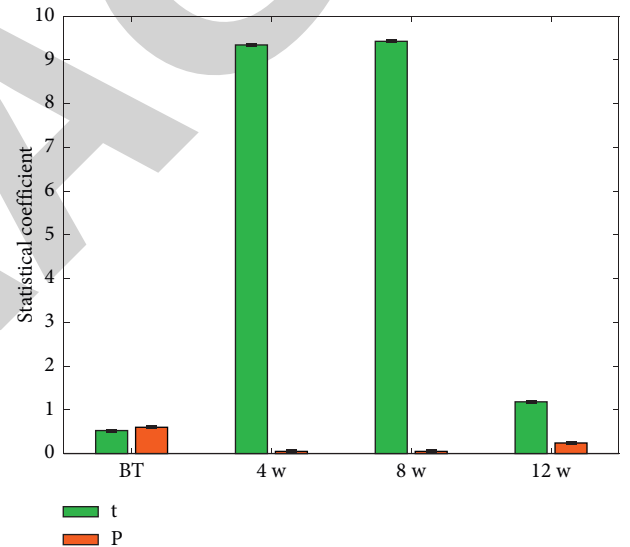


FIGURE 6: Comparison histogram of statistical coefficient.

relatively fast. Although shoulder arthroscopic surgery is affirmative for the treatment of this disease, most patients will not quickly relieve the clinical symptoms after surgery, and there are still various degrees of limb pain and numbness and other related symptoms in the short term after surgery. For such patients, rehabilitation methods such as medications are still required after shoulder arthroscopic surgery. It has been clinically found that traditional Chinese medicine has a good effect in the rehabilitation of patients with rotator cuff injury after shoulder arthroscopic surgery. Rotator cuff injury belongs to the category of “arthralgia” in Chinese medicine. From the perspective of Chinese medicine, after rotator cuff injury shoulder arthroscopic surgery, blood is still blocked on the affected side, postoperative inflammation still exists, and there were local meridians obstruction, poor circulation of qi and blood, and restricted limb abduction. In view of this, after shoulder arthroscopic surgery, it is still necessary to combine

Chinese medicine treatment to clear the blood of the patient's shoulder, play an analgesic, and relieve shoulder spasm. In this study, both groups of patients were treated with shoulder arthroscopic surgery. The control group received conventional treatment after the operation, and the study group received the combined treatment with Buyang Huanwu Decoction after the operation. The research data showed that the total effective rate of treatment in the study group was significantly higher than that in the control group after 4 weeks of treatment ($P < 0.05$); there was no significant difference in the FIM self-care scores of the two groups before treatment ($P > 0.05$). The FIM self-care score and Constant–Murley score of the patients in the group were significantly improved compared with the control group after 4 w and 8 w of treatment ($P < 0.05$). There was no significant difference in the comparison of the FIM self-care score and Constant–Murley score between the two groups of patients after 12 w of treatment ($P > 0.05$). The Buyang Huanwu Decoction used by the research group is a representative prescription for treating collateral diseases in Chinese medicine. It has the functions of activating blood, replenishing qi, and dredging collaterals. Buyang Huanwu Decoction is mostly used clinically to treat qi deficiency and the inability to promote blood circulation, collateral blood stasis, and the lack of nourishment of tendons and muscles and other diseases. *Astragalus* is used in the prescription to replenish the qi in the spleen and stomach, and when the qi is strong and the blood flows, the blood stasis will remove the collaterals; the bran-fried *Atractylodes* and *Codonopsis* in the prescription can invigorate the spleen and nourish qi and combine with astragalus to exert the effect of nourishing qi and dredging collaterals. It can promote blood circulation and remove blood stasis. Combining the traditional Chinese medicine chuanxiong, red peony root, peach kernel, and Safflower can promote blood circulation, remove blood stasis, promote qi, and dredge collaterals; Fang Zhong Dilong can clear the meridians and activate collaterals, and the combined use of soil turtle can break blood and remove blood stasis. Both dragon and turtle worms are insect medicines, which have the effects of eliminating phlegm, removing blood stasis, and removing pathogens, so they are often used in the treatment of collateral diseases. The vinegar frankincense can be used in the blood and qi to penetrate the blood. The qi stagnation can remove blood stasis and relieve pain and promote the qi and blood effect of the viscera; vinegar and myrrh can disperse blood, reduce swelling, and relieve pain; licorice tablets are used in the prescription to reconcile various medicines, and the vinegar frankincense in the prescription is removed after one week of treatment. Good-looking products include worm and vinegar and myrrh. The addition of mulberry parasitic, *Eucommia ulmoides*, and *Dipsacus vulgaris* can nourish liver and kidney, strengthen waist and knees, and strengthen muscles and bones. Combining with *Corydalis* can help promote qi and blood circulation, analgesic, and combined use of various drugs. The specimens take into account the effects of the rotator cuff injury and can play an analgesic effect and promote the recovery of the rotator cuff function in the treatment of rotator cuff injury after shoulder arthroscopic surgery.

To sum up, the combined use of Buyang Huanwu Decoction in the rehabilitation treatment of patients with rotator cuff injury after shoulder arthroscopic surgery can promote the recovery of the patient's rotator cuff function and exert a clearer effect. This combined treatment plan has promotion and implementation value in the clinical treatment of patients with rotator cuff injury.

6. Conclusion and Future Directives

Rotator cuff injury is among the common musculoskeletal disease, which is commonly observed during various surgeries in the hospitals. The probability of this disease is very high in elderly patients and athletes. In this paper, both groups of patients (controlled and study) were treated with shoulder arthroscopic surgery and pass through a rigorous evaluation process. Both control and study groups have received conventional treatment and the combined treatment with Buyang Huanwu Decoction, respectively, after the operation is performed successfully in the hospital. The collected data showed that the total effective rate of treatment in the study group was significantly higher than that in the control group; that is, after 4 weeks of treatment ($P < 0.05$), there was no significant difference in the FIM self-care scores of the two groups before treatment ($P > 0.05$). The FIM self-care score and Constant–Murley score of the patients in the group were significantly improved compared with the control group after 4 w and 8 w of treatment ($P < 0.05$). There was no significant difference in the comparison of the FIM self-care score and Constant–Murley score between the two groups of patients after 12 w of treatment ($P > 0.05$).

In future, we are eager to expand our experimental and evaluation study to other patient groups preferably for curing other diseases, which are common. Moreover, combination of the traditional Chinese medicine and Buyang Huanwu Decoction is needed to be investigated in the future.

Data Availability

The datasets used are available from the corresponding author on reasonable request.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

References

- [1] E. Kramer, S. P. Samagh, G. Melkus, B. Michael, and B. Feeley, "MRI quantification of fatty infiltration and muscle atrophy in a mouse model of rotator cuff tears," *Journal of Orthopaedic Research*, vol. 31, 2013.
- [2] C. Gerber, J. G. Snedeker, D. B. aumgartner, and A. F. Viehöfer, "Supraspinatus tendon load during abduction is dependent on the size of the critical shoulder angle: a biomechanical analysis," *Journal of Orthopaedic Research*, vol. 32, 2014.
- [3] J. M. Clark and D. T. Harryman, "Tendons, ligaments, and capsule of the rotator cuff. Gross and microscopic anatomy,"

- The Journal of Bone and Joint Surgery*, vol. 74, no. 5, pp. 713–725, 1992.
- [4] R. H. Cofield, J. Parvizi, P. J. Hoffmeyer, W. L. Lanzer, D. M. Ilstrup, and C. M. Rowland, “Surgical repair of chronic rotator cuff tears,” *Journal of Bone and Joint Surgery American Volume*, vol. 83, no. 1, pp. 71–77, 2001.
- [5] J. Pei, K. Zhong, J. Li, J. Xu, and X. Wang, “ECNN: evaluating a cluster-neural network model for city innovation capability,” *Neural Computing & Applications*, pp. 1–13, 2021.
- [6] C. S. Pei II, “Anterior acromioplasty for the chronic impingement syndrome in the shoulder: a preliminary report,” *Journal of Bone and Joint Surgery American Volume*, vol. 54, no. 1, p. 41, 1972.
- [7] N. A. Mall, M. J. Tanaka, L. S. Choi, and G. A. Paletta, “Factors affecting rotator cuff healing,” *Journal of Bone and Joint Surgery*, vol. 96, no. 9, pp. 778–788, 2014.
- [8] Y. Wang, “Clinical observation on treatment of frozen shoulder and rotator cuff injury with Chinese medicine combined with shoulder arthroscopy,” *Journal of New Chinese Medicine*, vol. 47, no. 5, pp. 159–160, 2015.
- [9] J. J. P. Warner, R. J. Goitz, J. J. Irrgang, and Y. J. Groff, “Arthroscopic-assisted rotator cuff repair: patient selection and treatment outcome,” *Journal of Shoulder and Elbow Surgery*, vol. 6, no. 5, pp. 463–472, 1997.
- [10] H. Sugaya, K. Maeda, K. Matsuki, and J. Moriishi, “Repair integrity and functional outcome after arthroscopic double-row rotator cuff repair. A prospective outcome study,” *Journal of Bone and Joint Surgery American Volume*, vol. 16, no. 2, p. 953, 2007.
- [11] J. N. Gladstone, J. Y. Bishop, I. K. Y. Lo, and E. L. Flatow, “Fatty infiltration and atrophy of the rotator cuff do not improve after rotator cuff repair and correlate with poor functional outcome,” *The American Journal of Sports Medicine*, vol. 35, no. 5, pp. 719–728, 2007.
- [12] J. Zhu and B. Chen, “Self-made jianbi decoction combined with local closure for the treatment of cold dampness stagnation type rotator cuff injury,” *Clinical Journal of Traditional Chinese Medicine*, vol. 32, no. 4, pp. 108–112, 2020.
- [13] L. Meng and E. Qiao, “Analysis and design of dual-feature fusion neural network for sports injury estimation model,” *Neural Computing & Applications*, pp. 1–13, 2021.
- [14] L. U. Bigliani, F. A. Cordasco, S. J. McIlveen, and E. S. Musso, “Operative repair of massive rotator cuff tears: I,” *Journal of Shoulder and Elbow Surgery*, vol. 1, no. 3, pp. 120–130, 1992.
- [15] H. J. Levy, J. W. Uribe, and L. G. Delaney, “Arthroscopic assisted rotator cuff repair: preliminary results,” *Arthroscopy: The Journal of Arthroscopic & Related Surgery*, vol. 6, no. 1, pp. 55–60, 1990.
- [16] M. Demirhan, A. C. Atalar, Y. Kocabey, and Y. Akalin, “Arthroscopic-assisted mini-open rotator cuff repair,” *Acta Orthopaedica et Traumatologica Turcica*, vol. 36, no. 1, pp. 1–6, 2001.
- [17] J. R. Walton and G. A. C. Murrell, “A two-year clinical outcomes study of 400 patients, comparing open surgery and arthroscopy for rotator cuff repair,” *Bone & Joint Research*, vol. 1, no. 9, pp. 210–217, 2012.
- [18] M. T. Scheibel and P. Habermeyer, “A modified Mason-Allen technique for rotator cuff repair using suture anchors,” *Arthroscopy: The Journal of Arthroscopic & Related Surgery*, vol. 19, no. 3, pp. 330–333, 2003.
- [19] S. Lichtenberg, D. Liem, P. Magosch, and P. Habermeyer, “Influence of tendon healing after arthroscopic rotator cuff repair on clinical outcome using single-row Mason-Allen suture technique: a prospective, MRI controlled study,” *Knee Surgery, Sports Traumatology, Arthroscopy*, vol. 14, no. 11, pp. 1200–1206, 2006.
- [20] S. Fealy, T. P. Kingham, and D. W. Altchek, “Mini-open rotator cuff repair using a two-row fixation technique,” *Arthroscopy: The Journal of Arthroscopic & Related Surgery*, vol. 18, no. 6, pp. 665–670, 2002.
- [21] C. B. Ma, L. Comerford, J. Wilson, and C. M. Puttlitz, “Biomechanical evaluation of arthroscopic rotator cuff repairs,” *The Journal of Bone and Joint Surgery*, vol. 88, no. 2, pp. 403–410, 2006.
- [22] I. Carbonel, A. A. Martinez, A. Calvo, J. Ripalda, and A. Herrera, “Single-row versus double-row arthroscopic repair in the treatment of rotator cuff tears: a prospective randomized clinical study,” *International Orthopaedics*, vol. 36, no. 9, pp. 1877–1883, 2012.
- [23] A. A. Shah, S. Milos, and A. Deutsch, “The strength and effects of humeral rotation on single-versus double-row repair techniques in small rotator cuff tears,” *Orthopedics*, vol. 33, no. 1, 2010.
- [24] X. Zheng, *Guiding Principles for Clinical Research of New TCM Drugs: Trial Implementation*, China Medical Science Press, Beijing, China, 2002.