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Progress of Chinese and Western Medicine on Rotator Cuff Injury

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Abstract: ***With the continuous development of medical technology, the average age of the population increases, people 's motor consciousness is generally improved, and the incidence of rotator cuff injury is increasing, which has become a common clinical soft tissue lesions around the shoulder joint, especially more common in elderly patients over 60 years of age. The pathogenesis of rotator cuff injury has not yet been conclusive in academia, and it belongs to the category of "shoulder pain" and "shoulder failure" in traditional Chinese medicine. Through consulting the relevant literature, to understand the etiology analysis and diagnosis and treatment of rotator cuff injury in Chinese and Western medicine were reviewed.***

Keywords: Rotator cuff injury, Combined therapy, Advancements**.**

1. Introduction

With the continuous development of medical technology, the average age of the population increases, people 's awareness of movement is generally improved, and the incidence of rotator cuff injury is increasing, which has become a common clinical soft tissue lesions around the shoulder joint. Rotator cuff disease is one of the most common musculoskeletal disorders [1-4]. The third leading cause of musculoskeletal disorders (16%) is the back (23%) and knee (19%) [5]. Its association is not only associated with its high prevalence, but also with the fact that it is disabling. It is particularly common in elderly patients over 60 years of age. The rotator cuff is composed of tendons of the supraspinatus, infraspinatus, teres minor, and subscapularis muscles, and its main role is to dynamically stabilize the glenohumeral joint, thereby preventing humeral head shift and ensuring the completion of shoulder abduction and internal and external rotation function, of which the incidence of supraspinatus injury is high, accounting for more than 85% of rotator cuff injuries [6]. The pathogenesis of rotator cuff injury has not yet been conclusive in academia, which belongs to the category of "shoulder pain" and "shoulder failure" in traditional Chinese medicine. The following will briefly describe the etiological theory, diagnosis and treatment of rotator cuff injury and the progress of Chinese and Western medicine treatment in recent years.

2. Modern Medical Understanding of Rotator Cuff Injury and Current Status of Diagnosis and Treatment

2.1 Anatomical and Epidemiological Characteristics of Rotator Cuff Injury

The rotator cuff consists of four muscles: supraspinatus, infraspinatus, subscapularis, and teres minor. These muscles all arise from the scapula and insert into the humeral tuberosity, and in addition to assisting in the completion of the internal rotation, external rotation, and abduction functions of the shoulder joint, they can firmly fix the humeral head at the glenoid cavity and maintain the stability of the shoulder joint. Supraspinatus muscle injury is most likely to occur due to its special location and physiological structure characteristics, and clinical data statistics show that supraspinatus injury accounts for more than 85% of rotator cuff injuries [7]. The incidence of rotator cuff tears ranges from 5% [8] to 39% [9]. It increases in the elderly population [9], and rotator cuff injury has an incidence of more than 25% in middle-aged and elderly people [10]. The main clinical manifestations are pain and limitation of shoulder joint movement, which seriously affect the daily life of patients.

2.2 Pathogenesis

The possible mechanism of exercise-induced rotator cuff injury has not been determined in academia. At present, there are three main possible mechanisms for rotator cuff injury.

2.2.1 Neer impingement theory: In 1972, NEER et al [11] concluded that rotator cuff injury was caused by subacromial impingement, and 95% of rotator cuff ligament ruptures were caused by impingement syndrome. Due to its special location, the supraspinatus is often squeezed and worn by the acromion and coracoacromial ligaments, and then a series of pathological changes such as congestion, edema, degeneration, and rupture occur, and Neer named a series of clinical manifestations produced by this "acromion impingement syndrome". This process is generally divided into three phases: the first phase is congestion and edema phase, the second phase is tendinitis and fibrosis phase, and tendon rupture will occur in the third phase. The shape of the acromion is greatly related to the degree of supraspinatus wear. Acromion is usually divided into three forms, which are horizontal acromion, arcuate acromion, and hooked acromion, with hook acromion having the highest wear rate to the supraspinatus tendon, which provides the basis for acromioplasty for the treatment of impingement lesions.

2.2.2 Blood supply theory: Studies have shown that areas about 1 cm from the insertion of the supraspinatus tendon have less blood supply and are prone to cause ischemia of the tendon, which leads to degeneration of the rotator cuff. Relevant anatomical studies have found that this region is not vascular insufficiency, but blood should be insufficient when the upper arm is in the abduction position [12].

2.2.3 Trauma Theory: Trauma theory is a widely accepted

theory in the industry and occurs more frequently in athletes who throw events. Such injuries were divided into severe violent injuries and repeated injuries. Minor injuries are easily overlooked and can progress further without timely intervention, which leads to partial or full-thickness tears of the tendon [13].

2.3 Diagnosis

Regarding the relevant diagnosis of rotator cuff injury, some experts do not recommend shoulder arthroscopy as the diagnostic method of choice, pointing out that arthroscopy will have a certain degree of mechanical trauma to the operation site. In suspected diagnosis, ultrasonography and MRI have the advantages of cost controllable and non-invasive, and ultrasonography has the advantages of dynamic examination and real-time observation, both of which have high clinical application value.

2.4 Treatment

Modern medicine [1] is mainly based on oral or topical non-steroidal anti-inflammatory drugs and opioid analgesics. Local seal therapy is often used to intervene, and early surgical treatment is recommended after conservative treatment is ineffective.

2.4.1 Conservative treatment: Conservative treatment can be used when rotator cuff injury is mild. Although there is no uniform indication standard for conservative treatment, most scholars believe that conservative treatment is recommended for small and medium-sized tears (< 30 mm), partial tears [14], short course of disease (within 3 months), Neer stage I, older age and patients who do not have high requirements for shoulder joint function and cannot tolerate surgery. There are many methods of conservative treatment, such as immobilization rest, physiotherapy, and drug and TCM treatment. Among them, physiotherapy includes non-steroidal anti-inflammatory analgesics, local injection, rehabilitation therapy, and intra-articular injection. After 6 to 12 months of conservative treatment[15], if the effect is not obvious, aggressive surgical treatment should be performed promptly to avoid delaying the condition.

2.4.2 Surgical treatment: When conservative treatment of rotator cuff injury is ineffective, surgical treatment should be performed. For patients with full-thickness rotator cuff tears, those who do not improve or experience acute exacerbation after 6 to 8 weeks of conservative treatment should be treated surgically as soon as possible; for patients with invasive or acute rotator cuff injury, tendons are still very strong and active, and surgical treatment should be performed as soon as possible; for patients with high requirements for muscle strength recovery, such as military personnel and athletes, surgical treatment should also be advocated [16]. Currently performed operations include open surgery and arthroscopic surgery, of which arthroscopic surgery is further divided into arthroscopic small incision treatment and total arthroscopic treatment. Open surgical approaches are more diverse and include rotator cuff debridement, repair, superior capsule reconstruction, tendon transfer, reverse shoulder arthroplasty, and the latest subacromial balloon interval [17].

3. Understanding and Diagnosis and Treatment of Rotator Cuff Injury in Traditional Chinese Medicine

3.1 TCM Understanding of Rotator Cuff Injury

3.1.1 Disease name: There is no clear definition of rotator cuff injury in classical ancient books of traditional Chinese medicine, but many physicians mostly record shoulder pain, dysfunction and other symptoms, which belong to the category of “shoulder pain” and “shoulder failure” in traditional Chinese medicine. For example, “Yin and Yang Eleven Moxibustion Classic” earlier than “Huang Di Nei Jing” has “shoulder detachment” description. “Internal Classic” discusses the disease has “shoulder pain” “shoulder does not lift” and other manifestations. “Acupuncture and Moxibustion A and B Classic” clearly states the name of “shoulder pain”.

3.1.2 Etiology and pathogenesis: Traditional Chinese medicine (TCM) believes that rotator cuff injury belongs to the category of “tendon meridians”, and the main pathogenesis is deficiency of the body, poor meridian running, obstruction of qi and blood, and lack of nourishment in the shoulders, which is caused by exogenous rheumatism, wind-heat in the lungs, strong weight-bearing, and falling servant injury, injuring the three yang of the hands.

3.2 Treatment

The shoulder is the intersection of the Sanyang meridian of the hand and belongs to the lung subregion. Caused by exogenous rheumatism, shoulder pain after, often with back pain and see, appropriate treatment of expelling wind and dampness, side with Qianghuo Shengshi Decoction. Because the lung by wind-heat, the syndrome showed shoulder pain before, pain even arm, side with Fangfeng Decoction, Qianghuo San and so on. Because strong weight bearing or falling servant injury, pain has a fixed place, extension and flexion disadvantage, or pain lead to the neck, etc., can be combined with trauma, massage, acupuncture treatment.

3.2.1 Traditional Chinese medicine treatment: Traditional Chinese medicine treatment of rotator cuff injury is often based on internal administration, according to the actual situation of syndrome differentiation and treatment, select the prescription medication, for patients with syndrome differentiation of liver and kidney deficiency type, tonifying the liver and kidney drugs are often the first choice, Zou Mingming [18] selected Duhuo Jisheng Decoction treatment of liver and kidney deficiency type rotator cuff injury, because such patients often suffer from illness for a long time, lingering refractory or lack of active, systematic treatment, exogenous pathogens into the interior, long illness damage the kidney, kidney main storage of essence and marrow, so the treatment of tonifying the liver and kidney at the same time, pay attention to eliminating pathogens out, select the prescription medication to Morus officinalis, Eucommia ulmoides tonifying the liver and kidney, supplemented by Duhuo, wind, Asarum, Gentiana products between the muscles and bones in addition of a small amount of Chuanxiong, Rehmannia glutinosa, Radix Paeoniae Alba Xiao Bo et al. [19] observed the clinical efficacy of traditional Chinese medicine ironing in the conservative treatment of

non-traumatic rotator cuff injury, and the results suggested that for patients with non-traumatic rotator cuff injury, ironing therapy with traditional Chinese medicine was more effective than conservative treatment alone. Chen Shiduo in the "Dialectical Record" cloud: "Blood is not alive is blood stasis can not go, blood stasis can not go bone can not be connected." Therefore, oral Fuyuan Huoxue Decoction or Xuefu Zhuyu Decoction, external fumigation has the effect of promoting blood circulation and removing blood stasis drugs, such as upper limb washing formula, traditional Chinese medicine selection is often used: angelica, red peony root, frankincense, myrrh and other drugs for promoting blood circulation and removing blood stasis and relieving pain, the clinical effect is exact.

3.2.2 Acupuncture treatment: Acupuncture is one of the unique treatment methods in TCM treatment, through the penetration of the needle combined with specific techniques, through the meridian qi, in order to achieve the effect of "internal disease and external treatment". "Surgical Zheng Zhi Quan Shu" mentioned that "all pains are caused by qi stagnation and blood stasis." Qi and blood are commanders, so in clinical diagnosis and treatment, blood circulation drugs are mostly selected, supplemented by qi, help blood running, provide power, blood vessels get through, increase its Shujin Tongluo pain effect. In clinical application, according to syndrome differentiation, specific acupoints are selected, combined with acupuncture manipulation and special manipulation to achieve therapeutic efficacy.

3.2.2.1 Electroacupuncture treatment. Electroacupuncture therapy is gradually formed in clinical practice on the basis of traditional acupuncture and moxibustion therapy, drawing on modern bioelectric theory, and is a combination of filiform needle and electrophysiological effects. In recent years, most studies on electroacupuncture combined with rotator cuff injury support the reliability of its efficacy. Zhu Dan et al., [20] summarized and summarized the different parameters of electroacupuncture by browsing the literature, according to the different parameters of electroacupuncture, through the understanding of the clinical and experimental use of electroacupuncture parameters, summarized the different effects of different parameters, and evaluated their use, for chronic pain, in acupuncture analgesia treatment can choose low-frequency treatment of [21], and many experts believe that dense waves should be selected, because such waveforms are not easy to tolerate, dense alternating current, can cause rhythmic muscle contraction, strengthen the blood circulation, lymphatic circulation and ion operation, strengthen tissue metabolism and nutrition, some soft tissue damage, low back fascia strain and other diseases have a certain effect. 1) Acupuncture combined with traditional Chinese medicine treatment. Liao Yanxia et al. [22] compared conventional treatment in floating needle combined with external application of Huangbai powder treatment effect, 60 cases of rotator cuff injury patients were randomly divided into control group and study group of 30 cases each, the control group was given conventional acupuncture treatment, the study group was given floating needle combined with external application of Huangbai powder treatment. The results showed that the overall response rate in the study group was higher than that in the control group. 2) cupuncture combined with rehabilitation. Including exercise therapy, physical factor therapy, intramuscular effect paste and so on. Exercise manipulation training is a way to actively strengthen the patients' own muscle strength training, rotator cuff joint exercise prescription treatment, combined with acupuncture and other operations can actively strengthen muscle strength training, core stability training, etc., enhance the range of motion, muscle strength level, balance ability, etc. contributing to better recovery. Guo Changli et al [23]. study to observe shoulder joint pain and function in patients with rotator cuff injury after acupuncture treatment. Acupuncture and moxibustion combined with physical rehabilitation exercise was used as the experimental group (102 cases), and physical rehabilitation exercise alone was used as the control group (112 cases). At 3 weeks after acupuncture (TII), 6 weeks after acupuncture (TIII) and 12 weeks after acupuncture (TIV), the VAS score, PPT score, SST score and CMS score of the two groups were significantly improved compared with those before treatment (TI), and the shoulder joint function score of the test group was significantly better than that of the control group.

3.2.3 Massage therapy: There are few reports on the treatment of rotator cuff injury with massage manipulation alone, which is mostly combined with other methods such as acupuncture, medicine, and surgery. Its main mechanism lies in the ability to regulate tendons and relieve pain as well as soothe tendons and meridians and improve local blood supply, while exercise maneuvers can adjust shoulder girdle muscle balance [24 – 25]. Han Weiyou[26] concluded through the study that the combined treatment of massage manipulation and rehabilitation training for patients with chronic rotator cuff injury can effectively relieve pain and improve shoulder joint function.

3.2.4 Combined therapy of medicine, acupuncture and massage: There are also many studies on the combined use of medicine, acupuncture and massage. Combined therapy can give full play to the advantages of various treatment methods and improve the clinical effective rate. Warm acupuncture combined with massage can better relieve local pain in patients with rotator cuff injury, reduce the degree of shoulder joint movement limitation, thereby improving shoulder joint function. Gan Daijing [27] used Hegu needling combined with Lijin bone-setting manipulation to treat 30 patients with shoulder dysfunction after rotator cuff injury. The results showed that the pain performance of the patients was greatly improved, the quality of life and shoulder joint function of the patients were improved, and the effective rate was higher than that of Lijin bone-setting manipulation alone.

4. Brief Summary and Outlook

Because rotator cuff injury has a high incidence, and the main clinical symptoms are pain and limited mobility, which seriously affect the quality of life of patients, the clinical treatment methods have become more and more diversified in recent years. Several large sample size studies support a significant positive effect of acupuncture treatment on pain and functional improvement in mild rotator cuff injury. At the same time, with the development of color Doppler ultrasound technology, it has achieved results in the diagnosis and treatment of various superficial tissue and organ-related diseases. Musculoskeletal ultrasound can clearly show the

anatomical shape of shoulder capsule labrum, intra-articular structure, rotator cuff and bursa, and perform accurate localization and injection. Although many literatures have confirmed that the combined use of multiple treatment regimens is effective, there are still some shortcomings: 1) the combined use of multiple means improves the treatment efficiency and also improves the treatment cost. How to determine the corresponding comprehensive treatment regimen according to the patient ‘s condition to reduce the cost and improve the efficacy needs to be further explored; 2) the follow-up time is mostly within 1 year, and there is a lack of further research in the long-term efficacy; 3) the current study samples are mostly tens of cases, and there may be errors in the study results. Although the current clinical study has some shortcomings, it also provides ideas and help for doctors in clinical treatment. Future research can be deeply explored in the selection of comprehensive therapy, long-term outcomes, and expansion of research samples. Therefore, we should promote the connection between TCM and modern medicine, strengthen multidisciplinary cooperation, optimize treatment options, effectively relieve patient diseases, and reduce pain.

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