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A comparative study of the efficacy of arthroscopic surgery and conservative treatment of gouty knee arthritis

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ABSTRACT. *Objective To study the clinical effect of arthroscopic knee joint cleansing for gouty knee arthritis.Methods A total of 80 patients with gouty knee arthritis treated in our hospital from January 2017 to December 2018 were selected. Among them, 42 patients underwent arthroscopic knee debridement in addition to drug treatment, and the other 38 patients were treated conservatively (medicine, physiotherapy, acupuncture and other treatments were given depending on the diagnosis and treatment guidelines).The knee joint VAS score and Lysholm score of all patients were collected before surgery (for conservatively treated patients at the initial visit) and after surgery (after the initial visit) at 1 and 12 months.Results In the arthroscopic surgery group, the VAS score and Lysholm score at the first month after operation was 4.45±0.90, 70.07±8.34, and the VAS score and Lysholm score at the 12th month after operation was 2.35±0.91, 80.59±10.55. The postoperative VAS score and Lysholm score of the arthroscopy group were significantly different from those before the operation (P<0.05).In the conservative treatment group, the VAS score and Lysholm score at the first month after treatment was 5.69±0.93, 58.61±12.12, and the VAS score and Lysholm score at the 12th month after treatment was 3.09±1.02, 70.42±9.54. The VAS score and Lysholm score of the conservative treatment group were significantly changed after treatment (P<0.05).However, throughout the follow-up period, the arthroscopic surgery group scored more significant changes than the conservative treatment group, while the arthroscopic surgery group had more significant changes in the first month after treatment (P<0.05).Conclusion Arthroscopic knee joint cleansing is more effective in treating gouty knee arthritis than conservative treatment, and it has an obvious effect early after surgery.*

KEYWORDS: *Gouty knee arthritis, arthroscopic surgery, conservative treatment,Efficacy analysis*

1. Introduction

Gouty arthritis is an inflammatory disease caused by the accumulation of urate crystals in the joints. Gouty arthritis is a common clinical disease [1]. Most patients with gouty arthritis are middle-aged and elderly people, but more and more young people are suffering from this disease. Related surveys show that the incidence of gouty arthritis is 1-2% among men over 30 years old and women over 50 years old [2]. The main clinical manifestations of gouty arthritis are joint swelling, elevated skin temperature and severe pain. Gouty arthritis can cause severe joint deformities, cause joint dysfunction, and affect the life and work of patients [3]. Most gouty arthritis attacks acutely at the first metatarsophalangeal joint, and then gradually invades other joints, changing from acute arthritis to chronic arthritis [4]. Gouty knee arthritis is caused by uric acid damage to the knee joint. At present, there are two main ways to treat gouty knee arthritis: drugs and arthroscopic debridement [5]. Arthroscopic debridement is an invasive treatment, and gouty knee arthritis may be exacerbated by postoperative inflammation. Therefore, through this study, we compared the efficacy and safety of arthroscopic knee debridement and conservative treatment (medicine, physical therapy, acupuncture and other treatments according to the diagnosis and treatment guidelines) in patients with gouty knee arthritis.

2. Materials and Methods

2.1 Patient's clinical data

According to the following inclusion criteria:①The patient was diagnosed with gouty knee arthritis, ②The patient had acute symptoms of knee arthritis, ③The patient was treated with arthroscopic knee debridement in our hospital or treated in the long-term outpatient visit of our hospital after the first visit

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Conservative treatment). According to the following exclusion criteria :① the patient has a mental illness and cannot cooperate, ② the patient has other diseases that affect knee function). According to the above criteria, this study selected 80 patients with gouty knee arthritis who were treated in our hospital from January 2017 to December 2018. Among the 80 cases, 42 cases were treated with arthroscopic knee debridement (32 males and 10 females, with an average age of 48.6±22.8 years); 38 of the 80 cases received conservative treatment (30 males, females) 8 cases, with an average age of 45.5±19.5 years).

2.2 Surgical treatment

All operations are performed by orthopedic surgeons above the deputy chief physician level. The patient lies in the supine position with water on the operating table. Use spinal anesthesia or local anesthesia so that patients do not feel pain. Use a pneumatic tourniquet to prevent the patient from bleeding during the operation. Cut the skin into the knee joint cavity on both sides of the front of the patient's knee joint. Rinse the knee joint cavity of the patient with saline, and then check whether the tissue in the knee joint is normal. Under the arthroscopy, remove as much as possible the knee cartilage, ligaments and urate crystals in the meniscus. During the operation, it is necessary to effectively protect the normal tissue of the joint and repair the damaged tissue. After the operation, a drainage tube connected to the body is left in the knee joint cavity, and the knee joint cavity needs to be flushed through this tube for the first 3 days after surgery. Postoperative precautions include pressure bandaging the knee joint and wearing elastic stockings for 24 hours. On the first day after surgery, start rehabilitation training, such as quadriceps contraction, straight leg elevation, ankle and metatarsophalangeal joint flexion and extension. After the patient is discharged from the hospital, regular follow-up visits are still required to use drugs to reduce the uric acid in the blood.

2.3 Conservative treatment

The patient was treated with oral medication under the guidance of a nephrologist (according to the "2016 Chinese Gout Diagnosis and Treatment Guidelines" plan) [6]. At the same time, personalized physical therapy, acupuncture and other treatments are given according to the patient's condition. Patients need regular follow-up visits during treatment, and physicians need to adjust medication plans for patients in time. The main drugs are: colchicine, sodium bicarbonate tablets, allopurinol, etoricoxib, glucocorticoids and so on. At the same time, patients also need to implement a strict life plan: regular diet and work and rest, weight control, smoking and drinking, reducing the consumption of high-purine foods, drinking plenty of water, and exercising properly.

2.4 Observation indicators and statistical methods

Collect the knee pain VAS score and Lysholm score of patients before treatment. At the same time, the knee joint pain VAS score and Lysholm score were collected in the first and 12 months after treatment. The VAS score is 10 points, and the Lysholm score is 100 points. The data was analyzed using SPSS 20.0 software, and the measurement data were shown as mean ± standard deviation and compared by t test. $P<0.05$ indicated that the difference was statistically significant.The data of all cases were reviewed by three clinicians at or above the associate chief physician level.

3. Results and discussion

3.1 Comparison of efficacy and advantages and disadvantages of two treatment methods

The efficacy results of the two treatment methods: Compared with before treatment, the knee VAS scores of the patients in the arthroscopic surgery group and the conservative treatment group decreased significantly in the first and 12 months after treatment, while the Lysholm scores were significantly improved. The differences in the scores of patients before and after treatment were statistically significant ($P<0.05$). (Table 1, Table 2).

Comparison of the efficacy of the two treatment methods: Compared with the conservative treatment group, the scores of patients in the arthroscopic surgery group were significantly improved at

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1 month after the operation. Patients who underwent arthroscopic knee debridement treatment recovered faster. During the entire observation period, the VAS score and Lysholm score of the conservative treatment group also changed, but the amount of change was less than that of the arthroscopic surgery group. The scores of patients in the arthroscopic surgery group were better than those in the conservative treatment group. The score difference between the two groups was statistically significant ($P<0.05$) (see Figure 1).

3.2 Discussion of results

With the development of society and economy, the human diet is constantly changing, and human life span has been significantly extended. The above conditions have led to the increase in the incidence and disability rate of gout every year [7]. The main pathological feature of gouty knee arthritis is the deposition of large amounts of urate crystals in the knee ligaments, synovium, cartilage and meniscus [8]. The normal articular cartilage collagen in the gouty knee joint is destroyed by uric acid, resulting in excessive proliferation of cartilage and synovium in the knee joint. Gouty knee arthritis can cause severe joint dysfunction, and its main clinical manifestations are joint pain, swelling and deformity [9].

At present, traditional Chinese medicine such as diet control, drug therapy, surgical treatment, and acupuncture physiotherapy have been used to treat gouty knee arthritis. These methods have certain curative effects, but they can only improve the adverse symptoms of the disease. Gouty knee arthritis cannot be cured at present [10].

Physicians and family members of patients train patients to correct their bad habits in personal diet and lifestyle, which can reduce the frequency of patients with gouty arthritis [11,12]. The main cause of gout is that uric acid cannot be excreted from the patient's body, which leads to hyperuricemia and hyperuricemia. Therefore, improving purine metabolism and promoting uric acid excretion in patients can reduce the formation of urate crystals in patients [13,14]. Good sleep, moderate exercise, and avoiding high-purine foods can help high-risk groups delay the onset and progression of gouty knee arthritis [6,15].

Drug treatment of gouty knee joint is a safe, simple and cheap treatment, but it needs to be taken for a long time with the correct dosage [16]. The main effect of the current use of drugs is to control the onset of acute gouty knee arthritis in time, reduce the frequency of attacks, and improve the symptoms and function of the knee joint. The application of non-steroidal anti-inflammatory drugs (NSAIDs), colchicine and glucocorticoids during the acute attack of gout can quickly relieve patient discomfort [17,18]. For patients with recurrent gout attacks, allopurinol and other drugs should be used regularly for uric acid-lowering treatment. It is recommended that patients with gout maintain blood uric acid below 360 μ mol/L (6mg/dl). Uric acid-lowering therapy can reverse the deposition of crystals secondary to long-term hyperuricemia. If the patient has long-term low uric acid levels, his gout signs and symptoms may disappear [19]. However, due to the continuous existence of the human body's physiological process of synthesizing uric acid, drugs cannot completely get rid of the troubles of the disease, and long-term use of uric acid-lowering drugs may also cause many complications [20-22].

Surgical treatment can directly remove the pathogenic factors that damage the knee joint and repair the damaged tissue at the same time, which has attracted more and more attention from clinicians [5,23]. Traditional incision surgery easily damages normal structures such as ligaments, and has a high probability of poor wound healing, sinus formation, and intra-articular infection. Incision surgery has gradually been replaced by arthroscopic minimally invasive surgery [5]. Arthroscopic knee joint debridement can directly observe the deposition of urate crystals in the joint, understand the involvement of the tissue structure in the joint, and can effectively remove the urate deposition and repair the damaged tissue [24]. At the same time, the operation time of arthroscopic surgery is short, the surgical incision is small, and the incidence of complications such as poor healing of the postoperative incision and infection is small [25].

Reviewing the published literature, there are few reports comparing the efficacy of arthroscopic surgery and conservative treatment of gouty knee arthritis. In this study, we compared the effects of arthroscopic knee debridement and conservative treatment on gouty arthritis. The results showed that the patients in the arthroscopic surgery group and the conservative treatment group had improved, but the patients in the arthroscopic surgery group recovered faster and better during the entire follow-up period.

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Table 1 VAS/Lysholm score analysis of patients before treatment and 1 month after treatment

Table 2 VAS/Lysholm score analysis of patients before treatment and 12month after treatment

	Arthroscopic surgery group		Conservative treatment group	
	VAS	Lysholm	VAS	Lysholm
Before treatment	7.65±0.88	48.04±7.24	7.57±0.82	49.56±6.92
After 1 month of treatment	4.45±0.90	70.07±8.34	5.69±0.93	58.61±12.12
t value	16.454	-12.873	9.398	-3.975
p value	0.000	0.000	0.000	0.000

	Arthroscopic surgery group		Conservative treatment group	
	VAS	Lysholm	VAS	Lysholm
Before treatment	7.65±0.88	48.04±7.24	7.57±0.82	49.56±6.92
After 12 month of treatment	2.35±0.91	80.59±10.55	3.09±1.02	70.42±9.54
t value	27.202	-16.488	21.084	-10.900
p value	0.000	0.000	0.000	0.000

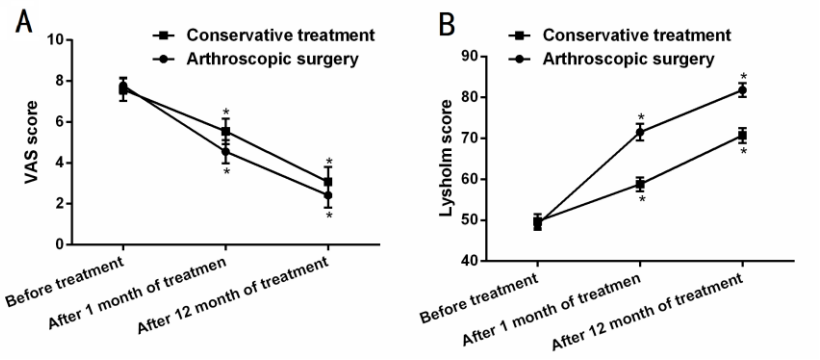

*Figure 1.Comparison of the VAS/Lysholm scores of the two treatment methods (marked with * is a significant difference in the group compared with the score before treatment, P<0.05).*

4. Conclusion

Patients with gouty knee arthritis who underwent arthroscopic knee debridement recovered better than those who received conservative treatment. Arthroscopic knee debridement is of high value in the treatment of gouty knee arthritis.

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