

# Arthroscopic Minimally Invasive Surgery for Knee Joint Gouty Arthritis

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**Abstract: Objective:** To analyse the efficacy of arthroscopic minimally invasive surgery in patients with knee joint gouty arthritis. **Methods:** A retrospective analysis method was carried out on randomly selected 56 patients with knee gouty arthritis from early July 2018 to the end of June 2019. All patients underwent arthroscopic minimally invasive surgery. **Results:** In this study, the patients were followed for 10 months. The Lysholm score of knee function was found to be significantly higher after treatment compared to the scores before treatment ( $P < 0.05$ ). **Conclusion:** Arthroscopic minimally invasive surgery is a promising method to treat for knee joint gouty arthritis.

**Keywords:** Arthroscopy minimally invasive surgery; Knee joint gouty arthritis; Effect

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## 1 Introduction

Knee joint gouty arthritis is a common clinical presentation. The main clinical feature is hyperuricemia, which is a part of a syndrome, either primary or secondary. The primary cause of knee joint gouty is mainly uric acid excretion disorder and sputum metabolism disorder. Chronic arthritis in these patients can cause tophi and joint deformity. In serious conditions, the patient may have bone and joint activity disorder and lesions, which may affect the knee joint of the patient<sup>[1]</sup>. Prevalence studies report that the incidence of gouty arthritis of the knee is increasing year after year due to changes in dietary structure, which can seriously affect and reduce the quality of life. A comprehensive analysis of its

treatment plan has been carried out and corresponding treatment methods have been proposed to improve patient prognosis. In this study, 56 patients were enrolled. The objective was to analyse the efficacy of arthroscopic minimally invasive surgery on knee joint gouty arthritis.

## 2 Materials and methods

### 2.1 Information

A randomized selection of 56 patients with knee gouty arthritis from our hospital with informed consent began from early of July 2018 to the end of June 2019. This was a retrospective analysis having a male to female ratio of 30:26, age distribution of 35 to 65 years old and median age of 45.5 years. The incidence of gouty arthritis in left knee and right knee was 30 cases and 26 cases, respectively. The clinical manifestations of the patients were repeated swelling and pain of the knee joint. There was a history of high blood uric acid, and the patients were treated conservatively. The effect was not satisfactory. Before the operation, the patient underwent X-ray examination of the affected side, MRI of the knee joint, and routine laboratory examination were investigated to exclude patients with surgical contraindications.

### 2.2 Method

Minimal invasive surgery for arthroscopic surgery: supine position and continuous epidural anaesthesia, the anterior and medial anterior aspect of the knee is the incision position, the arthroscope is placed from one side, the operation port is on the other side, and the knee joint is comprehensive. Systematic exploration, after clear results, moderately plan the synovial membrane

and remove the tophi, urate crystals in the joints (presented as white transparent), focus on clearing the crystal-like, cartilage surface distribution of the substance, use a large amount of physiological saline when washing, try to rinse the urate crystals, focus on rinsing and clearing the surface of the cruciate ligament, intercondylar fossa, and meniscus, affecting the crystallization of the knee joint activity, strengthening the protective cruciate ligament and cartilage, avoiding the patient's injury, if the patient has meniscus injury and cartilage injury should be properly treated to ensure that the knee flexion of the patient is more than 100°, showing 0° straightening, catheterization for patients with infection, wash for 3 d to 5 d, postoperative use of elastic bandage to bandage the affected limb, during the brake joint Using the functional position, after surgery, the patient was given a 48 h dressing treatment, and the patient's joint cavity effusion was

carefully observed. If necessary, pumping Patients with effusion. After the operation, encourage and guide patients to perform straight leg raising, joint flexion exercise, and gradually implement knee joint exercise for patients. If the patient has bone defect, the patient should be properly extended for weight-bearing time, regular review of blood uric acid, attention to dietary adjustment, and reasonable application.

### 2.3 Statistical processing

There was statistical difference in the data of 2 groups of patients in terms of gender, age, duration, condition, etc. ( $P > 0.05$ ).

## 3 Results

In this study, the patients were followed up for 10 months. The Lysholm score of the knee joint function was significantly higher after treatment compared to the scores before the treatment ( $P < 0.05$ ).

**Table 1.** Comparison of Lysholm scores of knee joint function before and after treatment in 2 groups of patients (points)

Group	Number of corresponding cases in each group	Knee joint Lysholm score
Before treatment	56	41.0±23.6
After treatment	56	92.0±22.6
t		11.6798
P		<0.05

## 4 Discussion

Knee gouty arthritis is characterised with greater degree of pain, occurrence of bone and joint activity disorders, chronic disease, longer treatment duration and complicated operational procedures. Therefore, the disease has a serious impact on the daily routine of the patients. Research should be carried out on to develop reasonable scientific treatment methods to treat the condition of patients with knee gouty arthritis, and how to effectively treat the clinical condition of patients with this disease. According to the studies, the causes of knee gouty arthritis include increased living pressure, accelerated pace of life, general lack of exercise, and poor diet. Therefore, the number of patients hospitalized for treatment has increased year after year, and more and more attention has been given on the treatment of patients with this disease.

Gouty arthritis has a high prevalence<sup>[2]</sup>. Patients of all age group are affected. However, males and people of about 40 years old are mostly affected. Based on the

clinical manifestations, patients can be divided into four stages, which are asymptomatic disease, acute arthritis, intermittent arthritis and chronic phase. Analysis of clinical data shows that patients generally have a history of gout for many years. Gout is a metabolic disease, and the related influencing factor is uric acid metabolism disorder. If the patient has hyperuricemia for a long time, it can accumulate too much uric acid, which can form urate crystals. The surface of the joint cavity tissue is deposited<sup>[3]</sup>. The white blood cells can phagocytize the crystals, degranulate rapidly after phagocytosis, and can be decomposed, releasing cytokines, which can cause damage to articular cartilage and soft tissues. In addition, uric acid crystals can stimulate macrophages, leading to the release of other cytokines, which can lead to further tissue damage. If the patient has long-term symptoms of arthritis, tissue fibrosis may occur, resulting in stiff and stiff joints. If the patient's knee joint is severe, redness, heat and pain may occur, and the pain may be severe.

Clinical features of patients with gouty arthritis<sup>[4]</sup>

include impaired blood supply distributed to the joint tissue, low temperature due to acid mucopolysaccharide distribution into the matrix around the patient's joint, which can significantly reduce the patient's pH, compared with other tissues. Urate is more prone to deposition. If the patient has knee gouty arthritis, it can seriously affect the knee function of the patient, lead to swelling of the knee joint, limited mobility and severe pain<sup>[5]</sup>, eventually causing damage to the intra-articular structure of the patient. Injury can lead to a significant decline in the quality of life of patients.

Knee joint gouty arthritis occurs due to the accumulation of a large number of urate crystals in the knee cartilage surface and synovial membrane, and the patient may have joint inflammation. The traditional method of treatment of patients is often not effective, it is associated with trauma and longer surgical incision which can significantly slow down the recovery time of the patient, and slow treatment effect<sup>[6]</sup>. Arthroscopic minimally invasive surgery can accurately detect the specific part of the patient's lesion. By observing the specific condition of the patient's lesion under direct vision can greatly increase the diagnosis rate of gouty arthritis of the knee joint. The arthroscopy minimally invasive technique can completely remove the urate crystal and tophi from the joint of the patient. The treatment method can significantly shorten the operation time of the patient, obtain the ideal surgical effect, reduce the postoperative infection rate of the patient<sup>[7]</sup>, reduce the incidence of postoperative complications, provide higher clinical recognition and higher safety, and importantly higher efficacy. It can also effectively reduce the pain of patients and can significantly improve the quality of life of patients.

The incidence of knee gouty arthritis disease is relatively rapid as the patient's joints and surrounding areas show obvious redness and heat. The patients suffer severe intolerable pain and mostly choose hospitalization. Patients are tested for blood uric acid and other laboratory tests. In the course of treatment, the use of colchicine, glucocorticoids and other drugs<sup>[8]</sup>, effective treatment of patients' conditions can effectively alleviate the clinical symptoms of patients, but clinical practice has confirmed that the use of drugs to treat this disease is associated with side effects. The prognosis is poor as the drug cannot completely cure the patient's condition. Therefore, joint irrigation has been proposed. However, it has certain limitations. The urate crystals in the joints of the patients can only

be temporarily cleared resulting in swelling and pain in patients. In terms of its efficacy, it is not effective in restoring the patient's joint function especially the patient's intra-articular lesions and symptomatic treatment. Arthroscopic treatment, which is a minimally invasive treatment, has been found clinically effectively in treating patients with knee gouty arthritis. By accurate positioning of the patient's lesions, arthroscopic examination showed patient's urate crystals with typical blizzard-like changes. Therefore, the use of arthroscopic minimally invasive surgery for the treatment of patients with knee gouty arthritis is easy to diagnose and can effectively treat the patient's cartilage and the meniscus has combined damage, and the rinsing solution can effectively wash a large amount of urate crystals and pain factors, and the planer can be effectively removed and cut.

During the treatment of knee gouty arthritis the intra-articular crystallization should be removed along with the inflammatory tissues in the joint, and the joint capsule should be cleaned. Therefore, arthroscopy should be used. The inflammation in the joints of the patient can be relieved by displaying the relevant parts on the screen. During the operation, the surgeon should have skilled operation technique and professional skills. During the operation, the joint cavity can be flushed with a large amount of saline, which is used for thorough cleaning and relieve the postoperative symptoms of the patient. It is necessary to reduce the uric acid by giving oral medications. Active cooperation from the patient with the treatment promotes the long-term therapeutic effect of the patient. During the follow-up period, the patient should be instructed to use the medicine to inform the patient of the corresponding precautions.

Literature reports that minimally invasive surgery has many clinical advantages, which can significantly shorten the operation time of patients, provide faster recovery, low incidence of infection, lesser preoperative complications, and significantly improved patient compliance. For patients with knee gouty arthritis, an ideal treatment effect can be obtained by arthroscopic treatment. However, during this period, the following points should be noted: when removing the crystal-like substance distributed on the cartilage surface, avoid violent spatula. Plane can be used for planning. Operating procedures should be gentle, protect the joint surface cartilage of the patient, as far as possible to detect the crystallized material distributed in the joint

capsule and clean it in time. After cleaning, use plasma. The cutter head surface treatment of exfoliated cartilage and planed synovial membrane to avoid further damage to the patient's cartilage, and the obvious haemostatic effect can effectively prevent postoperative joint swelling. If the patient has a large area of cartilage defect, needle drilling should be carried out.

The results of this study shows that Lysholm score of knee joint function was significantly higher after treatment ( $P < 0.005$ ).

Based on the above data, the effect of arthroscopic minimally invasive surgery on knee joint gouty arthritis is promising in terms of significantly improving the Lysholm score of knee joint function, and hence is worthy of clinical recommendation.

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