DOI 10.18019/1028-4427-2019-25-1-38-41

Endoscopic treatment of pathological medial patella plica syndrome of the knee

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Objective To evaluate the results of arthroscopic treatment of plica syndrome of the knee. **Material and methods** The study included 230 patients with plica syndrome of the knee. Their mean age was 40 ± 2.2 years. In 110 (47.8 %) patients, plica syndrome was combined with damage to the hyaline cartilage and in 75 (32.6 %) cases with Hoffa's fat pad hypertrophy. Forty-five (19.6 %) had synovitis and 53 (23 %) cases degenerative changes. Diagnosis and evaluation of results were based on R.M. Sherman and R.W. Jackson criteria, Lysholm Tegner Knee Scoring Scale, ultrasound, radiology, MRI and arthroscopy studies. Surgical treatment was performed with the technique developed at our clinic which included arthroscopic resection of the medial plica, shaving and coagulation. **Results** Postoperative period ran smoothly in 52 (22.6 %) patients. The average inpatient stay was 12 ± 2 days. Postoperative complications were recurrent synovitis (16 %), knee movement limitation (27.8 %), knee pain (49.6 %), limb muscle hypertrophy (57.4 %), and crepitus in the joint during movement (14.8 %). A combination of two or more of the complications occurred in 65 (28.3 %) patients. Knee function fully restored four to six months after the surgery. The average score on Lysholm Tegner Knee Scoring Scale after more than four years after surgery was 90 ± 5 points.

Keywords: knee, plica syndrome of the knee, arthroscopy

INTRODUCTION

Pathological medial patella plica (PMPP) is a rudiment, a remnant of the synovial membrane that develops phylogenetically in each person. It is needed only during embryonic development and is gradually resorbed after birth. In some cases, this process is incomplete, and the remnant of one of the membranes, called the medial patella plica (MPP) remains present in the knee joint.

Injuries to the knee joint (KJ), that need surgical treatment, make up from 5 to 7 % of the total of injuries to the musculoskeletal system, as reported by many authors. In addition to bone changes in the knee due to trauma, lesions of the capsulo-ligamentous apparatus deserve special attention [1–3].

Due to the inflammatory process and MPP thickening, problems arise in the knee joint. Among the diseases, the pathology of the synovial folds also plays an important role. The latter are classified according to the location in the anatomical KJ compartments: suprapatellar, mediopatellar, infrapatellar, and lateropatellar [4–6].

PMPP makes up to 31 % of all pathological KJ conditions. In 100 % of cases, the PMPP is combined with damage to hyaline cartilage, and in 28.3 %, with a change in the Hoffa's fat pad [5-7].

Today, endoscopy is the main and most effective method for diagnosing and treating knee pathology, in particular, if there are pathological folds [5–8].

The **purpose** of this study is to analyze the results of arthroscopic treatment of patients with PMPP of the knee.

MATERIAL AND METHODS

The study included 230 patients diagnosed with PMPP who were treated at the department of sports injuries of the RSPC in 2014–2017. Males were 127 (55.2 %) and 103 (44.8 %) were females. The average age of patients was 40 ± 22 years.

Diagnosis was based on the findings of clinical examination and images.

PMPP in all 230 patients was combined with other KJ pathology. Combined nosologies were damage to hyaline cartilage in 110 (47.8 %) patients, hypertrophy of the Hoffa's fat pad in 75 (32.6 %), and synovitis in 45 (19.6 %). In 53 (23 %) cases, the PMPP was combined with degenerative changes in the medial edge of the patella.

Chronic trauma to KJ was seen in the majority of patients (n = 144), the remaining 86 patients were treated for acute injuries.

Irismetov M.E., Tadzhinazarov M.B., Kholikov A.M., Shamshimetov D.F., Usmonov F.M. Endoscopic treatment of pathological medial patella plica syndrome of the knee. *Genij Ortopedii*, 2019, T. 25, No 1, pp. 38-41. DOI 10.18019/1028-4427-2019-25-1-38-41. (In Russian)

The criteria described by R.M. Sherman and R.W. Jackson: 1) anamnestic data and clinical signs; 2) ineffectiveness of conservative therapy; 3) pattern of avascular restructuring of the MPP edges which are in contact with the medial condyle of the femur during flexion/extension revealed by diagnostic arthroscopy; we found no other pathological changes.

Non-invasive instrumental methods were used: ultrasound, radiography and MRI diagnosis. Radiographs of the knee (primary stage of examination) showed a non-specific sign of the hypertrophied ligament. Ultrasound, according to our data, had a low sensitivity in the diagnosis of PMPP due to a complex visualization of this method.

MRI, as the most informative technique, was used in 208 patients (90.4 %). T2 or proton-weighted images in the sagittal and axial planes are considered to be the most informative for MPP imaging in or without lipid suppression mode. The MPP has a low MR signal and is easily recognized in a typical location in a small amount of intraarticular fluid. On the other hand, one should always pay attention not only to the size of the fold and its location relative to the medial condyle, but also to the condition of the articular cartilage in the medial compartment of the patella, femoral condyle and the patient's complaints. The large MPP size may make inspection of the medial regions of the joint difficult during arthroscopy [9].

Arthroscopy was used according to standard methods with the equipment of Karl Storz in order to make a final diagnosis upon an objective examination, a thorough collection of anamnesis, an examination of the data of instrumental diagnostics and the ineffectiveness of conservative therapy.

All the patients were subjected to surgical treatment according to the technique developed in our center, arthroscopic resection of MPP with shaving and coagulation. Interventions ran under spinal and general intravenous anesthesia. Anterolateral and anterior medial approaches were used. The arthroscope was inserted into the KJ through an anterolateral approach, while the anteromedial approach was used to introduce arthroscopic instruments (probe, various plyers, arthroscopic scissors, shaver, coagulator, or other necessary instruments). The excision of the MPP was complete and thorough to the unchanged tissues, in order not to leave separate parts of the pathological fold in the KJ cavity. At the same time, the course of the intervention was video monitored and recorded.

Dynamic clinical examination with assessment of the KJ function, analysis of stability and symptoms (pain, knee swelling, feeling of instability during exercise) immediately after the injury and before surgery, as well as in the long-term period was performed in each patient.

The knee condition and the results after arthroscopic treatment were assessed according to the internationally used Tegner Lysholm Knee Scoring Scale that includes the following parameters: lameness, use of additional supports for walking, blocks in the joint, instability, pain and swelling during exercise. The ability of climbing the stairs and squatting was also assessed. Next, the results were statistically processed with the Lysholm Tegner Knee Scoring Scale.

RESULTS

Early postoperative period was uneventful in 52 (22.6 %) patients, and there was a relief or disappearance of pain in the knee. The average duration of inpatient stay was 12 ± 2 days.

Early (up to 6 weeks) postoperative complications were recurrent synovitis in 37 (16 %) cases, KJ movement restrictions in 64 (27.8 %) cases, knee pain in 14 (49.6 %), hypotrophy of the limb muscles in 132 (57.4 %), crepitus in the joint during motion in 34 (14.8 %) cases. A combination of two or more of the above complications occurred in 65 (28.3 %) patients.

Intra-articular injections of anti-inflammatory drugs were administered in cases of complicated early postoperative period.

Full recovery of the KJ function was observed in all patients at follow-up from four to 6 months after surgery. Unsatisfactory results in the long-term period (up to 4 years) were not recorded. There were no complications.

Long-term results of surgical arthroscopic treatment of PMPP were analyzed by us on the basis of complaints, clinical data and objective examination data, MRI findings and using the Lysholm Tegner Knee Scoring Scale.

Lysholm Tegner Knee Scoring Scale comparison showed a statistical tendency to increase the average scores after the operation to 90 ± 5 without deterioration ($p < 0.05$).

Case report Patient G., born in 1990, was diagnosed with pathological MPP and complained of pain, restriction of movement and transient blocking of the left KJ. MRI showed a cord-like thickening in the medial region of the joint. No other pathology was identified. Pain was experienced by palpation on the anteromedial side of the left KJ, Baikov symptom was positive, Holding test was positive, Lachman test and symptoms of the anterior and posterior drawer and lateral ligaments were negative.

After collecting anamnesis, clinical data and MRI, the patient underwent arthroscopy of the left KJ under spinal anesthesia. In the medial part of the joint, a thickened and dense MPP, stung between the medial edge of the patella and the anteromedial part of the medial condyle of the left femur, was revealed. Other KJ structures were unchanged.

The patient was discharged after 3 days. After arthroscopy, therapeutic gymnastics took the leading place in the complex of means for functional therapy in this pathology. The goal of exercise therapy was to protect the KJ from overstrain, improve soft tissues regeneration, regain flexion and extension range in the joint and restore muscle strength. In general, the patient improved her quality of life.

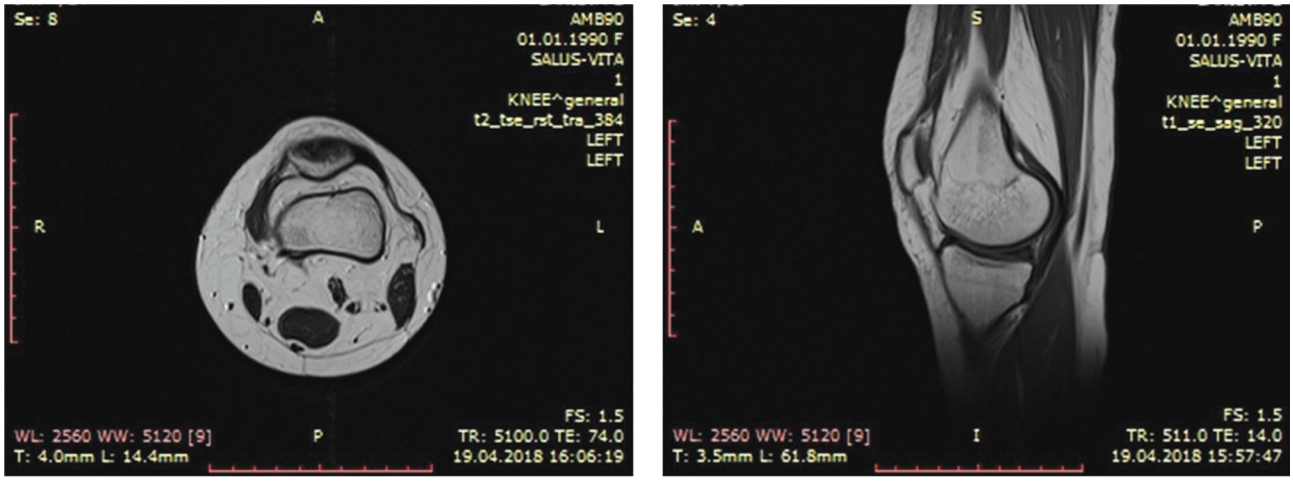

Fig. 1 MRI scans showing left knee PMPP

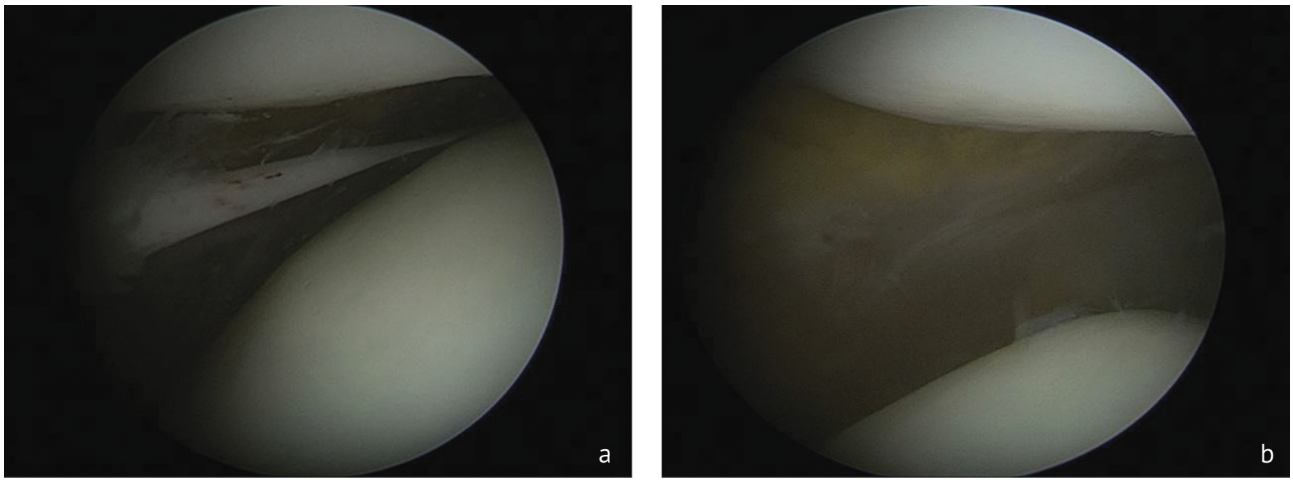

Fig. 2 Arthroscopic image before (a) and after (b) MPP resection

DISCUSSION

Undoubtedly, arthroscopy is a reliable method of diagnosis and treatment of not only PMPP but also of other knee pathologies to date. The technique provides examination of the intra-articular structure under physiological conditions.

Generally recognized benefits of arthroscopy are reduction in the postoperative recovery process and success rates. Also, intra- and periarticular tissues are less injured as compared to an open operation. Postoperative scars are less noticeable due to small incisions. This circumstance is especially convenient for professional athletes, who often face KJ injuries and should recover fast.

There are several methods and options for arthroscopic surgery of the MPP. Vijay D. Shetty et al. in their prospective study of 48 patients with an established diagnosis of PMPP with the use of arthroscopic resection of the MPP achieved good and excellent results in 39 (81.25 %) cases, and the diagnostic accuracy of arthroscopy in this pathology was 91.7 % [3].

Studies conducted by P. Jemelik et al. based on the results of 1408 arthroscopies showed that treatment of MPP with arthroscopic resection resulted in complete disappearance of pain in 34 % of cases (VAS score 0 points (Visual Analogue pain Scale) and 65.8 % of patients returned to previous sports activity [9].

The technical aspects of the technique of arthroscopic surgery of the MPP used in our clinic involve the use of standard approach with resection, shaving and coagulation of the MPP. At the same time, the stage of shaving involves the removal of MPP, including areas of altered tissue of the synovial membrane, while coagulation minimizes the recurrence of the disease.

CONCLUSIONS

Therapeutic and diagnostic program should include early MPP detection and conservative therapy using modern instrumental imaging techniques (ultrasound, MRI). Diagnostic arthroscopy is performed if it fails.

Surgical treatment of patients with PMPP with the arthroscopic method proposed restores the KJ function in optimal time, returns patients to their usual activities and improves their quality of life. Long-term positive results are observed in 100 % of the patients thus treated

REFERENCES

1. Andreeva T.M., Ogryzko E.V., Popova M.P. *Travmatizm, ortopedicheskaia zabolevaemost, sostoianie travmatologo-ortopedicheskoi pomoshchi naseleniiu rossii: spravochnik* [Traumatism, orthopedic morbidity, the state of traumatologic-and-orthopedic care to the population of Russia: reference book]. M-vo Zdravookhraneniia i Sots. Razvitiia, FGU TsITO im. N.N. Priorova. M., 2007, pp. 2-4. (in Russian)
2. Schindler O.S. Knee. Synovial plicae of the knee. *Current Orthopaedics*, 2004, vol. 18, pp. 210-219.
3. Shetty V.D., Vowler S.L., Krishnamurthy S., Halliday A.E. Clinical diagnosis of medial plica syndrome of the knee: a prospective study. *J. Knee Surg*., 2007, vol. 20, no. 4, pp. 277-280.
4. Dupont J.Y. Synovial plicae of the knee. Controversies and review. *Clin. Sports Med*., 1997, vol. 16, no. 1, pp. 87-122.
5. Blok A., Weiss W., Dolata T., Szczepaniec M. Medial synovial plica. *Ortop. Traumatol. Rehabil*., 2005, vol. 7, no. 4, pp. 397-400.
6. Farkas C., Hargitai Z., Gáspár L., Kuki A., Csernátony Z., Szepesi K. Histological changes in the symptomatic mediopatellar plica. *Knee*, 2004, vol. 11, no. 2, pp. 103-108. DOI: 10.1016/S0968-0160(02)00143-6.
7. Dupont J.Y. Synovial plicae of the knee. Controversies and review. *Clin. Sports Med*., 1997, vol. 16, no. 1, pp. 87-122.
8. Jemelik P., Strover A.E., Evans G. Results of resection of medial patellar plica through a supero-lateral portal as a main arthroscopic procedure. *Acta Chir. Orthop. Traumatol. Cech*., 2008, vol. 75, no. 5, pp. 369-374.
9. Vitko N.K., Filisteev P.A., Morozov S.P. Klinicheskoe znachenie i MR-diagnostika sinovialnykh skladok kolennogo sustava (obzor literatury) [Clinical value and MR-diagnosis of the knee synovial plicae (review of the literature)]. *Meditsinskaia Vizualizatsiia*, 2013, no. 4, pp. 103-110. (in Russian)

Received: 15.10.2018

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