Review Article
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Arthroscopy for Knee Osteoarthritis in the XXI Century: a Systematic Review of Current High Quality Researches and Guidelines of Professional Societies

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Abstract

Background. Current evidence based research data lead to reassessment of traditional approaches for treatment of patients with bone and joint disorders especially knee osteoarthritis (OA). ***The purpose of the study*** was to review randomized clinical trials (RCT) and meta-analyses of RCT as well as recent guidelines of professional societies for application of arthroscopic lavage, debridement and meniscectomy in knee OA. ***Materials and Methods.*** Databases PubMed, e-LIBRARY, EMBASE (Ovid), Cochrane Central Register of Controlled Trials (CENTRAL) were searched for the period from 2000 till 2019. From 138 heats irrelevant and poor quality studies were excluded. In total there were 1614 patients aged 48,9–62,8 in RCT and 20 770 patients aged 42–62,4 in meta-analyses of RCT. ***Results.*** Both arthroscopic lavage and debridement do not lead to significant pain relief as well as functional improvement in long term therefore are not recommended. Non-surgical treatment should be the first line strategy in patients with early and moderate knee OA even with degenerative meniscal tears irrespective of mechanical symptoms like painful locking, catching or sudden giving way. Arthroscopy might be performed only if complex non-surgical treatment including non-steroidal anti-inflammatory drugs, structured exercises program and intra-articular injections failed after 3 months in patients without 'bone on bone' cartilage erosions and frontal malalignment or if the knee is mechanically locked due to bucked handle type meniscus tear or loose body. ***Conclusion.*** Evidence based medicine approach let us to conclude that arthroscopy in knee OA is non-efficient and rarely indicated therefore if proper non-surgical treatment is failed around the knee osteotomies and partial or total arthroplasty should be considered.

Keywords: degenerative knee disease, osteoarthritis of the knee, arthroscopic surgery, lavage, meniscectomy.

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Introduction

Most authors refer to the nosological unit "knee joint osteoarthritis" (OA) (deforming arthrosis, osteoarthritis, osteoarthrosis) a complex of degenerative-dystrophic and inflammatory changes in the tissues that form the knee joint (cartilage, menisci, subchondral and metaphyseal bone, synovial membrane, ligaments , fibrous capsule), as well as in extra-articular formations inseparably connected with knee joint function, such as tendons and muscles located nearby (M17 according to ICD-10) [1]. The clinical disease manifests itself as pain associated with mechanical stress or discomfort of varying intensity, deformity and progressive knee joint dysfunction, and the lower limb in whole [2]. Degenerative knee joint diseases in older age groups are detected with frequency about 25%: from 19% (95% confidence interval [CI], 15-24) among women aged 50 to 59 years to 56% (95% CI; 46 - 66) among men aged 70 to 90) [3].

Due to the complexity and variety of molecular mechanisms responsible for the development and progression of OA, there are still no effective pharmaceuticals that can prevent or slow down its development. With early OA, the most effective long-term strategy for controlling its progression is a non-pharmacological prophylactic, which includes a 12-15% reduction in body weight from baseline in combination with walking, which maintains all muscles in optimal functional state, providing active mobility of the lower limb. A short-term analgesic effect is usually achieved through systemic and local use of non-steroidal anti-inflammatory drugs (NSAIDs) and local injection therapy (corticosteroids, hyaluronates, etc.). With moderate and severe OA, the effectiveness of the aforementioned therapeutic measures decreases, and therefore it becomes necessary to use surgical treatment, today the most common are total and partial knee arthroplasty, correcting periarticular osteotomies and arthroscopy of the knee joint. This review is devoted to the analysis of the endoscopic interventions expediency in patients with knee joint OA from the standpoint of evidence-based medicine.

The first to discover and describe the improvement in health state from lavage of the degeneratively altered knee joint were E. Bircher in 1921 and M.S. Burman et al. in 1934. [4, 5]. The achieved clinical effect was attributed by local and foreign authors to the elimination of free cartilage fragments, proteolytic enzymes, and proinflammatory cytokines from the joint cavity [6, 7]. Rational debridement consisting of removal of unstable fragments of cartilage, degeneratively altered menisci areas, osteophytes causing impingement, synovial membrane hypertrophied tissues and free intra-articular bodies, supplemented, according to the supporters of this approach, the effect achieved by flushing the joint [8, 9]. A number of researchers in the presence of full-thickness cartilage defects recommended combining the above manipulations with various methods of mesenchymal stimulation to form a "super-clot" capable of replacing worn out cartilage with newly formed tissue, the most popular of which were the creation of subchondral bone microfractures ("microfracturing") and abrasive chondroplasty [10].

Understanding the importance of applying the principles of evidence-based medicine in scientific research in surgery at the turn of the last century and the current century led to a number of randomized placebo-controlled clinical trials (RCTs) of the lavage and debridement effectiveness in patients with knee joint OA [7, 11, 12]. Despite the existing limitations of these studies, the results indicated a predominance of the placebo effect. The results of such high-level evidence studies were immediately reflected in the recommendations for the treatment of patients with knee joint OA, published by professional orthopedic communities and associations. As an example, the world's most influential American Academy of Orthopedic

Surgeons (AAOS) opinion: "Arthroscopic lavage and / or debridement is not recommended due to ineffectiveness and the associated risk of surgical complications." The experts assigned this recommendation (No. 12) the highest level of evidence: this means that it is unlikely that subsequent research will be able to disprove or change it [13].

Despite the unity of such recommendations in North America and Europe, arthroscopy of the osteoarthritic knee joint is still the most common orthopedic procedure, reaching two million interventions per year [14, 15, 16, 17]. In the United States alone, arthroscopy for degenerative diseases of the knee joint costs the healthcare system more than $ 3 billion per year [18]. An interesting fact is that in most cases, the expediency of arthroscopy is justified by the presence of degenerative injury to the meniscus / menisci, with which clinicians of various specialties associate responsibility for the persistence of the disease clinical symptoms.

The purpose of the study is to evaluate the expediency of using arthroscopic lavage, debridement and meniscectomy in patients with knee joint OA basing on high-level scientific studies (randomized clinical trials (RCTs) and meta-analyzes of RCTs), as well as the current recommendations of professional communities based on them.

Material and Methods

We searched for English- and Russian-language publications in the electronic databases PubMed, e-LIBRARY, EMBASE (Ovid), Cochrane Central Register of Controlled Trials (CENTRAL) for the period from 2000 to 2019 using the keywords: arthroscopy, gonarthrosis, osteoarthritis , osteoarthrosis, knee joint, debridement, lavage, meniscectomy. From 148 publications (with the full text), according to the inclusion criteria (excluded messages with less than 10 patients, as well as with irrelevant patients, design, interventions, observations) were selected 12 RCTs (comparison of surgical and conservative treatment), 12 review articles and 3 RCTs (analysis of complications of arthroscopy), 2 meta-analyzes based on the analysis of RCTs, two multidisciplinary consensus and 8 recommendations of the professional medical communities (ESSKA - European Society of Sports Traumatology, Knee Surgery and Arthroscopy; AAOS - American Academy of Orthopedic Surgeons; BOA - British Orthopedic Association; AOA - Australian Orthopedic Association; OARSI - Osteoarthritis Research Society International; NICE - National Institute of Health and Care Excellence, BASK - British Association for Surgery of the Knee, AAC - Arthroscopy Association of Canada) (Fig. 1).

It should be emphasized that the only relevant local literary source on the problem under consideration was clinical guidelines for the treatment of knee joint OA in 2013 [19].

The total RCTs analyzed include 1614 patients with an average age of 54.8 years (48.9–62.8 years) (women on average 49.2% (5.0–81.7%)), and review articles and meta-analyzes - 20770 patients aged 42 to 62.4 years (women accounted for 39% to 64.6%).

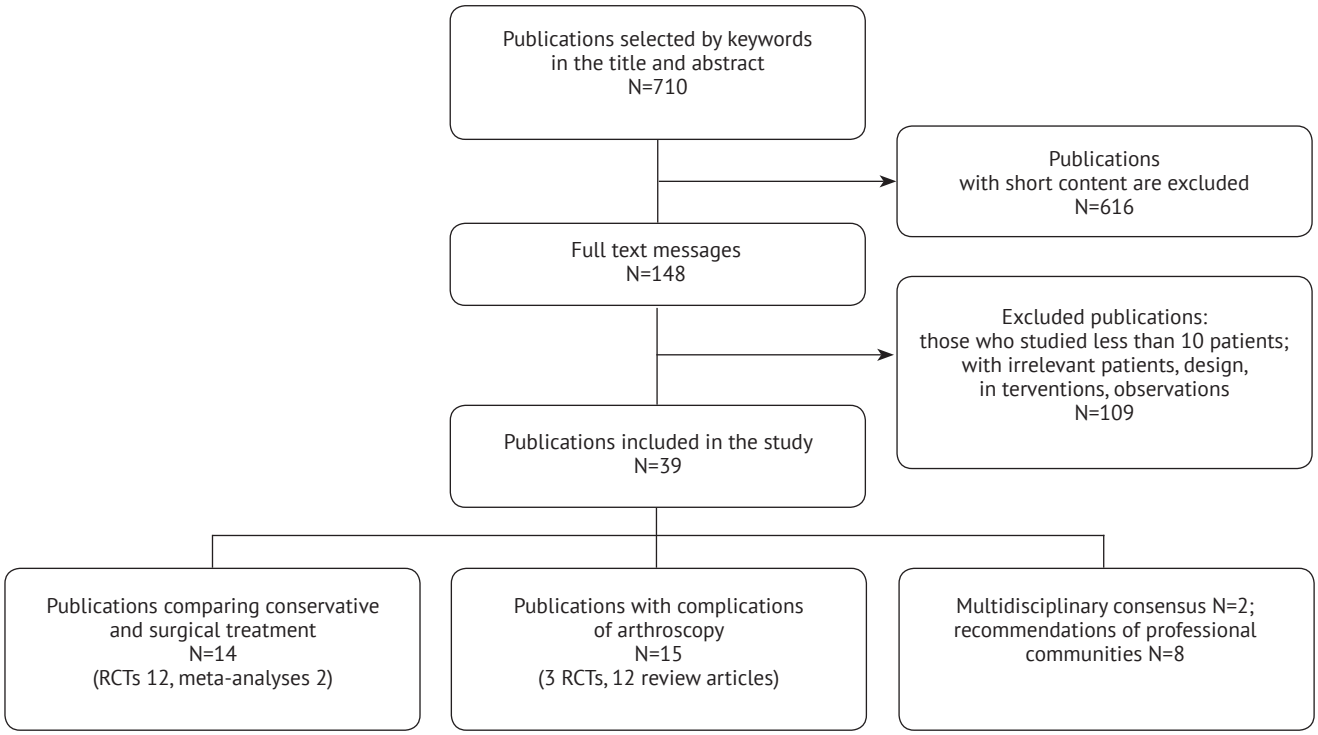

Figure 1. Study selection process

Results

Considering that the overwhelming majority of RCTs and recommendations of the professional community differentiate arthroscopic lavage and debridement from partial resection of degeneratively altered areas of the meniscus, the results of using these two options for endoscopic guidance will be considered separately.

Arthroscopic lavage and debridement

Most professional associations agree that arthroscopic lavage and debridement are contraindicated in patients with clear radiographic signs of knee joint OA (Table 1).

With regard to radiologically unconfirmed OA and in the presence of so-called mechanical symptoms (sudden episodes of instability in the knee joint when walking, accompanied by clicks, crunching and acute pain localized in the projection of the articular line; short-term spontaneously resolving blockages), the recommendations are ambiguous and diverge from an explicit statement that arthroscopy is "not indicated" to the point that it is "indicated." At the same time, OARSI and AOA refrain from additional comments for patients of this subgroup.

The Russian recommendations for the treatment of knee joint OA from 2013 indicate that the knee joint arthroscopy affected by the degenerative-dystrophic process can be used to confirm the diagnosis and clarify the tactics of further treatment if it is impossible to use non-invasive alternatives, for example, MRI. Arthroscopy is indicated in patients with stages I – II of the disease according to the classification of N.S. Kosinskaya with a moderately pronounced limitation of the knee joint function, with duration of pain syndrome for more than 6 months and ineffectiveness of complex conservative therapy, the normal axis of the lower extremity or its violation less than 5 ° and the presence of complaints and symptoms indicating concomitant damage to the menisci or the presence of free intra-articular bodies [19].

Table 1

Recommendations of professional communities

Organization	Lavage or debridement		
	X-ray confirmed knee joint OA	X-ray unconfirmed knee joint OA	Mechanical symptoms
AAOS [13]	Against	Possible	Possible
ESSKA [20]	Against	Pro	Pro
BOA [21]	Against	Pro	Pro
AOA [22]	Against	No comments	No comments
OARSI [23]	Against	No comments	No comments
NICE [24]	Against	Against	Pro

Pro — an explicit statement that arthroscopy is indicated for these patients.
Against — an explicit statement that arthroscopy is not indicated for these patients.
Possible — arthroscopy is recommended for individual indications

It should be noted that although in most countries after the above recommendations were issued over 10–15 years, there was a gradual reduction in the frequency of use of arthroscopic lavage in patients with knee joint OA, nevertheless, specialists did not completely abandon this intervention [25].

From 148 publications we have selected 12 the highest quality RCTs comparing arthroscopic interventions in patients with knee joint OA who suffer from persistent pain syndrome and reduced quality of life, both with non-surgical methods of treatment (non-drug and pharmacological, including injection therapy), and with placebo-surgery (skin incision without intra-articular manipulations). Studies with an insufficient number of observations and those in which patients with acute trauma participated were excluded. The patients characteristics and scales for assessing pain and joint function in the studied publications are shown in Table 2.

Analysis of the studies revealed high validity of the evidence that knee joint arthroscopy results in very small pain relief for up to 3 months. (mean difference = 5.4 on a 100-point scale; 95% CI 2.0-8.8) and very little or no pain relief up to 2 years (mean difference = 3.1; 95% CI 0.2 –6.4) in comparison with conservative treatment.

For joint function, there is moderate evidence that knee joint arthroscopy results in little improvement in the short term (mean difference = 4.9 on a 100-point scale; 95% CI 1.5–8.4) and very little improvement in function or its absence after 2 years (average difference = 3.2; 95% CI 0.5–6.8).

Like any surgical intervention, despite being minimally invasive, arthroscopy can cause complications. In the literature, among intra- and perioperative complications, trauma to nerves and vessels, thrombosis, air embolism, compartment syndrome and instruments breakdown are mentioned [38]. In the postoperative period, hemarthrosis, thrombosis, embolism and surgical site infection may develop. Late complications include spontaneous osteonecrosis of the femoral and / or tibial condyles (Albeck's disease, aseptic necrosis), arthrofibrosis with contracture formation, and complex regional pain syndrome (CRPS).

To analyze the frequency and structure of complications after the knee joint arthroscopy in patients with OA, 15 studies (selected from 148 analyzed articles), covering this problem in detail, including 12 retro- and prospective cohort studies [39, 40, 41, 42, 43 , 44, 45, 46, 47, 48, 49, 50], as well as three RCTs [30, 31, 37] (Table 3), were analyzed.

Table 2

Characteristics of randomized clinical trials included in the analysis

Study	Number of patients	Factor for comparison	Pain evaluation	Function evaluation
Moseley J.B. с соавт., 2002 [26]	119	Placebo-surgery	SF-36 body pain	SF-36 physical function
Herrlin S. с соавторами, 2007, 2013 [27, 28]	96	Physical therapy	KOOS pain	KOOS ADL
Kirkley A. с соавторами, 2008 [29]	188	Physical therapy	WOMAC pain	WOMAC function
Katz J.N. с соавторами, 2013 [30]	351	Physical therapy	KOOS pain	KOOS ADL
Sihvonen R. с соавторами, 2013 [31]	146	Placebo-surgery	VAS	Lysholm knee score
Vermesan D. с соавторами, 2013 [32]	114	Steroid hormones injections	Oxford knee score	Oxford knee score
Yim J.N. с соавторами, 2013 [33]	108	Physical therapy	VAS	Lysholm knee score
Gauffin H. с соавторами, 2014 [34]	150	Physical therapy	KOOS pain	KOOS ADL
Saeed K. с соавторами, 2015 [35]	120	Hyaluronic acid injections	KSS	KSS
Stensrud S. с соавторами, 2015 [36]	82	Physical therapy	Ordinal scale	Ordinal scale
Kise N.J. с соавторами, 2016 [37]	140	Physical therapy	KOOS pain	KOOS ADL

ADL — Activities of Daily Living; KOOS — Knee injury and Osteoarthritis Outcome Score; KSS — American Knee Society Score; SF-36 — 36-Item Short-Form Survey; VAS — Visual Analogue Scale; WOMAC — Western Ontario and McMaster Universities Arthritis Index.

Table 3

Characteristics of studies included in the systematic review of complications

Publication	Type of research	Number of patients
Wai E.K. с соавторами, 2002 [39]	Retrospective cohort study	14391
Hoppener M.R. с соавторами, 2006 [40]	Retrospective cohort study	335
Yacub J.N. с соавторами, 2009 [41]	Retrospective cohort study	12426
Jameson S.S. с соавторами, 2011 [42]	Retrospective cohort study	261446
Hetsroni I. с соавторами, 2011 [43]	Retrospective cohort study	418323
Maletis G.B. с соавторами, 2012 [44]	Retrospective cohort study	20770
Hame S.L. с соавторами, 2012 [45]	Retrospective cohort study	314578
Yeranosian M.G. с соавторами, 2013 [46]	Retrospective cohort study	432038
Bohensky M.A. с соавторами, 2014 [47]	Retrospective cohort study	139031
Basques B.A. с соавторами, 2015 [48]	Retrospective cohort study	17774
Krych A.J. с соавторами, 2015 [49]	Retrospective cohort study	12595
Cancienne J.M. с соавторами, 2016 [50]	Retrospective cohort study	173216
Katz J.N. с соавторами, 2013 [30]	Randomized clinical trial	174
Sihvonen R. с соавторами, 2013 [31]	Randomized clinical trial	70
Kise N.J. с соавторами, 2016 [37]	Randomized clinical trial	70

The key complications reported in the studies reviewed were mortality, venous thromboembolism (VTE), surgical infection, and nerve damage. To assess the number of VTE, studies reporting only pulmonary embolism or deep veins thrombosis, as well as their combination, were taken into account.

It was found that the development of death and nerve damage as a result of arthroscopy are extremely low risks, the development of infection is very low, and VTE is low (Table 4).

Among the limitations, it is worth noting the retrospective nature of data collection in most of the studies analyzed: the information in the registers was initially collected not for the purposes of scientific research data. In general, publications reporting mortality, VTE and infection have shown conflicting results from both clinical and statistical points of view, which reduces the reliability of the overall estimate. The study reporting nerve injury was the only one and therefore should be interpreted with caution [41].

Late complications such as osteonecrosis, arthrofibrosis and complex regional pain syndrome (CRPS) in the analyzed messages are not recorded.

The need to consider the risk of periprosthetic infection in patients who may require total knee arthroplasty after arthroscopy was discussed at an international consensus conference on periprosthetic infection [51]. Participants agreed that a history of joint surgery (including arthroscopy) in patients requiring knee arthroplasty increases the risk of developing inflammatory complications after it is performed.

Nevertheless, even with a favorable course of the postoperative period, recovery after arthroscopy requires 2 to 6 weeks, during which pain, swelling and limitation of joint function persist [52]. Most patients cannot fully load the lower limb in the first week after surgery, which requires the use of additional support; in addition, driving and physical activity during the recovery period are also significantly limited [53].

Table 4

Results of the knee arthroscopy complications study in patients with OA in comparison with conservative treatment (follow-up for 3 months)

Types of complications	Number of studies (number of patients in the study)	Arthroscopy	Conservative treatment
Mortality	7 (454086 patients)	<1 per 1000	0 per 1000
Nerve injury	1 (12426 patients)	<1 per 1000	0 per 1000
Infection	5 (603838 patients)	2 per 1000	0 per 1000
VTE	11 (119920 patients)	5 per 1000	0 per 1000

Arthroscopic meniscectomy

Table 5 presents the guidelines of the medical associations (ESSKA, AAOS, OARSI, NICE, AAC) and the recommendations of the professional orthopedic communities (BOA, AOA, BASK) for arthroscopic meniscectomy in patients with and without radiologic evidence of OA, and there is no unequivocal opinion on this issue.

The inconsistency of the recommendations can be explained by the fact that in most of the analyzed RCTs and meta-analyzes of RCTs, the inclusion criteria varied very widely, resulting in a heterogeneous sample of patients with a high frequency of transition from the group of non-operative treatment to surgical treatment, or often without any previous conservative treatment at all [54, 55, 56, 57, 58, 59, 60, 61].

Separately, the most relevant recommendations for the treatment of patients should be highlighted with meniscus injuries, based on evidence-based medicine principles and formulated by the UK Knee Surgery Association through consensus methodology.

Initially, a unified terminology was defined for the definition, diagnosis and classification of meniscus injury, after which 45 clinical scenarios were formulated, which were further summarized into five clinical groups with possible treatment recommendations. Final recommendations stratify patients depending on the nature of clinical symptoms and their duration, medical history, clinical, radiological and MRI examinations, as well as the effectiveness of previous treatment.

In relation to the topic of this study, arthroscopic intervention on the meniscus was recognized as inappropriate in all patients with severe knee joint OA or arthritis, which manifests itself only with typical symptoms and clinical signs. In patients with early / moderately severe knee joint OA after the initial treatment, conservative therapy is recommended for the first 3 months. (NSAIDs, physical therapy, intra-articular injections), only with the ineffectiveness of which and persistence of symptoms, as well as obvious clinical and MRI signs of damage to the meniscus, are indications for its arthroscopic resection determined. Arthroscopy without prior conservative treatment is recommended only if a joint blockage caused by a meniscus injury develops, which is not eliminated non-operatively [62].

Also, the differences between the BASK recommendations and those mentioned in Table 5 others should be attributed to the recognition of the knee joint surgeons in the UK, the vast majority of whom (97%) agreed to follow them in their daily practice.

Complications after arthroscopic resection of degenerative meniscus ruptures occur in 0.27–2.80% of cases [19]. The structure of complications does not fundamentally differ from those described above, however, the following factors should be taken into account:

- if the resection reaches the capsular attachment of the meniscus, the risk of progression of OA is higher than with partial meniscectomy;
- full-thickness cartilage defects and the presence of areas of damage to the subchondral bone on MRI are directly associated with unsuccessful outcomes;

Table 5

Recommendations of professional communities

Organization	Arthroscopic resection of degenerative injuried meniscus	
	X-ray confirmed knee joint OA	X-ray unconfirmed knee joint OA
AAOS [13]	Possible	Possible
ESSKA [19]	Against	Pro
BOA [20]	No comments	Pro
AOA [21]	Against	Pro
OARSI [22]	Possible	No comments
NICE [23]	No comments	No comments
AAC [60]	Possible	Possible
BASK [61]	Against	Possible (if conservative treatment is ineffective for at least 12 weeks.)

Pro — an explicit statement that arthroscopy is indicated for these patients.
Against — an explicit statement that arthroscopy is not indicated for these patients.
Possible — possible support for arthroscopy in certain conditions

- in the case of extrusion of the meniscus to the periphery, the risk of osteonecrosis developing increases.

Discussion

The first conclusion of this study can be considered the unity of the professional communities, expert groups opinions and the results of high evidence degree scientific studies: arthroscopic lavage and debridement in patients with knee joint OA does not lead to pain decrease and function improvement in the long term. During the follow-up period, most patients in the comparison groups experience clinically significant pain relief and improvement in function even without arthroscopy [63]. Less than 15% of patients have a weak or moderate superiority in terms of pain relief or improvement in functional status within 3 months after arthroscopic debridement, which, however, do not persist for a year.

As a second conclusion, there is a consensus on the method of choosing the first stage of treatment for patients with degenerative meniscus injuries: preference should be given to a conservative approach, regardless of the presence of "mechanical" symptoms (short-term blockages that resolve spontaneously; episodes of acute fleeting instability; painful clicks, etc.). P.). Therapy should combine a short course of NSAIDs or analgesics (up to 2 weeks) with a structured rehabilitation program (for 8-16 weeks), including neuromuscular training to improve position control of the trunk and lower extremities relative to each other, correction of altered movement patterns, dynamic improvement in strength, endurance and elasticity of the muscles of the lower limb [33, 36]. In some cases, intra-articular injections of corticosteroids may be used [32].

Arthroscopic meniscectomy is indicated only if conservative treatment is ineffective in patients with early and moderate OA. The need for meniscus resection after non-operative treatment due to its ineffectiveness varies in the range from 17 to 30%. Arthroscopic meniscus resection is not recommended in patients with pronounced morphological signs of OA detected by X-ray or MRI, as well as in the presence of OA only symptoms. Arthroscopic meniscus resection is indicated as the first-stage treatment only in presence of permanent blockage of the joint, which is directly caused by this injury [64].

Degenerative meniscus injury is characteristic of patients over 35 years of age, and in patients with OA, their frequency reaches 75–95%. They are not associated with an acute and typical trauma in terms of the mechanism, but can be provoked by a minimal force or repeated chronic overload of the knee joint as a result of frontal deformity of the limb, obesity, occupational, static stress etc. [65]. The pathogenesis of degenerative injuries is more complex and less studied than traumatic ruptures: they occur against the background of progressive mucoid degeneration and weakening of tissue strength at the micro level, caused by aging or OA [66]. Typical localization is the posterior horn or body of the medial meniscus, and the configuration is more common with horizontal dissection, patchwork / oblique rupture with a horizontal component, and complex multiplanar ruptures.

With aging, the frequency of degenerative meniscus injuries progressively increases, and most of the randomly examined patients (about 60%) have no clinical symptoms [3]. More than 60% of patients in the age group of about 40 years, hospitalized for arthroscopic meniscus resection, show signs of similar degenerative injuries in the asymptomatic contralateral joint [67].

Is pain a clinical manifestation of degenerative meniscus injuries as a result of mechanical instability of damaged fragments? Most likely, not, since there are no nerve endings in the avascular zone of the meniscus, and the penetration of vessels from the paracapsular zone in adults is only about 10–30% in the medial and 10–25% in the lateral meniscus [68]. The horizontal dis-

section of the meniscus is stable enough to cause such symptoms [69]. The pain occurs due to dysfunction of the damaged meniscus, that is, a decrease in its damping properties, as a result of which the mechanical load on the cartilage and the underlying subchondral bone increases. The emerging zones of damage to the subchondral bone (bone marrow lesions), well visualized on MRI, are directly associated with the intensity and dynamics of pain syndrome, as well as the degree of extrusion of the meniscus to the periphery, which, in turn, also directly correlates with the progression of OA [70]. According to C. Scher et al., the appearance of damage zones to the subchondral bone increases the risk of arthroplasty in the short term by almost 9 times [71]. Local synovitis and parameniscal cyst can also be sources of pain [72].

With early and often moderately severe knee joint OA, the severity of symptoms can vary widely: periods of intensification spontaneously give way to remissions, often without any treatment [2].

Refusal of ineffective knee joint OA treatment methods not only saves funds for the health care system, avoiding unnecessary costs, but also eliminates potential complications, some of which, in particular osteonecrosis, have an extremely unfavorable effect on the course of the disease, accelerating the need for arthroplasty. At the same time, arthroscopy should not be completely excluded from the arsenal of surgical methods for treating patients with knee joint OA, since in some clinical situations it may be useful, for example, in joint blockade caused by meniscus lesion.

Conclusion

Scientific high evidence level studies (RCTs and meta-analyzes of RCTs), as well as the current recommendations of the international professional communities based on them, do not recommend performing arthroscopic lavage and debridement in patients with knee joint OA due to ineffectiveness.

If a patient has degenerative meniscus lesion, regardless of the presence of "mechanical" symptoms, as the first stage therapy, non-surgical treatment should be applied, including a short course of NSAIDs and a rehabilitation program aimed at improving the functional state of the muscles of the lower limb and trunk, lasting at least 12-16 week. Arthroscopic meniscectomy is indicated if the non-operative approach is ineffective and only in patients with early and moderate OA. In the presence of pronounced X-ray or MRI signs of a degenerative process ("bone on bone", etc.), as well as only the usual symptoms of OA, arthroscopic meniscus resection is not recommended.

Thus, based on the principles of evidence-based medicine, it should be concluded that arthroscopy in patients with knee joint OA is ineffective and has very limited indications, therefore, if conservative treatment fails, preference should be given to such methods of surgical treatment as periarticular osteotomies and partial or total knee arthroplasty.

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