IMPROVING THE TACTICS OF TREATING PATIENTS AND PERSONS WITH DISABILITIES WITH ARTHROSIS ARTHRITIS OF THE KNEE JOINT

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https://doi.org/10.5281/zenodo.8178264

Annotation: The article presents a modern approach to rehabilitation in 560 patients and disabled people with pathologies of the knee joint, who underwent a comprehensive rehabilitation course during 2016-2020, at the National Center for Rehabilitation and Prosthetics for Persons with Disabilities of the Republic of Uzbekistan. Out of 560 patients, 156 patients and disabled patients were operated on for total knee arthroplasty, 204 patients underwent arthroscopy of the knee joint, the rest of the patients underwent conservative treatment of physiotherapy using plasmolifting (PRP, Plateletrichplasma). On the basis of a prospective study, as well as the conclusion of a medical and labor examination, a comparative assessment of the effectiveness of the rehabilitation after knee arthroplasty, depending on the dynamics of disability, was carried out.

Keywords: Arthrosis-arthritis, rehabilitation, knee arthroplasty, efficiency.

Actuality: Arthrosis-arthritis of the knee joint is considered as a symptom complex that affects about 11-13% of the world's population [3,4]. Arthrosis-arthritis ranks first among degenerative-dystrophic diseases of the body and is the most common cause of disability in people of working age, and also reduces the quality of life in patients and disabled people, both in middle and old age, which require constant contact with a medical institution for correction their treatment. The incidence of arthrosis-arthritis increases with age, the average age of polyclinic patients with arthrosis-arthritis of the knee reaches 68.2 years and is 1.3 times higher than the average age of polyclinic patients 53.1 years [5].

The leading predisposing factors for the development of arthrosis-arthritis are gender, age, overweight, inactive lifestyle, excessive physical activity, injury and hereditary predisposition. At present, there is a steady upward trend in the incidence and disability due to arthrosis-arthritis of the knee joint, with an increase in the proportion of older people in the population.

The choice of tactics for the treatment of patients with arthrosis-arthritis of the knee joints "is determined by a number of factors, among which the severity of pain and inflammation, functional deficiency, the degree of structural changes, the age of the patient and the presence of concomitant diseases are of primary importance" [1].

Arthrosis-arthritis is a serious medical and socio-economic problem [10]. The treatment of this pathology should be individualized, since patients of older age groups have several concomitant diseases. The algorithm of actions of an orthopedist-traumatologist and the financial component of treatment are strictly determined by the stage of the disease, age

and comorbidities. Treatment should always be staged from non-drug therapy and patient education to total knee arthroplasty [10,11].

Endoprosthesis replacement of the knee joint in case of arthrosis-arthritis is the optimal method of surgical treatment. The widespread use of endoprosthetics is primarily associated with the rapid relief of the patient from pain and the restoration of lost function [11]. Despite significant progress in arthroplasty, a large number of both local complications and complications from the internal organs remain [7]. The technique of the operation is constantly being improved, but despite this, the number of complications remains high and reaches 1%. To exclude complications of knee arthroplasty, careful preoperative planning, reliance on the study of new technologies and positive clinical results, adherence to the surgical technique, and the optimal choice of instruments and implants are necessary.

For the full rehabilitation of patients after knee arthroplasty, it is necessary to take into account the pathology of adjacent joints and the presence of osteoporosis in the patient, and make appropriate adjustments to the surgical treatment program.

David L., Briggs T. (2014) emphasize: "The surgeon must consider that total knee replacement is as much soft tissue surgery as it is bone." This thesis is also important for rehabilitators, especially in the event of a pain syndrome during active rehabilitation of the patient. Active rehabilitation is indicated for standard arthroplasty, but with extended access with damage to the medial and lateral ligamentous apparatus, standard active rehabilitation is difficult, and the presence of diseases of adjacent joints and the spine also affects the choice of tactics and the time to start rehabilitation [8,9].

The issues of adequate early rehabilitation due to pain remain debatable. Pain complicates full rehabilitation and prolongs hospitalization [6]. On the one hand, pain is a factor that needs to be eliminated, but, on the other hand, pain is adaptive in nature, since it provides a conscious or unconscious reduction in load. Under external influence or stress, the biological system reacts in a specific way. It tries to restore balance by appropriate adaptation: "successful acceptance of new environmental conditions without impairment of function", temporary disruption (damage) or "irreversible change" [2].

Despite the accumulated experience of total EP of the knee joint, the early, late and long-term results of the operation associated with the limited capabilities of the patient have not been studied enough. The dynamics of disability after total EP of the knee joint has not been sufficiently studied, the recommended types of labor have not been presented, taking into account the pathology of adjacent joints.

One of the most important tasks of social work is the preservation and maintenance of a person, group or team in a state of active, creative and independent attitude towards oneself, one's life and activity. In its solution, a very important role is played by the process of restoring this state, which can be lost by the subject for a number of reasons.

In this connection, this problem is considered relevant and requires further improvement of the technology of a comprehensive continuous rehabilitation process.

Purpose of the study: To study the effectiveness of the results of the organization of an improved approach to the rehabilitation of patients and disabled people with osteoarthritis of the knee joint.

Materials and methods of research: The National Center for Rehabilitation and Prosthetics of Persons with Disabilities of the Republic of Uzbekistan over the past 5 years (2016-2020) analyzed the results of a study in 560 patients and people with disabilities with osteoarthritis

of the knee joint, who underwent complex rehabilitation. Of these, 156 patients underwent total knee arthroplasty (men - 52 (33.3%) women - 104 (66.7%)). Thus, the vast majority of operated patients were women. The female to male ratio was 2:1. The average age of the surveyed was 59 years. 127 (81.4%) patients were diagnosed with deforming gonarthrosis, 9 (5.8%) patients were diagnosed with post-traumatic gonarthrosis, and 20 (12.8%) patients had rheumatoid knee pathology.

In 204 patients and persons with disabilities, operations were performed Arthroscopy of the knee joint, to clarify the diagnosis with simultaneous removal of the damaged meniscus of the joint. The distribution of patients who underwent Arthroscopy surgery was as follows: men - 124 (60.7%), women - 80 (39.%3), the average age of patients was 43 years.

The remaining 200 patients and persons with disabilities underwent conservative treatment with the simultaneous use of plasmolifting of the joint. Among these patients, the majority were women (153 (76.5%) women and 47 (23.5%) men).

Most patients suffered from the underlying disease for 5-10 years or more. This led to the presence of varying degrees of disability in half of the patients. Unilateral total knee arthroplasty was performed in 129 (82.75) patients, and 27 (17.3%) patients underwent knee arthroplasty on both sides.

Postoperative rehabilitation measures were carried out within a period of 1.5 months to 6 months after surgery.

When planning the operation, generally accepted studies were taken into account: clinical and biochemical analyses, X-ray, ultrasound n / c, biomechanical as well as electromyographic parameters for the choice of endoprosthesis and fixation method, as well as gender, constitutional features, as well as the general condition of the patient, taking into account anatomical and functional changes and comorbidities.

Results and their discussion:

All patients who received complex rehabilitation, as well as those who were planned for knee arthroplasty and arthroscopy, were examined according to the standard of the Ministry of Health of the Republic of Uzbekistan.

Of the 200 patients who received conservative treatment, 35 patients were diagnosed with: arthrosis-arthritis of the 2nd stage on the basis of an x-ray, a course of plasmolifting therapy was applied, which is 5 injections of the joint, with a 3-day interval. The rest of the patients underwent conservative treatment without the use of plasmolifting. All patients and persons with disabilities complained of pain in the knee joint, lameness, limitation of movement and swelling in the knee joints. To evaluate the results of the therapy performed, they were studied in a comparative form according to the scoring scale developed by us.

Fig 1. PRP therapy in the knee joint

Of which Arthroscopy operations were performed, in 103 (50.5%) patients, an isolated rupture of the medial meniscus (MM) was determined during the operation in different variants, in 36 (17.6%) patients, a combined injury was detected, rupture of the anterior cruciate ligament (ACL) and ruptures of the MM, only in 5 (2.4%) cases were determined ruptures of the lateral meniscus (LM) of the knee joint. In those who had isolated meniscus ruptures, partial meniscectomy was performed, and in 36 patients who had ACL rupture, we restored the ACL with autografts obtained from the medial thigh muscle group, which were fixed with absorbable screws. In this group of patients in the postoperative period, splints were used to fix the knee joint for up to 3 weeks. To prevent post-fixation contracture, patients were trained in isometric contraction of the anterior muscle group from the next day after surgery. Active development began from the 2nd week after the operation without additional load 5-6 times a day for 10-15 exercises. Complete recovery of the ACL was observed using ultrasound and MRI of the knee joint. Fig 2.

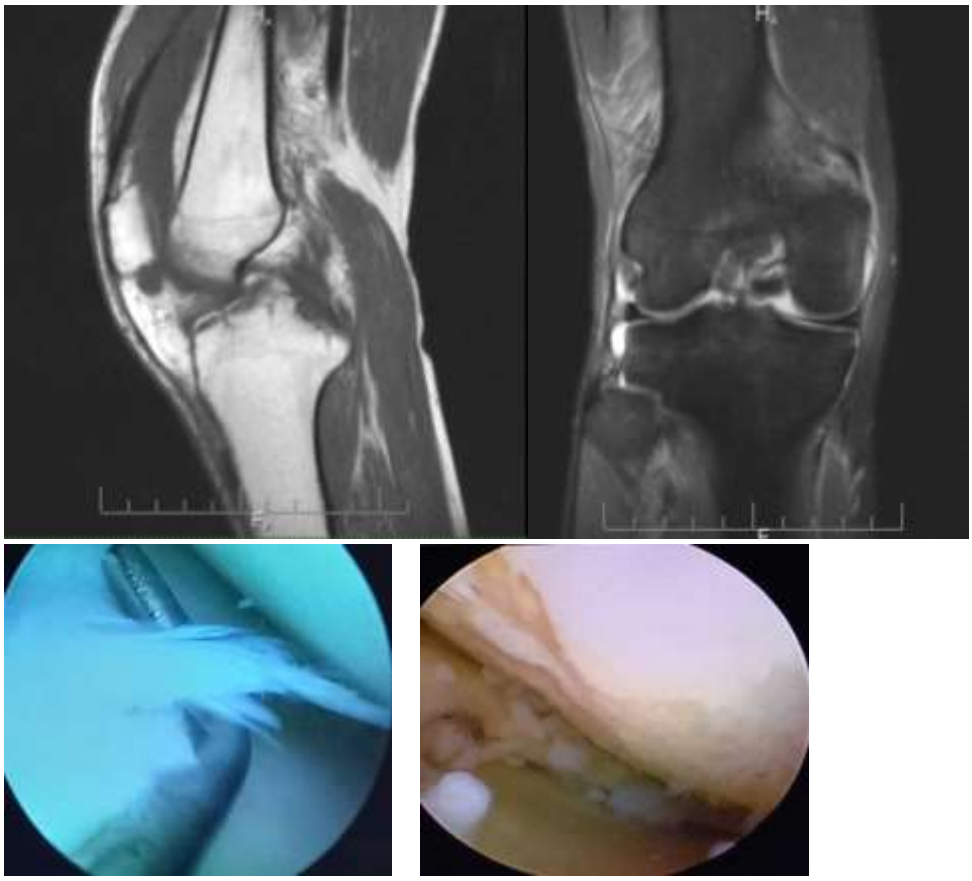

Fig 2. Patient V., 21 years old. MRI and arthroscopic studies of the right knee joint

In 60 (29.4%) patients who underwent arthroscopy, no damage was found in the MM, LM, or ACL, which in the preoperative period in the MRI findings had different types of damage to either the MM, LM, or ACL. During diagnostic arthroscopy, there were all signs of meniscopathy and an enhanced pattern of the synovial membrane that appears in chronic synovitis in the knee joint; in these patients, during arthroscopy, we used Dekasan's solution for the purpose of joint lavash.

During the examination before the operation of knee arthroplasty, the general condition of the patient was studied for the purpose of preoperative preparation. In preparation for surgery, 44 patients showed a high ESR (more than 30) and an increase in the number of leukocytes (more than 12) in the general blood test, as well as positive results in

the analysis of the rheumatic test, and a high fibrinogen and APTT in the caogulogram. In 3 patients parietal thrombus formation was detected in the saphenous veins of the lower extremity.

In the main group, 76 (48.7%) patients and disabled people underwent total knee arthroplasty, which was carried out using the “Subvastus” approach improved by us, while Meril endoprostheses were used in 62 patients, and prostheses from Zimmer, an Italian company, were used for 14 patients and "Bioimplants Group” as well as Korean prostheses Corentec. The choice of the type of arthroplasty was carried out taking into account the somatic condition and pathology of the patient. The conditional boundary for determining the type of prosthesis was the involvement of the tendon-ligamentous apparatus in the pathology of the articular element. The main patients were patients with arthrosis-arthritis, in which the tendon-ligamentous system was not severely damaged, so we used prostheses with preservation of the posterior cruciate ligament.

In the control group, 80 (51.3%) patients underwent knee arthroplasty with a standard “medial parapatellar” approach, and the above prostheses were also used for these patients.

In addition to the clinical and radiological methods of research, to study the clinical and functional results of arthroplasty, our patients also underwent electromyographic studies (EMG) and ichnography.

Electromyographic studies were carried out on the basis of the study of the global bioelectrical activity of the muscles of the lower extremities. Indicators of muscle biopotentials were studied at maximum muscle contraction and at rest. Biopotentials were directed using bipolar silver electrodes placed on the patient's skin. At the beginning, having lubricated the skin with a special ointment, skin plates are installed. Electromyography was carried out on a Neuropack-51 device, brand MEB-9400 AK from NIHON KonDEN, which registers total EMG parameters in the form of muscle biopotentials. In order to study the total electrical activity of the muscles, surface electrodes with an area of 100 mm^2 were used. The areas of the skin to reduce resistance, where the electrodes should have been located, were treated with 70° ethyl alcohol. Standard skin electrodes (6-12 mm) were used.

With a total EMG, skin electrodes were made of metal, made in the form of round cups, into which electrode pastes were placed. Before applying the electrodes to reduce resistance, the skin surface was treated and degreased with alcohol 70^0.

When assessing EMG, voluntary muscle tension was determined, attention was paid to the EMG amplitude, as well as to the frequency of oscillations, and the results of the study were evaluated. This method was used to study m.m vastus medialis, lateralis and rectus, the medial muscle group m, semimembranosus, and the muscle group m, biceps, as well as the muscles of the lower leg m.m tibialis anterior, gastrocnemius from both sides simultaneously both the damaged and the healthy side of the knee joint. At the same time, we were interested in the functional state of myoneurons-axons that regulate motor functions. The data obtained were examined by an electromyograph and processed automatically.

Studied EMG data in 156 patients to assess the state of the neuromuscular apparatus of the lower extremities before and after knee arthroplasty. The age of patients is from 48 to 70 years.

The obtained results show that in the preoperative period, the data of bioelectrical activity in the anterior muscle group, the adductor group and the posterior muscle group are lower than in the intact limb. In the postoperative period, with adequate early active

development and electrical stimulation, in the main group, the indicators of bioelectrical activity approached the norm.

Conclusions are made on the basis of registration and analysis of the total ENMG of voluntary amplification during muscle contraction and the conduction of impulses during qualified conduction. In the main group, EMG was performed in 2 patients as a stimulation electromyography to restore traumatic paresis of the peroneal nerve. Stimulation is carried out daily with an increase in time and force of exposure to nerve fibers for 10 days. After the first course of stimulation in one patient, the functions were restored, the rest of the patients needed a second course of electrical stimulation, unfortunately, in one patient, despite the repeated stimulation, the function of the peroneal nerve did not recover.

The spatial structure of walking was studied by the method of ichnography using footprints or footprints of patients in the process of walking. At the same time, frontal (cross-walking) sagittal (antero-posterior) step sizes, foot turn angle, gait straightness, and various ratios of step geometric parameters were quantitatively studied. With the help of a centimeter tape and a goniometer, the ichnographic parameters of the patients' walking were measured, also before and after the complex treatment.

The ichnogram showed a 16-18% decrease in the length of the step on the side of the operated knee joint, an increase in the width of the step and the angle of the turn of the foot on the opposite side. In all likelihood, this is due to the need to ensure the stabilization of equilibrium and dynamic support.

The noted biomechanical parameters are obviously associated with muscle weakness in the area of the operated joint and disorders of the reflexogenic zones.

Despite this, the walking speed in patients was 3.8-4.6 km/h with a reliably correct trend towards an increase in indicators in the operated knee joint. However, their growth reaches within 7-8 degrees (at a rate of 10-12 degrees). In this case, the acceleration of movement is achieved by shifting the GCM forward using its inertial moment and strengthening the rear pushing metatarsal push of the foot.

The step length on the side of the operated joint averaged 51.3+-3.5 cm, which is not significantly less than the step length of the contralateral leg. In general, the length of the double step was in the range of 75-85 cm, which is 12-16% lower than the norm for patients with appropriate growth.

Thus, the results of biomechanical studies revealed a certain level of recovery of static-dynamic function after knee arthroplasty.

For the purpose of preoperative planning, as well as to assess the state of the endoprosthesis after surgery, all patients underwent radiography of the knee joint in 2 projections. From the obtained X-ray images, the position of the mechanical and anatomical axis, as well as the angles of deformation of the affected knee joint before and after the operation, were evaluated.

Example: Fig 1

Fig.1 a.

Fig.1b.

Fig. 1c

Fig. 1d.

Fig. 1. Patient U., born in 1953, diagnosed with arthrosis-arthritis of the left knee joint. In 2019, a total arthroplasty of the left knee joint was performed with the Meryl India endoprosthesis without preserving the posterior cruciate ligament. The evaluation of the results of the performed arthroplasty operation according to the scale developed by us was 63 points (high result). She walks independently, without lameness, the range of motion in the operated joint has fully recovered. Figure 1a radiograph before surgery; 1b radiograph after surgery; 1c and 1d long-term functional result 3 months after the operation.

Example: Fig 2

Fig 2 a

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Fig 2b

Fig 2 c, d

Fig. 2. Patient S., born in 1958, diagnosed with deforming osteoarthritis of both knee joints. In 2020, total arthroplasty of both knee joints was performed with the Meryl India endoprosthesis without preservation of the posterior cruciate ligament. The evaluation of the results of the performed arthroplasty operation according to the scale developed by us was 65

points (high result). She walks independently, without lameness, the range of motion in the joints has fully recovered. Figure 2a radiograph before surgery; 2b radiograph after surgery; 2c and 2d long-term functional result 3 months after surgery

A program for determining the quality of life and the effectiveness of arthroplasty in patients after total knee arthroplasty. DGU 2020 0606 (Table 1)

Table 1

The name of indicators	Characteristics of indicators	Efficiency level (in points)
Pain in the operated joint	is absent; mild: episodic, rare, minor pain; moderate: does not affect vital activity, although sometimes it may require the use of pain medication. Sometimes the patient is forced to limit his activity, but continues to work regularly, taking stronger pain medications; severe: severe limitation of activity due to pain. Constantly often takes strong painkillers.	5 4 3 0
Gait (lameness)	Is absent light moderate severe	5 4 3 0
Possible walking distance without pain	not limited 2-3 km. only at home	5 4 3
limb axis	Fine - There are valgus and varus deformities up to 15* There are valgus and varus deformities greater than 16*-	5 3 1
Range of motion	flexion: full - partial - extension: full - partial - external rotation: partial - not defined- internal rotation: partial - not defined-	5 3 5 3 5 3 5 3

Daily activity	Stairs: - calmly walks up the stairs without the help of railings; - with the help of the railing, stepping on the step with only one foot; - with difficulty with a cane. on the uphill road downhill road	 5 3 1
Dressing shoes and socks	- without difficulty; - with moderate difficulty; - with difficulties; - impossible.	5 3 2 0
Use of auxiliary rehabilitation technical means	- does not use - one cane for walking; - one crutch for walking; - two canes (or two crutches) for walking;	5 4 3 1
Professional recommendation:	- with the preservation of the former profession or type of work; - transition to another job close to the previous one (possibly with restrictions on the volume and conditions of work); - transition to a new job or profession (possibly with training); - home work.	5 4 3 2
Need for medication	- is absent: - occasionally (only in the presence of pain syndrome) - systematic - constantly	5 4 3 0
The social status of the patient	Do not have a disability group There are 3rd group of disability due to joint implantation - There are 2nd group of disability due to the pathology of the contralateral and adjacent joints - There are 1st group of disability due to pathology in the operated joint	5 4 3 0

The evaluation system contains 11 criteria. Maximum score 70.0

High efficiency of rehabilitation: from 60.2 and more
Good rehabilitation efficiency: from 49.7 to 60.1 points
Average efficiency of rehabilitation: from 39.2 - to 49.6 points
Low effectiveness of rehabilitation: below 39.1 points

All the nearest clinical and functional results obtained by us were evaluated according to our developed programs to determine the quality of life and the effectiveness of rehabilitation.

We obtained the following results: the technologies we developed for arthroplasty surgery and timely and continuous complex medical and social rehabilitation in the MG showed a high effect in 82.5% of patients and a good effect in 16.8% of patients, and in CG 64.9% and 16.5% respectively. One patient in the control group, due to the preservation of peroneal nerve neuropathy according to the developed scales, had a total score of 39, and, accordingly, with a low level of efficiency of the operation. This shows that the complex tactics developed by us in arthroplasty improved the proportion of high patient efficiency by more than 17.6% than traditional arthroplasty.

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