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S.U. Asilova

*Tashkent Medical Academy, Tashkent, 100109, Uzbekistan, asilova\_saodat@mail.ru*

D.R. Ruzibaev

*Tashkent Medical Academy, Tashkent, 100109, Uzbekistan*

R.B. Nazarov

*Tashkent Medical Academy, Tashkent, 100109, Uzbekistan*

A.K. Khaydarov

*Tashkent Medical Academy, Tashkent, 100109, Uzbekistan*

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## ASSESSMENT OF THE EFFECTIVENESS OF MEDICO-SOCIAL REHABILITATION OF PATIENTS AND DISABLED AFTER HIP JOINT

S.U. Asilova<sup>1\*</sup>, D.R. Ruzibaev<sup>2</sup>, R.B. Nazarov<sup>2</sup>, A.K. Khaydarov<sup>2</sup>

<sup>1</sup> Professor, MD, Department of Traumatology, orthopedia, military field surgery and Neurosurgery, Tashkent Medical Academy, Tashkent, Uzbekistan. (\*-corresponding author's email: [asilova\\_saodat@mail.ru](mailto:asilova_saodat@mail.ru))

<sup>2</sup> PhD, MD, Department of Traumatology, orthopedia, military field surgery and Neurosurgery, Tashkent Medical Academy, Tashkent, Uzbekistan.

### ABSTRACT

**The aim.** To develop proposals and recommendations for improving the medical and social rehabilitation of patients and disabled people after hip replacement.

**Materials and methods.** The basis of this study was data on patients and people with disabilities with various degenerative and dystrophic diseases of one or both TBS who underwent the operation of total EP TBS for the last 7 years (2012-2019).

A total of 125 patients and invalids were examined, sent to the National Center for Rehabilitation and Prosthetics of the Disabled of the Republic of Uzbekistan for medical rehabilitation from VTEC and clinical hospitals in Tashkent and other medical institutions of the republic. Of these, 68 (54%) patients were women and 57 (46%) were male. Of the total 100 (80%) patients were in active working age - from 25 to 55 years.

Of the total number of rehabilitants, we identified 3 rehabilitation groups. Moreover, the main criterion for the separation of the group was the severity of violations of the SDF of the musculoskeletal system.

The first group is rehabilitants with a one-sided defect, replaced by an artificial implanted joint. There were no pathologies of the contralateral joint or other links in the patients with this syndrome. The size of the group was 86 people. person.

The second group of rehabilitants had a one-sided TBS defect, compensated by the operation of total TBS EP; from the contralateral joint, coxarthrosis of the I-II degree was detected. The second group consisted of 32 patients.

The third group included patients with a unilateral defect, compensated by a total EP of TBS and severe pathology from other parts of the ODS: coxarthrosis of the contralateral joint of the III-IV degree or osteochondrosis of the lumbar spine.

**Results.** The use of the device developed by us for early activation of the operated joint helped to reduce the number of contractures in the operated joint in 80% of patients. The results of the statistical analysis obtained with the application of the individual rehabilitation program developed by us for patients and disabled people after total TBS EP allowed us to evaluate the

effectiveness of the volume and standards of rehabilitation care at the inpatient and outpatient stages, which contributed to the reduction of temporary disability to 1 month in 37.5% sick.

**Conclusion.** The proposed timely and continuously conducted staged medical and social rehabilitation made it possible to obtain a high and 20.8% of patients with a good rehabilitation effect in 65.5% of patients.

**Key words:** Rehabilitation, pain, chromate, mobility, surgical treatment, endoprosthetics, disability.

## INTRODUCTION

In different countries, the frequency of post-traumatic and orthopedic pathology of the hip joint (TBS) among adults varies up to 25%, while disability makes up about 60% of cases. Every year, more than a thousand people are first recognized as disabled due to diseases of the musculoskeletal system and orthopedic connective tissue. Moreover, "primary disability in these diseases is characterized by a persistent severity index (group I - 0.8%, group II - 22.1%, group III - 77.1%)"

To achieve certain successes in the treatment of this pathology, numerous studies are being conducted in world practice. A number of surgical methods have been developed for osteosynthesis and osteotomy of bone fragments, tunneling of the femoral head with aseptic necrosis has been applied, muscle transposition on the vascular pedicle, joint decompression with capsule arthrotomy have been developed. In post-traumatic and orthopedic diseases of TBS, endoprosthetics (EP) is often the only operation of choice. Various endoprosthetics using a unipolar and total bipolar EP have been applied. Currently, EP has entered into everyday practice and has achieved significant success. Proof of this is the achievement of positive results after surgery in a period of up to 20 years. Despite the high effectiveness of surgical intervention, a number of complications are noted in practice that are characteristic only of total EP of TBS, such as dislocation of the endoprosthesis head, pulmonary embolism and the development of periprosthetic "deep" infection, which leads to patient disability. To solve these problems, it becomes necessary to develop new approaches to rehabilitation measures.

The incomplete positive results of various methods of surgical treatment of patients and disabled people due to post-traumatic and orthopedic pathology of TBS highlighted the operation of total EP - replacement of a pathologically changed joint with an artificial prosthesis. Currently, total EP TBS is a popular and highly effective method of treating many diseases and the consequences of TBS injuries, in particular osteoarthritis. In 2008, in the United States, more than 600,000 operations of EC TBS were performed; according to the long-term forecast, by 2030 the number of such interventions will reach 4.0 million (Zagorodni N.V., Nuzhdin V.I., Kudinov O.A., 2011). According to Ignatenko V.L. et al. (2011) modern technologies are not always able to fully reflect all those changes that occur in TBS under the influence of degenerative-dystrophic processes. One of the reasons for the frequent wear of the components of the TBS endoprosthesis and subsequent revision interventions is the insufficient alignment of the mechanical axis, taking into account the existing defects of the proximal femur, soft tissue imbalance, and joint dysfunction. An important medical, social and economic problem today remains the rehabilitation of patients with total EP TBS. The stages and types of rehabilitation in a separate direction were studied: medical and social rehabilitation (Kazak L.G., 2003; Kurbanov S.Kh., 2009).

To date, a number of new medical rehabilitation systems have been developed for patients after ETS, but the literature we have studied does not reflect the rehabilitation technology as complex and continuous (surgical in-patient rehabilitation center - clinic), in the form of social and professional rehabilitation and, accordingly, medical and Social Expertise (ITU) (Kazak L.G., 2003; Roy I.V., Babova I.K., Bayandina E.I., 2011; Brett Levine, Beth Kaplanek, 2007; Maiko V.M., 2011;)

Despite the accumulated experience of total EP of TBS, the early, late and long-term results of the operation related to the patient's limited abilities have not been adequately studied. The dynamics of disability after total EP of TBS has not been adequately studied, the recommended types of labor have not been presented taking into account the pathology of adjacent joints.

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

### **THE AIM**

The purpose of the study is to develop proposals and recommendations for improving the medical and social rehabilitation of patients and disabled people after hip replacement.

### **OBJECT OF STUDY**

The basis of this study was data on patients and persons with disabilities with various degenerative and dystrophic diseases of one or both TBS who underwent surgery for total EP TBS over the past 7 years (2012-2019).

A total of 125 patients and invalids were examined, sent to the National Center for Rehabilitation and Prosthetics of the Disabled of the Republic of Uzbekistan for medical rehabilitation from VTEC and clinical hospitals in Tashkent and other medical institutions of the republic. Of these, 68 (54%) patients were women and 57 (46%) were male. Of the total 100 (80%) patients were in active working age - from 25 to 55 years.

Of the total number of rehabilitants, we identified 3 rehabilitation groups. Moreover, the main criterion for the separation of the group was the severity of violations of the SDF of the musculoskeletal system.

The first group is rehabilitants with a one-sided defect, replaced by an artificial implanted joint. There were no pathologies of the contralateral joint or other links in the patients with this syndrome. The size of the group was 86 people. The average age of the rehabilitants of this group was 43.2 years, while patients under 30 years old - 3 (3.5%) people, 31-45 years old - 28 (32.6%) people. 46-55 years old - 32 (37.2%), 56 and older - 23 people (26.7%). Men in the study group were 40 (46.5%) people, women - 46 (53.5%) people.

The second group of rehabilitants had a one-sided TBS defect, compensated by the operation of total TBS EP; from the contralateral joint, coxarthrosis of the I-II degree was detected. The second group consisted of 32 patients. The average age of the rehabilitants was 49 years old. At the same time, up to 30 years old there were 4 (12.5%) people, 31-45 years old - 10 (31.3%) people. 46-55 years old - 16 (50.0%), 56 and older - 2 people (6.2%). Of these, men are 15 (46.9%) people, women - 17 (53.1%) people.

The third group included patients with a unilateral defect, compensated by a total EP of TBS and severe pathology from other parts of the ODS: coxarthrosis of the contralateral joint of the III-IV degree or osteochondrosis of the lumbar spine. This group included 7 patients. The average age of patients in the group is 30.5 years. By age, this group was distributed as follows: At the same time, up to 30 years old there were 5 (71.4%) people, 31-45 years old - 2 (28.6%) people. At the same time, there were 2 (28.6%) men and 5 (71.4%) women. The distribution of rehabilitants who underwent the operation of total EP of TBS by gender, age and severity of disorders of SDF is presented in table 1.

To accomplish the tasks, we conducted a comprehensive clinical and expert examination of 125 patients and disabled patients after total hip arthroplasty, at various times after the operation. According to the results of a survey and analysis of the outpatient card in patients of the control group, standard methods of physiotherapy and physiotherapy were used as methods of rehabilitation treatment, the frequency of treatment was determined mainly by the initiative of the patients themselves.

Table 1

**Distribution of rehabilitants after surgery for total TBS EP by sex, age, and severity of SDF impairment**

| The severity of impairment of SDF   | Age                |   |                 |    |                 |    |              |    |       |
|---|--------------------|---|-----------------|----|-----------------|----|--------------|----|-------|
|   | Up to 30 years old |   | 31-45 years old |    | 46-55 years old |    | 56 and older |    | Total |
|   | М                  | Ж | М               | Ж  | М               | Ж  | М            | Ж  |       |
| Unilateral defect compensated by total TBS EP without pathology of adjacent joints and spine  | 2                  | 1 | 13              | 15 | 15              | 17 | 10           | 13 | 86    |
| Unilateral defect compensated by total EP TBS coxarthrosis of the contralateral joint II - III degree without spinal pathology                    | 2                  | 2 | 4               | 6  | 8               | 8  | 1            | 1  | 32    |
| Unilateral defect, replaced by total EP of TBS, severe coxarthrosis with contracture of the contralateral or adjacent joints and spinal pathology | 2                  | 3 | -               | 2  | -               | -  | -            | -  | 7     |
| Total   | 6                  | 6 | 17              | 23 | 23              | 25 | 11           | 14 | 125   |

When performing the work, clinical, biomechanical, electromyographic, radiological research methods and the method of variation statistics were used.

**Biomechanical research methods.** In order to assess the restoration of support ability and SDF of the operated lower limb, as well as walking half the course, ES TBS conduct biomechanical (basometry, ichnography, podometry) studies. The basometric research method was carried out with special medical scales MVEN-150-100. The basometric research method includes measuring the distribution of body weight over the limbs, which determine the coefficient of asymmetry in the sagittal and frontal planes. These indicators should normally be equal to 1.1 in the frontal plane and 1.75 in the sagittal plane. For basometry, special scales were used that simultaneously determine the distribution of body weight over both lower limbs. In patients with orthopedic pathology, the asymmetry coefficient is different. With single-sided pathology, the distribution of body weight will be significantly greater than in the affected limb due to the shortening of the affected limb, and with bilateral pathologies, this indicator is closer to normal, because in these patients the limb length is almost the same. The studies were conducted in 64 patients in whom the coefficient of asymmetry along the frontal and sagittal planes was determined. In 45 patients with unilateral TBS pathology, the asymmetry coefficient was determined, which was 2.35, and with bilateral pathology it was 1.9.

The basometry of the milk after the operation was performed (Table 2.);

Table 2

**1. Data before surgery**

| Basometry                 | Norm%    | Right       | Left     |
|---------------------------|----------|-------------|----------|
| Total weight Kg           | 80       | 55          | 25       |
| On the frontal plane. kg% | 100%     | 69%         | 31%      |
| Asymmetry coefficient     | 50-50    | 2.2         |          |
|                           | 0,97-1,1 |             |          |
| Along the sagittal plane  |          | On the heel | Forefoot |
| Total weight Kg           | 80       | 61 (77%)    | 19 (23%) |
| Asymmetry coefficient     | 65%-35%  | 3,21        |          |
|                           | 1,86     |             |          |

**2. After surgery, 3 months.**

| Basometry                 | Norm%    | Right       | Left     |
|---------------------------|----------|-------------|----------|
| Total weight Kg           | 82       | 47          | 35       |
| On the frontal plane. kg% | 100%     | 57%         | 43%      |
| Asymmetry coefficient     | 50-50    | 1.33        |          |
|                           | 0,97-1,1 |             |          |
| Along the sagittal plane  |          | On the heel | Forefoot |
| Total weight Kg           | 82       | 56 (69%)    | 26 (31%) |
| Asymmetry coefficient     | 65-35    | 2.23        |          |
|                           | 1,86     |             |          |

**3. After surgery, 6 months.**

| Basometry                 | Norm%    | Right       | Left     |
|---------------------------|----------|-------------|----------|
| Total weight Kg           | 81       | 42          | 39       |
| On the frontal plane. kg% | 100%     | 52%         | 48%      |
| Asymmetry coefficient     | 50-50    | 1.09        |          |
|                           | 0,97-1,1 |             |          |
| Along the sagittal plane  |          | On the heel | Forefoot |
| Total weight Kg           | 81       | 53 (66%)    | 28 (34%) |
| Asymmetry coefficient     | 65-35    | 1.95        |          |
|                           | 1.86     |             |          |

After the rehabilitation, the main group of patients was determined by the asymmetry coefficient, an objective assessment of the results obtained is closer to normal, and in the control group these indicators remained above normal.

**Electroneuromyographic research methods.** In order to measure muscle tone, as one of the methods for taking into account the dynamics of restoration of the static-dynamic function of the joint, we used the most common and still widely used method of basometry and electromyography (EMG) at the level of the muscles of the hip joints.

EMG data were studied in 64 patients to assess the state of the neuromuscular apparatus of the lower extremities before and after EP TBS. The age of patients is from 25 to 70 years.

In the preoperative period, bioelectric activity was studied at the level of the midgluteal muscle, the adducting and abducting muscle groups (m. Gluteus maximus, m. Adductor magnus, m. rectus femoris, m. biceps femoris). The results were processed using a special program built into the computer. For spontaneous and voluntary activity of EMG muscles, the frequency spectrum was determined using the small Fourier transform.

Indicators for unilateral and bilateral pathology are studied in a comparative aspect.

**Table 3****EMG indicators in the control group**

| Muscle      | Hz to      | Hz after             | Mv to     | Mb after             |
|-------------|------------|----------------------|-----------|----------------------|
| Leading     | 38,73±0,67 | 75,9±0,73<br>p<0,001 | 4,36±0,47 | 1,31±0,04<br>p<0,001 |
| Abduction   | 34,7±0,6   | 72,3±1,33<br>p<0,001 | 4,22±0,07 | 1,45±0,03<br>p<0,001 |
| Wed buttock | 40,3±0,63  | 76,3±0,67<br>p<0,001 | 4,41±0,05 | 1,41±0,04<br>p<0,001 |

**EMG indicators in the main group**

| Muscle      | Hz to      | Hz after              | Mv to      | Mb after             |
|-------------|------------|-----------------------|------------|----------------------|
| Leading     | 40,6±0,61  | 77,97±0,71<br>p<0,001 | 3,6±0,08   | 1,14±0,05<br>p<0,001 |
| Abduction   | 43,04±0,58 | 73,03±0,97<br>p<0,001 | 3,99±0,064 | 1,14±0,03<br>p<0,001 |
| Wed buttock | 39,35±0,58 | 83,7±0,39<br>p<0,001  | 4,34±0,05  | 1,3±0,039<br>p<0,001 |

As can be seen from the tables, the results of the total EMG, the condition after treatment has changed significantly in a positive direction than in the original before surgery.

The duration of excitation of the neuromuscular system after treatment improved 2.0 times, the amplitude in PD-DR - 2.3 times, and the areas occupied by individual motor units decreased 2.5 times, which confirms the effectiveness of the comprehensive treatment measures.

The obtained data were processed statistically on a computer using Excel 7.0. The differences were considered significant when t-student criterion is equal to or greater than 2.0 or the probability of coincidence is less than 5% (p <0.05).

**X-ray research methods.** X-ray examination of TBS is the most important objective method that is used to diagnose and monitor the effectiveness of EP TBS. In this work, all patients performed the following: direct survey radiography of the pelvis and both joints with the capture of the proximal half of the femur in a strictly vertical position, using typical patient styling and strictly observing the focal length (100 cm) between the radiation tube and the joint. Radiographic examinations were carried out in a Bacara apparatus (Apelem, France), which

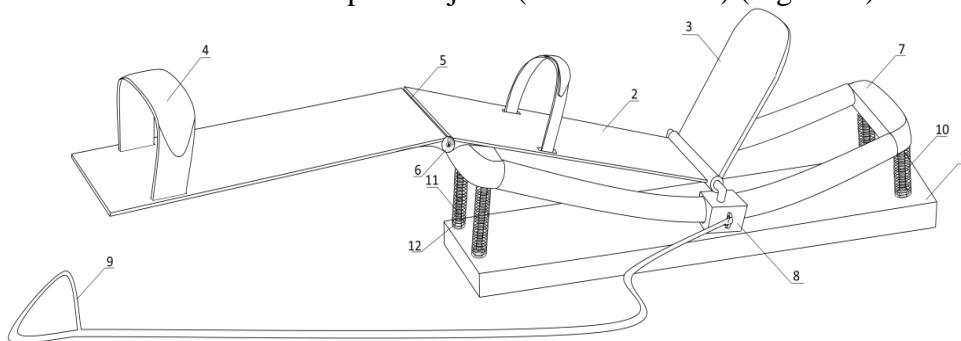
makes it possible to simultaneously conduct fluoroscopic examinations online with the load of the operated limb, and even due to a change in the position of the apparatus's tube, the axial position of the cup segment can be determined.

Strict adherence to research technologies allows you to obtain reliable information about the size and shape of the femoral canal, its curvature in the bottleneck, as well as about the size and condition of the acetabulum. The data obtained were taken into account when choosing the size of the endoprosthesis and the nature of its fixation.

When pathological changes in the spine were detected, radiography was mandatory in the lateral (position of maximum flexion and extension) and direct projections. In patients with polyarthritis, an additional study of the knee, ankle, shoulder and elbow joints was performed.

The results of the treatment of patients and people with disabilities after hip replacement are the results of the treatment of 64 patients after EP TBS using a device developed by us to improve active and passive movements in the operated joint.

The novelty of the device we developed consists in the following: firstly, unlike the prototype, in the apparatus we developed, the stopper moves in the frame using the rollers, the frame is specially made in an arc shape so that during the development of the movement it is smooth and effortless for the operated joint ( No. FAP 1270) (Figure 1.).



**Fig 1. Device for functional treatment of the hip joint**

The second difference of the device is that due to the special tightening belt, patients will be able to control the range of motion and the load on the operated joint. Features of the device for functional treatment of the hip joint: easy to use, does not need assistants during use, enables early adaptation of the limb to the implanted joint, reduces the percentage of postoperative contracture of the operated limbs, improves the efficiency of EP and helps to improve the quality of life of the patient. Development begins on the second day after surgery twice a day. Every day, add 1 min. on limb development. Daily increase the range of motion in the operated joint to 700. Develop a limb within 10-12 days. The device is convenient to use and provides active and passive development of movements in the knee and hip joints. Allows you to treat patients with diseases of the hip joints and conduct early activation of the patient. Available to each orthopedic trauma surgeon, it is recommended for widespread use in practical medicine. Development using the apparatus begins on the 2nd day after the operation. The patient on the 2nd day after the operation rises to a vertical position with the help of exercise therapy instructors and begins to move with the help of walkers. The instructors should monitor the patient's condition so as not to get a state of collapse. When moving, patients are allowed to step on the operated limb with a load of 20-25%. Daily walking load is reduced.

At the third stage of rehabilitation treatment for a patient after ES TBS, reinforced physical therapy was used from the 6th week in the equipped with physical therapy equipment. In this period, all the procedures were aimed at increased load on the operated joint and improvement of the lower limb SDF, for this, physiotherapy treatment, type of amplipulse, was used to improve the restoration of the reduced ability of the hip muscle and massage. An exercise bike and treadmill were used to restore the correct steoratype of walking. The patient conducted



exercise therapy daily on a treadmill for 30 minutes, taking into account the general condition. To increase the range of motion in the operated joint, a power simulator for legs was used. After warming the soft tissues of the operated joint, the LFK Instructor manually developed the operated limb to improve flexion and extension in the operated joint. The duration of this stage can last up to 2 weeks, depending on the volume of movements.

The results of the rehabilitation treatment were studied to restore the static-dynamic state and support ability of the operated lower limb, the volume of movement of the operated joint, and the correct walking steorotyp in patients after ES TBS. The following results were obtained: Good results of restoration of the function of the operated limb were obtained in 48 patients (75.0%), satisfactory with slight contracture and lameness when walking - in 13 patients (20.3%), unsatisfactory results, patients with systemic rheumatic pathology in 3 patients (4.7%)

The results of medical and social examination of patients and people with disabilities after hip replacement are devoted to the study of the results of medical labor examination (VTE) of patients after EP surgery. As a result of studying the indicators of severity, the dynamics of disability and nosological causes in patients who underwent total EP of TBS, it was found that disability in this category of patients has inadequately high severity and low rates of decline, which causes large and not always justified annual losses of labor resources in various industries national economy of the country.

The indicators collected according to the comprehensive phased medical and social rehabilitation based on the conclusion of the VTEC (Resolution of the Cabinet of Ministers of the Republic of Uzbekistan No. 195 of 2011) were analyzed at the level of the city of Tashkent and the Tashkent region (table 1). An analysis of the dynamics of disability before and after the operation of total EP of TBS showed that surgical treatment of TBS diseases leads to a decrease in the severity of disability subject to adequate postoperative rehabilitation.

**Table 4.**

**The results of partial and complete rehabilitation according to the conclusion of VTEK**

| Disability reduction                                | Main group<br>n = 64 |                                   | Control group<br>n = 61              |                                   |
|---|----------------------|-----------------------------------|--------------------------------------|-----------------------------------|
|   | From I to II group   | 2                                 | Partial<br>rehabilitation<br>(20.3%) | 1                                 |
| From II to III group                                | 11                   | 7                                 |                                      |                                   |
| From III to 0 group (not having a disability group) | 10                   | Full<br>rehabilitation<br>(15.6%) | 8                                    | Full<br>rehabilitation<br>(13.1%) |

It was established that if the severity of disability in the main and control groups before the operation of total EP of TBS is comparable, then a year after the operation in the control group, an increase in the severity of disability is clearly observed compared with its decrease in the main group, namely: in the main group of patients after completion of the individual rehabilitation programs, the proportion of disabled people of group II decreased due to partial rehabilitation, i.e. transition to group III disability. At the same time, the volume and invasiveness of the operation give grounds for experts to attribute such patients to the category with an anatomical defect. For this reason, complete rehabilitation is impossible for disabled people of group II, although, according to our data, about 62.5% of rehabilitants have a good functional outcome after surgery and, upon completion of an individual rehabilitation program, they could return to work in their main profession.

Thus, in order to create a patient rehabilitation system after ES TBS, it is necessary to take into account the anatomical, biomechanical and social characteristics of the patient. The diagnosis should reflect the severity of degenerative-dystrophic lesions, the features of the operation, the method of fixation of the patient are reflected in the biomechanical indicators of the activity of the main skeletal muscles, especially statics and localization. The social and everyday aspect contains information about the nature of the work of motor activity, the transport used, the intensity of walking, marital status, the presence of disability, etc.

Evaluation of the effectiveness of medical rehabilitation technology illuminates the results of a study of the effectiveness of medical rehabilitation taking into account the recovery of SDF on operated joints, adaptation to an implanted joint, return to the indicated types of labor and the economic benefits of EP. To determine medical rehabilitation, the degree of reduction of social and professional restrictions, as the most significant for a particular patient, is calculated. However, the restoration of the social role of the patient and the disabled person is preceded by a decrease in disabilities through the restoration of existing injuries and an improvement in the quality of life.

It is known that the dynamics of various functions in the same patient occurs at different speeds. So, according to our data, in the early rehabilitation period there is a positive dynamics at the level of the proximal femur defect after replacement with an endoprosthesis, which is significantly ahead of other changes in the body. On the contrary, in the late rehabilitation period in patients after total TBS EP, recovery at the level of life limitation due to the development of compensatory-adaptive reactions occurs much faster than restoration of impaired functions from the implanted joint. Therefore, at the stationary stage, when assessing the effectiveness of rehabilitation, we used rehabilitation indicators in the short-term (immediately after the rehabilitation stage) and long-term intervals (after 6 months - 1 year). After the completion of medical rehabilitation, the effect of rehabilitation at three levels was taken into account: organ (restoration of the deficit of the function of the total replaced joint), organismic (reduction of the severity of life limitations due to reduced abilities) and social (restoration of the social role of the rehabilitant).

We evaluated the results of the inpatient medical rehabilitation program in patients after total TBS EP according to the severity of the patient's disabilities and disabilities.

We assessed the effectiveness of medical, social and professional rehabilitation of patients who underwent surgery for ES TBS according to the developed point scale (table 5).

**Table5.**

**The scoring system for determining the effectiveness of medical, social and professional rehabilitation of patients after surgery for ES TBS**

| Name indicators                | Characteristic indicators   | Performance level (in points) |
|--------------------------------|---|-------------------------------|
| Pain on the operated the joint | - missing   | 5                             |
|                                | - mild: episodic, rare, minor pain;   | 4                             |
|                                | - moderate: does not affect vital activity, although it may sometimes require painkillers. Sometimes the patient is forced to limit his activity, but continues to work regularly, taking stronger painkillers; | 3                             |
|                                | - severe: severe limitation of activity due to pain. He often takes strong painkillers.   | 0                             |
| Gait (lameness)                | - Missing   | 5                             |
|                                | - light   | 4                             |
|                                | - moderate  | 3                             |

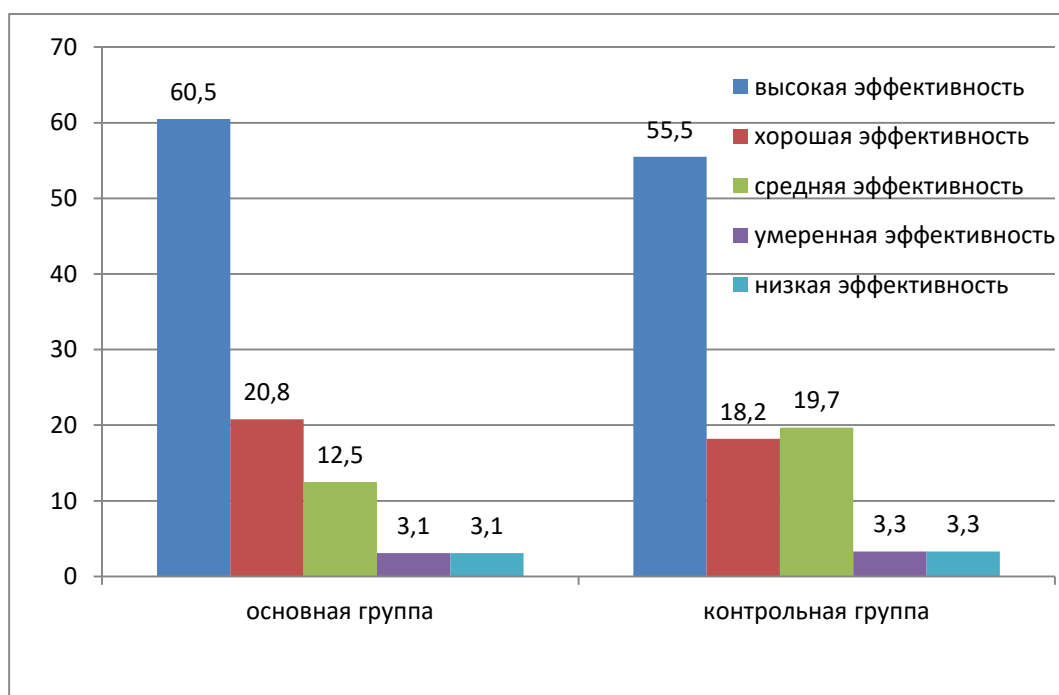
|   |  |        |
|---|--|--------|
|   | - expressed  | 0      |
| Possible walking distance without pain        | - not limited  | 5      |
|   | - 2-3 km.  | 4      |
|   | - only at home   | 3      |
|   | bending:   | 5<br>3 |
| Range of motion                               | - full   | 5<br>3 |
|   | - partial  | 5<br>3 |
|   | extension:   | 5<br>3 |
|   | - full   | 5<br>3 |
|   | - partial  | 5<br>3 |
|   | cast:  | 5      |
| Daily activity (walking up the stairs)        | - full   | 3      |
|   | - partial  | 1      |
|   | abduction:   | 5      |
| Putting on shoes and Socks                    | - full   | 3      |
|   | - partial  | 2      |
|   | external rotation:   | 0      |
|   | - full   | 5      |
| The use of auxiliary rehabilitation equipment | - partial  | 4      |
|   | internal rotation:   | 3      |
|   | - full   | 1      |
|   | - partial  | 5      |
| Professional recommendation:                  | - calmly walks up the stairs without the help of a railing;              | 4      |
|   | - with the help of the railing, stepping on the step with only one foot; | 3      |
|   | - with difficulty with a cane.   | 2      |
|   | on the road with a lift  | 5      |
| Need for medication                           | downhill road  | 4      |
|   | - without difficulty;  | 3      |
|   | - with moderate difficulty;  | 0      |

Based on the analysis of the data on the above scale, the gradation of points is revealed in the following order (table 4):

## Grade scale indicators

| Rehabilitation Effectiveness Level | Number of points     |
|------------------------------------|----------------------|
| high                               | from 56 and above    |
| good                               | from 46 to 55 points |
| average                            | from 36 to 45 points |
| moderate                           | from 26 to 35 points |
| low                                | below 25 points      |

Timely and continuously conducted stage medical and social rehabilitation in the main group in 60.5% of patients showed a high and 20.8% of patients a good effect, and in the control group 55.5% and 18.2%, respectively. This shows that the comprehensive medical and social rehabilitation that we developed allowed us to improve the share of high patient efficiency by more than 5.0% than the traditional rehabilitation technique (Fig. 3.)



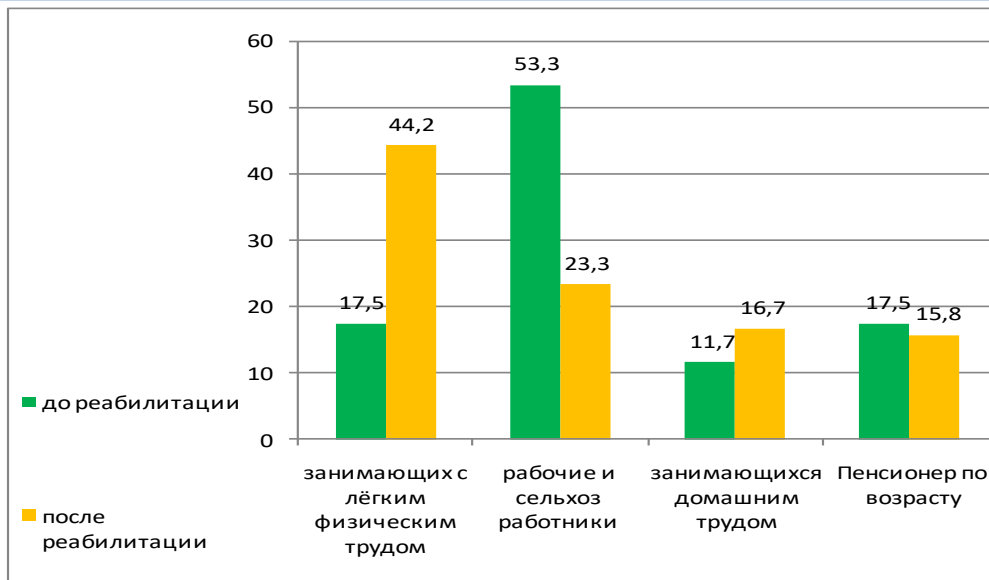
**Figure 2. Characterization of the effectiveness of rehabilitation of patients**

The materials we studied on the social and professional status of patients before surgery showed that most of the patients were workers and agricultural workers.

After the social and professional rehabilitation, the majority of patients managed to adapt to the family and society (Fig. 4).

The main factors for assessing the disability of patients and disabled with artificial implanted joints are: the nature of the course of the disease, the stage of the pathological process, the pathology of adjacent joints, the restoration of SDF. The return to work of patients in the main group was 67.5%, and in the control group 60.2%.

Economic efficiency is calculated according to the regulatory documents specified in order No. 254 of the Ministry of Health of the Republic of Uzbekistan of 2013.



**Fig. 3. Social and vocational rehabilitation**

According to our rehabilitation methodology, patients were temporarily incapacitated for 90 days, according to the traditional methodology, patients were usually incapacitated for up to 120 days, followed by registration of a disability group, according to the Cabinet of Ministers Resolution No. 195 of 2011:

$$Evr = (D1-D2) \times (G + E) \times H - 0.15 \times K$$

D1 = 120 days, D2 = 90 days, G = 21 346.93 soums, E = 17 077.54 soums, N = 66 patients, K = 414 500 soums,

where, D1 - the average number of disabilities of one patient for this disease before the introduction of the method;

D2 - the average number of disabilities of one patient for this disease after the introduction of the method;

G - average wage per patient amounts / day

E - the average amount of temporary disability benefit amounts / per day

H - scale of introduction (the number of patients per year on whom a new treatment method is expected to be distributed or has already been extended);

0.15 normal efficiency ratio

K - the estimated costs of implementing this method

Saving the time of disability (Evr) = (120-90) x (21346.93 + 17077.54) x 66-0.15 x 414500 = 76 018 275.60 sum

At the cost of treatment, the effectiveness (to reduce the treatment of the patient in the hospital) of the method is determined as follows:

$$Evr = [(M1-M2) + (C1-C2) + (B + E) \times 0.6] \times H - 0.15 \times K,$$

Where M1 – M2 - reduction in the cost of the drug for treatment

C1 - C2 - reduction in the length of hospital stay

B - the cost of one bed-day of a particular institution

E- average amount of temporary disability benefit (sum / day)

M1-M2 = 29,324.53 soums, C1-C2 = 4 days, B = 74,700 soums, E = 17,077.54 soums, N = 66 patients, K = 414,500 soums

$E_{vr} = [(29\ 324.53) + (4) + (74700 + 17077.54) \times 0.6] \times 66 - 0.15 \times 414500 = 5\ 507\ 898.54$  sum

The calculation of the economic efficiency of reducing disability when applying the new method according to the following formula:

$E_{inv} = [(T + E) \times (T1-T2) \times I1-I2 \times 0.6] \times H - 0.15 \times K$

$\frac{T1-T2}{T}$

$E_{inv} = [(21346.93 + 17077.54) \times (1-0.5) \times 67.5\% - 56.3\% \times 0.6] \times 66 / (1-0.5) - 0.15 \times 414500 = 171\ 114\ 379.89$  soums

Where,  $E_{inv}$  - cost-effectiveness by reducing disability;

T1 - the average number of years of illness on disability before the introduction of a new method

T2 - the average number of years of illness due to disability after the introduction of a new method;

I1 - percentage of disability for a given disease before the introduction of a new method;

I2 percent disability for this disease after the introduction of a new method;

0.6 - coefficient of workers excluding minors, pensioners and housewives

E is the average annual disability benefit;

H-scale implementation (person with disability)

0.15 - normative efficiency coefficient;

K is the cost of developing this method.

Thus, when treating patients with this method, the total economic sum on average for 1 year is 252,640,554.05 soums, including a reduction in temporary disability - 76,018,275.60 soums; the effectiveness of reducing the treatment of a patient in a hospital - 5 507 898.54 soums; the economic efficiency of reducing disability amounted to - 171 114 379.89.00 soums.

The proposed integrated system of physiotherapy exercises allows to minimize the frequency of dislocation of the head of the endoprosthesis of one of the complications, which improves the effectiveness of endoprosthetics.

The developed comprehensive physiotherapy exercise is a prophylaxis of venous thromboembolic complications and reduces mortality from thromboembolism in patients after hip arthroplasty.

Integrated physiotherapy exercises helps patients with an artificial hip joint to quickly adapt them to social conditions.

We recommend the developed methodology as a variant of physiotherapy exercises in the rehabilitation of patients with TBS endoprosthetics.

The results of biomechanical studies, we found an improvement in SDF in patients after EP TBS.

The developed technique allows to increase the effectiveness of MCP after EP TBS and reduce disability in patients with TBS pathology. Early activation of the operated joint on the developed device makes it possible to eliminate contracture in 80% of patients in the EX. The severity of primary disability in patients undergoing endoprosthetics is due to persistent, pronounced contracture and degenerative-dystrophic process in other sections of the ODS. According to the analysis of VTEK in the OG, 28.3% of patients showed a decrease in the disability group, and in the KG 16.5%

After a comprehensive rehabilitation, the types of contractures of the operated and adjacent knee joints were studied, as well as the contractures of the joints were studied according to comparative data with an unoperated limb after three and six months. We can see the positive dynamics in the main group, in which an early rehabilitation was carried out using the developed device to improve the function of the operated TBS and knee joints. In tables 3.5. indicated options for contracture and walking.

**Table 7.**

**Types of contracture, anomaly, and causes of changes in walking in patients after total TBS EP**

| Amount Sick | Anomaly of contracture and walking                                     | Symptom Definition  | Reasons for Change   |
|-------------|--|---|--|
| 21<br>16,8% | A tilt on the side of the body is detected when the pelvis is capsized | When the operated limb is raised, the gluteal fold goes down, and when the non-operated limb is lifted, the gluteal fold goes up (Trendelenburg symptom). | Due to the weakening of the contraction of the TBS abduction muscle, a slight pain appears in the operated joint. Relative shortening of the operated limb:<br>- moderate flexion contracture in the knee joint.   |
| 16<br>12,8% | When raising a limb  | The patient raises the affected side of the pelvis using the direct, posterior and lateral groups of abdominal muscles.                                   | Due to the relative lengthening of the operated limb:<br>-weak contractility of the muscles of hip flexors;<br>-Diverting and extensor contractures in TBS;<br>- Weak muscle of the anterior group of the leg;<br>- Flexion and adduction contractures of TBS joint on the opposite side |
| 31<br>24,8% | Internal and external rotation in TBS                                  | Hypermobility of rotational movements in the limbs.   | Outdoor rotation<br>- weakness of the leading muscle groups of the thigh.<br>Internal rotation:<br>- weakness of the abduction groups of TBS muscles;<br>- weakness of the anterior thigh muscle group   |
| 16<br>12,8% | Stride length changes  | The distance between the footprints from the forefinger to the end of the next heel is significantly greater than 65 cm.                                  | Stride length:<br>- contractures of the anterior thigh muscle group;<br>- instability due to fear;<br>- difference in limb length  |
| 19<br>15,2% | Strengthening lordosis of the  | When overextending the upper limb, there is an  | When overextending the lower limb:<br>- Flexion of TBS leads to weakness   |

|             |                               |   |   |
|-------------|-------------------------------|---|---|
|             | lumbar spine                  | increase in lordosis of the lumbar spine  | of the extensor group of the thigh muscles.<br>- Bending and driving contractures of TBS  |
| 22<br>17,6% | The rhythm of walking changes | The elapsed time of the transition and the step length of the operated limb is greater than that of the non-operated limb or normal walking | - Feeling of fear of falling and low supportability of the operated limb;<br>- Selection of a combination of movements using a cane |

From the table it is clear that in 16.8% of cases, patients in the late rehabilitation stages after EP, there was a tilt on the side of the body when the pelvis is tilted, when raising the limb, hypermobility of rotational movements in the lower limb, weakness of the muscles attaching the operated joint, change in stride length, increased lordosis and rhythmicity of walking changes, i.e. violation of physiological walking, which are associated with dysregulation of the ligamentous-muscular apparatus of the lower limb in 17.6% of cases.

General hypotrophy and hypotension of the muscles in the thigh region belongs to autonomic trophic disorders and causes contracture in this group of patients with TBS in this group of patients

Studies have shown that the range of motion in the operated joint is slightly limited, flexion and extension in patients were detected in 12.8% of cases. When determining the strength of the muscles of the flexors and extensors, deficiencies were revealed in 1.7% of the examined, while the abducting group of muscles suffered more in 6.2% of cases, the hip flexors in 1.5% and the tailoring and adducing groups were weakened in 3.4% the muscles.

**Table 8.**

**The range of movements in the operated joint in the control and main group of patients.**

| Type of movement                      | bending            | extension           | cast              | abduction         |
|---------------------------------------|--------------------|---------------------|-------------------|-------------------|
| Operated joint in the CG (No. 61)     | 90±8 <sup>0</sup>  | 170±5 <sup>0</sup>  | 5±1 <sup>0</sup>  | 30±3 <sup>0</sup> |
| The operated joint in the OG (n = 64) | 80±10 <sup>0</sup> | 180±10 <sup>0</sup> | 10±1 <sup>0</sup> | 40±8 <sup>0</sup> |

When studying the collected material, 65.5% of patients did not reveal any complaints. In 18.8% of patients mild lameness was detected with long walking, more than 1.5-2 km, and 6.2% of patients complained of pain when walking without the use of additional means of transportation, so these patients constantly used means of movement when walking.

X-ray studies were conducted for all patients before the surgical period and after surgery after three and six months. X-ray taken in a panoramic view of the pelvis. On the x-ray, the bone structures of the operated joint, the state of the endoprosthesis and the periprosthetic lysis of the endoosteal layer of the femur were studied.

An EMG study was performed in 64 patients in the form of a total EMG before and after TBS EP. In the EMG, the state of innervation of the abduction, adductors, and middle berry muscles was determined, and the total and stimulation electroneuromyography was performed on a Neuropack -51 apparatus, brand MEB-9400 AK, manufactured by NIHON Condens (Japan). Registration and analysis of the total EMG of arbitrary amplification during muscle contraction and impulse conduction, with qualified conduct, conclusions may be made. In the main group, EMG was performed in 3 patients, as in the form of stimulating EMG to restore traumatic paresis



of the sciatic nerve. Stimulation is carried out daily with an increase in time and strength of action on nerve fibers for 10 days. After the first course of stimulation, one patient recovered, the remaining patients needed a second course of electrical stimulation, unfortunately in one patient the repeated stimulation did not restore the sciatic nerve function.

The presented factual data on the severity and dynamics of disability, its nosological causes in patients who underwent the operation of total EP of TBS in Tashkent and the Tashkent region, allow us to state that disability of this category of patients has high severity and low rates of disability reduction, which leads to large and not always justified annual loss of labor resources in various sectors of the national economy.

Analysis of the dynamics of disability before and after the operation of total EP of TBS showed that surgical treatment of TBS diseases leads to a decrease in the severity of the disability group in patients, provided adequate postoperative comprehensive rehabilitation.

Moreover, the severity of the disability group was almost the same in the main and control groups before the operation of total ES BS, and after one year there was an increase in the severity of the disability group in patients after ES TBS in the control group. In the main group, a decrease in the disability group was determined compared to the control group. After conducting a comprehensive individual rehabilitation program in the main group of patients, the proportion of disabled people of group II decreased due to partial rehabilitation, i.e. transition to group III disability, so the number of patients with group III disability is greater than before surgery. This fact is explained by the fact that, despite the favorable functional outcomes of endoprosthetics, absolutely all those operated on during the examination were recognized as invalids of group III. At the same time, the volume and invasiveness of the operation give grounds for experts to classify such patients as persons with an anatomical defect. For this reason, complete rehabilitation of group II disabled people is impossible, although, according to our data, about 28% of rehabilitants have a good functional outcome after surgery and may return to the indicated types of work in their main profession.

Thus, in order to create a comprehensive event for the rehabilitation of patients and disabled people after total ES of TBS, it is recommended to take into account the following: the general condition of the patient, clinical and biomechanical characteristics, as well as social and living conditions of the patient. The diagnosis must indicate the severity of degenerative-dystrophic pathology, features of the operation, which reflect the static-dynamic indicators of the state of the operated lower limb and the localization of the affected pathologies. In the social aspect, it is necessary to consider in patients motor activity in working condition, the need to use transport, the intensity of movement, marital status, etc.

Given the foregoing, it can be said that the analysis of the results in the study of materials developed a comprehensive rehabilitation system, starting from before the surgical preparation of patients and planning the operation technology of total EP TBS depending on the stage of the underlying disease and pathologies of concomitant pathologies of patients, which avoids the development of possible errors and complications, both in the early stages after surgery, and in the long term after surgery

## RESULTS

To date, studies of the effectiveness of medical rehabilitation in patients and people with disabilities after total EP of TBS have made a decision to evaluate the clinical condition before surgery and after surgical rehabilitation treatment. The assessment of the clinical result is rather vague, does not have a clear definition and quantitative standards, and has a certain degree of subjectivity in assessing various clinical parameters. Therefore, one of the objectives of our work was to develop an assessment of the effectiveness of the rehabilitation of patients after total EP TBS. To determine the effectiveness of medical rehabilitation, they determine the degree of reduction in the possibility of social restrictions, as the most significant for each patient. In this

case, the restoration of the patient's social status is determined by the decrease in disabilities in everyday life and society.

It is known that the dynamics of various functions in the same patient occurs at different speeds. So, according to our data, in the early rehabilitation period there is a positive dynamic at the level of the proximal femur defect after replacement with an endoprosthesis, which is significantly ahead of other changes in the body. On the contrary, in the late rehabilitation period in patients after total TBS EP, recovery at the level of life limitation due to the development of compensatory-adaptive reactions occurs much faster than restoration of impaired functions from the implanted joint. Therefore, at the early stage of rehabilitation, the effectiveness of the ongoing rehabilitation was assessed; the rehabilitation data were used for short-term up to 3 months. and late rehabilitation with an interval after 3 months. and more. After medical rehabilitation, the effect of rehabilitation has been studied at three levels. Organ, at this level, the pathology of the affected joint was restored with the replacement of EP, the body in which the reduction of the possibility of limitations in the whole body and the restoration of social status were obtained. In the evaluation after surgical rehabilitation, criteria for the functional class were used. The functional class (FC) identified 2 criteria for the effectiveness of rehabilitation:

- 1) the achieved level of rehabilitation (FC after rehabilitation);
- 2) in fact, the effectiveness of rehabilitation in points.

In the developed methods proposed by us, a system for evaluating the effectiveness of comprehensive rehabilitation after EP TBS in the early and late stages of rehabilitation was proposed, which allowed us to evaluate the results of rehabilitation according to clinical results and quantitative criteria for the dynamics of FC disorders and limitation of vital activity, which allows us to justify the effectiveness of the proposed stepwise individual rehabilitation program (IPR) of patients with EP TBS.

After the study, the results of inpatient medical rehabilitation in the main group of patients after total EP of TBS were evaluated according to the severity of the patients' abnormalities and limitation of life (table.).

As can be seen from table 5.1. negative dynamics of impaired functions of the operated joint and the limitations of FC IV activity were not detected.

In most of the group, 53 (82.8%) patients of the main group managed to achieve positive dynamics of motor disorders in the functional class, which are estimated as insignificant. most patients revealed contracture in the operated TBS in the functional class. And others were aimed at rehabilitation after 4 months after the operation, when difficult scarring processes develop in the soft tissues of the operated joint. In these patients, it is advisable to evaluate rehabilitation in the long-term interval after completion of all stages of rehabilitation.

**Table 9**

**Assessment of the results of medical rehabilitation of patients main group**

| The severity of state parameters | Number of patients with contracture |                      | Number of patients with walking disorders |                      | Number of patients with self-care |                      |
|----------------------------------|-------------------------------------|----------------------|---|----------------------|-----------------------------------|----------------------|
|                                  | Before rehabilitation               | After rehabilitation | Before rehabilitation                     | After rehabilitation | Before rehabilitation             | After rehabilitation |
| Normal state of parameter ФK0    | -                                   | 51<br>79,7%          | -   | 51<br>79,7%          | -                                 | 53<br>82,8%          |
| Slight violation (minor) FC I    | 42<br>65,8%                         | 7<br>10,9%           | 42<br>65,8%                               | 7<br>10,9%           | 42<br>65,8%                       | 5<br>7,8%            |
| Moderate FC II violation         | 19<br>29,7%                         | 4<br>6,3%            | 19<br>29,7%                               | 4<br>6,3%            | 19<br>29,7%                       | 5<br>7,8%            |

|                            |            |            |            |            |            |            |
|----------------------------|------------|------------|------------|------------|------------|------------|
| Severe violation of FC III | 3<br>4.7%  | 2<br>3,1%  | 3<br>4,7%  | 2<br>3,1%  | 3<br>4.7%  | 1<br>1,6%  |
| Severe violation of FC IV  | 7          | 4          | 7          | 4          | 7          | 4          |
| TOTAL                      | 64<br>100% | 64<br>100% | 64<br>100% | 64<br>100% | 64<br>100% | 64<br>100% |

The developed scale is based on the idea of the TBS function. The rating system contains 9 criteria.

The pain is characterized by four criteria, including the intensity of pain in the hip joint, the relationship of pain with motor activity, back pain. The patient's pain sensations are evaluated separately in each hip joint and have values from 0 to 5 points.

The movement function is evaluated according to 6 criteria: the distance that the patient is able to walk, the use of additional support when walking, walking on stairs, entering public transport, putting on socks and shoes, the ability to sit on a chair, and the ability to take a bath independently. The above criteria most accurately reflect the degree of limitation of vital activity in case of damage to the hip joints, as well as the degree of functional adaptation of patients after single and bilateral hip replacement. Each criterion has a rating from 0 to 2-3 or 5 points. The range of motion is estimated for each TBS separately. Take into account the amount of flexion, abduction, external and internal rotation. The results are determined in points, in a value from 0 to 5 points.

The data obtained are expressed in points, and their total value allows us to assess the severity of damage to the hip joints when planning a system of rehabilitation measures and to trace the restoration of lower limb function at the stages of rehabilitation. The maximum score for each TBS is 70 points. At the same time, the value of evaluating the general criteria for operated joints (pain on the operated joint, gait (lameness), possible walking distance without pain, range of motion, daily activity, putting on shoes and socks, using auxiliary rehabilitation equipment, professional advice, need for use medicines).

In 10 patients (15.6%), under the influence of the rehabilitation carried out under hospital conditions, an improvement of 1 FC or more was achieved, which is regarded as a moderate improvement. This occurs mainly in patients in the early rehabilitation period, in which medical rehabilitation was carried out in a hospital in which a violation of the clinical and functional state of the operated joint is restored faster after a course of treatment. In these patients, vital activity is limited due to insufficient recovery of the supporting ability of the operated limb. Therefore, after a course of rehabilitation in stationary conditions, 5 (4.2%) people were left without positive dynamics in their general condition. When discharged from the hospital, these patients used two crutches when moving, but after a long comprehensive rehabilitation in the future, provided the rehabilitation process is not complicated, they will be able to partially restore self-care and movement with transitions to FC 2.

In addition, the results of inpatient treatment in the control group were evaluated (table 10.).

**Table 10.**

**Assessment of the results of medical rehabilitation of patients in the control group of patients**

| The severity of state parameters | Number of patients with contracture |                      | Number of patients with walking disorders |                      | Number of patients with self-care |                      |
|----------------------------------|-------------------------------------|----------------------|---|----------------------|-----------------------------------|----------------------|
|                                  | Before rehabilitation               | After rehabilitation | Before rehabilitation                     | After rehabilitation | Before rehabilitation             | After rehabilitation |
|                                  |                                     |                      |   |                      |                                   |                      |

|                               |             |             |             |             |             |             |
|-------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Normal state of parameter FC0 | -           | 44<br>72,1% | -           | 44<br>72,1% | -           | 43<br>70,5% |
| Slight violation (minor) FC I | 37<br>60,6% | 7<br>11,5%  | 37<br>60,6% | 7<br>11,5%  | 37<br>60,6% | 8<br>13,1%  |
| Moderate FC II violation      | 18<br>29,6% | 4<br>6,6%   | 18<br>29,6% | 4<br>6,6%   | 18<br>29,6% | 5<br>8,2%   |
| Severe violation of FC III    | 6<br>9,8%   | 4<br>6,6%   | 6<br>9,8%   | 4<br>6,6%   | 6<br>9,8%   | 3<br>4,9%   |
| Severe violation of FC IV     | -           | 2<br>3,2%   | -           | 2<br>3,2%   | -           | 2<br>3,2%   |
| TOTAL                         | 61<br>100%  | 61<br>100%  | 61<br>100%  | 61<br>100%  | 61<br>100%  | 61<br>100%  |

As can be seen from table 10., 6 patients from the control group (9.8%), who had a pronounced and pronounced violation of the SDF of the operated joint, only 1 (16.6%) patient had an improvement in the state of function with transitions to FC II, In the remaining patients, the condition improved slightly and they remained in the existing functional class of disorders. The study showed that the positive dynamics of the vital activity of patients after EP TBS, due to improved ability to move and self-care. In 74 (80.4%) patients, due to the improvement of self-care, they belong to FC I.

The given indicators indicate that the effect of medical rehabilitation after completion of an individual rehabilitation program at the stationary stage, expressed in a decrease in the deficiency of functional disorders of the implanted joint and a decrease in the severity of life limitations due to the ability of the operated patients to move and self-service, is significantly higher in the main group than in control.

This confirms the need for rehabilitation measures in this category of patients and disabled people in the shortest possible time after the operation of total EP TBS.

Evaluation of rehabilitation measures at the short and long-term stages of rehabilitation showed that improving the organization of medical rehabilitation after a total EP of TBS, especially in the early rehabilitation period, timely referral to the stationary stage of medical rehabilitation can improve the immediate functional results of the operation and its long-term socio-economic effect.

In addition, there is a real possibility of increasing the effectiveness of rehabilitation measures through streamlining and their phasing. This is confirmed by the results of the rehabilitation of patients after total TBS EP in clinical and rehabilitation groups.

Thus, the introduction of the developed technology for the comprehensive rehabilitation of patients and people with disabilities after total ES of TBS contributes to the quickest return of rehabilitants to work, reducing the severity of disability and lowering the initial exit to disability, reducing government spending on pensions and benefits, and ultimately, increasing the national income of the Republic Uzbekistan

## DISCUSSION

### Information on medical and social rehabilitation of patients and disabled people after total hip arthroplasty

An important medical, social and economic problem today remains the rehabilitation of patients with EP TBS [1, 2]. The researchers revealed a significant increase in the first decade of the 21<sup>st</sup> century in patients with EP TBS among young people under 40 [3, 4]. An increase in the incidence of joints and significant disability of the population require an immediate solution to this problem. With the help of WHO and the UN, the International Decade of Bones and Joints was organized to attract the attention of the general public around the world to patients with EP in order to improve the quality of life and maintain their health (The Bone and Joint Decade 2000-2010). First of all, the objectives of this program are to make society aware of the suffering

of patients and the socio-economic significance of articular-skeletal disorders, as well as the need to improve the prevention and treatment of this disease. In the framework of the decade, the need to create regional government programs to reduce the incidence and treatment of pathology of acute respiratory infections was noted, and EP is the most effective. Currently, the actual issue in the surgical treatment of TBS pathology is total EP, which in particular is the subject of numerous works by domestic and foreign researchers. However, the issues of compensating for SDF, ITU and rehabilitation after the operation of total ES of TBS are the least studied. Thus, when discussing the issues of relative compensation of the impaired TBS function, it was noted that with unilateral EP, the main source of compensation becomes the dynamic effect and the transfer of support power to a healthy limb. In bilateral EP, not only asymmetry but also the high energy significance of walking and a decrease in its anthropomorphism acquire the greatest importance [5, 6].

In the literature on the study of the characteristics of the bioelectric activity of muscles in patients after total TBS EP, it is reported that when walking such patients use an unoperated limb as their main support. The authors, however, indicate that the average value of bioelectrical activity on the sides of the operation and on the healthy side practically coincide, but the distribution of the waves of bioelectrical activity of the step is not as clear as normal [7, 8].

Total EP TBS allows for early activation of the patient, quickly eliminates pain in patients associated with TBS pathology, restores the patient's independent movement, to self-care, makes it possible to continue his professional activities and improves the patient's quality of life [9, 10]. Moreover, in patients of the III-IV stages of TBS pathologies with constant pain, expressed contracture and lameness, regardless of the patient's age, it is necessary to determine indications for total TBS EP so that the patient can independently move around at home and start professional activities in time [11, 12].

Over the past decade, separate works on the rehabilitation of patients with certain forms of orthopedic and traumatological pathology have appeared in domestic and foreign literature, one of the drawbacks of which is the lack of a consistent and comprehensive presentation of treatment issues taking into account modern views. Various specialists (orthopedists, rheumatologists, physiotherapists) summarize their developed rehabilitation measures and postoperative management of patients with orthopedic and traumatological pathology, which are devoted to means of rehabilitation treatment without organizing medical and social rehabilitation measures [13, 14].

Some authors suggest the appointment of physiotherapeutic procedures (applications of paraffin, mud, ozokerite, hydrogen sulfide, radon, coniferous, mineral baths, iontophoresis with lidase and hydrocortisones, UV, UHF, physiotherapy exercises, massage) in order to improve impaired blood circulation, normalize metabolic processes, and resorption of scar tissue degeneration [15, 16].

Drug therapy also aims to normalize metabolic processes, relieve pain, reduce the inflammatory component, improve the general condition of the patient. For this, ibuprofen, reopirin, pirabotal, vitamin B and other drugs are used. The most appropriate complex treatment, combining various physiotherapeutic procedures with massage and physiotherapy [17, 18].

In some developed countries of the world where the rehabilitation of such patients is the highest level of technology and science, the promotion of cost-effective rehabilitation technologies and attracting patients to participate in their own health care has long been a national policy. Some authors publish patient training manuals for pain relief and self-service groups. Such groups should be one of the parts of each treatment plan for patients with coxarthrosis [19, 20]. Implementation of the developed programs reduces the attendance of visits to the doctor by reducing pain and improves the quality of life of the patient [21].

Psychological rehabilitation measures for trauma and orthopedic patients are aimed at restoring the status of patients with the help of the psychological potential of the individual. This implementation is adopted using various approaches: reassurance, clarification, persuasion, suggestion, autogenous training and systematic desensitization, as well as sociotherapy, which

helps optimize the patient's connections with his social environment. The psychological aspect of rehabilitation provides for the occurring violations in connection with the disease and its consequences, and also prevents the negative influence of the individual and for successful coping with difficulties [22, 23].

An analysis of the literature data on the issues of total EP of TBS indicates that the majority of publications address the treatment of these patients, the problems of MSE and rehabilitation are raised only in a few works, and in some cases the information is contradictory. Currently, the operation of total EP of TBS is performed in all specialized departments of regional hospitals and, as a rule, patients are prescribed rehabilitation treatment, including early (from the second day under the control of hemodynamics) patient activation (passive and active physical exercises), physiotherapeutic treatment. The purpose of early rehabilitation is: prevention of complications of the operation (thromboembolism, postoperative pneumonia, suppuration, etc.) and the prevention of pathological conditions (dislocation of the endoprosthesis, ossification, etc.) At this early medical and rehabilitation stage, as a rule, intensive drug therapy (antibiotics, analgesics), funds that improve the rheological properties of blood, etc.). Patients are discharged from hospitals 12-16 days after surgery with severe motor impairment, and use crutches when moving. Further rehabilitation (inpatient clinic) is sporadic in nature and, as a rule, is determined by the initiative of the patients themselves, excluding clinical rehabilitation groups and clinical functional classes [24, 25].

Thus, the creation of new methods for MSR of patients and people with disabilities after total EP of TBS in the Republic of Uzbekistan is dictated by: high disability rates during the examination of patients with an endoprosthesis; to increase the number after surgical patients; the lack of a comprehensive rehabilitation system in healthcare practice, including medical, social and professional; the lack of stages in work, "hospital - rehabilitation center - clinic", failure to comply with the terms, scope and continuity of rehabilitation assistance [26, 27].

The published literature indicates the magnitude of the problem of degenerative-dystrophic diseases, including TBS as one of the main types of pathology that form the primary disability in people with motor impairments [28, 29].

Based on the analysis of literature on the study of total EP of TBS, it should be noted that a prerequisite for achieving a successful outcome of treatment should be rational planning of the operation, the optimal choice of the implant and the method of fixation, adequate preparation of the patient, strict observance of modern rules of surgical technique, the right choice of anesthesia [30]. In fact, the preoperative period, including the use of a number of preventive measures and, especially, the operation itself, is the first and most important stage of the studied complex of rehabilitation treatment, which completes the social rehabilitation of the patient. Despite the rapid achievement of a positive result in the field of TBS, the very nature of the surgical intervention creates mechanical prerequisites for the further use of the endoprosthesis, which is inevitable, and the task of the orthopedist is to slow it down or postpone it as late as possible [31,32].

The above unfavorable trends push the rehabilitation of such patients and people with disabilities to one of the priority areas of the problem of total EP of TBS and determine the need for a scientific approach to the issues of medical rehabilitation of patients and people with disabilities after total EP of TBS [33].

There are no scientifically based criteria for the ability to work of people with an endoprosthesis in the literature, and therefore the social results of expensive and long-term rehabilitation treatment are significantly reduced, which does not lead to the expected rehabilitation effect after TBS EP.

Based on the materials studied, the goal, comprehensive rehabilitation, the restoration of the SDF of the operated limb and independence in everyday life, the return to the patient's labor activity, by developing an effective MSS technology at the stages of a medical institution are determined [34, 35].

Currently, a number of new rehabilitation systems have been developed in patients after total EP of TBS. The materials we have studied do not adequately reflect the technology of rehabilitation, as an integrated technique in the form of medical, social and professional rehabilitation and, accordingly, medical and labor expertise. To date, the dynamics of disability after total EP of TBS has not been studied, and a list of recommended types of work is not presented taking into account the pathology of adjacent joints and spine [36]. The progress in the number of operations related to the total EP of TBS, difficulties in the field of rational employment and adaptation of patients in the social environment, a sense of inferiority of patients in the postoperative period, and others, led us to search for improved comprehensive rehabilitation methods and methods of medical and labor examination covering all areas of rehabilitation: medical, social, professional.

## CONCLUSION

1. The results of the analysis of the severity of disability in patients after EP showed that the disability group did not change in 6.4% of patients after rehabilitation in the presence of negatively influencing factors: persistent contracture and degenerative-dystrophic processes in other sections of the ODS.
2. The use of the device we developed for the early activation of the operated joint helped to reduce the number of contractures in the operated joint in 80% of patients.
3. The results of the statistical analysis obtained with the application of the individual rehabilitation program developed by us for patients and disabled people after total TBS EP allowed us to evaluate the effectiveness of the volume and standards of rehabilitation care at the inpatient and outpatient stages, which contributed to the reduction of temporary disability to 1 month in 37, 5% of patients.
4. The main factors of the disability of patients and people with disabilities after EP were the nature of the course of the disease, the stage of pathological processes, the combined pathology of adjacent joints and the spine, taking into account which an increase in the number of return to the indicated type of work was achieved in 67.5% of patients.
5. The proposed timely and continuously carried out staged medical and social rehabilitation made it possible to obtain a high and 20.8% of patients with a good rehabilitation effect in 65.5% of patients.

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