

# Application of the Non-Medical Treatment Methods in the Early Postoperative Period after Total Hip Arthroplasty

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## ABSTRACT

**Aim.** To evaluate the effectiveness of rehabilitation complexes at first stage of rehabilitation after hip arthroplasty.

**Methods:** The study included 161 patients after hip arthroplasty. They were all at the first stage of rehabilitation and received rehabilitation treatment complexes. In 47 cases rehabilitation complex No. 1 was used, in 42 cases rehabilitation complex No. 2, and in 35 cases rehabilitation complex No 3, the comparison group was 37 patients. Evaluation of the results was carried out during treatment and before discharge from the hospital.

**Results:** The most pronounced analgesic effect was noted with the use of rehabilitation complex No. 3 (pain regression up to 20-25 mm on a visual analogue scale by 5-6 days from the start of treatment and up to 15 mm by the 8<sup>th</sup> day). Rehabilitation complex No. 1 had a more pronounced decongestion effect (by 5-6<sup>th</sup> day regression of edema by 2-3 cm). Rehabilitation complex No. 2 had a moderate analgesic effect and good decongestant effect (pain regression up to 20-30 mm on a visual analogue scale by the 5-6<sup>th</sup> day and up to 18-22 mm by the end of the course of treatment, reduction of edema by 2-3 cm by the 5-6<sup>th</sup> day and elimination by the end of the course of treatment).

**Conclusion:** The results of the study showed the effectiveness of rehabilitation measures in the early postoperative period after total hip arthroplasty and the need for differentiated approach in each case.

**Keywords:** hip arthroplasty, rehabilitation, medical gymnastics, magnetotherapy, cryotherapy, photomagnetotherapy.

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## INTRODUCTION

In recent years, the number of diseases of the musculoskeletal system in all age groups has significantly increased, which has a general negative effect on the health status of the population, increases the number of disabled people and people with disabilities. Diseases of the musculoskeletal system significantly reduce the quality of life, bring tangible financial costs for patients<sup>1</sup>. Among the adult population of Russia, diseases of the musculoskeletal system account for 6.5% of the total morbidity structure. Osteoarthritis is the most common disease of the musculoskeletal system. Coxarthrosis ranks first among the incidence of arthrosis in terms of disability, both temporary and persistent<sup>2,3</sup>. Disability with this disease reaches 30%. In this regard, it is relevant to search for various methods of complex therapy of coxarthrosis, which can improve the quality of life of patients. The method of total hip arthroplasty has become widespread in pathologies such as coxarthrosis, aseptic necrosis of the femoral head, fracture of the femoral neck, etc<sup>4</sup>. This surgical intervention can significantly reduce the severity of pain or completely relieve the patient of pain, restore the range of motion in the hip joint and limb support<sup>5,6</sup>. However, there remain a number of problems that exist before and after surgery (muscle hypotrophy, functional impairment, decreased proprioceptive sensitivity), which

makes it necessary to pay special attention to the need for early rehabilitation of patients after total hip joint arthroplasty<sup>7,8</sup>.

The aim of our study was a comparative assessment of the effectiveness of 3 rehabilitation complexes used in the early postoperative period after total hip arthroplasty: rehabilitation complex No. 1, rehabilitation complex No. 2, rehabilitation complex No. 3 and with the effectiveness of recovery of patients who did not receive rehabilitation.

## MATERIALS AND METHODS

The results of treatment of 161 patients (72 women, 89 man) in the early postoperative period after total hip arthroplasty at the orthopedic and medical rehabilitation departments of the Regional Clinical Hospital in Ryazan were analyzed. The duration of the study of each patient was 14 days. The age was 47 – 60 years. They were all at the 1<sup>st</sup> stage of rehabilitation and received rehabilitation treatment complexes. In 47 cases rehabilitation complex No. 1 was used, in 42 cases – rehabilitation complex No. 2, in 35 cases – rehabilitation complex No.3, 37 patients did not receive rehabilitation. All patients were comparable in terms of the disease, the stage of coxarthrosis, the presence of concomitant pathology, and drug therapy. Evaluation of the results was carried out during treatment and before discharge from the hospital. The exclusion

criteria were: the presence of contraindications for rehabilitation, intraoperative and postoperative complications, age over 65 years. Statistical analysis was done with absolute indicators and their parts

Description of medical intervention. The leading place in each rehabilitation complex was held by therapeutic exercises, as the main method of compensating for impaired motor function in this group of patients. Therapeutic gymnastics was carried out from the 1<sup>st</sup> day after the operation, by the instructor individually, daily, the duration of the classes was 15-20 minutes, 1 time with the instructor, 2-3 times on their own, the course was 10 days. The instructor also taught the patient to move correctly on crutches, ascent and descent of stairs.

From the 2<sup>nd</sup> day after the operation, therapeutic exercises were supplemented by physiotherapeutic procedures. Depending on the severity of postoperative soft tissue edema, the inflammatory process, the presence of a hematoma, and the general somatic status of the patient, various methods of physiotherapy were included in the rehabilitation complex. Rehabilitation complex No. 1 included therapeutic gymnastics and magnetotherapy as a treatment method that helps to eliminate postoperative edema, prevent inflammation in a postoperative wound, improve microcirculation, stimulate trophism and regenerate damaged tissues. Magnetotherapy was prescribed to patients with severe postoperative edema, inflammatory phenomena in the postoperative wound, soft tissue hematoma. Magnetotherapy was carried out from the «MAG-30» apparatus according to a labile technique to the thigh area with the capture of a postoperative wound, daily for 15 minutes, 10 procedures.

Rehabilitation complex No. 2 included therapeutic gymnastics and cryotherapy, was prescribed to patients with severe postoperative edema. Cryotherapy was carried out from the apparatus «Holod» (-9 degrees on working surface), labile for 7-10 minutes on the thigh and hip joint from the operated side, daily, 10 procedures.

Rehabilitation complex No. 3 included therapeutic gymnastics and photomagnetotherapy, was prescribed to patients in the absence of contraindications for physiotherapy in order to provide anti-inflammatory effects and improve trophism and tissue regeneration. The procedure was carried out from the apparatus «Photomag» (combined exposure to alternating magnetic field, pulsed monochromatic infrared and blue light), labile, for 10-15 minutes, on the hip and hip joint with the capture of a postoperative wound, daily, 10 procedures per course.

Criteria for evaluation of effectiveness. Evaluation criteria: the severity of pain, which was assessed according to a visual analogue scale, the decrease in the severity of postoperative edema (assessed by measuring the circumference of the thigh with a centimeter tape), active flexion in the hip joint in the supine position to 70-80 degrees, the development of walking along the corridor within 100 meters, mastering the descent and climb stairs one flight.

## RESULTS

The most pronounced analgesic effect was noted with the use of rehabilitation complex No. 3 (pain regression up to

20-25 mm on a visual analogue scale by 5-6 days from the start of treatment and up to 15 mm by the 8<sup>th</sup> day; in the group received complex No. 1 - 30-33 mm by day 5 and 20 mm by day 8-10; in the group received complex No. 2 - 32-34 mm by day 5 and 25 mm by day 10; in the comparison group, by day 5, 65-70 mm and by day 10, 52-55 mm). Rehabilitation complex No. 1 had a more pronounced decongestion effect (by the 5-6<sup>th</sup> day there was a regression of edema by 4-5 cm and was completely eliminated by the end of the course of treatment). Rehabilitation complex No. 2 had a moderate analgesic effect and good decongestion (reduction of edema by 2-3 cm by the 5-6<sup>th</sup> day and elimination by the end of the course of treatment). In the comparison group, the regression of edema was 1-2 cm to 5-6 days and 3-4 cm at the end of treatment.

By the 6-8<sup>th</sup> day from the start of treatment, walking on the corridor with crutches within 100 meters was mastered by 79% of the examined patients who received rehabilitation, in the comparison group 56%. Descent and climbing stairs by 1 flight with a side step was mastered by 32%, in the comparison group 15%, the angle of flexion in the hip joint in the supine position was 70 degrees in 95% of patients, in the comparison group in 65 % of patients. Before discharge, walking 100 meters with crutches was mastered by all the patients studied (100%), descent and climbing stairs by 1 flight with a side step – 98% patients received rehabilitation, in the comparison group – 63%. The angle of flexion in the hip joint in the supine position was 90 degrees in 11% of patients, 85 degrees in 76%, 70 degrees in 13%, in the comparison group 90 degrees in 5%, 85 degrees in 52%, 70 degrees in 3% of patients.

## DISCUSSION

In this study it was proved that early rehabilitation of patients after hip arthroplasty reduces pain, reduces tissue swelling and promotes a more complete restoration on support and walking function. At the same time, it was found that the inclusion of the rehabilitation of magnetotherapy most effectively helps to eliminate postoperative tissue edema, cryotherapy reduces swelling and anesthetizes, photomagnetotherapy has the most pronounced analgesic effect.

## CONCLUSION

Thus, the results of the study showed the effectiveness of rehabilitation measures in the early postoperative period after total hip arthroplasty and the need for a differentiated approach in each case.

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