

ALGORITHM OF FUNCTIONAL RECOVERY AFTER ALOPLASTICA OF THE HIP JOINT

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Abstract: Due to the aging of the population and the increasing of the life expectancy, the disease arthrosis is increasing in numbers, leading to growth in the incidence of endoprosthesis worldwide. Arthroplasty is the ultimate solution for the debilitating diseases of the hip joint when medication fails. The fracture of the hip joint is also one of the main indications for performing arthroplasty. Patients with advanced arthrosis are a large burden on the health system. Osteoarthritis of the hip is one of the most common diseases of the locomotor system. The cost of medication, rehabilitation, physical therapy and hospitalization can be huge. Often these costs do not include the reduced disability and the absence from work. On the other hand arthroplasty of the hip joint effectively alleviates pain and improves function and quality of life of patients with advanced arthrosis. In building the correct algorithm for patients after total hip aloplastika is important the individual approach in compliance with the instructions of the treating doctor- orthopedist. The things that matter are the age, the etiology, the used surgical access, the fixture etc. Physiotherapist must be aware of the danger of possible complications such as fracture of the femur, peripheral nerve damage and paralysis, disloktsiya of the endoprosthesis and others. Several studies have shown that wound physiotherapy is no reason for problems with endoprosthesis and leading significance have surgical factors. The progress of physiotherapy through wounds postoperative period also depends on the way of attaching the prosthesis and surgical applications access. Well designed methodology of physical therapy is aimed at preventing complications and restoring not only the volume of the movements of the hip, but the overall function of the lower leg and accelerate the recovery of the patients to independent living. Best results are achieved with the beginning of physiotherapy before surgery, but in most of the cases this does realized for one or another reason. The main method for the construction of the algorithms for functional recovery after arthroplasty of the hip joint is optimizing the functional capacity and the education of the patients. Adequate physiotherapy, based on the instructions of the orthopedist and functional diagnostics of individual physical capacity leads to improved quality of life in patients after hip aloplastika. The criteria for assessing the condition of the patients after hip replacement endoprosthesis, regardless of the type of prosthesis are: determining the stability of the prosthesis, subjective sensation of pain, functional capacity (range of motion in the hip and strength of the treated muscles).

Keywords: Osteoarthritis of the hip joint, arthroplasty, algorithm of functional recovery physiotherapy

Since the aging of the population and the increase of the average lifespan, there is an increase in incidence of the arthrosis, and that leads to growth in the frequency of endoprosthesis in the world. Arthroplasty is a final solution to debilitating diseases of the hip joint when the medication treatment is unsuccessful. The most common reason for debilitating is the arthrosis disease but as a no small part are defined other born with or acquired diseases. There is a significant number of patients with a destruction of the joint following a rheumatoid arthritis and rheumatoid diseases, osteonecrosis, malignancies or infections. The fracture of the joint is also one of the main indications for performing arthroplasty. In a big part of the operated patients a significant improvement in the function of the affected joint is achieved. Since the big benefits for the patients today hip joint arthroplasty is the most commonly performed orthopedic intervention. Not by chance it was named "operation of the twentieth century".[1] The procedure is one of the most cost-effective orthopedic interventions and can lead to lowering the amount of spending of the patients.[2] The analysis value-efficiency shows us how the value of the given intervention is compared to the value of the alternative treatment based on price, quality and lifespan. The increasing expenses for treatment are compared to the increasing results which are measured according to the pathology, expended year life, saved human life. The final grade is presented as expenditure for a single accomplished result. According to the European Commission the frequency of the hip joint arthroplasties in the most developed European countries is more than 150 out of 100 000 residents. In Europe alone more than 600 000 hip joint arthroplasties are performed each year. [3] In 2012, in Bulgaria the number of the implanted primary hip joint arthroplasties is 4509 as their number is increasing significantly in recent years. There are significant differences between the countries. The possible reasons are the different health insurance systems, level of socioeconomic development and the mindset of the patients.

It is concluded, that many of the patients who benefit from hip joint endoprosthesis are informed of the benefit of this surgery. Their general knowledge and their social status define their willingness to undergo the

surgery. If the medicines, the changes in the daily activities and the use of walking aids are not adequate and they don't help resolving the symptoms, they might and should think about changing the hip joint.

The hip joint change is safe and effective procedure which could relieve the pain of the patient, increase the joint movement and help him return smoothly to his normal everyday activities. The successes in hip joint endoprosthesis lead to extending of the indications for performing the intervention as well as rejuvenating the average age of the operated patients. The expenses for medicaments, rehabilitation, physical treatment and hospitalization can be huge. Often in those expenses the reduced working capacity and the absence from work are not included. On the other hand, the hip joint arthroplasty combined with the substantial role of the physiotherapy relieve the pain effectively and improve the function and the quality of life of the patients with advanced arthrosis.

The total hip joint arthroplasty is an option for almost every patient with hip joint disease, which causes chronic discomfort and significant functional disorder. Of course, we should not overlook the fact that the total hip joint arthroplasty is a big surgical procedure and is connected to a significant number of complications, mortality rate is around 1%. Therefore, the selection of the patient requires detailed general health exam and assessment of the severity of the accompanying systemic diseases. The contraindications for arthroplasty are relatively small. As an absolute contraindication is accepted the presence of active joint infection or other area. There are a number of comorbid conditions which are relatively contraindicated for arthroplasty such as: advanced forms of chronic renal insufficiency, liver or cardiovascular insufficiency. One of the most frequently used classification for assessment of the general condition of the patients and perioperative risk before surgery in the world, is the classification of the American Society of Anesthesiologists.[4] The latter is a universal tool for assessment of the preoperative functional status of the patient, the risk of complications of non-orthopedic nature during the surgery and after that, the morbidity and the mortality, the duration and the cost of hospitalization. According his index, regardless of the improvement of the surgical techniques, the risk for the human life might be exceptionally high and it cannot justify the performing of the arthroplasty.

The implementation of the hip joint arthroplasty in most of the cases is connected with progressive pathologic changes in non-contractile and contractile structures, as well as with a significant limitation of the mobility and the mental comfort of the patients. The specific pain in the area of the groin in hip joint arthrosis leads to muscle hypotrophy and imbalance, reduced range of movement, contractures and limited mobility. These problems remain after the endoprosthesis, which determines the substantial role of the physiotherapy. In building the correct algorithm in patients after total hip joint arthroplasty is the individual approach with observing the instructions and contradictions of the treating orthopedist. There is significance in data about age, etiology, used surgical access, the means of attachment, accompanying diseases and so on. The algorithm of functional recovery after hip joint arthroplasty goes through 5 phases [7]:

1. Phase I - Protective phase– from the day of the surgery up until leaving the hospital facility (0-1 week)
2. Phase II – Transitional Phase (Guided by home or rehab therapist) Weeks 1 – 3
3. Phase III – Outpatient Early Phase (Weeks 3-6, guided by outpatient physical therapist)
4. Phase IV – Outpatient Intermediate Phase (Weeks 6-12, guided by outpatient physical therapist)
5. Phase V – Return to High Level Activity (3+ months)

The ideal result after hip joint arthroplasty with endoprosthesis is removing the pain and recovering the normal range of movement in the concerned hip joint. Which is of a particular importance in improving the walking of the patient and smooth recovery of his quality of life. In rehabilitation programs with patients after total hip joint endoprosthesis is included walking, which basically is recovery of the correct way of walking, rhythm, speed and smoothness of movement.

The Physiotherapist should have the consideration the danger of possible complications as: Femur fracture, peripheral nerve damage and paralysis, dislocation of the endoprosthesis, etc. Numerous researches are showing that the early physiotherapy is not reason for problems with the endoprosthesis and leading significance has the surgical factors. The progress of the physiotherapy during the early postoperative period depends not only on the method of the affixing of the endoprosthesis but also on the applied surgery access. There are researches concerning the surgery access (frontal, lateral, rear, mini invasive or standard) which are showing that there is no difference according to the primary physical exercise, walking with crutches and the functional results. [5] Which means that the size of the section is not one of the leading indicators of early and more intensive physiotherapy. It is important the individual approach to the patient in order the less painful and more efficient recovery of the musculature according to the surgery access and movement. There are two differentiated types of pain after endoprosthesis: neuropathic and inflammatory. The postoperative reduction of

the pain can be achieved by using medicines but it is needed restricted usage because there is a risk of excessive sedation, which prevents the recovery of the movement abilities of the patients as fast as possible. The patient has been trained to distinguish the type of the pain, to follow it and limit the movement activities leading to the onset of the pain. The pain indicates if the exercising is adequately. Effective way to reduce the pain level is the cryotherapy- gel applying for about 10 (20) minutes. [6] The positive effect is proven- the reduction of the postoperative edema, muscle tension and the reduced usage of analgesics after endoprosthesis. The postoperative intraarticular hematoma is reduced by swollen, lymphatic massage and drainage, combined with the application of the medication for prevention of the complications from respiratory and cardiovascular system. It is necessary to start with inhaling exercises separately or combined with upper limbs ankle joints. Active isotonic movements for ankles, wrist and elbow joints are included firstly. The purpose is overcome of the muscular imbalance, recovery of the possible range of motion and control over compensatory mechanisms to improve the opportunity for balance.

Well constructed methodology of physiotherapy is pointed towards preventing complications and the recovering not only to the range of movement in the hip but the overall the function of the lower leg and accelerating the patients to the normal way of living. Starting with physiotherapy before the operation can give the best results but in the most cases this is not happening because one or another reason. In the early stages of the degenerative changes is important the education of the patients for the essence of the disease which had led to endoprosthesis, for the risky factors such as: stressful and extended physical encumbers, immobilization, overweight, food with zero nutritional value, hereditary defects, etc. Paramount in the early postoperative phase is the individual approach and the patient should be trained properly. The physiotherapeutic techniques are pointing towards the muscle relaxing with raised muscle tone and stimulating all these with decreased muscle tone. The recovery of the muscle activity with the early motion function (early burden and walking), also the gradually inclusion of the active exercising freely against the manual resistance. In the beginning the adduction and rotation in the hip endoprosthesis is reduced. The crossing of the lower limbs as well. The burdening of the operated lower limb is individual. The recommendations of the treating orthopedist must be observed. The training of the patients in the self-service and everyday activities - walking, sitting and standing up, climbing a stairs up and down, dressing and undressing, getting in and out the car, etc. have the priority. Some patients are recommended the first weeks after the surgery to reduce the stairs climbing because of the torsion forces. Gradually the set of exercises is expanded (active against resistance, isometric muscle contractions). Gradually the motion of the patient goes over the burdening with an aid. And when the equilibrium and coordination capabilities of the patient are recovered he goes over to walking without any aids. Priority is restoring the capability of the patient to walk correctly again which is connected with restoring of the muscle functionality and the capacity of the motion in the endoprosthesis joint. As an indicators about it are used: stride length, duration of the supporting phase, length of the gait cycle and its phases, speed, rhythm response of the footprint, etc. (The Timed Up And Go test). The implementation of full activation of the muscles is an ongoing process. The proprioception is improved by incorporating exercises in a closed kinematic chain from burdened position. The patients are taught towards everyday physical activity with the needed endurance and the adapting of the physiotherapy to the specific conditions and preferences. The functional recovery of the full independence of the patient in the everyday activities and the professional life after endoprosthesis onto the hip joint is the best way to test if the chosen physiotherapy was properly conducted.

A primary method in building of algorithm about the functional recovery after arthroplasty of the hip joint is the optimisation of the functional capacity and patient's education. The adequate physiotherapy is based on the instructions of the orthopedist and the functional diagnostics of the individual physical capacity is leading to improvement of the life quality of the patients after hip alloplastics. Individual instructions and recommendations are given about what kind of exercises should be implemented so the patients can recover and maintain their condition after the hip endoprosthesis.

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