COXARTHROSIS AS UNDERLYING DISEASE IN PATIENTS WITH PHYSIOTHERAPY AFTER ALLOPLASTICA OF THE HIP JOINT FRACTURE

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Abstract: Coxarthrosis is a chronic disease of the musculoskeletal system with characteristic changes, which start from the cartilages, and later affects the bones and the capsule-related ligaments apparatus of the joint. Its main clinical signs - pain, contractures of muscles, limits of the motion, limping are the cause for the building of individual algorithm for functional recovery compared to patients with alloplastica of the hip joint where there was no coxarthrosis as an underlying disease. The most frequent contractures in coxarthrosis are flexion, adductor and external rotator. The recovery of the joint function after the surgery depends in parts from the reasons for the damage. Arthroplasty is a final decision for debilitating diseases of the hip joint when medication fails. The most common cause of endoprosthesis is arthritic disease but there is a significant proportion of patients suffering from other congenital or acquired diseases. There is a considerable number of patients with joint destruction due to rheumatoid arthritis and rheumatic diseases, osteonecrosis, or neoplasia infection. Fracture of the joint is also one of the main indications for performing arthroplasty. The vast majority of operated patients achieved significant and sustainable improvement in the function of the affected joint.Patients with advanced arthrosis are a large burden on the health 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.Hip joint arthroplasty has two main goals: pain relief and improvement in the joint function. Today it is one of the most commonly performed orthopedic surgeries with over 1 million hip arthroplasty implanted worldwide annually. The methods of physiotherapy aim prevention of complications and restoration not only the volume of the movements of the hip, but the overall function of the lower limb and the acceleration of the return of the patient to independent living, as he/she had before the fracture. 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.Improving muscle imbalance is due to this algorithm physiotherapy. It in turn leads to good results in the subsequent phases of physiotherapy, which is important to reduce the time of the disability of the patient
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Coxarthrosis is a degenerative disease of the hip joint. Osteoarthritis (arthrosis deformans, osteoarthrosis) include degenerative –productive changes in the joints and it involves the premature wear and degeneration of the elements forming the joint. The hyaline cartilage that covers articular surfaces is a subject of degenerative abrasion and, as a result, bone surfaces of the joint begin to rub against each other. In the course of the disease, there are changes in the bone epiphyses and the inflammation of the synovial membrane of the capsule, which in turn causes the damage of the structures and functions of the joint. It also leads to the increase of pain symptoms, (because hyaline Cartilage does not contain nerves and the underlying bone do) reduction in every-day life activity and the significant deterioration of the quality of life.

The hip joint is particularly susceptible to this kind of degeneration. This is closely related to the lifestyle of modern man, especially in the developed countries, where, along with the progress of civilization, the natural physical activity decreases steadily. Osteoarthritis of the hip, also known as a degenerative –deforming disease of the hip joints (artrhosis deformans coxae) or, more commonly, coxarthrosis (coxarthrosis), may affect one or both hip joints. Its occurrence varies in different countries, for example, in Sweden it affects 2% of the population, while in Finland the number of incidences reaches 15%. . In Poland, around 8 million people suffers from the degenerative changes, the 40% of which involve the hip joints diseases. Coxarthrosis affects the vast majority of women (they constitute 2/3 of of the Europeans over 55 years of age diagnosed with coxarthrosis). The disease is also more common among physical workers. Etiologically two basic forms of changes can be distinguished that lead to coxarthrosis. The primary (or idiopathic) accounts for approximately 48% of all cases of this disease. This group includes patients in whose case, despite of conducting the precise medical documentation and performing clinical and radiological examination, the agent causing the disease cannot be clearly identified and its cause

remains unknown. The indirect factors that can affect the formation of osteoarthritis of the hip include the wrong lifestyle, the environment impact and the genetic predisposition. Studies have shown a correlation between the occurrence of coxarthrosis and a chromosome 16p , as well as the relationship between the 6 gene Co19A1 localized on chromosome and the occurrence of coxarthrosis of the hip joint among women. . This gene is associated with the abnormality of the cartilage structure. Secondary coxarthrosis, on the other hand , accounts for 52 % of all cases of the degenerative diseases of the hip joint. It is a result of congenital or acquired defects, such as , for example, the congenital hip dysplasia , hypoplasia of the acetabulum , congenital or acquired hip dislocation , coxa vara or coxa valga, Perthes disease , joint damage after the inflammatory, purulent, infectious, tuberculous or traumatic process, (for example, after a fracture of the femoral neck or trochanter of the femur , dislocation of the hip), hemophilia , underactive thyroid gland , diabetes , metabolic disorders or gout arthritis . The causes of secondary coxarthrosis are also related to the changes in blood supply of the head and neck of the femur, as well as the properties of the blood. In addition to the disturbances in the structure and mechanics of the joint, the risk of the occurrence of the degenerative changes in the hip joint is increased by the metabolic and hormonal disorders , smoking, unhealthy eating habits and obesity. Endocrinologic and metabolic disorders also define bigger correlation between coxarthrosis and females. This is connected with the influence of certain hormones, particularly estrogens, on the bone tissue metabolism in postmenopausal women . The correlation between obesity and the occurrence of the degenerative disease of the hip joint is also more frequently observed in women than in men. Obesity can have both a direct and indirect impact on the development of degenerative changes in the hip joints A direct impact is associated with an increased load to which the hip joints are exposed , which, in turn, can lead to the mechanical damage . Indirect effects of obesity on the degenerative disease of the hip joints are, on the other hand, connected with the adverse impacts of metabolic changes on the condition of the structures forming the joint (mainly the cartilage) . Due to the hypercholesterolemia which usually occurs with obesity, the composition of synovial fluid may be subject to change and may appear the disorders of the nutrition of the subchondral bone layer. Both the obesity and a significant overweight , as well as the occurrence of diabetes, have a considerable impact on the faster development of coxarthrosis.

The symptom most frequently reported by patients in clinical examination is pain, often mistakenly felt in the knee joint (Anatomy of the obturator nerve). In most cases a weakening and a numbness of the affected limb , as well as a sense of fatigue, are underestimated by the patient, and only in case of pain with different intensity and duration in the diseased hip he seek medical attention. In the initial stage of the disease, the pain sensation occurs only when the load is exerted on the limb, and it is located in the groin area, radiating to the knee joint or lumbar section of the spine. However, over time, the symptoms aggravate and start to occur during rest. The limitation of the mobility of the joint is observed. There is a flexion contracture of the hip. It leads to the functional shortening of the limbs, difficulty in movement, limp and performing daily activities. The patient is trying to avoid the movement of the limb affected by degenerative process, which may result in the atrophy of the thigh and buttock muscles (gluteal musculature) over time. Contractures are almost unavoidable component of the clinic of arthrosis in its late stage. Danielson has established flexion contracture in 75% of the cases, - inside rotary at 27%, adductor - at 22% and abductor - at 0.8 percent. The walk of the person affected by these contractures, determined by the symptoms of pain in the hip is difficult. Patient start to avoids physical burdening the parts affected by the degenerative process by performing rotary movements of the hip and violates his gait begins to limp (gentle gait). This kind of walk, however, leads to the formation of a valgus knee and the positioning of the lower leg in the external rotation. Even more difficult situation may occur in case of a person whose both hip joints are affected by degenerative process - due to the crossing of legs, a patient experiences even greater problems with his mobility. As a result of all this changes, , the support surface is reduced, as a result of which the kind of walk violates and preservation of equilibrium in space in locomotor act, which is a prerequisite for the falling and subsequent fracture. On each little doubt about degenerative changes in the hip joint, it is necessary to use X-radiation. A special attention is drawn to the form and structure of the acetabulum, the shape of the articular surfaces forming the joint, the degree of the bone density , the depth of the acetabulum, etc. The radiographic picture of the hip joint affected by degenerative process shows the narrowing of the joint space , the excessive density of the bone structure , the radiolucency called cysts which are opposite located on the femoral head and acetabular roof, acetabula edges of the boundary of the acetabulum; deformation of the femoral head is described as a "sponge - like" and observed shortening and extending femoral neck is taken as radiology sign to determine the extent of the disease (Rating Scale Kellgren-Lawrence). Compared to the degree of degenerative changes in arthrosis and the block syndrome, clinical studies show that they not associated mutually. On the other hand, significant progress of degenerative changes visible on X-ray are not always equivalent to the proportionate symptoms of pain. This depends mainly on the degree of inflammation of the articular capsule and inflammation of the synovial membrane. Coxarthrosis includes not only pathological

changes in the joint, visible radiographically, but also changes in its engine apparatus. [1] Muscular contractures are the reason about the construction of individual physiotherapy program after endoprosthesis of hip joint. When a patient traumatize his hip after a fall he get fracture of some bone elements.

Hip fracture is a common injury affecting older women with accompanying "diminution" of the bones (osteoporosis). About 8 in 10 people who fracture a hip are women. The average age is 80 years. A hip fracture can be intracapsular (fracture line is within the joint capsule) or extracapsular (fracture line is outside the joint capsule). The hip fracture can be displaced or non-displaced. Arthroplasty is a final decision about debilitating disease of the hip joint when medication fails. The most common cause of endoprosthesis is arthritic disease but the majority of patients also suffer from other congenital or acquired diseases. There are a significant number of patients with destruction of the joint, because of rheumatoid arthritis and rheumatic disease, osteonecrosis, neoplasia or infection. Fracture of the joint is also one of the main indications for arthroplasty's performance. Majority of operated patients achieve significant and sustainable improvement of function in the affected joint. The recovery rate of joint function after surgery depends in part on the reason for the damage. Patients with progression of severe osteoarthritis constitute a large burden for the health-care system of a individual country. The cost for medication, rehabilitation, physical therapy and hospitalization can be huge. Often in these costs are not calculated the reduced disability and absence from work. On the other hand, arthroplasty of the hip joint effectively relieves pain and improves the function and quality of life of patients with severe progression of arthrosis. Hip arthroplasty has two main goals: pain relief and improvement in joint function. Today it is one of the most commonly executed orthopedic surgeries with over 1million hip arthroplasty implanted worldwide annually. Methods of physical therapy are directed at prevention of complications and restoration not only at the volume of movements of the hip joint, but also at all the functions of the lower limp and a kind of acceleration that allows patient return to his/her independent life before the fracture.

Physiotherapy rehabilitation includes 4 main components, concerning patients after hip arthroplasty with accompanied arthrosis: therapeutic exercise, self-training, proper gait training and recommendations and instructions for carrying out activities of daily life. [2] The approach of physiotherapy in patients after hip joint endoprosthesis complies with degree of manifestation of coxarthrosis.It is important to have individual designed program for the physiotherapy. What works with one patient will not necessarily work with another and there is no matter that both suffer from muscle contractures of the hip. The construction of proper algorithm in patients after total hip arthroplasty is the individual approach in compliance with the instructions and contraindications of the treating orthopedist. Significance have data about age, etiology, used surgical access, the fixture, the accompanying medical disorders, etc. Perfect score after hip arthroplasty with endoprosthesis is eliminating pain and restoring normal range of motion in the affected hip joint [3] Which is essential in order to improve the patient's gait and smooth recovery of his quality of life. In rehabilitation programs in patients after total hip replacement endoprosthesis includes walking, which practically consists in restoring proper gait, rhythm, speed and fluidity of movement. Physical therapy techniques are aimed at relaxing the muscles with increased muscle tone and stimulate those with lowered. Recovery of muscle activity with wound motor function (early burdens and walking), and with the gradual inclusion of active exercises against free and manual resistance. It aims to overcome muscle imbalance, to recover possible constructional volume movement and and volume mastering of compensatory equilibrium improvement opportunities. The burden of surged low limb is individual. People need to respect current recommendations of the orthopedist. . Educating patients in the self-service and activities of everyday life have a priority - walking, sitting and standing, climbing up and down the stairs, dressing and undressing, entering and exiting the car, etc. Functional recovery of full independence of the patient's daily activities and professional life after endoprosthesis of the hip joint is the best test properly conducted physiotherapy. The improvement of muscular disbalance is due to this algorithm that includes physiotherapy. It in its turn leads to good results in the subsequent phases of physiotherapy, which is important to reduce the time of disability of the patient.

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