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IMPROVEMENT OF THE RADIATION DIAGNOSIS OF ASEPTIC NECROSIS OF THE FEMORAL HEAD IN PERSONS WITH POSTCOVID SYNDROME

Dilshodov A.A., Madumarova Z.Sh.
Medical radiology department
Andijan State Medical Institute
Andijan, Uzbekistan

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Abstract:

Osteonecrosis is a severe disabling disease that often develops in people of young working age (the average age is 33-45 years) and is associated with the death of bone cells in a certain area of bone tissue, usually provoked by a violation of local blood supply. IT most often develops in the head of the femur, the condyles of the femur and tibia are indicated in second place in terms of the frequency of lesion, the head of the humerus, talus, etc. It is customary to distinguish idiopathic (primary) and secondary IT. The latter is associated with specific causal factors and is more common than the primary one. Risk factors for the development of secondary ON of the femoral head are, for example, considered to be: traumatic damage to the hip joint, surgical interventions on it, hip dysplasia, immuno-inflammatory rheumatic diseases, various coagulopathies, hyperlipidemia, genetic abnormalities, chronic liver diseases, treatment with glucocorticoids (HA), radiation and polychemotherapy, alcohol abuse and a number of others.

Keywords: aseptic bone necrosis, osteonecrosis, coronavirus infection.

RELEVANCE. The hip joint in the structure of the incidence of osteoarthritis occupies a leading position in terms of the severity of dysfunction of the system of organs of support and movement (Lane N.E., 2007; Manaster V.J., 2010). Coxarthrosis leads to significant functional limitations, joint pain, which significantly reduces the ability to work, worsens the quality of life of patients, and also contributes to the rapid development of pathological changes in other joints (Drachevsky V.A. et al., 2000; Bierma-Zeinstra S.M. et al., 2007; Jacobsen S., 2006). According to the World Health Organization, osteoarthritis is diagnosed in 4% of the world's population, and in 10% of them it is the cause of disability. In the last five years, the incidence of the musculoskeletal system in Russia has increased from 10.9 to 16.9% (Khominets V.V. et al., 2014). At the same time, the incidence of coxarthrosis is about 9.5% of the total number of patients (Tikhilov P.M. et al., 2008; Bierma-Zeinstra S.M. et al., 2007). Untimely treatment of hip arthrosis in 25-30% of patients leads to persistent contractures, and in 10-12% it requires highly traumatic surgical treatment, hip replacement (Tikhilov P.M. et al., 2008; Altman R.D., 2005). In 30-80% of cases, the cause of arthrosis is the congenital inferiority of the elements of the hip joint (Machotka Z., 2009). In almost half of all cases, the cause of coxarthrosis remains unexplained. Early detection of pathomechanism factors for the development of degenerative and dystrophic changes in the joint, adequate and timely surgical restoration of disturbed relationships in the joint can significantly slow down the development of signs of arthrosis and maintain the patient's quality of life at a high level for longer (Akhtyamov I.F., 2008).

THE PURPOSE OF THE WORK. Improving the diagnosis of MRI and improving the effectiveness of early diagnosis in diseases of the groin joint.

MATERIALS AND METHODS OF RESEARCH. 198 patients with hip pain syndrome who underwent a stationary examination and were treated at the orthopedic-traumotology Hospital of the Andijan region were sorted out. Of these, 112 people were included in the main group (66 women; 58.9% and 46 men; 41.1%; average age: 50.1±11.1 years). Criteria for inclusion of patients in the main group: the presence of clinical signs of coxarthrosis; identification of pathological changes in bone, cartilage and soft tissue structures of the joint, characteristic of the course of coxarthrosis at various stages of the disease. The criteria for excluding patients from the main group were: traumatic joint changes; pathological conditions and diseases of the lumbar spine and pelvic joints;

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pathological conditions and diseases of the hip and pelvic region (damage to the thigh muscles, inguinal hernia, inflammatory diseases of the pelvic organs, etc.); systemic diseases associated with a high risk of developing aseptic necrosis of the femoral head; age over 65 years, due to the high proportion of age-related degenerative-dystrophic changes in joints in these patients. The control group consisted of 86 people (52 women; 60.5% and 34 men; 39.5%; the average age was 51.3±5.8 years). The criteria for selecting patients in the control group were: hip pain syndrome caused by various pathological conditions other than coxarthrosis. Radiation studies were conducted at the Department of Radiology and Radiology with the course of ultrasound diagnostics of the Military Medical Academy named after S.M. Kirov of the Ministry of Defense of the Russian Federation in the period from 2010 to 2014. All patients of the main and control groups (n=198) underwent MRI of the hip joints and lumbosacral spine. According to the doctor's prescription, 20 patients of the main group (17.9%) underwent CT, 47 people (42.0%) of the main group and 12 patients (14.0%) of the control group underwent radiography.

THE RESULTS OF THE STUDY. Patients with significant differences in the values of SDU (> 7°), Viberg angle (> 10°), AI (> 6°) on different limbs were evaluated separately. The smaller difference between these indicators was designated as symmetrical values. Joints with a combination of normal and "pathological" values of alpha angle, Sharp angle, femoral head extrusion index and acetabulum index were separately isolated. In the control group, only the difference in the values of the alpha angle was determined in 3 patients (3.5%). In the joints of the patients of the main group, asymmetric values of SDU were noted - in 17 patients (15.2%); Viberg angle - in 14 (12.5%); AI - in 10 (8.9%); alpha angle - in 19 (17.0%), Sharp angle - in 9 (8.0%), femoral head extrusion index - in 12 (10.7%); acetabulum index - in 11 patients (9.8%). In the control group, the asymmetric values of the alpha angle were determined in three people (3.5%). There were no differences in the values of the angles of the acetabulum version > 7° (asymmetric values) in the joints of patients of the main and control groups. When evaluating symmetrical values in patients in the main group, "borderline" and "pathological" SDU indicators were determined significantly more often than in the control group (p< 124°; alpha angle > 55°; combination of parameters - alpha angle > 55° and 11 small SDU values (< 128°). Such changes were detected in 61 joints (27.2%) of patients in the main group. In the control group, signs of such deformities were detected in 10 joints (5.8%). Valgus deformity of the hip (SD > 136°) or a tendency to it (SD 133°-135°) was determined in 74 joints (33.0%) of patients in the main group. In the control group, such deformity was found in 17 joints (9.9%). The increase in the depth of the acetabulum was characterized by an increase in the angle of vibration > 40°, negative values of AI. Such changes were visualized in 51 joints (22.8%) of patients in the main group and in 13 joints (7.6%) of the examined control group. A decrease in the depth of the acetabulum was characterized by a decrease in the Viberg angle < 20° and/or an increase in the Sharpe angle >45°, a decrease in the acetabulum index < 250, and an increase in the acetabular index > 11°. Such changes were noted in 54 joints (24.1%) of patients in the main group and only in 21 joints (12.2%) of the examined control group. Patients with significant differences in the values of SDU (> 7°), Viberg angle (> 10°), AI (> 6°) on different limbs were evaluated separately. The smaller difference between these indicators was designated as symmetrical values. Joints with a combination of normal and "pathological" values of alpha angle, Sharp angle, femoral head extrusion index and acetabulum index were separately isolated. In the control group, only the difference in the values of the alpha angle was determined in 3 patients (3.5%). In the joints of the patients of the main group, asymmetric values of SDU were noted in 17 patients (15.2%); Viberg angle - in 14 (12.5%); AI - in 10 (8.9%); alpha angle - in 19 (17.0%), Sharp angle - in 9 (8.0%), femoral head extrusion index - in 12 (10.7%); acetabulum index - in 11 patients (9.8%). In the control group, the asymmetric values of the alpha angle were determined in three people (3.5%). There were no differences in the values of the angles of the acetabulum version > 7° (asymmetric values) in the joints of patients of the main and control groups. Symmetrical "pathological" values of the alpha angle (55°-68°) were measured in 15 people (16.1%) of the main group of 93 with symmetrical angle values and in 8 (9.6%) of the 83 surveyed control group. In the main group, symmetrical "pathological" Sharpe angle values were determined in 12 joints out of 206 (5.8%); femoral head extrusion index - in 14 out of 200 (7.0%); acetabulum index - in 16 joints out of 202 (7.9%). No "pathological" values of these parameters were detected in patients of the control group.

CONCLUSION. As a result of scientific work, the possibilities of MRI in the diagnosis of hip joint pathology and assessment of its morphometric parameters were determined. The possibilities of MRI in a full assessment of all joint structures, prognosis of

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further development of pathological changes in it based on morphometry results were shown, which can be of great importance in planning the treatment of patients with hip pain syndrome. The optimal method of MR examination of the hip joint is justified in identifying various pathological changes in bone, cartilage and soft tissue structures in it, determining the disturbed relationships and features of the configuration of the hip and acetabulum. In order to improve the quality of MR imaging of hip joint structures, the main technical parameters and scanning frequencies were optimized, which varied depending on the detected pathology. The technique of MR morphometry of the hip joint has been developed and its use in routine MR examinations of the hip joint has been justified. The semiotics of damage to the bone and soft tissue structures of the hip joint in patients with coxarthrosis has been clarified and systematized. Patterns of combinations of signs of coxarthrosis have been revealed. Pathological changes in the articular cartilage of the femoral head and acetabulum were the earliest and most common sign of arthrosis. Based on the strong correlation between the severity of chondromalacia and the degree of coxarthrosis in general, it can be judged that chondromalacia may be a sign that determines the severity of osteoarthritis of the hip joint as a whole. Edema of the bone marrow and cyst-like restructuring of the supporting segment of the femoral head, marginal osteophytes are closely related to the degree of chondromalacia. Damage to the articular lip, its hypertrophy and paralabral cysts form a single set of signs, most often detected with pronounced pathological changes in the articular lip. The results of the scientific work carried out determined that MRI allows to identify and fully characterize the initial signs of degenerative-dystrophic changes in bone, cartilage and soft tissue structures of the joint, as well as to establish the configuration and structure of the femur and acetabulum, which determine the likelihood of further development of these changes. The predominance of "borderline" and "pathological" values of SDU, AI, angles of the acetabulum version, femoral head extrusion index, acetabulum index, Sharpe angle, alpha angle, femoroacetabular interval and ratio in joints with moderate (10-18 HOAMS points) and pronounced (19-27 HOAMS points) manifestations of coxarthrosis (p< 124°. The values of the acetabular index >11° were more often determined. The significant predominance of "pathological" and "borderline" values of the Viberg angle was determined only with "moderate" manifestations of coxarthrosis (p< 20°.

CONCLUSIONS 1. The results of magnetic resonance imaging make it possible to identify and fully characterize all the signs of coxarthrosis. The primary and main manifestation of coxarthrosis is chondromalacia, which develops in all patients. The lesion of articular cartilage is naturally and reliably closely interrelated (g=0.72-0.77; p<0.05). with edema of the bone marrow of the adjacent segment of the femoral head, marginal osteophytes, as well as with the severity of other signs of hip arthrosis (1=0.86; p<0.05).

2. The magnetic resonance imaging data make it possible to make all the necessary measurements of the morphometric parameters of the hip joint with high accuracy. The main pathological variants of the joint structure are valgus, varus deformities of the hip, deep and shallow acetabulum. Varus deformity of the hip, deep acetabulum, as well as their combination can cause the development of hip impingement syndrome.

3. In young patients with severe coxarthrosis, "borderline" and "pathological" values of certain morphometric parameters are significantly more common. The values of the cervical-diaphyseal angle greater than 133°, the acetabular index greater than 8°, and the alpha angle greater than 55° determine a higher probability of developing coxarthrosis in young patients.

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