The diagnostic importance of radiation diagnostic methods in determining the degree of expression of gonarthrosis
D.Zh. Yakubov, Sh.O. Gaybullaev
Samarkand state medical institute, Samarkand, Uzbekistan

Corresponding author: Doniyor Zh. Yakubov. kamina0606@gmail.com

Abstract.
According to the materials of the survey of 96 patients presented the result of a comparative analysis of radiography, sonography and magnetic resonance imaging in the detection of degrees of severity of deforming arthrosis of the knee joint. In a differential approach to the delineation of the severity of pathological changes of gonarthrosis deformans. The contribution of each of the methods used at various stages of development of the disease and its diagnostic importance in the recognition of the dominant manifestations of degenerative-dystrophic process in the stages of compensation, subcompensation and decompensation.

Keywords: diagnosis, radiography, ultrasonography, MRI, deforming osteoarthrosis, the knee joint


Deforming osteoarthritis (DOA), a chronic progressive degenerative-dystrophic disease, is classified as primary and secondary. In primary arthrosis, degenerative changes occur in an unchanged, healthy joint under the influence of functional overload. Secondary arthrosis appears in a joint that has been exposed to various pathogenic factors. Many etiological factors include: hereditary predisposition, structural diseases, arthritis and joint diseases, endocrine imbalance, overweight, as well as overload, mechanical damage, cartilage disorders age-related, physical activity at work associated with productive activity. And active professional sports. All of these factors interfere with microcirculation at the articular ends of the bones involved in the formation of joints, and as a result, lead to a lack of cartilage nutrition. It is established that impaired microcirculation in the affected area is characterized by the emergence of pathological vascular transformation, thrombosis and venous stasis, which ultimately leads to an active progressive development of dystrophy, resulting in bone loss. Beams become sparse and the affected areas are replaced later. Fibrous or chondroid tissue.

The total number of registered patients with lesions of the musculoskeletal system is more than 14 million, according to official statistics of Russia. Previously, it was thought that this pathology mainly affects the elderly, but unfortunately, the issue of prevention, diagnosis and treatment of the knee joint DOA has recently become a major cause of the development of this disease in adolescence. Gained importance and significance. At the same time, the incidence of youth, especially men, is on the rise. The prevalence of DOA has increased by 35% in recent years. Disappointing figures emphasize the medical and social importance of the issue under consideration.

In the DOA structure, a special place belongs to the beating of the lower leg joints, especially the knee, the main functional and bearing weight. Osteoarthritis of the knee joints attracts special attention because of the progressive course, the persistence of the pain syndrome, which significantly affects the motor activity of patients. Currently, there is no doubt that degenerative-dystrophic diseases of the musculoskeletal system are significantly detrimental to the diagnosis of this category of patients. Due to ongoing illness, impairment in active activity, disability, the quality of life of the patient himself, his family, and consequently, a significant population of society, changes altogether.

Often, in the early stages, joint lesions do not have sufficient characteristics of medical and radiological manifestations that can be used as diagnostic criteria. In many cases, the diagnosis of joint disease is also rapidly hindered by its unusual course, especially when multiple joints are affected.

Cartilage has long been thought to be incapable of regenerating and renewing itself, and changes in osteoarthritis are a result of aging and degeneration. However, many studies in recent years have shown that cartilage recovers in osteoarthritis.

An important role in diagnosing various knee joint diseases is to keep the X-ray procedure easy and inexpensive. In terms of radiography, several stages of DOA development (Kellgren J.H. and Lawrense J.S.) are distinguished from suspicious
to obvious changes.

For the initial evaluation of DOA, methods were developed and used that could be used to establish early changes in the pathological variability of articular cartilage. This includes arthroscopy, which makes it possible to visually assess the condition of cartilage and intraarticular structures and to identify early changes in cartilage in the radiological phase prior to the expression of DOA. Ultrasound examination (ultrasound) makes it possible to detect changes in articular cartilage in the early stages, subchondral plates of the conjugated articular surface, meniscus and synovial membrane. In recent years, the method of magnetic resonance imaging (MRI) has been widely used to make possible the diagnosis of DOA at the stage of development of pathological changes in the structure of the articular cartilage matrix, when it appears intact. Imagine damage to the meniscus and ligament apparatus of the knee joint.

The goal of this study was to determine the stages of knee joint DOA in people of different ages using radiographic, ultrasound, and MRI techniques.

A study was conducted on 96 patients aged 18 to 76 with knee DOA, including 69 males and 27 females. Of these, 4 adolescent patients (17–21 years), 14 first and 39 adolescents (21–60 years) of the same sex, 55 adults (56–74 years) and 2 older people (75–90 years).

All patients had different clinical manifestations of degenerative-dystrophic knee joint disease. Patients underwent two projection X-ray studies, ultrasound with a standard 7.5 MHz linear probe program, including dopplerography, as well as one or both pairs of knees with a particular orthopedic magnetic resonance tomograph (1.5 T). In GE mode T1, T2 and STIR.

The compensation part is the first demonstration of the DOA. During this period, as a rule, joint function is maintained, with occasional dull pain, usually after physical exertion, characteristic. A small, self-disappearing peptocyst and inflammation is possible, presenting itself as subcapsular bursitis, transient bursitis. At this stage, the synovial membrane is not more than 3 mm thick, without showing pathological vascularization, no joint deformity.

This stage of the disease is characterized by a slight decrease in the thickness of the intraarticular cartilage, indicated on a radiograph by a slight decrease in the height of the X-ray joint space and the development of subcortical osteosclerosis. Slight narrowing of the X-ray joint space from the lateral-6-8 mm, usually fixed only in comparative analysis in the opposite joint. The fire It should be noted that the initial and reliable sign on DAOK MRI of the knee joints is uneven thinning of hyaline cartilage at the articular surfaces. At the same time, degenerative changes in the menisci also occur.

These data are significantly related to the results of ultrasound, which include uneven thinning of cartilage antigometry, structural changes in the meniscus, the presence of varying degrees, frequent supraprartolar bursitis, sinusitis. On Doppler sonography, there is no pathological vascularization in the synovium. Treatment for gonarthrosis at this stage should begin as soon as possible.

The sub-compensation component of DOA is characterized by an increase in clinical symptoms. At this stage of the disease, the severity and duration of the pain syndrome increases. Patients complained of the appearance of a crunch in the knee joint during movement, difficulty trying to bend, especially severe. In general, there was mild or moderate restriction and there was slight deformity of the joint part in case its size increased. At this stage of the disease, dystrophic changes in cartilage on the radiograph are thought to be due to the initial reaction in the form of changes in adjacent bone structure due to decreased exhaustion characteristics, albeit a slight but uneven active overload.
significant reduction of the joint space along its entire length - twice as usual - up to 2–4 mm. Annoying Libran - always rational, easily offended, overly passionate and maybe overly intense. Superficial destruction of cartilage tissue occurs at the most active sites of load.

Ultrasound image of the lesion showed continuous bursitis and sinusitis, the synovial membrane was unevenly thickened to 4–8 mm, marginal osteophytes were clearly located, articular cartilage was unevenly thinned And mixed- mixed with moderate interest. In the area of the internal condyles, a formed cyst beaker was identified in 4 patients.

MR tomograms showed a decrease in joint space height, superficial destruction of articular cartilage, normal bone growth, degenerative changes in the ligament apparatus, secondary occipital synovitis, with areas of inflammation of the synovial membrane and bone marrow induction. Parts of the bone. These changes were found in II adult (9.7%), advanced (9.7%) and old age (5.1%).

In the stage of decompensation, the clinical manifestations of gonarthrosis reach a maximum. This stage is characterized by the appearance of severe pain not only during exercise but also during rest. Movement of the affected knee joint is extremely limited, gait is disturbed and severe foot malfunction is observed. Cartilage tissue was almost absent, which is why the radiograph revealed a more obvious narrowing of the joint space - less than 2.0 mm. The adjacent articular surfaces of the bones are sclerosed, deformed, flattened and enlarged due to bone growth of more than 2.0 mm. The degree of severity of osteosclerosis corresponds to the zone of most active load. Against the background of osteosclerosis, signs of secondary changes in bone structure in the form of cystic formations were found as one of the options for pathological, functional restructuring. In addition, independent bodies of medium and high density are determined in the joint cavity. According to the radiogrammatic results, the deformation of the articular surfaces was noticeable along with significant changes in the size of the tibia and femoral epiphyses, as well as changes in the radius of the posterior and posterior parts of the femoral condyles. As a measure of the height of the condyles and the posterior offset of the distal segment of the femur.

Ultrasound showed sharp and uneven stiffness of the joint space, deformation of the subchondral plate and thickening. Significant changes occurred in the intra-articular structure, as evidenced by Meneski’s sharp decrease in their fragmentation. In most patients, Doppler ultrasound revealed pathological vessels in the meniscus array. In the presence of subcapsular synovitis there is also marked degeneration of the ligamentous apparatus. Most patients have bursitis of varying severity. Baker’s cyst was detected in 39% of cases. With severe catastrophic change, conservative treatment is ineffective.

Based on the results of the study, it was found that to identify degenerative-dystrophic changes in the ligamentous apparatus of the articular cartilage, subchondral plate, meniscus and knee joint, characteristic of the early stages of DOA, it is highly recommended Is. Use the MRI technique as well as the ultrasound method as a screening method.

A comprehensive overview of the manifestations of degenerative changes in the knee joint allows you to dynamically enable the condition of all interested elements of the joint. In addition, it is possible to determine the severity and severity of the disease, assess functional disorders in the joint and discuss the possibility of predicting the further course of the disease and choosing the appropriate treatment strategy, including surgical intervention. This will undoubtedly help to prevent or significantly delay the development of a complex course of osteoarthritis and the presence of negative clinical manifestations.
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Информация об авторах:
Якубов Дониёр Жавланович — ассистент кафедры медицинской радиологии ФПДО Самаркандского государственного медицинского института, Самарканд, Узбекистан. E-mail: kamina0606@gmail.com; https://orcid.org/0000-0003-3680-0408.
Гайбуллаев Шерзод Обид угли — ординатор кафедры медицинской радиологии ФПДО Самаркандского государственного медицинского института, Самарканд, Узбекистан. E-mail: uzyordam@gmail.com; https://orcid.org/0000-0002-6253-2390

Information about the authors:
Yakubov Doniyor Zhavlanovich — Assistant at the department of medical radiology FPE, Samarkand state medical institute, Samarkand, Uzbekistan. E-mail: kamina0606@gmail.com; https://orcid.org/0000-0003-3680-0408.
Gaybullaev Sherzod Obid ulgi — Resident at the department of medical radiology FPE, Samarkand state medical institute, Samarkand, Uzbekistan. E-mail: uzyordam@gmail.com; https://orcid.org/0000-0002-6253-2390

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