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Early Dislocations after Hip Replacement in Patients with Dysplastic Coxarthrosis

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A B S T R A C T

To a greater extent, the articular cartilage of the patella and medial condyles of the knee joint is subject to degenerative changes. The affected areas were characterized by thinning of the articular cartilage or its complete absence, as well as the presence of osteophytes along the edges of the articular surfaces. Measurements of the relative length, width, and thickness of the menisci also confirmed the fact of their significant deformation and degeneration, mainly of the medial meniscus. The posterior part of the body and the posterior horn of the medial meniscus were most susceptible to cartilage destruction and were accompanied by erasure and disfoliation of the inner edge. Synovial membranes in deforming osteoarthritis were thickened, compacted and locally hyperemic, had papillary growths, which indicates the presence of synovitis and fluid accumulation not only in the joint cavity, but also in the synovial sacs, the size of which was significantly increased. Intra-articular ligaments-hyperemic, there were areas of splintering. Pterygoid folds are enlarged, locally hyperemic, with a vascular pattern, elongated processes are visualized along the edges. The revealed morphological changes in the progression of deforming osteoarthritis lead to trophic and metabolic disorders of all structures of the knee joint. The results of the study of auxiliary elements of the knee joint can be used as a reference in the diagnosis of deforming osteoarthritis.

A R T I C L E I N F O

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Introduction. The complex structure of the knee joint causes a wide variety of causes of pain in its diseases or traumatic injuries, which creates difficulties in differential diagnosis, and thereforein the choice of treatment tactics[1, 4, 5, 11, 15]. When diagnosing knee joint lesions, a number of difficulties arise, one of which is insufficient information about the structure of auxiliary elements in normal conditions and its morphological changes in the progression of deforming osteoarthritis [2, 6, 7, 10]. The knee joint has numerous auxiliary elements: patella, menisci, intra-articular ligaments, synovial bags, pterygoid folds [3]. A number of works are devoted to morphological studies of individual auxiliary elements of the knee joint [8, 9, 12, 14], however, a comprehensive study of them in deforming osteoarthritis was not carried out. The relevance of this study is due to the fact that degenerative changes in soft tissue structures in diseases of the knee joint are leading.

The shape, external structure, and morphometric characteristics of the patella, menisci, cruciate ligaments, synovial sacs, and pterygoid folds of the knee joint were studied. Measurements of auxiliary elements were carried out using a caliper and a millimeter ruler. The greatest length, width, and thickness of the patella was measured. The meniscus study included measuring their bodies and horns. The boundary of the base of each horn was a continuation of the tangent line of the inner edge of the meniscus. The width of the meniscus body was defined as the maximum distance between the inner and outer edges, and the greatest thickness-between the upper and lower surfaces in the middle of the body. The length of the horns was defined as the line connecting the top of the horn with the middle of its base. In addition, the width and thickness of the base of each horn in the middle part were measured. To measure the length of

the cruciate ligaments, the latter were cut off from the place of their fixation, the greatest thickness was measured in the middle third. Relative to the lower third of the femur, the greatest height and width of the synovial sac, as well as its contours, were estimated. Pterygoid folds were evaluated for their shape, presence of processes, and color.

Results and their discussion. In the study of intact knee joints, the patella had clear and even edges, the articular surface without signs of chondromalacia. In pathologically altered joints with deforming arthrosis, various deformities of the patellar margins, the presence of osteophytes along the edges of the articular surface, mainly in the apical region, as well as sharp local thinning of the articular cartilage in these places were revealed. The cartilage changed its pale gray color, becoming pink due to the translucency of bone vessels. These changes indicate significant chondromalacia and increasing signs of deforming osteoarthritis. The size of medial osteophytes was 3-4 mm, and the depth of deformity of the articular surface was 1.5-2 mm. Pronounced degenerative changes of articular cartilage in the medial part of the patella were observed in all studied knee joints with the presence of deforming osteoarthritis, which allows us to conclude that this trait is constant. It can be assumed that with deforming osteoarthritis, the tension of the quadriceps femoris muscle and the tension of the patellar ligament significantly increases, which leads to displacement of the patella and increases its friction. When assessing the articular surfaces of the femoral condyles in knee joints with signs of deforming osteoarthritis, extensive local thinning of the articular cartilage was also noted, and in some places its complete absence. The size of the affected areas reached 2-3 cm. In places of thinning of the cartilage, vessels are visualized, the affected articular surface becomes pink. These changes are mainly the medial condyle and patellar surface of the femur. In the area of the lateral condyle, the cartilage retained a pale gray color, but its thickness became uneven. Along the edges of the condylesocте, osteophytic growths are observed, reaching 3-6 mm in the medial condyle. Morphological assessment of the menisci of intact knee joints showed that they have clear, even contours and a uniform structure of articular cartilage. In most cases, the size of the posterior horns of the menisci exceeds the size of the anterior horns. Preparation of intact The knee joint is shown in Figure 2A. With deforming osteoarthritis, the width increases and the greatest thickness of the menisci decreases both in the body and in the horns. Moreover, the most dramatic changes occur in the final stage of deforming osteoarthritis, and to a greater extent affect the medial meniscus (table). In the posterior part of the body and in the posterior horn of the medial meniscus, in most cases, degenerative-necrotic changes are noted, accompanied by deformation and local destruction of the cartilage tissue. Splinters in its anterior and posterior parts, protrusions into the articular cavity, serration of the edges and atrophy (erasure) of the inner edge are determined (Fig. 2b). The structure of the lateral meniscus becomes heterogeneous, with the presence of small inclusions of a round or oval shape, the contours are uneven. Apparently, this is due to a pronounced chronic inflammatory process inside the joint, with subsequent sclerotic and degenerative changes and the appearance of connective tissue jumpers. The cruciate ligaments in the intact knee joint had smooth contours and a uniform structure. The average length of the anterior cruciate ligament was 48±5 mm, the thickness was 7.8±0.4 mm, and the posterior cruciate ligament was 40±4 and 7.3±0.4 mm, respectively. In stage II–III deforming osteoarthritis, which is manifested by narrowing of the joint gap, expansion of the peripheral parts of the joint cavity, thinning of hyaline cartilage and the presence of osteophytes, thickening and loosening of the cruciate ligaments were observed. The average length of the cruciate ligaments in stage III–IV deforming osteoarthritis decreased, while the thickness increased. Thus, the average length of the anterior cruciate ligament in deforming osteoarthritis was 40±5 mm, the thickness was 9.8±0.3 mm, and the posterior cruciate ligament was 39±4 and 9.2±0.4 mm, respectively. With the progression of deforming osteoarthritis, there was a dilution of the cruciate ligaments. Apparently, the revealed structural changes in the cruciate ligaments of the knee joint in deforming osteoarthritis are due to a violation of their trophic function, and consequently the strength of connective tissue fibers. The synovial membrane lining the cavity in the intact knee joint has a uniform pale pink color. Free fluid in the joint cavity is not detected. Synovial bags also do not contain free fluid, are well moistened, and have no extra pockets or bulges.

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