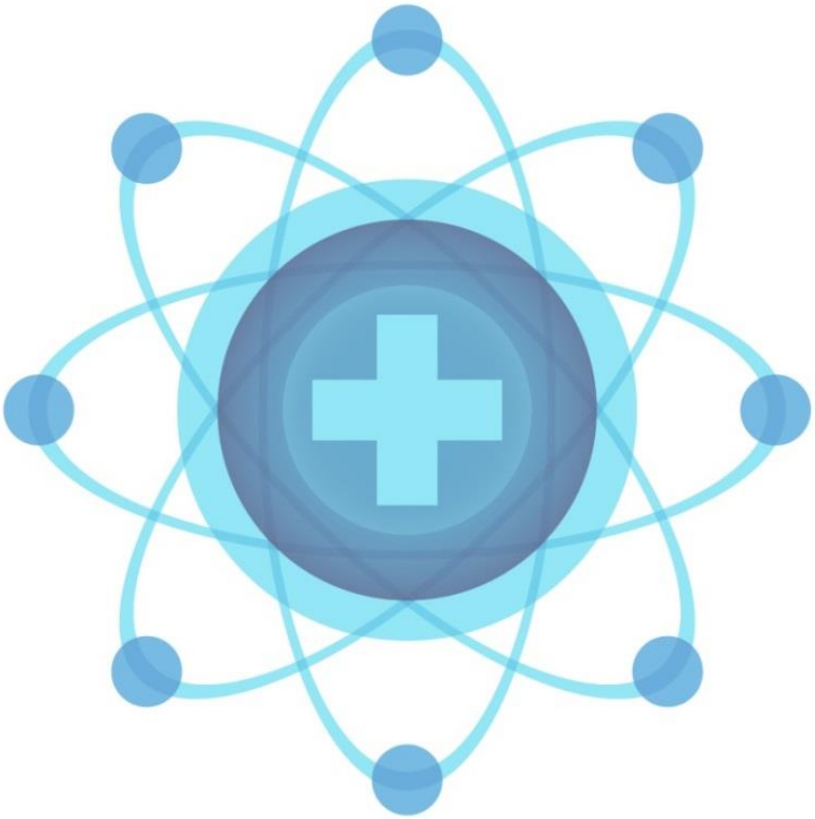

INTERNATIONAL MEDICAL SCIENTIFIC JOURNAL

ART OF MEDICINE

Volume-3
Issue-1

Founder and Publisher **North American Academic Publishing Platforms**
Internet address: http://artofmedicineimsj.us
E-mail: info@artofmedicineimsj.us
11931 Barlow Pl Philadelphia, PA 19116, USA +1 (929) 266-0862

Available at https://www.bookwire.com/
ISBN: 978-0-578-26510-0

MORPHOLOGICAL CHANGES IN THE ARTICULAR CAPSULE IN POSTTRAUMATIC COXARTHRITIS

Bekmetov R.A.
Babadzhanov G.B.
Urgench branch of the Tashkent Medical Academy

Abstract: In posttraumatic coxarthrosis, on the basis of morphological changes in the capsule of the hip joint, changes in the ligamentous apparatus of the joint are observed on the part of the components that make up the joint capsule. In particular, the morphological substrate due to post-traumatic coxarthrosis develops with destructive-dysregenerative changes in the ligaments of the thigh and a sharp accumulation of acid mucopolysaccharides between the fibers, tearing of the fibers, the development of reactive changes around the synovial pocket, and the development of pathological thickening foci.

As a result, the joint capsule does not swell, becomes sclerosed, and is clinically manifested by rotation of the thigh inward or outward.

Keywords: morphology, hip joint, chondromatosis, joint capsule, fibrinoid edema, sclerosis.

Relevance of the topic: coxarthrosis of the hip joint makes up 21.3% of total arthrosis. 11.2% of the world's population is infected with complicated coxarthrosis of various nosological types of hip joint. In particular, post-traumatic coxarthrosis of the hip joint develops mainly after 38-55 years of age. Most hip fractures develop after trauma to the hip joint, followed by osteoporosis and severe pain in the femoral head and neck. This disease is observed especially in developed countries, megapolis cities, in the stratum of the population with a sharp increase. The longer duration of the rehabilitation period after traumas of the hip joint, the more frequent occurrence of this nosological unit in the group of traumatized patients with high work capacity, prevents the completion of the treatment process, and ultimately ends with the development of coxarthrosis.

Purpose: the components of the femoral head and joint capsule were obtained in post-traumatic coxarthrosis. Development of an algorithm for evaluation and clinical morphological diagnosis based on morphological and morphometric characteristic changes of the elements that make up the hip joint.

Materials and methods: As a research object, the joint capsule and tendons resected during total endoprosthesis of 86 coxarthrosis were taken at the department of traumatology and orthopedics of the multidisciplinary medical association of Khorezm region. Morphological changes in the obtained capsule were analyzed.

Research results and their discussion: Due to the changes that develop in the joint capsule in post-injury coxarthrosis, it develops with changes in the biomechanics of movement, dystrophic and dysregenerative changes in the ligaments that make up the joint capsule, and the occurrence of pathological thickening foci in the intersecting areas of the joint ligaments.

The components of the joint capsule that make up the femur undergo various degrees of improvement after joint damage. For example, in writing or flexion

fractures of the femur joint, if bending type fractures are observed depending on the trajectory of the head of the femur located in the joint cavity, then there is damage to the ligaments that make up the composition of the joint capsule, the front side wall of the joint capsule, as a result, in these areas, the joint surface of the head of the femur is a hemispherical cavity. due to lateral friction, there are foci of dehyalinization on the surface of the joint and severe pain in terms of clinical morphology. It is in our research work that sharp erosion of the anterior-lateral medial branch of the femoral head is determined in cases of post-traumatic coxarthrosis of different degrees compared to age. It is determined that the changes leading to injuries on the surface of the joint are strongly manifested on the front surface of traumas at the age of 21-35 years. According to the observation of post-traumatic coxarthrosis at the age of 36-45, the development of sharp dehyalinization in the lateral and upper part of the femoral head and in the dynamics of the development of traumas in obese people at this age, the surfaces with sharp dehyalinization in the front and back of the femoral head are determined. It was determined that these changes depend on the human constitutional structure and the biomechanics of how injuries develop. If the femoral head is fractured in the writing type, the reverse of the above-mentioned injuries will develop.

It should be noted that in post-traumatic coxarthrosis of the femoral head, the damaged branch developed with different morphological changes depending on the duration. Through morphological studies, sharp erosion of the bone beams of the metaphysis, massive formation of resorption spaces in the epimetaphyseal branches of the femur is age-related, and it is determined that it is at its peak at the age of 55-71 years, and at the age of 21-47, the metaphyseal branches have a different beam appearance. In order to prepare histological micro-preparations, intraoperatively removed joint capsule and head of femur were fixed in 10% formalin for 72 hours. The fixed tissues were then rinsed in tap water for 1 h. Then, the soft tissues were passed through growing alcohol solutions in 70, 80, 90, 100% ethyl alcohol, dehydrated, degreased in chloroform, rinsed thoroughly through xylene, and blocks in the form of wax paraffin were prepared. The resulting paraffin blocks were cut at a thickness of 5-8 μm on a microtome and stained with hematoxylin eosin and Altian blue and Van Gison's histochemical methods. The obtained microsections were placed on glass slides and micrographs were taken under a microscope. Bone tissue was prepared in the same way, but additionally, after formalin solution, after rinsing in tap water for 1 hour, the bone tissue was left in a decalcifying solution for 72 hours in a thermostat at a temperature of 57 0 C. The softened [bone] tissue was then subjected to the above steps.

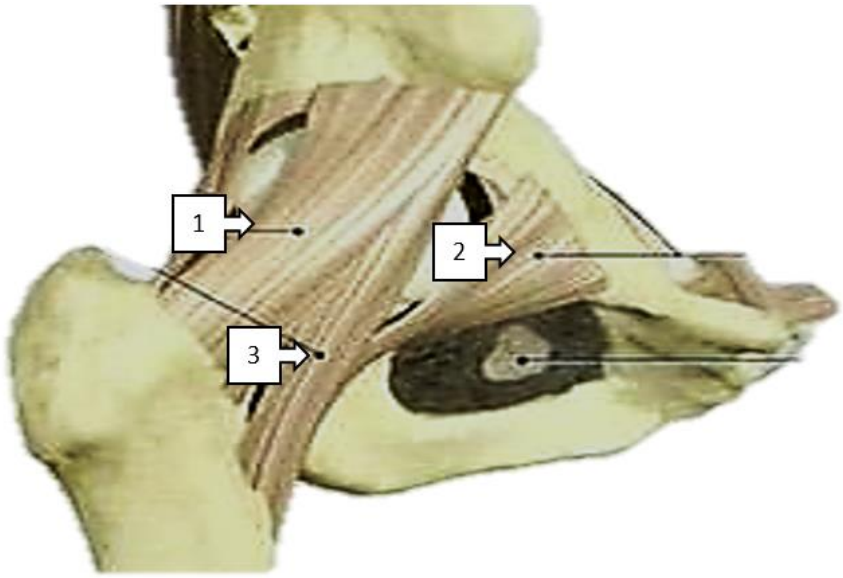

Figure 1. The anatomic structure of the hip joint is a general view of the ligaments that make up the joint capsule. (1st lig, iliofemorale. 2nd lig, pubofemorale, 3rd lig ischiofemorale).

These changes lead to an increase in the type 4 and 8 coarse collagen fibers in the hyaline layer, the disruption of the microhistioarchitectonics of the homogeneous structure of the hyaline layer, and the transition of the smooth-surfaced hyaline coating to a rough-fibrous surface (see Figures 2 and 3). As a result, between the layers of the hyaline layer, coarse collagen fibers disrupt the diffusion process of the hyaline layer and lead to the formation of various uneven surfaces.

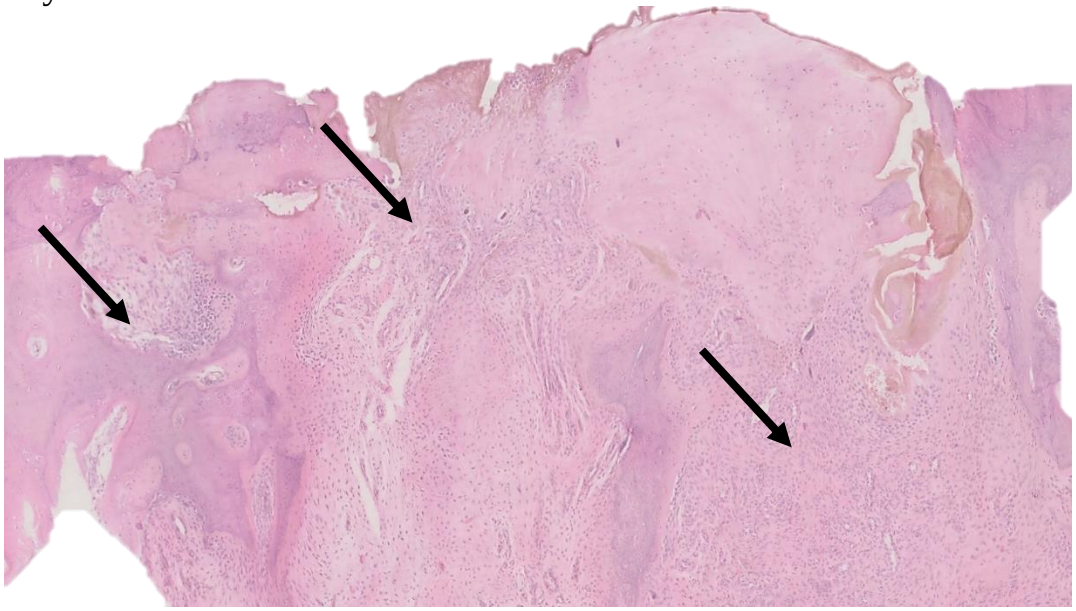

Figure 2. Posttraumatic coxarthrosis. Patient N is 39 years old. Isogenically located chondrocytes are of different sizes, atrophic and necrobiotically altered focal surfaces are identified. Paint G.E. The size is 10x10.

As a result, the thinned hyaline leads to an increase in the proliferative activity of fibroblasts in the connective tissue tract growing from the epiphyseal branch. This proliferative activity leads to rapid erosion of the hyaline cartilage lining and

compression of the spongy substance to the bony columns due to body weight bearing on this area and deformation of the joint surface (see Figures 4-5). In the microscopic view of the hyaline hyaline, the surface and thickness of the hyaline hyaline are different, the presence of granular and columnar curved surfaces on the surface of the joint is considered to be the proof of our above opinion (see pictures 6-7).

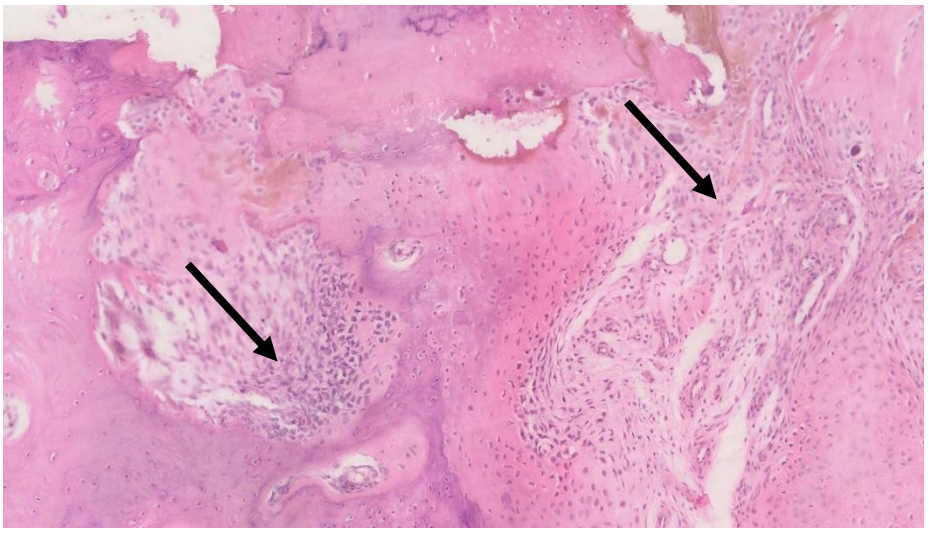

Figure 3. Posttraumatic coxarthrosis. Patient R is 62 years old. A small inflammatory infiltrate and foci covered with fibrous tissue are determined in the hyaline area. Paint G.E. The size is 10x10.

Post-traumatic coxarthrosis, disturbance of diffusion nutrition in the structures of the hyaline tendon, increase of glycosaminoglycans in the hyaline structure as a result of increased hypoxia increases fluid absorption into the hyaline tendon in these increased foci. As a result, focal mucoid swelling on fluid-soaked joint surfaces leads to fibrinoid swelling and a sharp disruption of the hyaline cartilage structure (This change is considered to be a clinical proof that the effective effect of intra-articular chondroprotectors does not always have a positive result) (see Fig. 5). As a result, reparative regeneration processes in the necrobiosis hyaline cover are completed in the form of incomplete replacement. Depending on the spread of the process, damage and the dynamics of the influencing factor, as a result of advanced osteoarthritis, the collection of fibroblasts that have proliferated in the perimeters of the joint gradually undergoes dystrophic calcinosis and ends with the formation of osteophytes along the perimeter of the joint. This change in turn can lead to limitation of movement in the joint and to ankylosis of the joint.

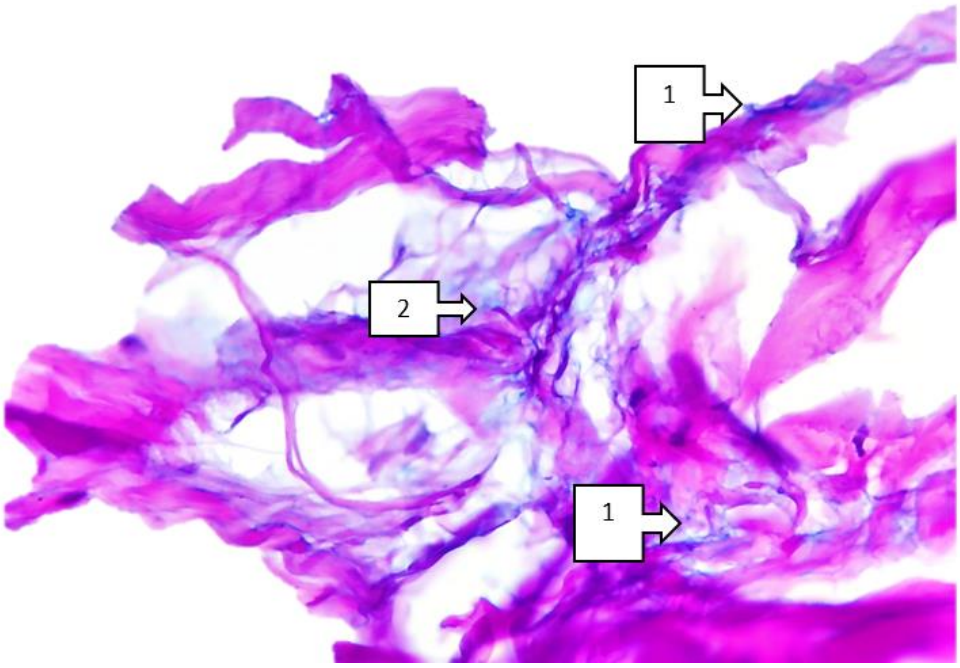

Figure 4. Posttraumatic coxarthrosis. Patient L is 49 years old. In the elements of the joint capsule, fibrous structures are detected on the joint surfaces, in which focally increased Schiff (8GX+) positive structures of acidic glycosaminoglycans are detected (1). Shades of isogenic chondrocytes are detected in the interstitial space of the fibrous tissue. (2). Paint Altsian blue. The size is 40x10.

The resorptive cystic enlargement of the femoral head, in turn, is characterized by the compression of the rounded femoral head and its semi-mushroom shape due to the weight of the body. These changes are mainly explained by the simultaneous development of joints, bones and ligaments as a result of post-traumatic injury. It is the resorptive erosion of the porous substance of the epiphyseal branch, which is diagnosed as osteoporosis, and leads to the formation of sclerosis and hyalinosis of rough ligaments in the perimeter of the deformed joint. This leads to a radical change in the biomechanics of the joint from a clinical morphological point of view.

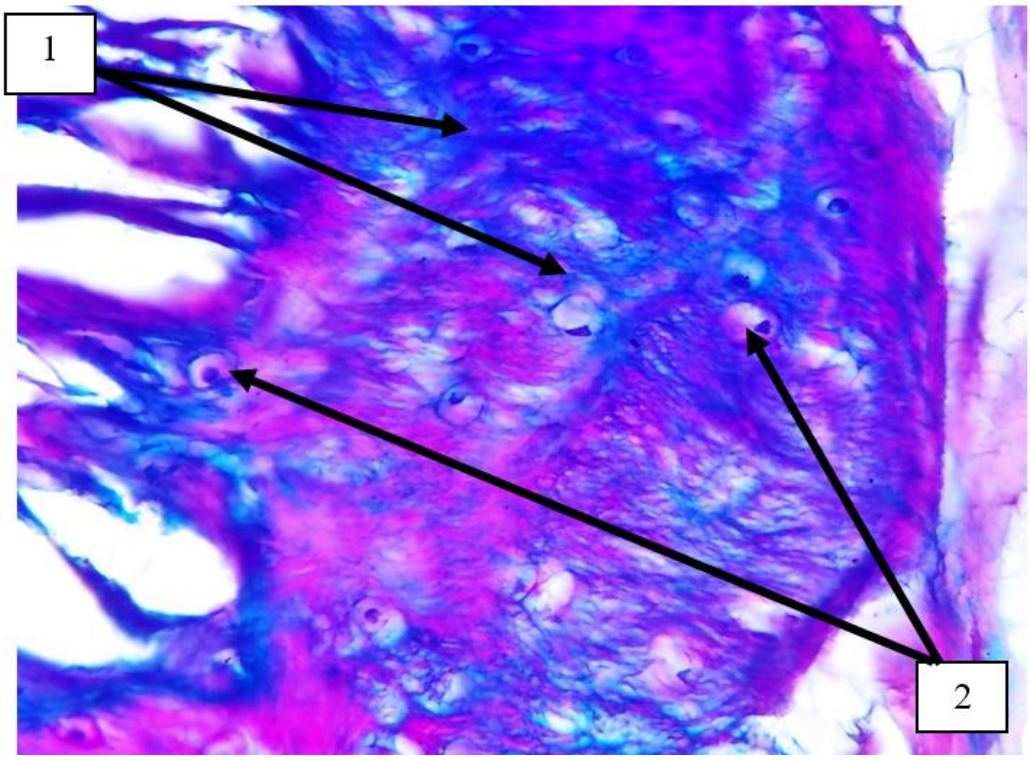

Figure 5. Posttraumatic coxarthrosis. Patient B is 57 years old. In the capsule of the joint, a lot of incompletely scarred components are identified, in which acidic mucopolysaccharides are accumulated (1). On the left is a relatively preserved hyaline tumor, on the right are foci of connective tissue, the surface of which is completely covered with fibrous tissue (2). Paint Altsian blue. The size is 40x10.

In post-traumatic coxarthrosis, which is accompanied by the formation of a lot of fibrous adhesion scars on the joint surfaces, unevenness of the joint surfaces, neoosteogenesis in the fibrous tissues (in the pathological type leads to dystrophic calcinosis), and in the process, reparative regeneration continues with the appearance of osteophytes.

As a result of a sharp decrease in the dynamic movements of the tendons of the joint capsule in the areas where osteophytes have formed, it continues with the appearance of foci of hyalinosis and calcinosis in the tendons. These changes can lead to limitation of movements and ankylosis of the hip joint from a clinical morphological point of view.

Conclusions

1. In posttraumatic coxarthrosis, the development of dehyalinization foci on the surface of the hyaline joint was found to develop differently depending on the age and type of trauma.

2. In post-traumatic coxarthrosis, the incomplete reparative regeneration on the surface of the hyaline bone continues in the form of substitution, and the development of coarse fibrous tissue on the joint surfaces is completed by the different formation depending on the age, type and duration of the injury from a clinical morphological point of view.

3. In post-traumatic coxarthrosis, osteoreparation on the surface of the joint takes place in the form of substitution and continues with the formation of ossificates on the surface of the joint and osteophytes on the perimeter of the joint.

Used literature

1. Swarup I, Sutherland R, Burket JC, Figgie MP. Total hip arthroplasty in young patients with post-traumatic arthritis of the hip. //Hip Int. 2017 Nov 21;27(6):546-550.
2. Frysz M, Faber BG, Ebsim R, Saunders FR, Lindner C, Gregory JS, Aspden RM, Harvey NC, Cootes T, Tobias JH. Machine Learning-Derived Acetabular Dysplasia and Cam Morphology Are Features of Severe Hip Osteoarthritis: Findings From UK Biobank. //J Bone Miner Res. 2022 Sep;37(9):1720-1732.
3. Faber BG, Ebsim R, Saunders FR, Frysz M, Lindner C, Gregory JS, Aspden RM, Harvey NC, Davey Smith G, Cootes T, Tobias JH. A novel semi-automated classifier of hip osteoarthritis on DXA images shows expected relationships with clinical outcomes in UK Biobank. //Rheumatology (Oxford). 2022 Aug 30;61(9):3586-3595.
4. Hanke MS, Steppacher SD, Zurmühle CA, Siebenrock KA, Tannast M. Hips With Protrusio Acetabuli Are at Increased Risk for Failure After Femoroacetabular Impingement Surgery: A 10-ear Followup. //Clin Orthop Relat Res. 2016 Oct;474(10):2168-80.
5. Herath SC, Holstein JH, Pizanis A, Pohlemann T. Azetabulumfrakturen: Komplikationen und Endoprothetik [Fractures of the acetabulum: complications and joint replacement]. //Z Orthop Unfall. 2014 Aug;152(4):399-413.
6. Söylemez MS, Kemah B, Poyanli O. Arthroscopy-Assisted Reduction and Fixation of Femoral Head and Acetabulum Fractures: A Systematic Review of the Literature. //Orthop Surg. 2022 Apr;14(4):652-662.
7. Manson TT. Open Reduction and Internal Fixation Plus Total Hip Arthroplasty for the Acute Treatment of Older Patients with Acetabular Fracture: Surgical Techniques. //Orthop Clin North Am. 2020 Jan;51(1):13-26.
8. Hashimoto S, Fujishiro T, Hayashi S, Kanzaki N, Nishiyama T, Kurosaka M. Clinical importance of impingement deformities for hip osteoarthritis progression in a Japanese population. //Int Orthop. 2014 Aug;38(8):1609-14.
9. Clohisy JC, Dobson MA, Robison JF, Warth LC, Zheng J, Liu SS, Yehyawi TM, Callaghan JJ. Radiographic structural abnormalities associated with premature, natural hip-joint failure. //J Bone Joint Surg Am. 2011 May;93 Suppl 2:3-9.
10. Raveendran R, Stiller JL, Alvarez C, Renner JB, Schwartz TA, Arden NK, Jordan JM, Nelson AE. Population-based prevalence of multiple radiographically-defined hip morphologies: the Johnston County Osteoarthritis Project. //Osteoarthritis Cartilage. 2018 Jan;26(1):54-61.
11. Nelson AE, Stiller JL, Shi XA, Leyland KM, Renner JB, Schwartz TA, Arden NK, Jordan JM. Measures of hip morphology are related to development of worsening radiographic hip osteoarthritis over 6 to 13 year follow-up: the Johnston County Osteoarthritis Project. //Osteoarthritis Cartilage. 2016 Mar;24(3):443-50.