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Clinical Morphological Changes in the Treatment of Deforming Osteoarthritis of the Knee Joint against the Background of Type 2 Diabetes

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Abstract: For many ears, according to the data, the problems of diagnosis and treatment of knee-deforming osteoarthritis (DOA) in the background of type 2 diabetes mellitus are one of the insufficiently studied and underdeveloped areas of modern orthopaedic science. remains In this case, the development of guidelines for treatment methods, the choice of treatment tactics and the selection of operative interventions for these patients are drastically different compared to the knee joint DOA without accompanying diseases, and the failure to carry out the treatment procedures correctly can not only lead to the occurrence of various complications, but also causes a sharp decline in human performance and early disability.

The purpose of the work: is to improve the results of treatment based on the clinical morphological approach to the treatment of DOA of the knee joint against the background of type 2 diabetes.

Keywords: Diabetes, deformity, osteoarthritis, morphology.

Relevance of research. The application of minimally invasive knee joint treatment, contemporary platelet-rich plasma (PRP) in the treatment of knee joint degenerative arthritis depending on the degree of the degenerative process, and intra-articular fluid replacement therapy Widespread adoption of the hip arthroscopy technique considerably expanded the knee joint's range of motion and raised the proportion of patients with this illness who had favorable outcomes. On the other hand, the opposite situation is seen when DOA of the knee joint occurs in conjunction with type 2 diabetes mellitus. This condition is attributed to a marked decline in blood circulation and metabolic processes within the knee joint, as well as a persistent rise in blood sugar levels. The specificity of the development of deforming osteoarthritis of the knee joint against the background of type 2 diabetes mellitus has not been fully clarified from the morphological point of view.

From this point of view, it is an urgent task to improve the results of treatment in DOA of the knee joint against the background of type 2 diabetes mellitus, to improve the treatment methods aimed at sharply reducing the rate of complications. Interpretation of the disease of the knee joint in patients with type 2 diabetes mellitus based on the findings of contemporary clinical instrumental examination methods of changes in the joint structure; knee joint disease associated with type 2 diabetes mellitus o substantiation of its specificity according to the findings of morphological examination; development of a diagnostic algorithm that explains the severity of the process in the disease of the knee joint on the background of type 2 diabetes mellitus; and development of guidelines for treatment methods; improvement of the minimally invasive operative treatment method in the ongoing disease of the knee joint on the basis of type 2

diabetes mellitus; evaluation of the treatment outcomes in the ongoing DOA of the knee joint against the backdrop of type 2 diabetes is an urgent problem.

Material and methods. In this scientific study, two main and comparative groups of 125 patients treated with a diagnosis of DOA of the knee joint against the backdrop of type 2 diabetes mellitus at the private clinic "STAR ORTHOMED" in the Bukhara region were examined based on the findings of their clinical and instrumental examinations. Based on their diagnostic units and treatment strategies, the 125 patients were split into three groups: 35 patients in the first comparison group had deforming osteoarthritis of the knee joint; these patients received conventional treatment; 40 patients in the second comparison group had deforming osteoarthritis of the knee joint with a history of diabetes; these patients also received conventional treatment; the remaining fifty patients were treated with the suggested approach after receiving a diagnosis of deformity osteoarthritis of the knee joint associated with diabetes.

Medical histories of treated patients, treatment plans, clinical research techniques, radiographic examination techniques (X-ray, magnetic resonance imaging), and laboratory test results were collected and used as research material for our scientific study.

This scientific study included 125 patients, broken down by age and gender. In this investigation, we employed clinical functional, goniometric, roentgenological, magnetic resonance tomography, morphological, and statistical evaluation approaches.

Result and Discussion.

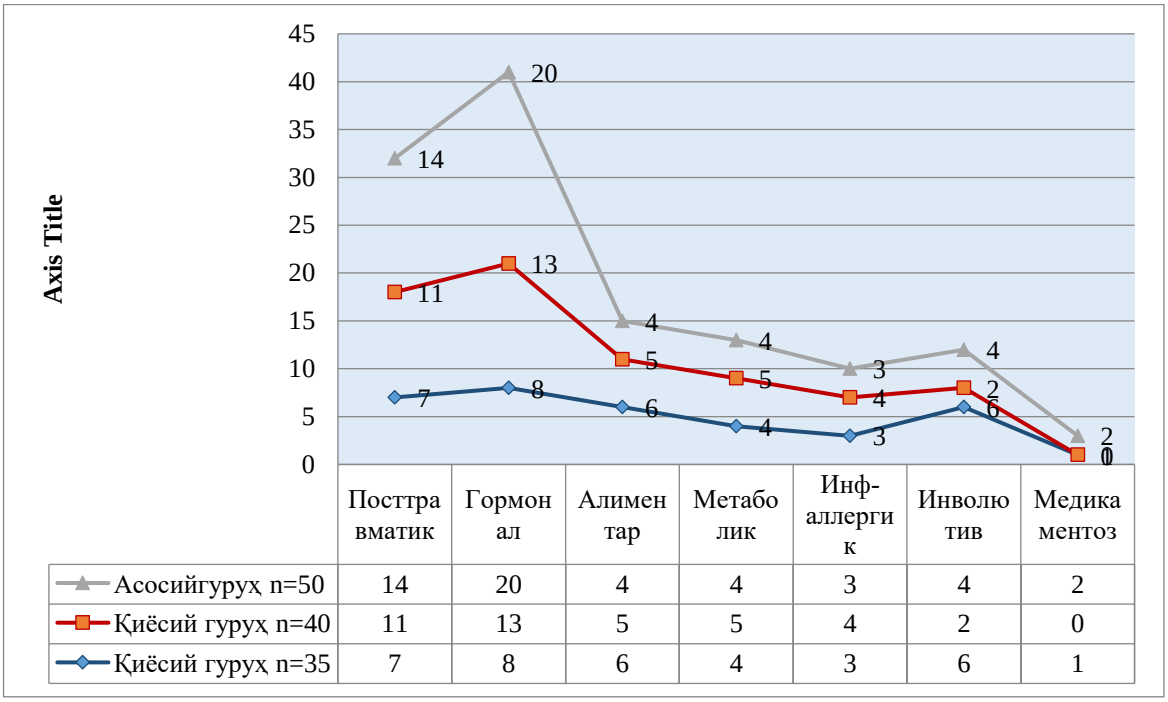
125 patients were involved in this scientific research work, they were divided by age and gender categories, the data are presented in the table.

Table 1. Distribution of patients by gender and age

Groups	**Age** / **Gender**	**35-44 years old**		**45-59 years old**		**60-80 years old**	
		Abs	%	abs	%	abs	%
Comparative group n= 35	Male n=11	2	1,6	6	4,8	3	2,4
	Female n=24	3	2,4	12	9,6	9	7,2
Comparative group n=40	Male n=12	3	2,4	5	4	4	3,2
	Female n= 28	4	3,2	14	11,2	10	8
Main group n= 50	Male n=17	2	1,6	10	8	5	4
	Female n=33	6	4,8	18	14,4	9	7,2
Total 125		20	16	65	52	40	32

Table 1's data indicates that 65 (52%) of the patients in the 45–59 age group and 60–80 age group had deforming osteoarthritis of the knee joint. Young patients accounted for 40 (32%) of the clinical cases. With 20 (16%) of the patients, the age group of 35–44 had the fewest patients.

Based on data analysis about patient distribution by gender, it can be observed that women are often more affected by this pathology than males, with a ratio of 2:1 to 3:1. The causes of deformity osteoarthritis in the knee joint are common to all individuals. was suggested based on the information shown in Diagram 1.



	Посттравматик	Гормонал	Алиментар	Метаболик	Инф-аллергик	Involutiv	Медикаментоз
Асосийгуруҳ n=50	14	20	4	4	3	4	2
Қиёсий гуруҳ n=40	11	13	5	5	4	2	0
Қиёсий гуруҳ n=35	7	8	6	4	3	6	1

Chart 1. Division of patients according to the etiological factors of the disease

The majority of patients with deforming osteoarthritis of the knee joint induced by hormonal reasons are 41 (32.8%), as determined in clinical condition, out of 125 patients with the condition. This breakdown of patients is based on etiological variables. Of the comparison groups, sixteen (16) were identified as belonging to the main group, and the first comparable group, which consisted of patients with deformity osteoarthritis of the knee joint and conventional treatment for type 2 diabetes, came in second. Second position went to the etiological factor of trauma, which was found in 32 (25.6%) instances. Etiological variables include involution, metabolic alterations, viral allergy factors, and diet took the second spot. Three (2.4%) individuals were identified as the minority with drug-related problems.

The 125 patients were categorized into severity levels based on the X-ray alterations of gonarthrosis described by Kellgren and Lawrence (1957):

1. "0" stage - no changes are detected;
2. 1 stage – there are suspicious X-ray signs;
3. 2 stage - a slight narrowing of the joint crack, minimal changes with a small number of osteophytes;
4. 3 stage - moderate level of changes - moderate narrowing of the joint crack, a large number of osteophytes;
5. 4 stage - advanced changes - large-sized osteophytes, joint crack is hardly noticeable;

Data on the distribution of patients according to the level of radiological severity is presented in diagram 2.1.2. Most of the patients have 2, 3 and 4 severity levels.

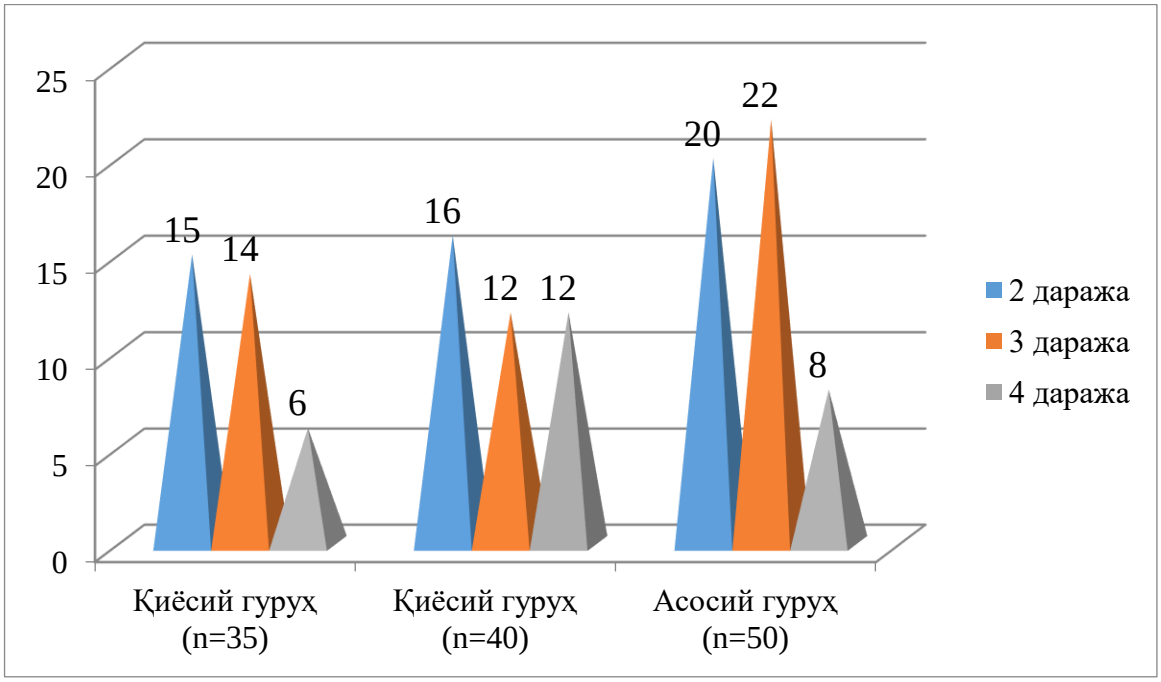


Chart 2. Division of patients according to radiological severity.

Based on the data shown in Chart 2, it was seen that patients with severity level 2 osteoarthritis of the knee joint had the highest rate (40.8 %) among the three comparison groups. This information was confirmed by in-person examination. In 26 (20.8%) clinical examples of patients with severity level 4, the lowest indicator was found.

In the primary group, which consists of patients with deformative osteoarthritis of the knee joint associated with type 2 diabetes, severity level 3 patients were found in 22 (17.6%) clinical cases, as well as in 14 (11, 11, 2%) and 12 (9.6%) individuals.

We can see the following morphological changes in deforming osteoarthritis of the knee joint against the background of type 2 diabetes.

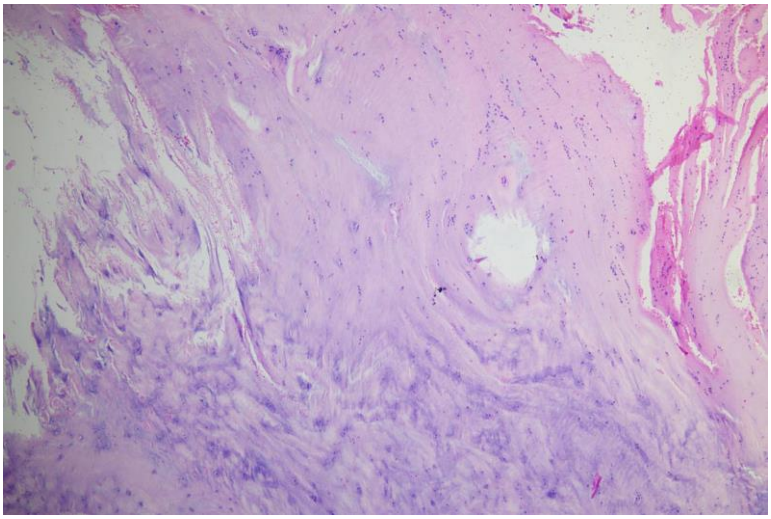


Figure 1. Fibrillar zone with apoptotic chondrocytes.

Hematoxylin-eosin staining.

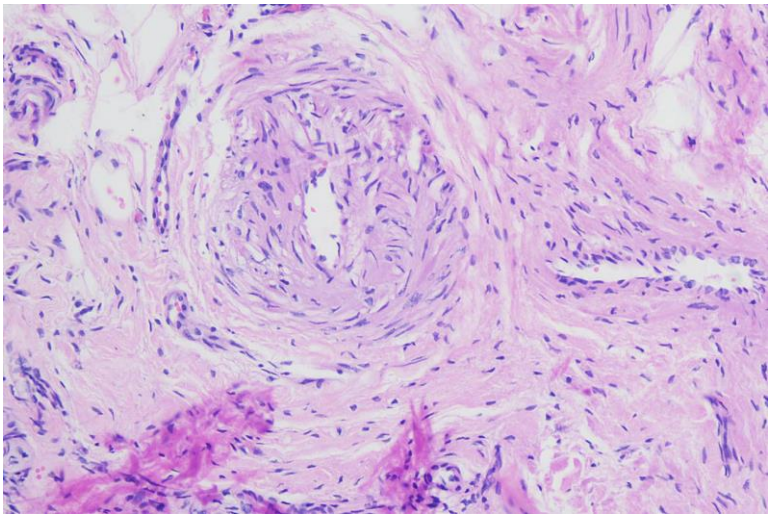


Figure 2. Thickening of the walls of blood vessels, edema and focal desquamation of endothelial cells are noted.

Hematoxylin-eosin staining.

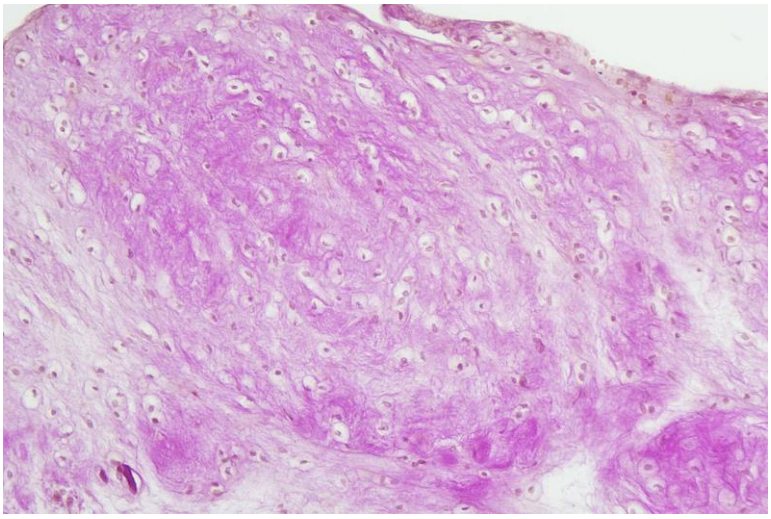


Figure 3. Hypertrophy and apoptosis processes in chondrocytes.

Painting in the Van-gizon method.

For the purpose of analyzing the results of the knee joint examination and choosing the best course of action for treating the degenerative-dystrophic process in the knee joint while determining the joint's varus curvature, an EHM software application was created. The primary objective of the devised algorithm is to facilitate treatment strategy selection based on the severity of knee joint deformity caused by osteoarthritis.

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