International Journal of
Health Systems and Medical Science

ISSN: 2833-7433
Volume 1 | No 5 | Nov-2022

Modern View in the Diagnosis and Treatment of Avascular Necrosis of the Femoral Head

Eranov N. F. [1], **Eranov Sh. N** [2], **Nuraliev A. M.** [3]

[1, 2,3] Samarkand State Medical University

Annotation: Avascular necrosis of the femoral head is a serious disease, the relevance of which has not been lost to this day. With early detection and adequate therapy, the prognosis is favorable, but late diagnosis and lack of treatment lead to rapid destruction of the joint and disability of the patient. The purpose of this study is to provide information on modern diagnostic possibilities and a differentiated approach to the choice of treatment method depending on the stage of osteonecrosis.

Keywords: avascular necrosis of the femoral head, osteonecrosis.

Introduction. Avascular necrosis is a severe disease characterized by disruption of the physiological regeneration of bone tissue and the death of bone cells in a particular area of bone tissue [1,2,4]. The most common localisation is the femoral head, which usually develops in 35-55 year olds and in 20% of people over 50 years of age [3,5,7]. Several classifications of avascular necrosis of the femoral head are currently in use. These are based on the early stages of the process and the post-impression late stages of the disease. The most commonly used classification is the Association Research Circulation Osseous (ARCO) classification (29).

The diagnosis of avascular necrosis of the femoral head in the early stages has its own difficulties. Some authors indicate early symptoms such as progressive atrophy of the thigh and gluteal muscles on the affected side (18, 22). The earliest symptom is limitation of rotational movements, especially internal rotation (80-85% of cases). This is followed by limitation of abduction and, lastly, reduction of flexion.

ARCO classification (1991)

Stages of the disease	Morphological changes
0 stage	no lesion focus detected
Stage I	no radiological changes, only MRI examination reveals lesion
Stage II	Initial signs of osteonecrosis without articular surface disruption are detected in femoral head on radiograph, MRI, radionuclide examination
stage III	subchondral fracture without sphericity disruption of the femoral head. The subchondral bone shows a "crescent sign"
Stage IV	impingement (flattening) of the femoral head
stage V	All of the above changes combined with a narrowing of the joint cavity (secondary necrosis).
stage VI	Total degenerative-dystrophic changes in the joint

According to ARCO International, the diagnosis of osteonecrosis is based on instrumental methods such as radiography and MRI [14, 26].

X-rays should be performed in all patients with joint pain to diagnose late-stage osteonecrosis and to detect bone fracture and associated osteoarthritis or osteoarthritis of the joint. In the absence of

radiological changes to the joint, an MRI scan with a magnetic field strength of at least 1.5 Tesla is recommended to detect osteonecrosis at an early stage. It is advisable to have an MRI scan 3 months after the initial treatment to evaluate the efficacy of the treatment and the management of the patient (13, 23). An angiographic study during radiological examination is recommended to assess the blood flow in the area of osteonecrosis when planning surgical treatment with bone grafts [12,17]. Whole-body bone scintigraphy is recommended for the differential diagnosis of osteonecrosis with cancer (10, 28).

Densitometry is recommended for patients over 50 years of age with secondary or idiopathic osteonecrosis. Systemic bone mineral density loss was observed in 60% of patients with traumatic osteonecrosis, 33% of patients treated with glucocorticoids, 27% of patients with idiopathic osteonecrosis, 11% of patients with alcohol abuse and 10% of patients treated with chemotherapy [6,8,9].Depending on the stage of the disease, conservative or surgical treatment of avascular necrosis of the femoral head is prescribed. Conservative treatment includes unloading of the adjacent joint in combination with the administration of NSAIDs, orthotropic therapy, vascular therapy, intra-articular injections and physiotherapy. Walking on crutches with joint unloading for at least three months is recommended. Joint unloading in the early stages of osteonecrosis is necessary to reduce the risk of impingement of the articular surface because walking then increases the load by a factor of 3.5, which can be critical for the patient in the acute phase of osteonecrosis in the presence of micro fractures in the subchondral area. Unloading for less than three months is insufficient, as the remodelling cycle of a particular bone area, even under favorable conditions, is 3 months [21].

The aim of drug therapy in the early stages of osteonecrosis is to reduce the intensity of bone resorption of the femoral head and stimulate osteoregeneration, which leads to an increase in bone mass, improving bone quality, increasing bone strength and preventing impingement deformity [7,8].

As basic therapy in osteonecrosis, the daily administration of calcium-containing preparations (500-1000 mg/day) in combination with colecalciferol is recommended from the first days after the disease and independent of its localisation [10, 11, 19]. Active metabolites of vitamin D3 and calcium preparations influence the proliferation of osteoblast precursors, activate bone formation processes and improve mineralisation of newly formed bone tissue. Improved intestinal calcium absorption contributes to an increase in skeletal mass and increases the mineral composition of bone, including its cortical component, which determines the strength properties of the femoral head [7, 9, and 20]. Among the etiological factors of osteonecrosis a role is played by pathology of the blood coagulation system, the use of anticoagulants in the treatment of the disease is suggested. Desaggregants are prescribed to improve microcirculation in the affected area. Depending on the stage of the disease, conservative or surgical treatment of avascular necrosis of the femoral head is prescribed. Conservative treatment includes unloading of the adjacent joint in combination with the administration of NSAIDs, osteotropic therapy, vascular therapy, intra-articular injections and physiotherapy. Walking on crutches with joint unloading for at least three months is recommended. Joint unloading in the early stages of osteonecrosis is necessary to reduce the risk of impingement of the articular surface because walking then increases the load by a factor of 3.5, which can be critical for the patient in the acute phase of osteonecrosis in the presence of microfractures in the subchondral area. Unloading for less than three months is insufficient, as the remodelling cycle of a particular bone area, even under favourable conditions, is 3 months [21].

The aim of drug therapy in the early stages of osteonecrosis is to reduce the intensity of bone resorption of the femoral head and stimulate osteoregeneration, which leads to an increase in bone mass, improving bone quality, increasing bone strength and preventing impingement deformity [7,8].

As basic therapy in osteonecrosis, the daily administration of calcium-containing preparations (500-1000 mg/day) in combination with colecalciferol is recommended from the first days after the disease and independent of its localisation [10, 11]. Active metabolites of vitamin D3 and calcium preparations influence the proliferation of osteoblast precursors, activate bone formation processes and improve mineralisation of newly formed bone tissue. Improved intestinal calcium absorption contributes to an increase in skeletal mass and increases the mineral composition of bone, including its cortical component, which determines the strength properties of the femoral head [7,9]. Among

the etiological factors of osteonecrosis a role is played by pathology of the blood coagulation system, the use of anticoagulants in the treatment of the disease is suggested. Desaggregants are prescribed to improve microcirculation in the affected area

Conclusion. Early diagnosis of osteonecrosis determines treatment tactics and prognosis. Small lesions (less than 15% of the femoral head) can be completely repaired with treatment. Lesions of more than 50% of the femoral head, with a high likelihood of progression to collapse, eventually require total joint endoprosthesis. However, in most cases the progression of the disease cannot be prevented, as the patient's lack of orthopaedic compliance, comorbidities and chronic diseases have a particular influence.

List of references:

1. Ильиных ЕВ, Барскова ВГ, Лидов ПИ, Насонов ЕЛ. Остеонекроз. Часть 1. Факторы риска и патогенез. Современная ревматология. 2013;1:17–24.
2. Каххаров А.С., Ибрагимов С.Ю., Напасов И.З., Муродов С.С., Пак В.В., Рахмонов У.Т. Отдаленные результатs оперативного лечения врожденного вывиха бедра Uzbek journal of case reports.2022;2(1):46-50
3. Каххаров, А. С., Гиясова, Н. К., Шавкатова, Ш. Ш., & Рахмонов, У. Т. (2022). Асептический Некроз Головки Бедренной Кости, Рекомендации Для Врачей. Central Asian Journal of Medical and Natural Science, 3(4), 268-277.
4. Мансуров, Д. Ш., Жураев, И. Г., & Мухсинов, К. М. (2022). Перелом Тилло у взрослых: клинический случай и обзор литературы. Uzbek journal of case reports, 2(1), 7-12.
5. Матвеев Р.П., Брагина С.В. Аваскулярный некроз головки бедренной кости (обзор литературы) // Экология человека. 2018. №3. С. 58-64
6. Мельниченко ГА, Белая ЖЕ, Рожинская ЛЯ, и др. Федеральные клинические рекомендации по диагностике, лечению и профилактике остеопороза. Проблемы эндокринологии. 2017;63(6):392–426.
7. Родионова С. С., Шумский А. А. Ранние стадии асептического некроза головки бедренной кости // Клинический протокол. М., 2013. 16 с.
8. Тиляков Хасан Азизович, Пардаев Саидкосим Норкулович, Эранов Нурали Файзиевич, Гафуров Фаррух Абуалиевич, Амонов Гайрат Турсунович Наш опыт оперативного лечения неспецифического спондилита и спондилодисцита // Вопросы науки и образования. 2019. №26 (75).
9. Ткаченко, А. Н., Корнеенков, А. А., Дорофеев, Ю. Л., Мансуров, Д. Ш., Хромов, А. А., Хайдаров, В. М., ... & Алиев, Б. Г. (2021). Оценка динамики качества жизни методами анализа выживаемости у пациентов, перенесших артропластику тазобедренного сустава. Гений ортопедии, 27(5), 527-531.
10. Торгашин А.Н., Родионова С.С., Шумский А.А., Макаров М.А., Торгашина А.В., Ахтямов И.Ф., Коваленко А.Н., Загородний Н.В., Миронов С.П. Лечение асептического некроза головки бедренной кости. Клинические рекомендации // Научно-практическая ревматология. 2020. №6. С. 637-645
11. Фармакологическая терапия ранних стадий асептического некроза головки бедренной кости: метод. рекомендации / ФГУ ЦИТО им. Н.Н. Приорова Росмедтехнологий; авт.-сост.: Миронов СП, Родионова СС, Шумский АА. М.; 2011:11 с.
12. Хайдаров, В. М., Ткаченко, А. Н., Вороков, А. А., Мансуров, Д. Ш., & Долгих, А. А. (2020). Особенности расчета затрат на проведение эндопротезирования крупных суставов при травмах и в случаях ортопедической патологии. In Медицинская помощь при травмах. Новое в организации и технологиях. Перспективы импортозамещения в России (pp. 239-240).

13. Эранов Н. Ф., Уралов Ш. М. Профилактика и раннее лечение плоскостопия у детей //Современная педиатрия: актуальные задачи и пути их решения. Ташкент. – 2015. – С. 309-310.

14. Эранов Шерзод Нуралиевич, Пардаев Саидкосим Норкулович, Жураев Илхом Гуломович, Шопулатов Искандар Бахтиярович, Холхужаев Фаррух Икрамович К вопросу хирургического лечения застарелого вывиха головки лучевой кости у детей // Вопросы науки и образования. 2019. №26 (75).

15. Ali SA, Christy JM, Griesser MJ, et al. Treatment of avascular necrosis of the femoral head utilising free vascularised fibular graft: a systematic review. Hip Int. 2014;24(1):5–13. DOI: 10.5301/ hipint.5000076

16. Calori GM, Mazza E, Colombo A, et al. Core decompression and biotechnologies in the treatment of avascular necrosis of the femoral head. EFORT Open Rev. 2017;2(2):41–50. DOI: 10.1302/2058-5241.2.150006

17. Chi Z, Wang S, Zhao D, et al. evaluating the blood supply of the femoral head during different stages of necrosis using digital subtraction angiography. Orthopedics. 2019;42(2):e210–e215. DOI: 10.3928/01477447-20190118-01

18. Eranov Sherzod Nuraliyevich, Eranov Nurali Fayziyevich Experience of surgical restoration of annular ligament with dislocations of radial bone head in children // Достижения науки и образования. 2020. №6 (60).

19. Ito H. Health-related quality of life in patients with systemic lupus erythematosus after medium to long-term follow-up of hip arthroplasty. Lupus. 2007, 16 (5), pp. 318-323

20. Kim YH, Oh SH, Kim JS, et al. Contemporary total hip arthroplasty with and without cement in patients with osteonecrosis of the femoral head. J Bone Joint Surg Am. 2003; 85(4):675–681. DOI: 10.2106/00004623-200304000-00014

21. Klumpp R, Trevisan C. Aseptic osteonecrosis of the hip in the adult: Current evidence on conservative treatment. Clin Cases Miner Bone Metab. 2015; 12(Suppl 1):39–42. DOI: 10.11138/ccmbm/2015.12.3s.039

22. Li C., Shen L., Yang Y. et al. Plasma ghrelin and von Willebrand Factor lev els in patients with non-traumatic osteonecrosis of the femoral head. Hip Int. 2014, 25, pp. 76-81.