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RADIODIAGNOSIS FOR ASEPTIC NECROSIS OF THE FEMORAL HEAD

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Abstract				

X-ray signs of the disease ANGB (aseptic necrosis of the head of the hip joint) have 5 stages. Under our supervision, there were 135 patients, including 10 patients in the first stage, 15 patients in the second stage, 30 patients in the third, 45 patients in the fourth stage and 35 patients of the fifth stage of the disease. In case of ANGBC disease, X-ray data is of great importance, based on these data, it is possible to determine the stages of the disease. X-ray data for the disease of ANGBC has 5 stages and coincides with the clinic. Based on x-ray data, we can identify degenerative-destructive changes in TBS in patients with ANHD and choose a treatment method.

Keywords: X-ray signs, ANGBC diseases, stages, degenerative-destructive changes, hip joint, aseptic necrosis of the femoral head, symptom of "eggshell".

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INTRODUCTION

Diagnosis of aseptic necrosis of the femoral head (ANGBC) in adults is an urgent problem today. Diseases develop dynamically, one stage passes to another and does not have strictly defined boundaries. [7] Patients have difficulty diagnosing because of the similarity of symptoms during the onset of the disease with other pathological conditions. [10].

Characteristic degenerative processes are observed in the area of the femoral head, which lead to the development of the disease and disability of the patient is observed [23]. Diseases occur in the youngest and most able-bodied age of 20-50 years [1] Studying the objective signs of the onset of the disease and the functional significance of the hip joint determines the appropriateness deep search and development of new methods of early diagnosis, as well as treatment methods appropriate to the stages of the disease [14].

Filed by Ermakov E.A. (2002) the use of modern diagnostic methods by duplex scanning of vessels of the TBS region in patients with ANGB disease, which makes it possible to predict the risk of developing aseptic necrosis in the heads of the femurs.

The author Aigner N. (2005) describes that computed tomography for the disease of ANGBD determines the localization of the affected areas of bone tissue with the highest efficiency with the establishment of the exact geometric position, size, damage or repositioning of the surrounding bone tissue.

Researcher Shorin I.S. (2018) characterizes that by magnetic resonance imaging, which allows to identify and localize changes in the so-called soft tissue structures of the TBS region and makes it possible to identify the arising pathological condition in the femoral head.

However, these studies do not provide complete information about the early and accurate localization of the lesion site, its shape and degree, and also do not allow to isolate and analyze all areas of bone tissue [2]. Radiographs should conduct three projections of TBS (hip joint) and characteristic of this study, you can identify the symptom of an "egg shell" on the axial projection of the joint in the initial stages of aseptic necrosis of the femoral head [25].

At the same time, there is the presence of expansion of the joint space, as well as a slight decrease in the height of the pineal gland in the anteroposterior x-ray and a characteristic area of enlightenment of the subchondral bone of the head of the right femur on the axial projection of TBS is observed - the correct diagnosis can be made based on the above.

METHODS AND MATERIALS

We studied x-ray data in 135 patients from the disease ANGBK from 2015 to 2020, located in the Republican Clinical Hospital No. 1 in the Department of Traumatology and in the BukhMI Department of Traumatology and Orthopedics. All of the patients underwent an X-ray examination before and after treatment of the hip joints in three projections (TBS).

Using X-ray studies, the stages of development of degenerativedestructive changes in the area of the femoral head were specified, and the anatomical structures of the hip joint were studied to determine the prevalence of the pathological process for changes in the shape of the pineal gland.

Of the observed patients: 10 patients were in the first stage, 15 patients in the second stage, 30 patients in the third, 45 patients in the fourth and 35 patients with the disease. The results of 10 patients in stage 1 of the disease ANGB - on x-rays (Fig. 1), moderate sclerosis (with a possible "border") was observed in the affected subchondral layer of the femoral head. At this stage, a weak signal is characteristic or there is no signal at all. It depends on the amount of bone damage. Radiological changes in this stage are practically absent, therefore this period is called latent and lasts no more than 10-12 weeks.

At this stage, radiological signs are minimal, slight osteoporosis and uneven compaction of the pineal gland are noted. Most patients have a uniform joint gap, cartilaginous structures are not changed and uneven compaction transforms into an unchanged structure, is noted in the area of necrosis of bone remodeling in the form of endo-steel bone formation.

Clinically there is slight pain and atrophy of muscles and subcutaneous fat, asymmetry of the position of the proximal departments of the femur in the form of an increase in neck anteversion on the affected side.

MRI studies show changes in the capsule of the hip joint by increasing the strength and volume of the light signal. hypointensive focus in T1 VI and hyperintensive in T2 VI, in the corresponding zone of bone tissue edema, and there is also a violation of the venous outflow of the proximal femur, deformation of the focus of necrosis and the formation of aseptic destruction.

Magnetic resonance imaging allows you to see the disease on the sign and serves to localize changes in the so-called soft tissue structures of the TBS region and makes it possible to identify a local change in the structure of bone tissue in the loaded upper lateral part of the femoral head. MRI makes it possible to identifypathological changes in the hip joint before the onset of visible radiological signs of the disease.



Figure 1. Radiograph of patients with 1 tbsp. Diseases

At this stage, on the roentgenogram, we observed a slight expansion of the joint space and a decrease in the height of the pineal gland, which appears due to a violation of enchondral ossification and noted osteoporosis around the joint, is clearly visible in the structure of the bones, their porosity and increased vertical striation were also determined.

For this stage, minor periarticular osteoporosis was characteristic and the femoral head was noted to retain its shape, and the bone structure was not changed. At this stage, there are areas of necrosis in the area of the spongy substance of the head and its bone marrow.

Lack of radiological signsdiseases does not exclude the presence of a pathological process and requires morea detailed study of this disease. Clinically already at this stage there are pains, restriction of movement in the joint, atrophy of muscles and subcutaneous fat. In the second stage, we observed 15 patients (..%).

These patients had a radiological characteristic: the head of the femur was densified, a seal around the pineal gland was also homogeneous, there was a thin strip of enlightenment and a decrease in the height of the pineal gland. Radiological expansion of the joint gap was noted, with a partial decrease in the height of the pineal gland. At this stage, there is a violation of osteogenesis, which is caused by perifocal resorption and secondary necrosis (Fig. 2).



Figure 2. X-ray of patients with 2 tbsp.

Of the upper lateral articular surface of the femoral head with bone marrow impression.At this stage, it is characterized by many microscopic impression fractures against the background of pathological changes in the (necrotic) bone tissue. Radiologically on this

At the stage, the femoral head is homogeneously darkened, its structural pattern is lost and the area of aseptic necrosis is determined, with the presence of signs of impression. When viewed from a macrodrug, the femoral head is typically wrinkled and has a "lunar surface". At the beginning of the disease, the cartilaginous layer is observed whole, without changes, without segmental defects. In the development of the disease observed as a result of local rupture of the articular cartilage is observed naked affected subchondral bone.

MRI examination can detect a necrotic defect in the upper (loaded) section and the area of aseptic destruction with deformation of the articular surface due to theimpression of the femoral head. At this radiological stage, there is a violation of osteosynthesis and there is an expansion of the joint space, a decrease in the height of the pineal gland is also noted.

Under our supervision, there were 30 (...%) patients with the third stage of the disease. X-ray studies at this stage were characterized by resorption of the necrotic area and the femoral head was noted to be reduced in height and with the presence of fragmentation, there was a continuous shadow, and it was also divided into sequestration-like and structureless areas of various configurations.



Figure 3. X-ray of patients with 3 tbsp.

We noted that aseptic necrosis of stage 3 at the beginning is marked by the femoral head of the necrosis zone with "demarcation", also sequestration and has the formation of a saddle deformity. Multiple foci of aseptic destruction of the femoral head with signs of impression of bone fragments, violation congruence of articular surfaces. Characteristic of this stage in MRI is the staged development of theprocess. It developed rapidly (within 12 months) and led to the completedestruction of both the heads of the femurs and joints as a whole. X-ray data at this stage, the epiphyseal cartilage is loosened, its relief is uneven, thickened due to the thickening of the articular cartilage, this is manifested by the expansion of the joint space.

With stage 4 c, under our observation of the disease, ANGB were 45 (...%) patients. . At this stage, a clear epiphyseal plate was observed, and the beam structure of the pineal gland was restored, and disappeared sequetiform bone fragments were also noted.



Figure 4. X-ray of patients with 4 tbsp.

In some patients, radiological cystic enlightenments with sclerotic rims were noted; restoration of the bone structure begins from the periphery, i.e. more uniform bone tissue appears in the area of the former necrosis. Then there is a decrease in the width of the joint space and an increase in the height of the pineal gland, and normalization of endosteal and enchondral bone formation is observed. In the area of the femoral head, the structural pattern is rough and the disordered direction of the trabeculae. At this stage, the impression of the outer-upper pole of the femoral head, rupture of the Shanton line and a reduced Wiberg angle are characteristic, and saddle deformation in the region of the head of the left femur is also noted.

In the fifth stage, 35 patients (..%) were under our supervision. These radiological patients were characterized by degenerative - dystrophic changes in the form of deforming arthrosis, repeated necrosis and cystic restructuring.



Figure 5. X-ray of patients with 5 tbsp.

We noted that aseptic necrosis of stage 5 at the beginning is marked by the bone structure of the femoral head on radiographs at this stage is traced, but its shape is extremely changed by the type of deforming arthrosis. At this stage, the edge of the acetabulum extends the contact zone and the socalled "saddle deformation" is formed.

The Viberg angle becomes negative and secondary arthrosis of the acetabulum is connected, marginal bone growths and dystrophic brushes are also noted. In the region, the contact zone of the elements of the joint increases, while the articular cavity does not cover the entire femoral head and the congruence of the articular surfaces is completely impaired and a subluxation of the femoral head was observed. MRI can supplement information on the state of a pair of articular tissues and the mutual orientation of the elements of the joint.

Thus, X-ray data are of great importance in the case of ANHD disease, the division at the stage is relative, since the process develops dynamically, one stage passes to another and does not have strictly defined boundaries. From a practical point of view, such a division is necessary. Based on these data, the stages of the disease can be determined. As indicated above, x-ray data has 5 stages.

Each stage characterizes the degree and depth of the pathological process, shows in which direction it is developing, i.e. makes it possible to predict, to some extent, the further development of the process. Based on x-ray signs, we can determine degenerative-destructive changes in TBS, which gives the orthopedist the opportunity to determine tactics and the choice of treatment method.

CONCLUSION

- 1. The X-ray signs of TBS in the case of ANHD disease have 5 stages and coincide with the clinic of the disease.
- 2. X-ray data enables the disease ANGBK to determine the degenerative-destructive changes in TBS with and the choice of treatment method.

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