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DIFFERENTIAL DIAGNOSTICS OF BENIGN CYSTIC FORMATIONS OF THE BONES OF THE UPPER AND LOWER LIMBS

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ABSTRACT

The article presents the clinical and radiological features of benign bone tumors and tumor-like conditions. The study was conducted on 51 patients with various benign cystic masses of the bones. Specific clinical and radiological signs of differential diagnosis of benign tumors and tumor-like bone diseases were determined for each of the pathologies.

KEYWORDS: Bone, Benign Tumors, Differential Diagnosis, Clinical Sings, X-Ray Sings.

INTRODUCTION

The problem of treating benign tumors and tumor-like diseases of the bones is highly relevant and insufficiently developed according to many authors.[3] The constant growth of bone tumors explains the high interest to the problem of treating neoplasms and attracts the attention of both domestic and foreign oncologists, onco-orthopedists and surgeons.[1] Tumors and tumor-like diseases of the bone tissue take the fourth place after cardiovascular diseases, diseases of the respiratory system and diabetes mellitus.[4] The bone is a multi-tissue structure, various histogenesis tumors can develop in it. Basically the bone is built from connective tissue. However, muscular, vascular, nervous, and also reticular and hematopoietic tissues are part of or closely associated with the bone. Tumors can arise from any component of the bone: periosteum, cortical or spongy substance, endosteum, hyaline germ and articular cartilage, bone marrow and blood vessels. Such an abundance of the original sources of tumor development causes a variety of clinical and radiological manifestations of pathological processes of different nature. (Lagunova, IG, 1962; Reinberg, SA, 1964; Trapeznikov, NN, et al., 1986; Krayevsky, NA.Ioavt., 1993).

Difficulties in differential diagnostics can arise at various stages of the diagnostic process — during clinical examination, radiation diagnostics, and morphological survey. The non-specificity of the clinical signs of skeletal tumors (pain, swelling and dysfunction of the limb), characteristic of many non-tumor lesions, lack of experience with doctors in non-oncological institutions in recognizing signs of pathological changes in the bone, and insufficient knowledge of the informativity of radiation diagnosis methods are often the causes of diagnostic errors at first stage of the survey and leads to untimely treatment of patients with tumor pathology in specialized institutions.[1,2,3,4,5,6] The variety of manifestations of primary bone tumors of long tubular bones, as well as the similarity of signs with those with tumor-like and non-tumor processes in some cases, leads to a late start of treatment or to the choice of an inadequate treatment method, which worsens the prognosis of the disease (Kochergina N.V., Lukyanchenko A. B., Zimina O. G., etc. Errors and difficulties in the diagnosis of primary malignant bone tumors // Medical imaging. 2000. No. 4. P.92-97).

The early and accurate diagnosis of bone diseases has recently become topical with respect to distinguishing between low malignant and highly malignant neoplastic processes, which affects the management of patients. Given the fragmented opinion of the authors, we analyzed the clinical and radiological manifestations of various cystic lesions of the bones of the extremities.

The aim of the study was to improve the methods of clinical and radiological diagnosis of limb bones.

MATERIALS AND METHODS

During the period 2014-2019, 51 patients with various benign cystic lesions of the limbs were examined on the basis of the orthopedics departments of the TMA and the RCH №1. The age of patients from 9 to 67 years. Of these, 16 are children under 20 years old. Women 26 and Men 25.

All patients were examined by clinical, radiological, (MRI and MSCT) methods.

For the clinical parameters, the patient's age was taken as a characteristic of pain, swelling, restriction of movement (impaired function).

X-ray characteristics were taken localization, the size of the lesion, the contours of the lesion, a violation of the cortical layer of the lesion, for the rest of the reaction, as well as the internal structure of the lesion.

We observed patients with cystic lesions of the upper and lower extremities: enchondromas -19, osteoid osteoma - 2, Brody abscess 1, bone cyst - 11 of them solitary cyst-10, aneurysmal bone cyst - 1, fibrous dysplasia, non-oxidizing fibroma (fibro-cortical defect) -7, glomus tumor - 11.

RESULTS AND DISCUSSIONS

Osteochondromas (exostosys) are the most common benign bone tumors with possible localization to any bone, but more often in the region of the epiphyses of the long bones. Most often they occur between the ages of 10 to 20 years, are both single and multiple. Visually, the patient has a visible deformation (swelling), depending on the size and location of exostosis. When growing between the two bones of the forearm or lower leg, it often breaks, disrupting their growth and structure. Which leads to saber deformity of the bone and limb. On the radiograph, exostosis is visualized in the form of a heterogeneous structure of the formation, on the peg protruding from the cortical layer of the bone, more often in the form of cauliflower.

Multiple exostoses connected to the bone with the pedicle or broad base, having a spongy structure, with the subsequent formation of calcareous inclusions. Secondary bone deformities, sometimes synostoses. Exostosis is presented in the form of a spongy tissue of a large-cell structure, its “leg” is covered with a cortical layer, which passes into the maternal layer. Calcification sites are sometimes found in the cartilage covering it. Often, exostosis has a “cap” on top consisting of dense mass.

When imaging, the tumor is detected as a bone protrusion with a cartilaginous cup (more than 2 cm) above the surface of the bone without the underlying cortical layer under the protrusion. The bone marrow channel communicates with the base of exostosis. The bone marrow canal and exostosis are connected to each other, and there is no underlying cortical layer at the base of the exostosis. Pain was generally observed if the tumor squeezed a large nerve, or muscle, and the formation of an inflammatory synovial sac.

Enchondromas were more commonly detected in people from 10 to 40 years old. Visually, when placed in long tubular bones, they were invisible. With localization in the area of the bones of the hand, the club-shaped thickening of the area of localization of the focus can be determined. They are usually located in the metaphyseal-diaphyseal region inside the medullary canal. These tumors are usually asymptomatic, but there have been cases of local pain with a painful load. Often they were X-ray findings. There were cases of pathological fracture. On the radiograph, the tumor looked like a cystic mass inside the medullary canal with a heterogeneous (speckled) internal structure. When located near the cortical layer, the enchondromas have scalloped edges. At an arrangement at the level of long tubular bones come to light as the calcified sites of a bone. In patients with multiple enchondromas (Oleer's disease) and especially with multiple enchondromatosis with soft tissue hemangiomas (Maffucci syndrome). determined by the visible deformation of the limbs. Accompanied with pain. On radiographs are usually characteristic changes in multiple bones, in severe cases with limb deformity and pathological fracture.

Osteoid osteoma most often occurs at a young age (usually from 10 to 35 years) is more common at the level of epimetaphysis of the bone, (neck of the femur) and diaphysis. Characterized by pain (usually aggravated by the night) stop when taking weak analgesics but only in the initial stages. Visually possible atrophy of regional muscles, due to a decrease in physical activity. On the radiograph reveal typical changes: a small area of enlightenment, surrounded by a wide sclerotic border. Often, a focus of destruction is revealed in the middle of the zone of enlightenment - sequestration.

Non-identifying fibroma (fibrous cortical defect) - often found in children. Non-deficient fibroma is a benign fibrous bone defect, which on the radiograph looks like a clearly delineated area of increased transparency, single elongated zones of enlightenment, with a clear sclerotic rim in the cortical layer. A very small (less than 2 cm in diameter) non-tissue fibroma is referred to as a fibrous cortical defect. They usually occur in the area of the metaphysis, especially often in the distal femur, in the distal and proximal tibial bones. They can also be multifocal. Often detected by chance.

Benign giant cell tumors of the bone usually occur in individuals between the ages of 20 and 30 and are located in the epiphyses. On radiographs appear as an expansive lytic lesion. When imaging at the border of the tumor and healthy trabecular bone substance, the edges without a sclerotic rim are determined. Simple bone cysts manifested clinically pain during exercise which, when at rest, did not manifest itself. Radiographically more often determined at the level of the metaphysis or metadiaphysis of the bone, characterized by clear contours of the cyst, the cortical layer thickens. A cellular structure forms in the nidus; a sclerosis and cellular structure area is formed between the epiphyseal pole of the cyst and the growth zone.

Aneurysmal bone cyst is characterized by pain in the area of lesions, with large size deformity and pathological fracture. Radiographically different cell

formation with a violation of the cortical layer is characterized by a lytic focus of destruction, swelling, thinning of the cortical layer, sometimes until its complete disappearance, germ as a zone is not affected. On computer tomography, it is characterized by a characteristic expansion at the lesion level, thinning of the cortical layer, but preserving it.

CONCLUSIONS

Recognizing bone tumors is considered one of the most difficult tasks in a bone pathology clinic. X-ray method facilitates this task. At the same time, radiography is the most common and accessible method of visualization of benign tumors and tumor-like bone diseases, and is available for a diagnosis or a stage of the process. sensitivity exceeds 80%.[1,2,3,4,5,6]

Computer tomography makes it possible to more accurately assess the degree of damage to the bone and surrounding tissues. Moreover, its sensitivity can be used to diagnose the early stages of osteoid osteoma. MRI scans the spread of the tumor inside the bone; sensitivity increases with enchondrom diagnostics. Thus, the diagnosis of tumors and tumor-like bone diseases requires an integrated approach and knowledge of both the orthopedologist and the radiologist. Nevertheless, the most important question: a benign or malignant tumor is solved by histomorphological examination.

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