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MORPHOMETRIC CHARACTERISTICS OF DISTAL LIQUID BONES OF CATTLE LEGS

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Abstract: Macro- and microanatomical parameters of tubular distal bones of cattle legs were studied. The linear dimensions and weights of the tubular bones located in the distal part of the leg skeleton were found to be higher in the hind leg than in the front leg. Also, it was noted that the epiphysis, compact material, articular cartilage, thickness of the meta-epiphyseal cartilage, and the height and width of the marrow cavity of the bones of the distal part of the feet are higher in the palm and foot-palm bones than in the I and II phalanx bones.
Keywords: cattle, distal, palmar bone, phalanges, linear size, absolute index, proximal, epiphysis, compact substance, articular cartilage, spongy substance, metaepiphyseal cartilage, marrow cavity.

Enter. The organism continuously interacts with the external environment at all stages of the period of personal development. It ensures homeostasis or adaptation to the influencing factors of the environment by directing the activity of the organism to these dynamically changing conditions of the external environment.

Morphofunctional changes that occur as a result of physiological processes in the body, like all systems, are reflected in the morphological state of bones. The bone system is not only a reserve of elements such as calcium and phosphorus, which are important in the process of metabolism, but also an immune factor that ensures the natural resistance of the body.

With the help of experimental experiments, it has been proven that the structural structure of the joints of tubular bones shows certain changes in different situations. In the experiments of the authors, when lead acetate poisoning was induced in pregnant laboratory animals, it was found that the destructive changes in the articular surfaces of tubular bones were especially strong in the middle layer rich in chondrocytes [2].

In the conducted scientific research, when laboratory animals are exposed to heat every day for 7 days, the process of absorption of bone tissue increases, and on the 5th day, osteoclastic properties of bone prevail over osteoblastic properties, cracks appear in bone tissue, and bone beams become brittle. found [3].

It has been found experimentally that the long tubular bones show changes in the adaptive properties according to the living conditions of animals with a normotonic autonomic nervous system. According to the authors, these morphological changes are observed with symptoms such as compression of the epiphyseal bone, expansion of the marrow space, loss of porous material in the osteogenesis zone, reduction of the total ash content of the bone, increase in sodium content, and decrease in potassium [1].

When animals in experimental experiments were exposed to moderate gravity, it was observed that the morphological indicators of long tubular bones improved, they grew in length, and the amount of macro- and microelements increased [6].

The authors have identified previously unclear individual development laws of humans and animals, and individual development consists of 3 stages, i.e., embryonic, postnatal, and mature periods. One of the laws they interpret is that at each stage of development, the chemical composition of cells, and morphological and physiological characteristics of tissues and organs differ from each other, and each stage has its biological rhythm [4].

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Materials and methods. Scientific investigation was carried out on the distal bones of legs taken from 3-year-old cattle raised in farms in Nurabad district of Samarkand region. Young, clinically healthy, and moderately obese female animals were selected for sampling.

General morphological methods used and introduced by N.P. Chirvinskiy was used in processing bones and determining their morphometric parameters. Research work was carried out at the Department of Animal Anatomy, Histology and Pathological Anatomy of the Samarkand State University of Veterinary Medicine, Animal Husbandry and Biotechnology.

All numerical data obtained as a result of scientific investigations were subjected to mathematical processing according to the method of E.K. Merkureva.

Reliability level - p (R) was found according to Student's table.

To determine the dynamics of bones depending on age, the growth coefficient was calculated. The growth coefficient was determined by dividing the length and weight of the bones of an adult animal by the corresponding indicators of the bones of a young animal, and the entire period of postnatal ontogenesis was determined by the formula developed by K.B. Svechin:

K – growth factor;

W is the absolute index of the bone of an adult animal;

V0 is the initial index of the bone.

Mathematical-statistical analysis was performed using Student's and Fisher's criteria in a Microsoft Excel computer spreadsheet.

Results and their analysis. The linear dimensions and weights of the tubular bones of the distal part of the front leg of the cattle are slightly different from those of the fathers. cm, weight is 198.2±0.16 g. The absolute length of the I phalanx of the front leg is 5.73±0.04 cm, width is 2.43±0.02 cm, thickness is 2.43±0.02 cm, weight is 32.13±0.28 g the absolute length of II phalanx bone is 3.36±0.02 cm, width is 2.16±0.02 cm, thickness is 2.46±0.02 cm, and weight is 22.66±0.11 g organization was noted.

It was observed that the linear dimensions and weights of the tubular bones of the distal part of the hind limb, as in the forelimb, have certain differences according to the location of the bones in the skeleton. The absolute length of the foot-palm bone is 29.66±0.14 cm, its width is 3.03±0.02 cm, its thickness is 3.43±0.05 cm, and its weight is 281.3±0.12 g. was recorded. The absolute length of the I phalanx of the hind leg is 6.16±0.02 cm, width is 2.53±0.02 cm, thickness is 2.46±0.02 cm, weight is 32.96±0.05 g, Also, the absolute length of II phalanges is 3.76±0.02 cm, width is 2.26±0.02 cm, thickness is 2.53±0.02 cm, weight is 27.06±0.21 g it was noted that

The absolute dimensions of the microanatomical structures of the tubular bones located in the distal part of the forefoot showed certain differences in the location of the bones in the foot skeleton.

The thickness of the epiphysis at the proximal end of the tubular bones of the distal part of the forelimb is different in the studied bones, it is 1.13±0.05 cm in the palmar bone, 0.63±0.02 cm in the I phalanx bone, and 0.56±0.02 in the II phalanx bone. cm was noted. The highest index of the thickness of the proximal epiphysis was observed in the palmar bone.

The distal epiphysis of the palm bone is slightly thicker than the proximal epiphysis, it is equal to 2.56±0.05 cm, and the thickness of the distal epiphysis of the I phalanx bone is 0.63±0.02 cm, the same as that of the proximal epiphysis, this index of the II phalanx bone is similar to that of the proximal epiphysis it was noted that it is lower than (0.43±0.02 cm).

The height of the bone marrow cavity has its size in each bone in proportion to the length of the bones, that is, it is 13.33±0.04 cm in the palmar bone, 2.36±0.02 cm in the I phalanx, and 1.33±0 in the II phalanx. It was 02 cm.

The width of the bone marrow cavity showed a different picture compared to its height. The width of the medullary cavity of the palm bone is equal to 0.56±0.04 cm, and this indicator is higher

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in the tubular bones below it, i.e. 1.36±0.02 cm in the I phalanx bone, 1.06±0.02 cm in the II phalanx bone. was observed to be equal to

The compact substance is one of the main components of the bone, and its thickness was found to be different in the dorsal and volar parts. The thickness of the dorsal compact substance is 0.73±0.02 cm in the palm bone, this indicator is equal to 0.33±0.06 cm in the I phalanx bone, and 0.43±0.02 cm in the II phalanx bone. The thickness of the volar compact substance was lower than that of the dorsal compact substance, it was 0.53±0.02 cm in the palmar bone, and 0.23±0.02 cm in the I and II phalanx bones, respectively.

It was found that the thickness of the articular cartilage has different dimensions at the proximal and distal ends of the bones. The thickness of the proximal articular cartilage is 0.032±0.001 cm in the palmar bone, 0.045±0.001 cm in the I phalanx bone, and 0.025±0.001 cm in the II phalanx bone, while the thickness of the distal articular cartilage is 0.04±0.0007 cm in the palmar bone, 0.034 in the I phalanx bone. ±0.001 cm, it was 0.02±0.0007 cm in II phalanx bone.

The thickness of the porous substance of the bones showed different indicators in the studied tubular bones, it was 0.96±0.02 cm in the proximal part of the palmar bone, 0.3±0.03 cm in the I phalanx bone, and 0.36±0.02 cm in the II phalanx bone. equal to It was noted that the absolute thickness of the distal porous substance was 0.023±0.007 cm in the palm bone, 0.73±0.02 cm in the I phalanx bone, and it completely disappeared in the II phalanx bone.

The meta epiphysis is present only in the distal part of the palmar bone and in the proximal part of the I and II phalanges. It was determined that the thickness of the distal meta epiphyseal bone of the palm is 0.042±0.0007 cm, the thickness of the proximal meta epiphyseal bone of the I phalanx is 0.034±0.0009 cm, and that of the II phalanx is 0.021±0.002 cm.

In cattle, tubular bones of the distal part of the hind leg have different thicknesses depending on the anatomical topography of the proximal and distal epiphyseal bones. The absolute thickness of the proximal epiphysis of the foot-palm bone was 0.86±0.02 cm, and this indicator was 0.76±0.05 cm in the I phalanx bone and 0.66±0.04 cm in the II phalanx bone.

The thickness of the distal epiphysis of the foot-palm bone differs sharply from the size of the proximal epiphysis, it is equal to 2.63±0.02 cm. The thickness of the distal epiphysis of the I phalanx was 0.63±0.02 cm, and that of the II phalanx was equal to 0.66±0.02 cm.

It was noted that the absolute size of the height of the bone marrow cavity is 18.13±0.05 cm in the foot-palm bone, 2.4±0.08 cm in the I phalanx bone, and 1.23±0.04 cm in the II phalanx bone. The absolute index of the width of the bone marrow cavity is 0.76±0.02 cm in the metatarsal bone, 1.1±0.05 cm in the I phalanx bone, and 1.13±0.04 cm in the II phalanx bone, similar to that of the palmar bone of the front leg. it was observed that it was less in the metatarsal bone compared to that of the finger bones.

The thickness of the compact substance of the foot-palm bone is different in different parts of the bone, the absolute thickness of the dorsal compact substance is 1.06±0.02 cm, and the thickness of the volar compact substance is 0.76±0.02 cm. The thickness of the dorsal compact substance of the I phalanx bone of the hind leg was 0.43±0.02 cm, and the thickness of the volar compact substance was 0.3±0.03 cm. It was determined that the dimensions of the compact substance of the II phalanx are similar to those of the bones located above, the thickness of the dorsal compact substance is 0.53±0.02 cm, and the thickness of the volar compact substance is equal to 0.23±0.05 cm.

It was observed that the absolute thickness of the proximal articular cartilage decreases in the direction of the distal section, that is, this indicator is 0.038±0.0008 cm in the foot-palm bone, 0.023±0.0008 cm in the I phalanx bone, and 0.02±0.0008 cm in the II phalanx bone. did

It was found that the spongy material of the tubular bones of the distal part of the hind limb differs sharply according to the location of the bones. That is, the proximal pore of the foot palm bone has completely disappeared, and it was noted that its thickness is 0.43±0.02 cm in the I phalanx

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bone and 0.33±0.02 cm in the II phalanx bone. The distal spongy substance was preserved only in the metatarsal bone, its thickness is 1.16±0.02 cm, and it was found to have disappeared in the I and II phalanx bones.

The distal and proximal metaepiphyseal bones were slightly thicker in the metatarsal bone, and its absolute size was 0.028±0.001 cm, this index was equal to 0.015±0.001 cm in the I phalanx bone, and 0.016±0.0007 cm in the II phalanx bone.

Summary:

- it was noted that the linear sizes and weights of the tubular bones located in the distal part of the cattle leg skeleton are higher in the rear leg than in the front leg;

- it was noted that the epiphysis, compact material, articular cartilage, porous material, the thickness of meta epiphyseal cartilage, the height and width of the marrow cavity of the bones of the distal part of the feet are higher in the palm and foot-palm bones than in the bones of the I and II phalanges.

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