

**MORPHOMETRIC CHARACTERISTICS OF HORSE'S LEGS DISTAL NAYSIMON
BONES**

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Abstract: The macro- and microanatomical parameters of the tubular distal bones of horses' 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 metaepiphyseal 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 I and II phalanx bones.

Key words: Horses, distal, palmar bone, phalanges, linear size, absolute index, proximal, epiphysis, compact substance, articular cartilage, spongy substance, metaepiphyseal cartilage, medullary 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.

Bone tissue is unusually variable and very sensitive to any physiological or pathological changes in the body. For many years, bone was considered to be an inert system whose main function is to provide mechanical strength only. Bone tissue is one of the organs with the possibility of rapid reconstruction, easy functional adaptation, rapid regeneration. It can be noted that the bone is the organ in the body that completely regenerates after the blood, even in the last state of fracture or erosion.

The historical development of the leg bones is studied by the example of the evolution of horses. The ancestor of horses - fenakod - was 30 cm tall, had five toes, but only the middle three were well developed, and he relied on them. The middle finger was strong and hoofed. Phenacodes lived in a humid climate in North America, then as the weather got warmer, the grass dried up and they went to far places in search of food, ran, so as a result, the bones of the legs became complex and well developed, the third toe developed quickly, and the remaining fingers were reduced. Along with the feet, the body of the phenacodes also developed and reached the level of modern horses [3].

Some authors claim that the skeleton is not only the primary system that determines the physical appearance of the animal body, but also carries out vital processes for the organism - movement, blood production, metabolism. Structural changes occurring in the bone system depend on the nature of the physical load [4].

The structural laws of the locomotor apparatus have been studied in different ways, and it is emphasized that when evaluating it, it is necessary to take into account the interrelationship with other systems in the body [1].

In order to determine changes in the morphometric parameters of tubular bones depending on the period, it was observed that the internal structures and strength of these bones of people of different ages differ from each other, that is, in modern people, the compact substance in the wall of the bone diaphysis decreases, the marrow cavity increases, the level of mineralization and

strength decreases [2]. The author explains that this is the result of adaptive reconstruction in the bone system in relation to physical activity, nutrition, lifestyle and environmental conditions.

Materials and methods. Scientific investigation was carried out on the distal bones of the legs taken from 3-year-old horses kept in farms of 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 were 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 factor 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 examined 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 Microsoft Excel computer spreadsheet.

Results and their analysis. The linear dimensions and weight of the tubular bones of the distal part of the front leg of horses are slightly different from those of cattle, the absolute index of the length of the palmar bone is 24.23 ± 0.05 cm, its width is 3.5 ± 0.03 cm, and its thickness is 2.53 ± 0.05 cm, weight is 320.2 ± 0.12 g. The absolute length of the I phalanx bone of the front leg is 8.56 ± 0.07 cm, width is 3.53 ± 0.05 cm, thickness is 2.33 ± 0.02 cm, weight is 98.2 ± 0.07 g the absolute length of II phalanx bone is 4.56 ± 0.05 cm, width is 4.16 ± 0.12 cm, thickness is 2.6 ± 0.09 cm, and weight is 59.6 ± 0.09 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 412.4 ± 0.16 g. was recorded. The absolute length of the I phalanx of the hind leg is 9.06 ± 0.02 cm, width is 3.5 ± 0.05 cm, thickness is 2.53 ± 0.05 cm, weight is 101.3 ± 0.12 g. Also, the absolute length of II phalanx is 5.13 ± 0.05 cm, width is 4.46 ± 0.05 cm, thickness is 2.46 ± 0.05 cm, weight is 62.5 ± 0.08 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 1.56 ± 0.04 cm in the palmar bone, 0.71 ± 0.02 cm in

the I phalanx bone, and 0.33 ± 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 2.73 ± 0.05 cm, and the thickness of the distal epiphysis of the I phalanx bone is the same as that of the proximal epiphysis by 0.73 ± 0.02 cm, this index of the II phalanx bone is 0. It was noted that it is 37 ± 0.02 cm.

The height of the bone marrow cavity has its own size in each bone in proportion to the length of the bones, that is, it is 17.43 ± 0.05 cm in the palmar bone, 3.27 ± 0.03 cm in the I phalanx, and 1.46 ± 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 marrow cavity of the palmar bone is 0.61 ± 0.03 cm, and this indicator is higher in the tubular bones below it, i.e. 1.38 ± 0.03 cm in the I phalanx bone, 1.07 ± 0.03 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 0.86 ± 0.02 cm in the palm bone, this indicator is equal to 0.51 ± 0.05 cm in the I phalanx bone, and 0.62 ± 0.03 cm in the II phalanx bone. The thickness of the volar compact substance was lower than that of the dorsal compact substance, and it was 0.73 ± 0.03 cm in the palmar bone, 0.43 ± 0.03 cm in the I phalanx bone, and 0.46 ± 0.02 cm in the II phalanx bone.

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 0.043 ± 0.002 cm in the palmar bone, 0.056 ± 0.001 cm in the I phalanx bone, and 0.036 ± 0.001 cm in the II phalanx bone, while the thickness of the distal articular cartilage is 0.053 ± 0.0004 cm in the palmar bone, 0.048 ± 0.001 in the I phalanx bone. cm, it was 0.032 ± 0.0006 cm in II phalanx bone.

The thickness of the porous substance of the bones showed different indicators in the studied tubular bones, it was 0.98 ± 0.02 cm in the proximal part of the palmar bone, 0.43 ± 0.03 cm in the I phalanx bone and 0.48 ± 0.02 cm in the II phalanx bone. equal to The absolute thickness of the distal porous substance was 0.036 ± 0.007 cm in the palm bone, 0.086 ± 0.02 cm in the I phalanx bone, and it was completely lost in the II phalanx bone.

The metaepiphysis 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 metaepiphyseal bone of the palm is 0.051 ± 0.0006 cm, the thickness of the proximal metaepiphyseal bone of the I phalanx is 0.064 ± 0.0009 cm, and that of the II phalanx is 0.032 ± 0.0005 cm.

In horses, the 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 0.97 ± 0.03 cm, and this index was 0.77 ± 0.05 cm in the I phalanx bone and 0.58 ± 0.05 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 2.71 ± 0.02 cm. The thickness of the distal epiphysis of the I phalanx was equal to 0.58 ± 0.03 cm, and that of the II phalanx was equal to 0.46 ± 0.02 cm.

It was noted that the absolute size of the height of the bone marrow cavity is 26.21 ± 0.06 cm in the foot-palm bone, 4.81 ± 0.07 cm in the I phalanx bone, and 2.12 ± 0.03 cm in the II phalanx

bone. The absolute index of the width of the bone marrow cavity is 0.71 ± 0.03 cm in the metatarsal bone, 1.26 ± 0.05 cm in the I phalanx bone, and 1.38 ± 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 1.63 ± 0.02 cm, and the thickness of the volar compact substance is 0.84 ± 0.02 cm. The thickness of the dorsal compact substance of the I phalanx bone of the hind leg was 0.56 ± 0.02 cm, and the thickness of the volar compact substance was 0.47 ± 0.02 cm. The dimensions of the compact substance of the II phalanx bone were determined to be similar to those of the bones located above, the thickness of the dorsal compact substance was 0.78 ± 0.02 cm, and the thickness of the volar compact substance was equal to 0.36 ± 0.06 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 was 0.042 ± 0.0007 cm in the foot-palm bone, 0.036 ± 0.0009 cm in the I phalanx bone, and 0.028 ± 0.0007 cm in the II phalanx bone.

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 0.61 ± 0.02 cm in the I phalanx bone, and 0.42 ± 0.02 cm in the II phalanx bone. The distal spongy substance was preserved only in the foot-palm bone, its thickness is 1.32 ± 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 0.032 ± 0.002 cm, this index was equal to 0.023 ± 0.001 cm in the I phalanx bone, and 0.017 ± 0.0001 cm in the II phalanx bone.

Summary:

- it was found that the linear sizes and weights of the tubular bones located in the distal part of the horse's leg skeleton are higher in the rear leg than in the front leg;
- the epiphysis, compact material, articular cartilage, porous material, thickness of the metaepiphyseal cartilage, the height and width of the marrow cavity of the bones of the distal part of the legs were observed to be higher than those of the I and II phalanx bones.

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