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MORPHOLOGY OF THE STIFLE MENISCI IN DOGS: PRELIMINARY STUDY

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Introduction

In dogs, ultrasonography can be realised to assess soft tissue and bony surfaces. Little is known about ultrasonographic appearance of canine meniscal lesions and their histological appearance and signification. Meniscal lesions are common in dogs and are generally associated with rupture of the cranial cruciate ligament. The medial meniscus is more often and more severely injured than the lateral one.

Objectives

The aims of this study were to set the technique for the histological examination of the dog menisci, to describe the normal echographical and histological appearance and to present 2 pathological specimens of injured menisci.

Methods

Sound menisci were taken from the stifles of an 8 month old mixed breed dog and a 9 years old Bernese mountain dog. Two injured medial menisci were also evaluated: from a 9 years old rottweiler and a 7 years old shepherd dog.

The menisci were examined in situ and after post-mortem excision in a water bath with a linear 7.5 MHz ultrasonographic transducer. Three zones were examined: Zone 1: cranial horn, Zone 2: body of the meniscus, Zone 3: caudal horn, near the collateral ligament.

Vertical sections were made. These are plane perpendicular sections to a given horizontal plane. Two kinds of sections were tested. The isolated menisci of the 8 month old dog were put on the dissection table (horizontal plane) and cut from the cranial to the caudal horn (the sections were triangular in shape, with thin axial border and thick abaxial border), or cut into 4 quarters that were then cut tangential from the abaxial border to the axial border. Menisci of the 8 month old dog were embedded in paraffin whereas the other menisci where embedded in methyl metacrylate and cut with a vertical diamond saw. The sections were stained either with toluidine blue, PAS/ hematoxylin or safranin O.

Results and discussion

Ultrasonography

The normal menisci appeared triangular and homogenously echogenic. The injured menisci were more heterogeneous and contained hypoechogenic areas. In horses, hypoechogenic defects were associated with fibre disruption and collapse, oedema, or degenerative processes such as fibroplasias or necrosis.

Histology

Normal menisci were more fibrous in the middle, with a regular architecture composed of collagen trabeculae in two main directions: circumferential or cranio-caudal direction and radial or abaxio-axial direction. The periphery showed more chondrocytes and more matrix organised in several layers.

In this study, hypoechoic defects or heterogeneous areas were associated with fibrillation, major degenerative changes and modification of internal architecture.

MORPHOMETRIC STUDY OF INTERPHALANGEAL JOINTS IN ARDENNER HORSES WITH JUVENILE OSTEOARTHROPATHY

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Introduction

Little information is available about the morphometrical aspect of osteochondral tissues in horses though osteo-articular pathologies may cause pain, handicaps and also important economic loss. Attempts are made to rehabilitate Ardenner horses but they may develop juvenile osteoarthropathy which lead to precocious cast. This disease, also called osteoarthritis, may be considered as a group of degenerative disorders characterized by a common end stage: progressive deterioration of the articular cartilage accompanied by changes in the bone and soft tissues of the joint.

Objectives

The aim of this study was to improve knowledge about bone and cartilaginous tissues in Ardenner horses with osteoarthropathy, regarding proximal and distal interphalangeal joints.

Material and methods

Two Ardenner geldings aged 4 years were included in this study. One was euthanized because of dangerous behavior and the other for ataxic problems after an accident. Both of them presented radiographic signs of osteoarthropathy with entheseophytes at the dorsal border of the middle phalanx. Fore and rear digits were dissected. Four sampling sites were used for each digit: distal articular surface of the proximal phalanx (P1D), proximal (P2P) and distal (P2D) articular surfaces of the middle phalanx and articular surface of the distal phalanx and navicular bone (P3P). A standardized squaring was carried out using a graduated rubber band giving place to 9 intake points by articular surface. Osteocartilaginous samples, of a fixed diameter of 5 mm over a length of 8-10 mm, were taken owing to a surgical motor with a bell mill. The samples were embedded in methyl metacrylate without previous decalcification. Sections were stained with toluidine blue or methylene blue and were imaged with a microscope provided with a video camera connected to a computer. Five measurements were made with the imaging analysis system (Leica): maximal thickness of full cartilage (TC), maximal thickness of calcified cartilage

(CC), maximal thickness (TSB) and porosity (PSB) of subchondral bone and porosity of cancellous bone (PCB). Maximal thickness of non calcified cartilage (NCC) was calculated as well as the ratio between CC and TC. For each variable, the effect of the following factors was studied: member, articular level, site 1 (type Anterior, Middle and Posterior), site 2 (type Internal, Middle and External) and the interaction between site 1 and site 2.

Results and discussion

Significant differences were observed for the variables listed in the table below.

	Member	Level	Site 1	Site 2	Site 1* Site 2
CC		****	****	****	**
NCC	****	****	****	**	
TC	****	****	****	****	
CC/TC	***	****	****		
TSB	****	****	****		***
PSB		**			
PCB				**	

TC and NCC were thicker for the fore digit, with a smaller ratio CC/TC and smaller TSB. This could be related either to the pathology or to the different distribution of body weight and efforts during locomotion. TC, CC and NCC were thicker for P3P and smaller for P1D. TSB was thicker for P2P and smaller for P2D whereas PSB was higher for P1D. For site 1, CC, NCC, CT and TSB were larger for site M whereas CC/TC was higher for site P. For Site 2, CC, NCC and CT were also larger for site M, as well as TSB, PSB and PCB. The results are related to different strains zones within and between joints. To better understand the results, itís necessary to compare them with aged-matched sound horses.

MORPHOLOGICAL DIFFERENCES BETWEEN THE KIDNEYS OF SHEEP AND DOG

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Introduction

The kidneys of horse, ox, pig, sheep and dog belong to the same group of organs and it is not difficult to identify them. However, the kidneys of dog and sheep are very similar to each other. Our aim, therefore, was to find some differentiating between the organs using certain parameters, which would help identification to which animal do the individual kidney belong.

Material and methods

We collected sheep kidneys during the year 2006 from a few slaughterhouse surrounding sarajevo and sacrificed three sheep for the organs studying in situ. We took kidneys of dogs of different sexes, ages, and breed from the dog-pound in Sarajevo. The number of organs in total was 25 left and 25 right sheep kidneys and 15 left and 15 right dog kidneys. We performed transverse and longitudinal sections for observation of the number and form of lobes and their mutual relationship.

Results

During the examination of the kidneys, some parameters were used. So we compared the dorsal and ventral surfaces (Facies dorsalis et ventralis), cranial and caudal extremities (Extremitas cranialis et caudalis) as well as the borders of organ (Margo lateralis et medialis). Special attention was paid to medial border (renal hilus). These examinations were done separately on the left and on the right kidneys of both, sheep and dogs. Our observations are presented in the table below which shows the differences in some parameters between the sheep and dog kidneys.

Discussion

In various references, including different anatomy books, we did not find detailed morphological description of kidneys of dog and sheep as it is done here considering all the relevant parameters (surfaces, poles and borders including renal hilus). Ellenberger-Baum mentions that the kidneys of small ruminants are bean shaped, while the dog's have similar shape as kidneys of pig, but are thicker and rounded, whereas the pig's are flatter. Our observations brought us to another conclusion. On the other side, Niel D.S. May, while examining the kidneys of dogs and sheep, concluded that Dog kidneys are somewhat longer and have darker color in comparison to sheep kidneys, which are more bean- shaped. Our observations correspond with his statements. Sisson mentions the elliptical form of sheep kidneys with convex surfaces and round borders which are bean shaped, while those of dogs are somewhat longer and have more convex ventral surfaces in comparison to the dorsal surface. However, our observations show that both sheep kidneys have heart-like shape, while the surfaces correspond with the statement of Sisson.

Conclusion

Comparing all the parameters of left and right kidneys separately of both animals, we can say that the similarities are great. That is why it is difficult to differentiate which kidney belongs to which animal.

On the basis of morphological data the most obvious differences of sheep and dog kidneys are connected with the form of the organ. While sheep kidneys are bean shaped, dog kidneys have more the shape of a flat bean. There are also differences in the borders of the kidneys, the Sheep's are more bent, while the Dog's are less bent, especially the medial border which is more straight. Dorsal surface (Facies dorsalis) of Dogs is almost flat, while the sheep's is convex. Kidney poles of sheep and dogs differ in the sense that the cranial extremities more round in comparison to the posterior extremity which is more flat on both kidneys. While the anterior extremity of sheep is somewhat narrower compared to the posterior extremity, dog's extremities have almost equal diameters.

Parameters	Sheep	Dog
Colour	Bright reddish brown	Dark reddish brown
Form	Heart- shaped	Bean- shaped and flat
Facies dorsalis Facies ventralis	Less flat Convex	More flat Convex
Relation Margo lat et med.	More bent	Less bent
Extremitas cranialis Extremitas caudalis	Narrower-rounded Wider - rounded	Wider-rounded Less-rounded and flat
Hilus renalis	Shallow hilus	Deeper hilus