

DIFFERENCES OF THE INITIAL PART OF THE URINARY ORGANS (PELVIS RENALIS WITH RECESSES) AND A. AND V. RENALIS, WITH THEIR BRANCHES IN THE KIDNEYS OF SHEEP AND DOG

Ibrahim Arnautović, Bejdić Pamela, Adnan Hodžić
Veterinary Faculty Sarajevo, BIH

Introduction

Morphological studies which have included comparison of dorsal and ventral surfaces (Facies dorsalis and ventralis), lateral and medial borders (Margo lateralis et medialis), as well as comparison of cranial and caudal extremities (Extremitas cranialis et caudalis) of both left and right kidneys of sheep and dogs did not provide us with relevant data by which we could differentiate with certainty the sheep kidney from the dog kidney. That is the reason why we decided to examine by corrosion techniques initial parts of the urinary organs (renal pelvis with their recesses), renal arteries and renal veins (a. et v. renalis) and their mutual relationship.

Material and methods

For the presentation of initial parts of the urinary organs and blood vessels, we used the corrosion technique with the iVinilyte'. For the sake of examination we used 11 pairs of sheep kidneys and 14 pairs of dog kidneys. The age of the animals was from 1-3 years. For renal pelvis (pelvis renalis) and recesses we used yellow and for arteries and veins red and blue vinilyte respectively. After the injection and when the time needed for hardening of vinilyte was over (8-12 hours), we put the kidneys in the adequate acid (36% HCl) for the purpose of maceration. 48 hours after the corrosion we washed off the kidneys so we could examine the initial part of the urinary organs and blood vessels as well as their mutual relationship.

Results

By the corrosion preparation of sheep and dog we studied the size and the form of renal pelvis and also the size, form and number of recesses. The distribution of renal artery and vein and their branches also were studied:

Pelvis renalis

Both animals, sheep and dogs, have the same number of recesses. The most obvious difference is that the pelvis walls of dogs are unequal. The dorsal wall from which the dorsal recesses come out is longer than the ventral one. Renal pelvis of sheep on the other side has equal dorsal and ventral wall. Recesses of sheep come closer to their end (dorsal and ventral recesses) than those of dogs. The ureter exit of dog differs in the fact that its initial part is a funnel-shaped, while the sheep's is triangular in form.

The distribution of the renal artery in sheep and dog

Renal artery (a. renalis) of the right kidney of sheep and dog differ in the position. Right renal artery (a. renalis dextra) is divided into two branches, one dorsal and one ventral.

The division of right renal artery in dog is much prior to the hilus, while the sheep's division is just before the hilus. Ventral branch of renal artery in the right kidney of dog is much stronger than the dorsal branch and it provides more interlobar arteries which even run over to facies dorsalis of the cranial pole. The number of interlobar arteries of sheep corresponds with the number of recesses in the kidney and we have the same situation in the left kidney of dog. This is not the case in the right kidney, because the ventral

interlobar arteries run into the dorsal recesses. According to this, it is very difficult to differentiate between the sheep and dog kidneys since the vascularity is quite similar in both animals. Any anastomoses between the dorsal and ventral branches, as well as interlobar arteries and their branches have not been noticed.

Table 1: Number of aa. interlobares of the right kidney in sheep and dog

	DOG	SHEEP
Aa. interlobares (dorsales)	6-7	6-8
Aa. interlobares (ventrales)	7-8	6-7

Table 2: Number of aa. interlobares of the left kidney in sheep and dog

	DOG	SHEEP
Aa. interlobares (dorsales)	6-7	5-7
Aa. interlobares (ventrales)	7-8	6-7

The distribution of the renal vein in sheep and dog

Renal veins of both sheep and dog are much prior to renal hilus into two branches, one dorsal and one ventral. From the dorsal branch, at the entrance to renal hilus, two branches run in separate ways and inside of the sinus of the kidney both of them divide into two more branches in sheep, and into 2-3 branches in which they join interlobar veins in dogs.

The ventral branch is stronger than the dorsal and prior to hilus it is divided into three branches, while the fourth branch appears in the renal sinus. These branches give off interlobar veins (mostly 7-9) from the ventral side.

In both left and right kidneys of sheep and dog, there are anastomoses between two neighboring interlobar veins and between the ending branches which are separated from the dorsal and ventral branch of renal vein. The number and position of branches in Dogs differ, and there are also differences between the right and left kidney which can be seen in the table 3 and 4 below:

Table 3: Number of vv. interlobares of the right kidney in sheep and dog

	DOG	SHEEP
Vv. interlobares (dorsales)	4	4-5
Vv. interlobares (ventrales)	8-9	7-9

Table 4: Number of vv. interlobares of the left kidney in sheep and dog

	DOG	SHEEP
Vv. interlobares (dorsales)	6	4-5
Vv. interlobares (ventrales)	6-7	7-8

Conclusion

According to the analysis of the corrosion preparation of pelvis and his recesses, and renal artery and vein and their mutual relationship it can be concluded that it is possible to differentiate not only

the kidneys of the sheep and dog, but also the right and left kidneys of the animals.

The most interesting observation in our investigation is that the interlobar arteries vascularise just the half of two neighbouring lobes. A part of the renal parenchyma in the centre of which lays aa. interlobares is actually the physiological lobus. That is why it would be proper to rename interlobar arteries into lobar arteries which are placed in the centre of the physiological lobus. We also noticed that the anatomical lobus does not coincide with the physiological lobus and also that anastomoses do not exist between the neighbouring interlobar arteries. These information we could not find in the literature. The differences of sheep and dog kidney are mainly connected with the form of renal pelvis and the initial part of ureters, and with the number of interlobar arteries and veins which can be seen in the tables.

STUDY OF THE WILD FAUNA OF FRENCH ZOOLOGICAL GARDENS: WORKSHOP OF AN ORIGINAL ASSOCIATION

C. Guintard¹, E. Betti¹, C. Douart¹, M. Dutertre², A. Borvon^{1,3}, M.C. Marinval³, Y. Gruet², T. Boisdard⁴, G. Le Maux⁴, C. Picard¹, F. Tekkouk⁵, J. Baudet²

¹Ecole Nationale Vétérinaire de Nantes, Unité d'Anatomie Comparée, route de Gachet, BP 40706, 44307 Nantes Cedex 03, France; guintard@vet-nantes.fr, beti@vet-nantes.fr, cdouart@vet-nantes.fr, picard@vet-nantes.fr; ²Faculté des Sciences et des techniques, Université de Nantes, Laboratoire d'Ecophysiologie marine intégrée EA 2663, 2 rue de la Houssinière, BP 92208, 44322 Nantes Cedex, France; mickael.dutertre@univ-nantes.fr, joseph.baudet@isomer.univ-nantes.fr, achil.lemeur@wanadoo.fr; ³Université Paris 1 - Panthéon-Sorbonne et UMR 7041 Equipe Archéologie Environnementale, 21 allée de l'Université, 92000 Nanterre, France; aureliageronimo@aol.com, marie-christine.marinval-vigne@wanadoo.fr; ⁴Museum

d'Histoire Naturelle de Nantes, 12 rue Voltaire, 44000 Nantes, France; thierry.boisdard@mairie-nantes.fr, t.boisdard@wanadoo.fr [<http://tb.moulage.free.fr>], gaelle.lemaux@mairie-nantes.fr; ⁵Université Mentouri de Constantine, Département des Sciences Vétérinaires, Laboratoire d'Anatomie, BP 56 El Khroub, Algérie; ftekkouk@yahoo.fr.

Dead wild animals are a primary source of information for scientific purposes. Then, a cooperation of different institutions for comparative anatomy studies is a promising approach. In 2006 (Guintard et al.), we have created a working group of dissection (an open association located in Nantes) which continues this goal with new members (Paris, Constantine). Thanks to a more efficient support from zoological gardens of the western part of France, three recent dissection sessions (2006-2007) have been performed and are exposed here: an Orfe (*Leuciscus idus* L., 1766), a Boa (*Boa constrictor* L., 1758), and an Hippopotamus (*Hippopotamus amphibius* L., 1758). This project gathers the advantages of a total traceability: the precise origin of the animals (the zoological gardens) and the removed parts (skin, skeleton or plastinated organs) is exactly known. This incipient association welcomes every person or institution dealing with comparative anatomy (technicians, veterinarians, researchers, Medicine faculties, Anatomy departments and biodiversity conservation (museum collections, genes banks)).

Reference

Guintard et al. A study of the wild fauna of French zoological gardens: the birth of an original association, Messina, 19th-22th July 2006, XXVIth Congress of the European Association of the Veterinary Anatomists).

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