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Title	STUDIES ON DIAGNOSTIC ULTRASOUND IMAGING IN DOMESTIC ANIMALS : FUNDAMENTAL STUDIES AND CLINICAL APPLICATION
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Citation	Japanese Journal of Veterinary Research, 31(2), 98-98
Issue Date	1983-05-13
Doc URL	https://hdl.handle.net/2115/2296
Type	departmental bulletin paper
File Information	KJ00002374123.pdf

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STUDIES ON DIAGNOSTIC ULTRASOUND IMAGING IN DOMESTIC ANIMALS – FUNDAMENTAL STUDIES AND CLINICAL APPLICATION –

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In this study the abdominal organs, the fetus and the heart of normal cows, horses, goats and dogs were investigated by the use of ultrasonotomography and ultrasound cardiography. Clinical application was also attempted in several clinical cases. The results are summarised as follows:

1) Liver & gall bladder: In cows and goats the liver was imaged on the right side between the 8th to 12th intercostal spaces. Clear ultrasound images of the canine liver were obtained by subcostal scanning. However, the border of the hepatic parenchyma was visualized only in the horses. In cows, goats and dogs the hepatic parenchyma, portal vein, hepatic vein and gall bladder showed characteristic echo patterns, respectively, but the appearance of the bile ducts was obscure.

2) Spleen: In each animal, the ultrasound images of the spleen were obtained on the left side in the lower intercostal spaces; in horses and dogs the same was obtained also in the flank. In all animals the spleen appeared in the characteristic low amplitude echo pattern.

3) Kidney: In cows and goats, each kidney was displayed on the right flank, and the right kidney was observed in the 12th intercostal space. In horses and dogs, each kidney was visualized in the lower intercostal spaces and the flank. In all animals echoes of the kidney were composed of a low amplitude echo pattern showing the renal cortex, an echo free pattern exhibiting the renal medulla and an echogenic pattern indicating the renal pelvis.

4) Fetus: The fetus and fetal organs of cows, goats and dogs were visualized by scanning from the body surface of the lower abdomen or flank. Fetal movement and fetal heart contractions were detected by real time ultrasonotomography.

5) Heart: The cardiac window in all the animals was defined in the right or left thoracic wall between the 3rd to 5th intercostal spaces near or above the olecranon. Though location and direction for scanning had to be selected according to the target valve, it was possible to identify each cardiac valve and cavity, and the ventricular walls and their motion by ultrasonocardiotomography and ultrasound cardiography. However, obtaining typical images of cardiac valves by ultrasound cardiography was not as easy as that for the ventricular walls, especially in the cows, in which the ossa cordis seemed to have an effect on imaging of the mitral and aortic valves.

6) Clinical cases: Diagnostic ultrasound imaging contributed to the diagnosis of endocarditis and purulent pleuritis in cows; ascites and cirrhosis, hepatic tumor, and urinary calculosis in dogs; and hydronephrosis in a cat. Also, adult filariae (*Dirofilaria immitis*) could be imaged.