Ultrasonographic Aspects of Mammary Tumours in Bitches

Iulia Maria BALACI*, Simona CIUPE, A. R. POP, Laura PARLAPAN, Alexandra ARION, Raluca VIDRIGHINESCU, I. S. GROZA

University of Agriculture and Veterinary Medicine, Mănăştur Street, 3-5, Cluj-Napoca, Romania;

* Corresponding author e-mail: balaci_i@yahoo.com

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Abstract

Some imaging aspects of mammary tumours in bitch were investigated in order to individualize them from other pathologies and among themselves. 10 bitches of different breeds and ages that were presented to the Clinic of Animal Reproduction for suspicion of mammary tumours were subjected to a complete clinical examination and an imaging investigation using ultrasound and colour Doppler. Subsequently, tissue samples were collected and sent for histological diagnosis.

In total there were investigated 18 tumours with an average of 1.8 tumours/animal; 94.4 % of tumours were malignant, and 5.6% were benign. Of the malignant tumours, 82.36% had irregular margins, 88.24% were heterogeneous and 17.65% showed areas of necrosis. In 11.76% of cases there were imaging artefacts. Increased blood flow was observed around the margins of the tumour in 82.36% of examined tumours using colour Doppler. The benign tumour had oval margins, mild granulation and one central blood vessel. Using ultrasound and colour Doppler examination, mammary tumours can be differentiated from other mammary pathologies and one can even determine, with a high level of accuracy, if the tumour is malignant or benign.

Keywords: *color Doppler, mammary tumours, ultrasound*

Introduction. Approximately 50% of tumours identified in bitches are mammary tumours. They affect about 26% of bitches, intact ones being more exposed. (Kahn, 2011). The use of ultrasound and colour Doppler as means of mammary investigation has increased the accuracy of diagnosis and may also play a part in choosing the best treatment for a given case. Studies suggest that there is a correlation between ultrasound examination in B mode and colour Doppler and the histopathologic type of the tumour. Using ultrasound may help in determining if the tumour is benign or malignant. This evaluation is based on size, shape, echogenicity, echotexture, the presence of artefacts and the density and distribution of blood vessels (de Bulnes et al, 1998; Mannion, 2006; Nyman et al, 2006)

Aim. This study aims to identify some of the imaging aspects that individualize mammary tumours in bitch from other pathologies and

among themselves. These aspects may be used to increase the relevance of ultrasound examination of the mammary gland.

Materials and Methods. The study took place between November 2013 and May 2014 and included 10 bitches of different breeds and ages between 1 and 14 years. They were all presented to the Clinic of Animal Reproduction with suspicion of mammary tumours. In all cases were performed a complete clinical examination followed by an imaging investigation using ultrasound and colour Doppler. For the ultrasound examination were used both linear and microconvex transducers with a frequency of 8 MHz, both in longitudinal and transverse orientation. All cases were afterwards scheduled for surgery, performed by the surgeons in our clinic. After the surgery, tissue samples were collected and submitted for histological diagnosis to the Pathologic Anatomy Department from our Faculty.

Fig. 1. Ultrasound and colour Doppler aspects in a 12 years old cross breed bitch. Note the irregular margins of the tumour, the granulation, the vascularisation and invasiveness of the tumour.

Fig. 2. Sonographic aspects of a malignant mammary tumour in a 5 years old German Shepherd. Note the acoustic enhancement and the central necrosis.

Fig. 3. A gray-scale image of a malignant tumour in a 4 years old Labrador retriever. Note the acoustic enhancement artefact with edge shadowing and the oval margins of the tumour.

Fig. 4. Ultrasound aspects of a benign tumour in a 9 years old Fox Terrier. Note the oval shape and the ecotexture.

Results and Discussions. All animals included in the study were diagnosed with mammary tumours. Six bitches had only one tumour, while 4 bitches presented multiple neoplasms, the number varying from 2 to 5. In total there were investigated 18 tumours with an average of 1.8 tumours/animal. Histopathology results showed that 94.4 % (17 tumours) of tumours were malignant, and 5.6% (1 tumour) were benign.

The malignant tumours presented the following sonographic characteristics: 82.36% had irregular margins with the tendency to invade adjacent tissues, 88.24% were heterogeneous with different granulation pattern from the healthy tissue (Figure 1) and 17.65% showed areas of necrosis (Figures 1 and 2). In 11.76% of cases there were acoustic enhancement artefacts with or without edge shadowing (Figure 2 and 3). The colour Doppler examination pointed out increased blood flow around the margins of the tumour in 82.36% of examined tumours (Figure 1). The benign tumour had oval margins, mild granulation and one central blood vessel (Figure 4).

Conclusion. Ultrasound and colour Doppler examination offered important information about

the mammary lesions identified. Mammary tumours are relatively easy to differentiate from other pathologies and have specific characteristics depending on whether the tumour is malignant or benign. Still, it is difficult to differentiate between different types of tumours only using clinical and ultrasound examination.

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