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Case Report

HAEMANGIOSARCOMA IN A DOG

Ts. Hristov[1]*, L. Lazarov[1], R. Simeonov[2], Y. Nikolov[1]

[1]Department of Internal Diseases
[2]Department of General and Clinical Pathology
Faculty of Veterinary Medicine, Trakia University, Stara Zagora, Bulgaria

ABSTRACT

A clinical case of haemangiosarcoma of the spleen and liver in a male mixed breed dog, of age 10 years and 8 months, weighing 8 kg, is presented. The clinical signs were general and non-characteristic. Initially, the disease was diagnosed by ultrasonography and blood laboratory investigations. Ultimately, the type of the growth was determined by a histological examination of a spleen specimen. The liver metastases were evidenced by ultrasound-guided fine-needle aspiration biopsy. The prognosis was poor.

Key words: Haemangiosarcoma, dogs, abdominal ultrasonography, haematology.

INTRODUCTION

Haemangiosarcoma is a malignant tumour originating from the endothelium of blood vessels. It is more commonly encountered in dogs over 8 years old and from the large breeds (1) The tumour was observed in German Shepherds, Golden Retriever and Labradors (2, 3, 4).Haemangiosarcoma is rarely seen in cats and other domestic animal species (5, 6). The visceral form is most commonly encountered in the spleen and the liver, but was also observed in lungs, kidneys, ureters, mesenterium etc. (7, 8, 9). According to Withrow at al, 2001 and Day *at al*., 1995 (1, 10) this is the most frequent neoplasm of the spleen in dogs and accounts for 51-66 % of all cases of spleen neoplasm. The dermal form is more common in light-haired breeds: Beagle, Bloodhound, English Pointer, Dalmatian etc. (11). It usually develops on the ventral abdominal wall and the region of the prepuce where the hairs are few. Unlike the visceral form, dermal haemangiosarcoma metastasizes more rarely (12). The cardiac form affects the atria and results in pericardial effusion and cardiac tamponade (1).

Haemangiosarcoma is an aggressive, highly malignant tumour and, usually, metastases are detected within 6 months after diagnosis (1). The commonest metastatic sites are the brain, the lungs, the liver, the heart, skeletal muscles and bones.

CLINICAL CASE

A clinical case of haemangiosarcoma in a male dog, aged 10 years and 8 months, weighing 8 kg, owned by a private owner and referred to the Clinic of Internal Diseases is presented here. The dog was refereed to the Clinic of Internal Diseases on July 08, 2005. According to the history data, it had a decreased appetite from 6-7 days and experienced weight loss. The physical examination revealed a general lethargy, a slight kyphosis of the spine and increased sensitivity to abdominal palpation. The rectal body temperature was within the reference range, the respiratory rate: 48 min^{-1}, the heart rate 138 min^{-1}. The haematological analysis showed Hb 106 g/L, Er 5.01 T/L, Hct 31.1 %, Leu 52.2 G/L, Eo 2%, Mm 2%, St 5%, Sg 81%, L 10%, whereas the blood biochemical analysis: ALAT 37.2 U/L, ASAT 42.6 U/L, creatinine 61.0 µmol/L, urea 6.8 mmol/L, alkaline phosphatase (AP) 1140 U/L. Urine analysis showed pH 6, protein (++), glucose (–), bilirubin (–), urobilinogen (–), ketone bodies (–), blood (–), density 1.020. Urine sediment consisted of single erythrocytes and leukocytes and single kidney cells. The

*** Correspondence to**: *Tsanko Hristov, Department of Internal Diseases, Faculty of Veterinary Medicine, Trakia University, Stara Zagora, Bulgaria; Tel.: +359 42 699-534; E-mail: hristov_vet@abv.bg,*

ultrasonography revealed a general enlargement of the spleen and within, a distinct formation with a diameter of 8 cm. Its structure was heterogeneous and included hyperechoic, hypoechoic and anechoic areas (***Figure 1***). The laparotomy, performed on July 12 2005, revealed an enlarged spleen with an irregular surface (***Figure 2***) and a splenectomy was necessitated. The histological study of the spleen showed a neoplastic growth. Neoplastic cells varied by both shape and size. Irregular mitotic figures were observed. The cell's nuclei were pleiomorphic and hyperchromatic and the cytoplasm – with indistinct margins. The tumour stroma was poor: necrotic areas with various shapes and sizes were seen. In some areas, there were blood vessel-like structures, filled with blood (***Figure 3***). The diagnosis of splenic haemangiosarcoma was made on the basis of clinical, laboratory, ultrasonographic, gross and histological examinations. A cyclophosphamide therapy was prescribed (Cytoxan®, fl. á 100 mg), intravenously, at a dose of 100 mg/m^2 body surface area, two times a week for 5 weeks.

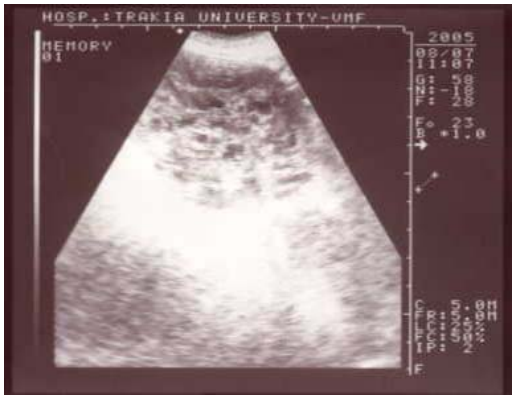

Figure 1. *Haemangiosarcoma. Spleen – ultrasonographic finding.*

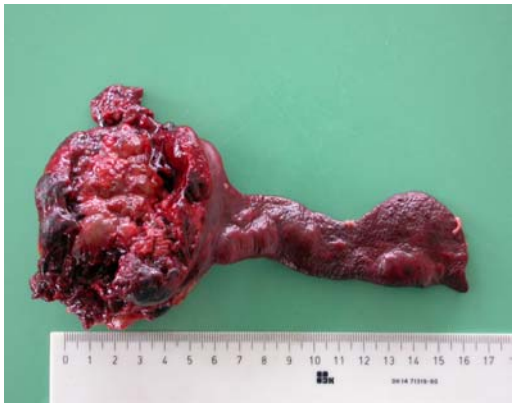

Figure 2. *Haemangiosarcoma. Spleen – gross finding.*

On November 18, 2005 the dog was referred to the clinic for the third time because further deterioration in its condition had occurred. The physical examination revealed pale mucosae, rectal body temperature within the reference range, but the respiratory and heart rates were accelerated. The haematological analysis showed the following parameters: Hb 48 g/L, Er 3.45 T/L, Hct 25.5 %, Leu >100.0 G/L, St 15%, Sg 65%, L 20%, ALAT 94.0 U/L, ASAT 110.3 U/L, creatinine 118.4 µmol/L, urea 7.6 mmol/L, AP 762 U/L, and urine analysis: pH 6, protein (+), glucose (–), bilirubin (–), urobilinogen (–), ketone bodies (–), blood (–), density 1.020. Urine sediment exhibited single erythrocytes, 15 leukocytes, single urinary bladder and kidney cells.

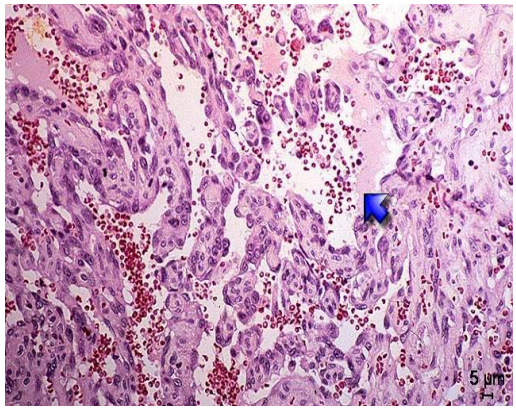

Figure 3. *Haemangiosarcoma. Spleen – histological finding. Pleiomorphic cells, forming blood-filled lacunae. Haematoxylin-eosin staining (H/E).*

The ultrasonography revealed an enlarged liver with focally increased echogenicity. In the right hepatic lobe, a well differentiated formation with diameter of 4.2 cm, with hypoechoic structure and anechoic areas within was visualized (***Figure 4***). As the presence of a metastasis was hypothesized, ultrasonographic-guided fine-needle aspiration biopsy was performed. The cell material was fixed with methanol and the smears were stained with Giemsa's stain. Cytologically, the findings contained a large amount of blood. The neoplastic cells were with a various shape and size; their shape varied from fusiform to squamous. The cytoplasm was basophilic, with indistinct cytoplasmic borders; in some cells, small vacuoles were observed (***Figure 5***). The cell's nuclei were oval, with coarsely clumped chromatin and prominent nucleoli. The nuclear/cytoplasmic ratio was in favour of the nucleus.

As a result of performed examinations (physical, laboratory, ultrasonography and cytology), the diagnosis of liver haemangiosarcoma was established. With

regard to the poor prognosis, euthanasia of the dog was recommended. The owner however preferred to postpone the euthanasia. That is why a supportive therapy with hepatoprotectors, electrolyte solutions, vitamins and analgesics was prescribed.

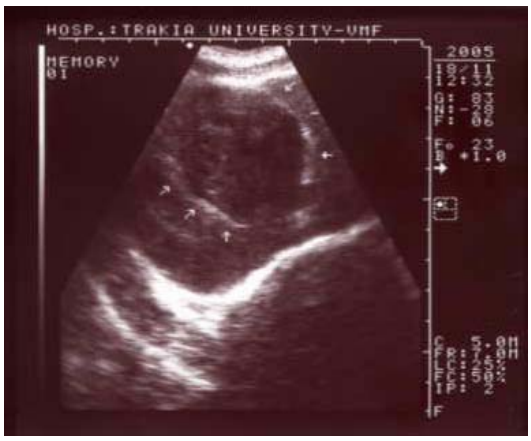

Figure 4. *Haemangiosarcoma in the liver - ultrasonographic finding.*

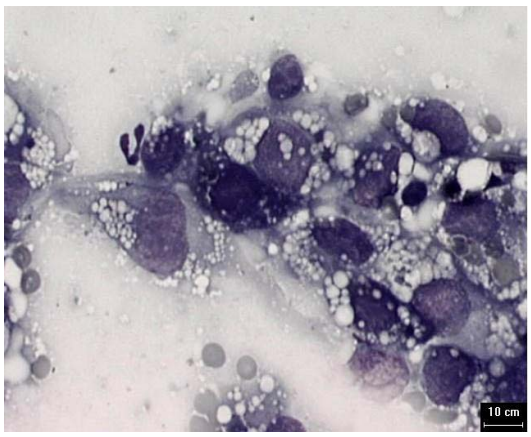

Figure 5. *Cytological finding. Anisokaryosis, anisocytosis. The small vacuoles within the cytoplasm of meoplastic cells are well visible. Giemsa staining.*

DISCUSSION

When the haemangiosarcoma is localized in internal organs, the early symptoms are general and non-specific. They largely depend on the size and localization of tumour growths, the presence of metastases and the development of secondary complications. Most owners seek help when the state of the animal aggravates. The commonest complaints are lack of appetite, general weakness and weight loss (1, 2, 4). With progression of the disease, a high-degree anaemia, haemorrhages on mucosae, development of DIC syndrome, collapse, cardiac arrhythmia, abdominal effusion etc. could be observed (1, 4, 11). Initially we could not make a correct diagnosis according to observed arexia, depression, weight loss, accelerated heart rate and tachypnea. Laboratory results (low haemoglobin and erythrocyte counts, hyperleukocytosis, increased alkaline phosphatase) corresponded to neoplastic changes in internal organs observed by others (1, 4, 13). This fact caused us to perform an ultrasonography and thus, to evidence a splenic neoplasm (**Fig. 1**). The splenectomy done after three days and the subsequent gross and histological examinations revealed the type of the tumour – a 2nd stage haemangiosarcoma. The prognosis was poor. The critical period for performing splenectomy is 20-60 days after identifying the tumour growth. The average life span in dogs with splenic haemangiosarcoma is up to 3 months and only 10% survived up to 1 year or longer (1, 2, 3, 11). Chemotherapy could prevent the distribution of the tumour through control of early metastases. Cyclophosphamide, applied either independently or in combination with other anticancer drugs, is the most commonly used preparation in veterinary practice (14). The combination of splenectomy with chemotherapy increases the average survival time with 140 to 202 days (1, 15). Unfortunately, in our case the therapy was ineffective and 4 months after the splenectomy, the dog visited the clinic for the third time. The clinical signs were similar to those manifested during the second visit, but the blood laboratory analysis showed a negative tendency (***Table 1***).

The performed abdominal ultrasonography confirmed the suspected secondary neoplastic growth (***Figure 4***). Because of the high aggressivity and malignancy of this tumour type, a similar outcome was expected by us. The localization in the liver explained the haematological changes and alterations in organ-specific enzymes (ASAT and ALAT). The increased creatinine and urea concentrations are reflecting the enhanced cellular degradation.

In summary, it could be concluded that the development of new medications and diagnostic tests would assist in the control of these diseases. The early diagnostics is essential for the success of the treatment and the efforts of veterinarians should be aimed at in this direction. This would result in increased survival time and better quality of life in patients with haemangiosarcoma.

Table 1. *Blood analysis*

Parameter	***Normal range***	***First visit 08.07.2005***	***Second visit 18.11.2005***
Hb g/L	120-180	106	48
Er T/L	5.5-8.5	5.01	3.45
Hct %	37-55	31.1	25.5
Leu G/L	6-17	52.2	>100.0
ALAT U/L	10-27	37.2	94.0
ASAT U/L	10-27	42.6	110.3
Creatinine µmol/L	<106	61.0	118.4
Urea mmol/L	1.66-7.4	6.8	7.6
AP U/L	10-94	1140	762
Eo %	0-7	2	-
Mm %	-	2	-
St %	0-3	5	15
Sg %	50-70	81	65
L %	18-40	10	20
Mo %.	1-6		-

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