

## METASTATIC HEMANGIOSARCOMA OF THE SUBLUMBAR LYMPH NODES CAUSING TENESMUS IN A DOG

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Hemangiosarcoma (HSA) is a malignant vascular neoplasm of endothelial origin with very aggressive behaviour. It occurs more frequently in dogs than in other species (Priester & McKay, 1980) and accounts for about 5% of all canine malignancies (Oksanen, 1978). In dogs, the commonest primary sites of HSA are the spleen – 50–65%, the right atrium – 3–25%, the subcutaneous tissue – 13–17% and the liver – 5–6% (Smith, 2003). About 80% of the dogs have metastases by the time of diagnosis. HSA tends to metastasize through haematogenous or transabdominal implantation and the most frequently reported metastatic sites are the liver, the omentum, the mesentery, the lungs, and the brain (Withrow & MacEwen, 2001). In this study, a case of HSA in the right atrium and an enormous tumour metastasis in sublumbar lymph nodes causing atypical clinical presentation with tenesmus is described.

A routine physical and haematological investigation and blood chemistry (Human Diagnostica – Germany) profile were performed after 5-mL blood samples were collected in heparinized tubes from the cephalic vein.

Two-plane abdominal radiographs (lateral and ventrodorsal views) and one contrast radiography using barium sulfate (DC-bar® – Milve, Bulgaria), 30% water

suspension, 10 mL/kg applied in the rectum were made. Additionally, two thoracic radiographs in both views were done.

Electrocardiography was accomplished using one-channel microcomputer electrocardiograph MAIMEX-ECG 1222 ASB (Bulgaria). Six leads (3 standard and 3 augmented) were recorded over thermopaper at a speed of 50 mm/s.

Operation was performed under general inhalational halothane anaesthesia (Narcotan®, Leciva, Czech Republic), 1.5 vol% in oxygen flow 2.5 L.min<sup>-1</sup> using Bain circuit system and Fluotec Mark III halothane vaporizer. Premedication with atropine sulfate (Atropinum sulfuricum 0.1% Sopharma, Bulgaria) s.c. at 0.02 mg/kg was made 20 minutes before the i.v. induction of anaesthesia with diazepam (Diazepam® 0.5%, Sopharma, Bulgaria) at 0.5 mg/kg and ketamine hydrochloride (Ketamin® 10%, Alfasan, Holland) at 10 mg/kg. A venous line was kept using physiological saline applied at a rate of 10 mL/kg/h. Additionally, 300 mL blood was transfused.

Tissue samples obtained from the paraaortal tumour mass and the heart atrium were fixed in 10% buffered formalin, embedded in paraffin, sectioned at 5 µm and stained routinely with haematoxylin and eosin (HE). Selected sections of

the tumour tissue were stained with Gomori's reticulin stain for reticular fibers (methenamine silver plating kit, Merck, Darmstadt, Germany).

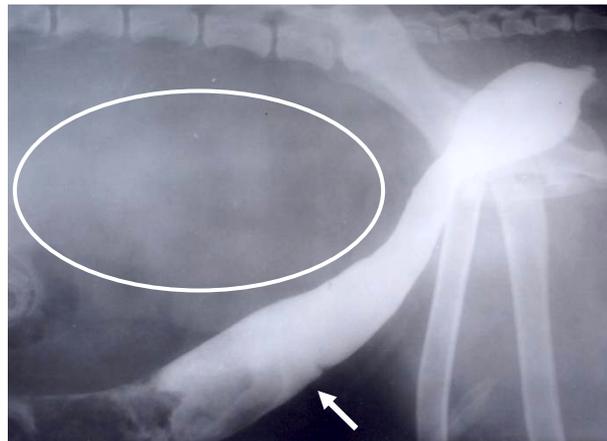
*Case history.* A 12-year-old male mongrel dog weighing 19.5 kg was presented to the clinic of surgery with a history of tenesmus, swollen hind legs, anorexia, weight loss and apathy to the environment over the last ten days. The dog was semi-castrated because of a seminoma 1.5 years ago. On physical examination, an enormous solid mass in the abdominal cavity was palpated through the abdominal wall. No mechanical obstacles or prostatic enlargement were found on rectal examination. Superficial inguinal lymph nodes were enlarged but mobile and not painful. The results of clinical and laboratory tests performed were as follows:

- Core body temperature – 39.3°C;
- Heart rate – 100 beats/min
- Respiratory rate – 40 breaths/min
- Haemoglobin – 112 g/L;
- Packed cell volume (PCV) – 32%;

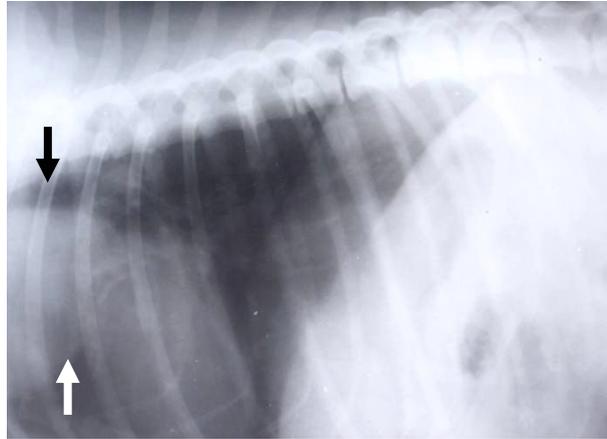
- Red blood cells – 4.12 T/L;
- White blood cells – 24.0 G/L;
- Blood urea – 4.6 mmol/L;
- Serum creatinine – 70 µmol/L;
- Aspartate aminotransferase (AST) – 44 U/L;
- Alanine aminotransferase (ALT) – 15 U/L;

On both plane and contrast radiographs, an oval radiopaque mass was observed in the caudal abdomen just under the lumbar vertebrae in front of the pelvic inlet (Fig. 1). This mass pushed down the rectum near the ventral abdominal wall. An unusual radiopaque mass in the cranial mediastinum connected to the heart was observed on thoracic radiographs (Fig. 2). A marked displacement of the trachea also was seen. A normal electrocardiogramme was recorded.

Metastasis of seminoma to the regional sublumbar lymph nodes was suspected and the dog was operated in order to remove the tumour mass and to alleviate the difficult defecation. Anaesthesia was well tolerated and no arrhythmias were ob-



**Fig. 1.** Lateral view of the caudal abdomen showing a huge atypical mass under the lumbar vertebrae (ellipse) displacing the rectum filled with contrast medium (arrow) towards the ventral abdominal wall.



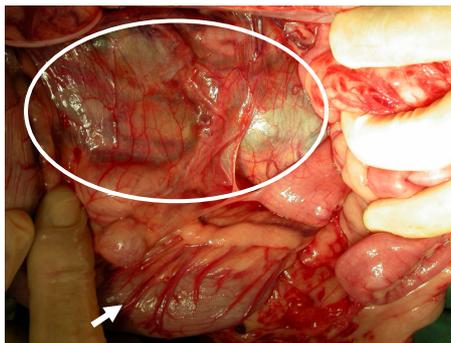
**Fig. 2.** Lateral thoracic radiograph showing an atypical radiopaque mass cranially to the heart (white arrow) and a marked dorsal dislocation of the trachea (black arrow).

served during the operation.

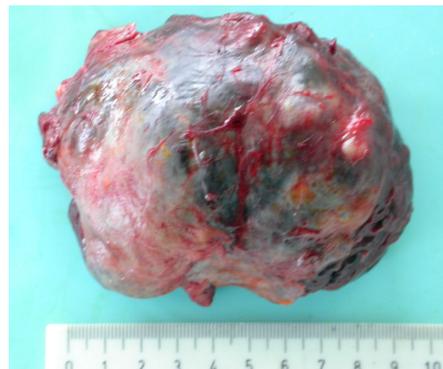
The abdominal cavity was opened by incision over the white line. An enormous firm reddish-blue mass filling up almost the entire caudal part of the abdominal cavity was exposed (Fig. 3, 4). It was located in the retroperitoneal space in immediate vicinity of the kidneys and closely bound to the abdominal aorta and surrounding peritoneum. No one of the organs in the peritoneal cavity was af-

fected. The mass was carefully and entirely removed. Tissue samples were sent to the histopathologic laboratory for histological examination. The animal recovered well from anaesthesia and surgery and left the clinic the same day. The hindlimbs swellings resolved immediately after operation.

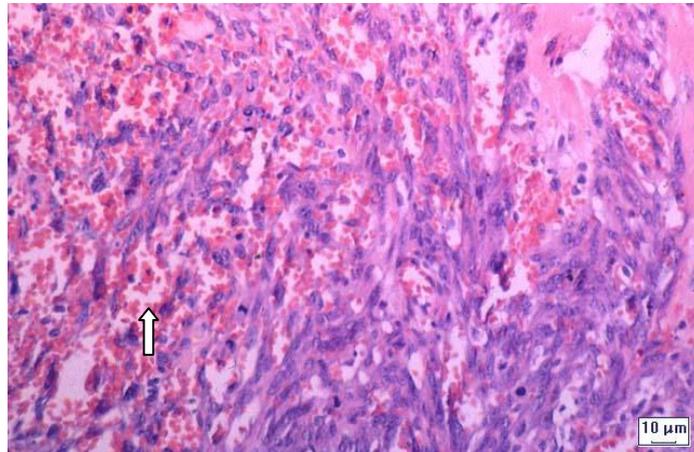
Unfortunately, the dog died two days later. At necropsy, a ruptured tumour mass of the right atrium of the heart and a hae-



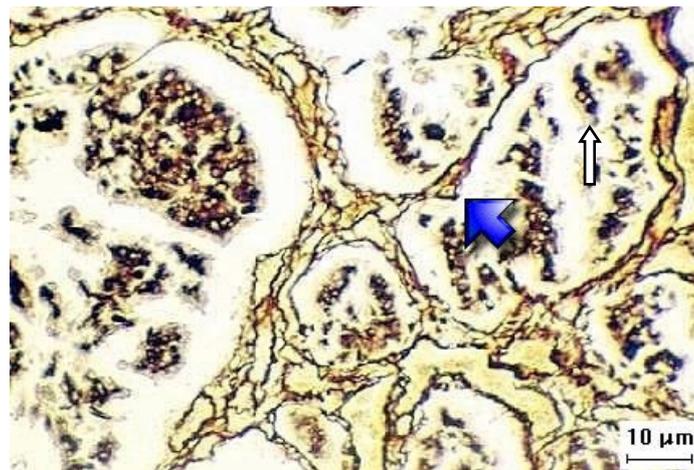
**Fig. 3.** Intraoperative view of the tumour mass. Note retroperitoneal location – the peritoneal cover is obvious (into the ellipse) and the rectum is ventrally displaced (arrow).



**Fig. 4.** View of the tumour after surgical removal.



**Fig. 5.** Histological section of an abdominal tumour tissue sample. Spindle-shaped to ovoid neoplastic cells which formed irregular blood vessels (arrow). Pleiomorphic and hyperchromatic nuclei are visible. H/E stain.



**Fig. 6.** Histological section of an abdominal tumour tissue sample. Reticulin fibers are staining black (white arrow). There are neoplastic endothelial cells (dark arrow) inside tumour vessels. Most of the neoplastic cells are fallen in the vessels lumen (weak connection between neoplastic cells correlating with tumor malignancy). Gomori's reticulin stain.

mopericardium were found. This tumour mass was the same in appearance as the abdominal tumour. Tissue samples were sent for histological determination of the tumour.

*Pathologic findings.* The histological findings revealed that both cardiac and abdominal tumours had the characteristics of a hemangiosarcoma (Fig. 5). The shape of neoplastic cells varied between fusi-

form and oval. These cells formed small vessels of different shape and size, filled up with blood. Tumour cells' nuclei were polymorphic and hyperchromatic. Protruding nucleoli and mitotic figures were very often observed. The presence of lymph tissue around the abdominal tumour mass indicated that this neoplastic formation was metastatic.

Reticulin fibers around vascular spaces stained positively with Gomori's reticulin method (Fig. 6).

\* \* \*

It is known that HSA is the most common cardiac tumour identified in dogs. In the large retrospective study of Ware & Hopper (1999), the number of HSA was almost 10-fold higher than the number of the 2nd most common cardiac tumour, the aortic body tumour. Primary heart tumours were more common than cardiac metastases. Most heart tumours are classified as malignant. Cardiac tumours (excluding lymphoma) occurred most commonly in dogs between the age of 7 and 15 years and there were no breed or sex predisposition (Brown *et al.*, 1985). In very old dogs (>15 years), the frequency of cardiac tumours was the same or lower than that of the youngest age group.

Cardiac HSA usually metastasize to the liver or to the lung (Hirsch *et al.*, 1981). Although the metastatic site of this cardiac HSA in our case was unusual, it is interesting to note that in another retrospective study, most of the retroperitoneal tumours (excluding those originating from the adrenal glands, kidneys and ureters) were HSA (Liptak *et al.*, 2004). Moreover, the authors reported a mean survival time of 37.5 days regardless of the therapy. In another study the mean survival time without any treatment was 123 days

(Brown *et al.*, 1985). The authors also reported that there was no difference in survival times according to therapy or the stage of disease. In cats, the reported mean survival times were 22 weeks for abdominal HSA and 44 weeks for subcutaneous HSA (Scavelli *et al.*, 1985).

The previous history of seminoma as well as sublumbar lymph nodes metastasis misleded us about the initial diagnosis. The prognosis of seminoma is good. The metastatic rate is low – 6 to 11% (Nielsen & Kennedy, 1990) and limited to the regional lymph nodes. Castration and excision of enlarged lymph nodes is generally the treatment of choice for all testicular tumors (Postorino, 1989). With this regard, we decided to operate in order to improve defecation and the health condition of the animal.

The laboratory data showed a slight anaemia, moderate leukocytosis and normal values of blood urea, creatinine, ALT and AST, as was reported in other studies (Wang & Su, 2001; Gülbahar *et al.*, 1998). The thoracic radiograph finding was the sign of orientation to HSA in our case. According to Holt *et al.* (1992) the radiographic sensitivity was 47%, and the negative-predictive value for cardiac HSA was 43%.

An ECG may be helpful in identifying the presence of pericardial effusion and/or myocardial disease. Arrhythmias including tachycardia and ventricular premature contractions may be detected, suggesting myocardial damage. Electrical alternans, if seen, is an indication of pericardial effusion (Bonagura, 1981). No abnormalities were detected on ECG in our case.

Canine HSA is an aggressive and malignant neoplasia with a grave prognosis. The overall survival time reported in dogs with HSA was 6 months at the time of diagnosis (Sorenmo *et al.*, 2004). The

reported mean survival times of dogs with cardiac HSA that underwent surgical therapy alone ranged between 3 and 5 months (Aronsohn, 1985; Clifford *et al.*, 2000; Withrow & MacEwen, 2001). Surgery and chemotherapy have limited success in prolonging survival times and increasing quality of life in dogs with HSA. Likewise, surgery could not be performed on every site, especially when the tumour is located in the heart. Complications after surgery are common and included atrial and ventricular arrhythmias, anaemia, disseminated intravascular coagulation, and pneumonia (Aronsohn, 1985). Chemotherapy with doxorubicin and cyclophosphamide appears to improve survival with acceptable morbidity only in patients with early stage disease (Clifford *et al.*, 2000). Radiotherapy has no effect in the treatment of canine HAS since the tumour is generally considered a systemic rather than a localized disease (Withrow & MacEwen, 2001; Smith, 2003). Promising new treatment options include inhibitors of angiogenesis that seem to be safe and, unlike conventional chemotherapy, do not induce drug resistance (Clifford *et al.*, 2000).

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