

# UNIVERSITY OF MINNESOTA

## **Veterinary Diagnostic Laboratory** **College of Veterinary Medicine**

1333 Gortner Avenue  
St. Paul, MN 55108

1-800-605-8787

612-625-8787

Fax: 612-624-8707

e-mail: [vdl@umn.edu](mailto:vdl@umn.edu)

[www.vdl.umn.edu](http://www.vdl.umn.edu)

**Accession Number:** D07-010657

**Owner:** Kitty Mohs 7550 Queen Street Greenfield, MN 55357

**Veterinarian:**

Veterinary Center on Main  
123 Central Avenue  
Osseo, MN 55369

**Site:**

**Received:** 03/02/2007

**Reference:** Jake

**Species:** Canine

**Breed:** German Shepherd

**Age:** 10 years

**Sex:** M/N

**Weight:** 37.1 kg

**History:** The dog had an aural hematoma repair performed on 01/26/2007. The blood chemistry and CBC were within normal limits just prior to the repair. At the recheck appointment on 02/13/2007 there was right facial nerve paralysis noted. The thyroid panel was to be checked, but the dog died suddenly at home, the following week on 03/01/2007. The necropsy was performed on 03/02/2007 by Dr. Susan Detmer, under the supervision of Dr. Anibal Armien.

**Specimen:** A white german shepherd dog was presented in a good state of postmortem preservation.

**Necropsy:** Body Condition Score: 3/5 (1=emaciated and 5=obese).

General Findings (mucous membranes, body orifices): The mucous membranes were a light yellow.

Integumentary system: The hair was discolored (yellowed) on the rump, hind limbs and front feet. The hair was cut short over the gluteal muscles. There were small multifocal hemorrhages in the subcutaneous fat.

Body cavities: There was 1 liter of dark red opaque fluid in the abdominal cavity and 500 ml of dark red opaque fluid in the pericardial sack.

Respiratory system: There were multifocal, soft, round, dark red masses ranging from 3 to 5 mm in diameter, throughout the lung parenchyma.

Cardiovascular system: There was a 1 cm diameter, dark red, irregular mass in the right auricle. The heart weighed 278.7 grams and the free walls of the left and right ventricles and interventricular septum measured 20, 7, and 20 mm, respectively.

Alimentary system: The liver weighed 1750 grams (The expected weight of the liver for a 37 kg dog is approximately 1113 grams) and had multiple dark red masses, the largest measuring 10x8x7 cm. There was a large blood clot (15x10x2 cm) attached to a fissure in the largest mass in the liver. The esophagus contained a scant amount of creamy pea green material along its full length. The stomach contained seven 4x0.8x0.3cm strips of blue leather, partially digested chicken tenders and a moderate amount of creamy pea green material. The small intestines contained a moderate amount of creamy orange material with occasional blood clots. The colon contained dark red soft material.

Urinary system: Both kidneys had a 2x1x1cm dilation containing clotted blood at their renal pelvises.

Muscular system: There were small (<2 cm diameter) multifocal hemorrhages in the muscles of the trunk, abdomen and neck.

Skeletal system: no significant macroscopic lesions were present.

Endocrine system: The thyroids were dark red.

Reproductive system: The specimen was a neutered male.

Hemolymphatic system: The spleen had three large, masses with multiple dark red blood clots inside measuring 7x7x10cm, 5x7x7cm, and 7x8x7 cm. The abdominal, prescapular, submandibular and axial lymph nodes were all enlarged and dark red.

Nervous system: no significant macroscopic lesions were present.

**Histopathology:**

SLIDE A: Lungs – There were small multifocal areas of tumor invasion, centering over the blood vessels. The blood vessel walls were disrupted by neoplastic endothelial cells, similar to those described in the heart. There was also a large blood filled vascular space that was lined by neoplastic endothelial cells. There were also areas of multifocal inflammation of the alveolar and interstitial walls. There were infiltrates of lymphocytes, plasma cells, and macrophages around the tumor foci. There were infiltrates of hemosiderin laden macrophages in the alveolar walls and spaces.

SLIDE B: Heart – There was a locally extensive infiltration of neoplastic mesenchymal cells in the wall of the right auricle and atrium. The neoplastic cells were pleomorphic ranging from spindle to polyhedral in shape with large pleomorphic nuclei exhibiting one or more fairly prominent nucleoli surrounded by abundant slight basophilic cytoplasm with indistinct cell borders. The cells were displayed a moderate amount of anaplasia and he frequent mitotic figures. The neoplastic cells were surrounding areas of erythrocytes, neutrophils and fibrin deposits. The tumor contained multiple small foci of necrosis characterized by hypereosinophilic cells with pyknotic and ruptured nuclei. These foci were also accompanied by fibroblasts, lymphocytes and fibrin deposits.

SLIDES C&D: Liver – There were several blood filled vascular spaces of varying sizes separated by connective tissue septa that were lined by neoplastic mesenchymal cells (hemangiosarcoma). The tumor cells were in sheets or lined many blood filled sinusoids accompanied by multifocal areas of hemorrhage, necrosis and neutrophilic infiltration.

SLIDE E: Kidneys – There was mild to moderate glomerular tufting and increase mesangial matrix with occasional synechia. The distal tubular endothelial cells contained golden brown pigmented granules. There were multifocal infiltrates of lymphocytes and plasma cells near the corticomedullary junction. There were small multifocal hemorrhages in the interstitium of the cortex and medulla.

SLIDE F: Thyroid gland – There were multifocal mineralized follicles in both thyroid glands.

SLIDES G&H: Adrenal gland – In one adrenal gland, there was a single cortical focus composed of many capillary type lumina lined by neoplastic mesenchymal cells.

SLIDES I&J: Spleen – There were several large blood filled vascular spaces separated by connective tissue septa that were lined by neoplastic mesenchymal cells (hemangiosarcoma). In some areas of the tumor neoplastic cells were arranged in bundles or sheets of closely packed cells. Throughout the tumor there were multifocal areas of necrosis with hemorrhage and deposits of fibrin. The spleen contained scattered aggregates of hemosiderin-laden macrophages.

SLIDES K, L, M and N: Brain and facial nerve– There were no significant microscopic lesions. Histopathology of the facial nerve nuclei in the brainstem is pending.

**Diagnosis: FINAL:**

Spleen, right auricle and atrium, hemangiosarcoma, high grade.

Liver, lung, and adrenal gland, metastatic hemangiosarcoma.

Thyroid gland, follicular mineralization, mild, chronic.

Kidneys, mild glomerulosclerosis and lymphoplasmacytic interstitial nephritis, chronic.

Hemopericardium, marked, acute (gross).

Hemoperitoneum, marked, acute (gross).

**Comment:** The most likely cause of death was exsanguination secondary to rupture of an abdominal hemangiosarcoma, leading to hemoperitoneum. The hemopericardium can result from rupture of the tumor on the heart and can lead to cardiac tamponade, which is also fatal. The most common primary sites of the hemangiosarcoma are the right auricle and spleen, with metastasis to the lung, liver, lymph nodes and other organs. Hemangiosarcomas metastasize early and frequently; therefore they often have a poor prognosis. The hemorrhages in the muscles, subcutis and lymph nodes are all possible signs of disseminated intravascular coagulopathy (DIC). Hemangiosarcoma is one of the neoplasias that have been known to be accompanied by DIC.

**Addendum:** Histopathology (03/26/2007): SLIDE N: Brainstem: There were no significant microscopic lesions.

No obvious cause of the facial paralysis was found. However, the entire path of the facial nerve was not examined microscopically, therefore a lesion within the nucleus, nerve root or nerve cannot be ruled out.

Anibal G. Armién, DVM, MSc, PhD, Diplomate, ACVP

Susan E. Detmer, DVM

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Fax (763) 315-4732 Ph (763) 315-4643

Fax:	Mail:	Written: 03/09/2007	Addendum: 03/26/2007
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