

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
www.vdl.umn.edu

Accession Number: D08-067179

Owner: MALINOWSKI, PAT
238 ALTHEA LN
HOPKINS, MN 55343

Veterinarian:
Hopkins Pet Hospital
8870 Excelsior Blvd
Hopkins, MN 55343

Site:
Received: 12/30/2008
Reference:
Species: Canine
Breed: German Shepherd Dog
Age: 8.5 years
Sex: Male
Weight: 44.7 kg

History: The dog was noted to be normal on 11/23/2008. A difference in gate and weakness in the right front and left hind limbs was noted on 11/24/2008. The dog was taken to the veterinarian for evaluation. The dog was started on Rymadyl® to help with these clinical signs. The weakness became progressively worse over the next two weeks to where standing became difficult. Weight loss was noted as the weakness progressed. Two years ago the dog was genetically tested for Degenerative Myelopathy. This test was positive for genetic markers for the disease. The animal was euthanized on 12/30/2008 due to the progressing weakness. The necropsy was performed on 12/31/08 by Kirsten Jagow, Mary Luebbers, and Melissa Lee under the supervision of Dr. Bouljihad and Dr. Remmers.

Specimen: [O'Leavy's Real McCoy] a white, male intact, German Shepherd dog was submitted in a good state of post mortem preservation. Microchip identification was not detected.

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

General Findings (mucous membranes, body cavities): There were no significant gross abnormalities.

Integumentary system: A 10 mm x 7 mm oblong, black, roughened area (callus) was found on the left elbow.

Muscular system: There were no significant gross abnormalities.

Skeletal system: Boney proliferation was found on the ventral surface of the vertebral bodies, bridging the disk spaces of cervical vertebra 7 to lumbar vertebra 1, and all lumbar vertebra. This was most severe over lumbar vertebra 3 to lumbar vertebra 4. The disk spaces of thoracic vertebra 13 to lumbar vertebra 1, lumbar vertebra 2 to lumbar vertebra 3, and lumbar vertebra 7 to sacral vertebra 1 were semi-firm, fibrous, yellow to green, and dry. Disk protrusion into the spinal canal could be seen at the disc space between thoracic vertebra 12 to thoracic vertebra 13 and lumbar vertebra 2 to lumbar vertebra 3. There was mild fibrillation of both femoral head, moderate fibrillation to eburation on both lateral condyles of the femur and the trochlear notches and anconeal process of the ulna.

Respiratory system: All lung lobes were diffusely mottled dark red and pink. A small amount of white froth was in the carina of the bronchi.

Cardiovascular system: There were multiple, 1 mm in diameter, well demarcated, tan, smooth nodules along the free edge of the mitral and tricuspid valves. The heart weighed 396 grams, 0.89% (0.85-1% of body weight is considered normal). The right ventricular free wall, left ventricular free wall, and interventricular septum measured 8, 18, and 14 mm, respectively

Alimentary system: There was moderate calculus on the caudal aspect of all canines, and the buccal surface of the upper molars and premolars. The mucosal surface of the stomach was smooth and dark red to purple. The mucosal surface of the duodenum was pale tan with multifocal small, dark red to purple foci. One similar larger, 12mm x 7mm, flat, irregular, smooth, well demarcated, red to purple area was also found on the duodenal mucosal surface. The remaining intestinal mucosal surface was pale tan and smooth. The stomach contained a large amount of liquid, partially digested commercial dog food and multiple small, coarse, white granules; all measuring less than 1 mm. The small intestine contained a moderate amount of tan, viscous, liquid ingesta that transitioned to a minimal amount of beige paste in the ileum. The colon was moderately distended with green-tan, semi-formed feces. The liver weighed 1,928 grams, 4% (normal = 3% of body weight).

Urinary system: The cranial pole of the right kidney contained a flat, white, soft, circular focal area measuring 9mm x 9mm which on cut section consisted of a cavernous depression extending through the cortex but not entering the medulla, filled with red tinged watery fluid. The walls of this depression were covered in a thin, white tissue creating a sack.

Endocrine system: There were no significant gross abnormalities.

Reproductive system: The dog was an intact male. The prostate measured 65mm x 53mm x 27mm. The surface was smooth and tan.

Hemolymphatic system: There were no significant gross abnormalities.

Nervous system: There were no significant gross abnormalities on eyes, brain, spinal cord, sciatic nerves and brachial plexus.

Histopathology:

Lungs – 4 sections (Slide A): The alveolar lumen contained a moderate amount of pale eosinophilic, wispy to amorphous material (edema). The alveolar septae were mildly distended by erythrocytes (congestion). There were rare dilated alveoli with ruptured alveolar septae (emphysema).

Heart – 1 section (Slide B): There were no significant microscopic abnormalities.

Skeletal muscle – 1 section (Slide B): There were no significant microscopic abnormalities.

Pancreas – 1 section (Slide C): There were no significant microscopic abnormalities.

Duodenum – 2 sections (Slide D): There were no significant microscopic abnormalities.

Stomach – 1 section (Slide D): There were no significant microscopic abnormalities.

Jejunum, ileum – 4 sections (Slide D): There were no significant microscopic abnormalities.

Liver – 4 sections (Slide E): There were no significant microscopic abnormalities.

Kidney – 2 sections (Slide F): There was one focal extensive cyst compressing the adjacent renal parenchyma and lined by a thin layer of interstitial fibrosis admixed with a small number of lymphocytes and plasma cells. Blood vessels were mildly distended by erythrocytes (congestion). Within the tubules, there was a small amount of intra-cytoplasmic, light brown, globular material (hemoglobin).

Adrenal gland – 2 sections (Slide G): There was mild accumulation of erythrocytes in the interstitium of the zona reticulate and part of the fasciculata (congestion). There was multifocal interstitial and intracellular light brown foamy material within those areas of congestion.

Lymph node – 1 section (Slide G): There were no significant microscopic abnormalities.

Spleen – 1 section (Slide H): The red pulp was distended by a large number of erythrocytes (congestion).

Bone marrow – 1 section (Slide H): The cellularity of the bone marrow was approximately 15%. All cell lineages were present. The ratio myeloid:erythroid precursor was 1:1.

Prostate – 1 section (Slide I): The prostatic acini were larger than expected as the epithelium was hyperplastic and the cells enlarged (hypertrophy). There was abundant granular apical cytoplasm and uniform size and shape of cells. Mitosis activity was very low. There was hyperplasia of the interlobular and to a lesser extent the interlobular fibromuscular stroma.

Testicle – 1 section (Slide J): There were no significant microscopic abnormalities.

Spinal cord – 6 sections (Slide K): Multifocally within the white matter, there was a mild to moderate number of dilated myelin sheath with occasional accumulation of eosinophilic amorphous material (axonal spheroid). The neuronal bodies sometimes contained a moderate amount of intra-cytoplasmic golden brown granules (lipofuscin). There was mild gliosis. A few neuronal bodies were hypereosinophilic and angular (chromatolysis). There were rare, intra-cytoplasmic or free in the neuropil, basophilic, 5-20 um particles (Lafora bodies).

Sciatic nerves – multiple sections (Slide L): There were no significant microscopic abnormalities.

Cerebrum – 1 section (Slide M): There were no significant microscopic abnormalities.

Eye – 1 section (Slide O): There were no significant microscopic abnormalities.

Diagnosis:

- 1) Spinal cord, axonal degeneration, multifocal, moderate, chronic with mild gliosis
- 2) Intervertebral disk, degeneration, moderate, multifocal, chronic with mild protrusion within the spinal canal
- 3) Vertebra, spondylosis deformans, focally extensive, moderate to marked, chronic
- 4) Femoral head, osteochondrosis, bilateral, focal, mild, chronic
- 5) Lateral femoral condyle, osteochondrosis, bilateral, focal, moderate, chronic
- 6) Ulnar trochlear notch and anconeal process, osteochondrosis, bilateral, focal, moderate, chronic
- 7) Prostate, prostatic hyperplasia, moderate, diffuse, chronic
- 8) Heart, tricuspid and mitral valves, endocardiosis, multifocal, mild, chronic
- 9) Right kidney, renal cyst, focal, mild, chronic
- 10) Dental calculus, moderate, chronic

Comment: The lesions seen in the spinal cord are compatible with degenerative myelopathy. The presence of mild intervertebral disk protruding in the spinal canal was not severe enough to explain the histopathological lesion of this dog, as the disk did not seem to compress the spinal cord. The prostatic changes are consistent with benign prostatic hyperplasia. This condition occurs in almost all intact dogs over the age of 5 years. The endocardiosis is commonly seen in older dogs. The focal area in the right kidney is consistent with a renal cyst and did not appear to be impairing renal function. This animal had also evidence of osteochondrosis in the elbow, stifle and hip joints that were moderate to mild and were not likely the cause of clinical sign. The body was placed on hold until 01/30/2009 for further samples to be taken if so desired at a later date.

Communication: (12/31/2008, 1h30 PM): I talked with the owner of the dog and told her that we found some evidence of intervertebral disk protruding into the spinal cord. Histopathology is needed for the diagnosis of degenerative myelopathy. I told her that the best way to diagnose osteochondrosis is to take X-Rays and that this will be additional cost and we had save bone for this purpose. She declined additional cost. Genevieve Remmers, DVM

(12/31/2008): I went back and opened the joints and found evidence of osteochondrosis in multiple joints (please refer to description and diagnosis). Genevieve Remmers, DVM

Mostafa Bouljihad, DVM, PhD

Genevieve Remmers, DVM

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Fax (952) 935-1823 Ph (952) 935-5566

Fax:	Mail:	Written: 01/12/2009	Addendum:
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