MICHIGAN STATE UNIVERSITY

DCPAH
Diagnostic Center for Population & Animal Health

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**REPORT OF LABORATORY EXAMINATION**

Client:
White Shepherd Genetics- (295483)
Project - Attn: Judy Huston
PO Box 404
Howell, MI 48844

Owner:
Erskine, Gloria
7126 Wolf Run
Clarksville MI 48815

| | | | | | |
|---|---|---|---|---|---|
| Rcvd Date: | 2/28/2012 4:13:00 PM | Animal: | CHANCE | MRN: | |
| Admitted By: | Not, Applicable | Species: | Canine | Breed: | German Shepherd |
| Ordered By: | N/A | Age: | 11 years | Gender: | Fetus, Male |
| Encounter: | 01319528 | Tag/Reg ID: | | | |
| CR#: | AP | Other ID: | | | |

# *Necropsy Preliminary Report*

| Accession Number: | Received Date/Time: | Verified Date/Time: | Pathologist: |
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| NC-12-0000239 | 2/28/2012 4:16:00 PM | 2/29/2012 8:41:08 PM | Patterson, Jon S. |

## History

An 11-year-old, intact male, white German shepherd was euthanized on 2/28/12 after a 1.5-year history of progressively worsening hind limb weakness. He was "unstable" in the hind end, and had a pacing rather than a trotting gait. There was minimal tail tone, and the dog had lost full control of defecation. Some weight loss also was reported. Other than this recent history, the dog did not have many illnesses earlier in his life, except for chronic ear infections which were difficult to resolve. Additional history is on file at the DCPAH.

## Gross Description

A 36.6-kg dog in good nutritional condition and fair post mortem condition was presented dead for necropsy. The necropsy was performed on 2/29/12.
The gingiva was moderately excessively receded above the third upper incisor tooth bilaterally. The linings of both external ear canals were moderately thickened and corrugated, but the skin was a normal tan color. Both canals contained a moderate amount of light brown, waxy material. The skin was shaved in a 4x4-cm area on the dorsal aspect of the left antebrachium.
There was a raised, semicircular mass in the skin of dorsomedial aspect of the left front fetlock, between digits 2 and 3, and beginning approximately 1 cm distal to the base of the dewclaw and extending to a point approximately 6.5 cm from the tips of the digits. The mass was 3.5 cm long (proximal to distal), 2.5 cm wide (medial to lateral), and 1 cm thick, involving the epidermis and dermis. The center of the mass was alopecic and red in a round, 1-cm diameter area, and on cut section, the mass was firm and tan white.
There was a thick, 3.5x2-cm, elliptical, red black, dry callus on the lateral aspect of the right elbow. A similar, yet thinner, 3x1.5-cm callus was present on the lateral aspect of the left elbow.
There was moderate atrophy of gluteal and quadriceps femoris muscles bilaterally.
Semi-formed, brown feces was present at the anus and on the perineum.
The vertebral column was examined and the entire spinal cord was removed and examined. The spinal cord was grossly normal. Intervertebral discs between vertebrae C5 and C6, and between C6 and C7 were yellow brown, dry, and flaky (degenerate), but there was no protrusion into the vertebral canal. There was moderate bridging spondylosis on the ventral

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aspects of vertebral bodies at intervertebral spaces T4-T5 and T5-T6. The bony bridges were white, hard, ventrally rounded, 12 mm long, and 7 mm tall (dorsoventral). At T4-T5, the periphery of the bony bridge was white in a 3-mm wide band, and the center was black.
There was severe bridging spondylosis at intervertebral spaces T13-L1, L1-L2, L2-L3, L3-L4, L5-L6, and L7-S (lumbosacral junction). The white bony bridge was 15 mm long and 6 mm tall at T13-L1; 28 mm long and 9 mm tall (and square, rather than rounded on sagittal section) at L1-L2; 21 mm long and 9 mm tall at L2-L3; 18 mm long and 7 mm tall at L3-L4; 26 mm long and 8 mm tall at L4-L5; 21 mm long and 5 mm tall at L5-L6; and 20 mm long and 4 mm tall at L7-S.
The intervertebral disc material at T13-L1 was diffusely yellow brown, dry, and flaky. The disc material at L1-L2 was yellow dorsally and ventrally, but white in the center (nucleus pulposus region). The disc at L2-L3 was brown black ventrally (6 mm) and yellow dorsally. The disc at L3-L4 was yellow in the ventralmost 6-mm annulus portion. The disc at L4-L5 was yellow dorsally and black ventrally. THe discs at L5-L6 and L6-L7 were grossly normal. The disc at L7-S was yellow, dry, and flaky diffusely, and was wider (5 mm) than the other lumbar discs (3-4 mm). There was no obvious protrusion of degenerate disc material into the vertebral canal at any site.
The head of the pancreas was dark red on its serosal and cut surfaces in an irregularly shaped, 2x3-cm area. Small intestinal contents were creamy and tan. The liver weighed 1.65 kg, and was grossly normal in color and texture. The supcapsular and cut cortical surfaces of the kidneys were mottled light brown and dark red; this was more evident in the right kidney than in the left.
The prostate gland was 5 cm (wide) by 3.7 cm (cranial to caudal) by 3.3 cm (dorsoventral), symmetric, spongy, and tan.
The right testis contained one spherical, 1.2-cm diameter, soft, yellow brown mass; one half of the mass was dark red.
The left testis contained 3 similar masses; one was 1.4 cm in diameter, one was 0.7 cm in diameter, and one was 0.4 cm in diameter. The masses were soft and brown yellow, and the largest of the 3 masses had a soft red center.

## Gross Diagnosis(es)

**severe multifocal intervertebral disc degeneration**
**moderate to severe intervertebral bridging spondylosis**
**moderate bilateral gluteal and quadriceps femoris muscle atrophy**
**moderate prostatic hypertrophy**
**bilateral testicular neoplasms (interstitial cell tumors, presumptive)**

**Comment:**
Intervertebral disc degeneration and bridging spondylosis were marked in the lumbar vertebral column, but there was no gross evidence of disc protrusion or rupture. Histopathologic examination of spinal cord, brain, and major organs is in progress.

Jon S. Patterson, DVM, PhD, Dipl ACVP
Anatomic Pathologist

Jon S. Patterson, DVM, PhD, DACVP

(Electronically signed by) JSP

Verified: 02.29.2012 20:41

JSP /JSP

# Necropsy Final Report

| Accession Number: | Received Date/Time: | Verified Date/Time: | Pathologist: |
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| NC-12-0000239 | 2/28/2012 4:16:00 PM | 3/8/2012 3:59:56 PM | Patterson, Jon S. |

## History

see previous report

## Gross Description

see previous report

## Gross Diagnosis(es)

see previous report

## Laboratory Findings

NA

## Microscopic Description

Sections of spinal cord (4 cervical, 8 thoracic, 8 lumbar, 2 sacral, 10 cauda equina), brain, lung, liver, kidney, heart, spleen, testes, prostate gland, thyroid gland, parathyroid gland, pancreas, small intestine, colon, lymph node, and skin were examined.
In sections of caudal thoracic spinal cord, there was mild to moderate, patchy loss of myelin staining in the peripheral white matter, along with scattered large vacuoles, suggesting fragmentation of myelin sheaths. Occasional vacuoles contained granular pale basophilic debris or macrophages. Rare axonal spheroids were present. Changes were similar but less severe in more cranial segments of the thoracic cord.
In sections of cranial lumbar spinal cord, there was mild patchy loss of myelin staining in dorsal funiculi, with occasional vacuoles. Caudal lumbar segments showed mild spongiosis of white matter, with rare spheroids.
There was very mildly decreased myelin staining in the peripheral white matter of the cervical spinal cord, with rare spongiosis.
There was mild spongiosis, with mild linear patchy loss of myelin staining, in the cauda equina. Occasional vacuoles (areas of spongiosis) contained pale basophilic, granular debris or swollen, pale basophilic axons. There were plaques of very dense collagen or osteoid-like material in the dura mater, with small numbers of scattered lymphocytes, plasma cells, and macrophages. Thin bands of dense fibrous tissue dissected through one spinal root ganglion.
Many neuronal cell bodies in the spinal cord, spinal root ganglia, and lesser numbers of neurons in the brain contained granular, gray brown to yellow brown pigment compatible with lipofuscin.
Four sections of testis were examined, and in three, there were discrete masses composed primarily of dense nests of large polygonal cells with uniform, round to oval nuclei and abundant pale eosinophilic, rather homogeneous to granular cytoplasm. A delicate fibrovascular stroma separated or surrounded the nests of neoplastic cells. Mitotic figures were rare among the neoplastic cells. In one of the masses, there were multiple coalescing areas of hemorrhage. In another mass, approximately one-third of it was composed of large polygonal cells with large, round to oval, generally hypochromatic nuclei and a small to moderate quantity of pale basophilic cytoplasm. These cells were arranged in larger, less distinct nests or in sheets, and there was moderate anisocytosis and anisokaryosis. Approximately 5 mitotic figures per 10 HPF were present.

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The skin mass described in the gross necropsy report on the left front limb was a foreign body granuloma composed primarily of macrophages, lymphocytes, plasma cells, and various numbers of neutrophils in the dermis, surrounding hair follicles and apocrine glands. A few foci contained extruded hair shafts and necrotic debris in their centers.
In sections of heart, there were a few small areas in the myocardium where myofibers were atrophied and surrounded by mildly increased quantities of fibrous tissue. The liver was diffusely congested, and occasional aggregates of Kupffer cells containing hemosiderin were present. Many renal glomeruli contained mildly increased amount of eosinophilic matrix, and scattered tubular epithelial cells contained yellow brown or orange brown, granular pigment (hemosiderin or bile). In sections of lung, there were areas in which alveoli contained homogeneous eosinophilic material, indicating edema. Also, there were multiple peribronchiolar aggregates of macrophages containing granular black, or irregularly shaped, granular to linear, refractile material (pneumoconiosis). The spleen was diffusely congested, with scattered hemosiderin-laden macrophages.
The adrenal cortex was congested in the zona reticularis. Many thyroid follicles contained pale basophilic colloid, and in a few follicles, the colloid material was mineralized. There was moderate diffuse hypertrophy and hyperplasia of prostatic epithelium. In a section from the head of the pancreas, there was locally extensive interlobular and intralobular hemorrhage, without evidence of inflammation or necrosis.
There were no other significant histopathologic findings.

## Morphologic Diagnosis(es)

mild to moderate myelin and axon degeneration of the spinal cord (especially caudal thoracic and cranial lumbar)
mild to moderate myelin and axon degeneration of the cauda equina, with multifocal dural fibrosis and ossification
mild to moderate neuronal lipofuscinosis (brain and spinal cord)
testes: multiple interstitial (Leydig) cell tumors; one seminoma
skin: focal granulomatous to pyogranulomatous dermatitis, with extruded hair shafts ("foreign body" granuloma)
prostate gland: moderate diffuse epithelial hypertrophy and hyperplasia
heart: mild multifocal myocardial atrophy and fibrosis
lungs: mild pneumoconiosis
kidneys: mild membranous glomerulopathy
liver: moderate diffuse congestion

## Final Diagnosis(es)

**mild to moderate degenerative myelopathy**
**mild to moderate lumbosacral stenosis (presumptive)**
**severe multifocal intervertebral disc degeneration**
**moderate to severe intervertebral bridging spondylosis**

**Comment:**
Histopathologic changes in the caudal thoracic and cranial lumbar spinal cord were suggestive of degenerative myelopathy. Changes in the cauda equina nerve roots were suspicious for lumbosacral stenosis as well, but this is difficult to confirm because arthritis and narrowing of the vertebral canal at the lumbosacral joint are hard to appreciate at necropsy. There was no histopathologic evidence of focal spinal cord compression to go along with the degenerative disc disease noted grossly.
The testicular tumors and prostatic hypertrophy and hyperplasia were not unexpected in this older, intact male dog. Other microscopic findings (in major organs) were probably of no clinical consequence.

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Anatomic Pathologist

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(Electronically signed by) JSP

Verified: 03.08.2012 15:59

JSP /JSP

# Special Requests

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|---|---|
| Collected Date/Time (If Provided) | 02/28/2012 16:18:00 |
| Procedure | |
| Notification * | "See Below" |

2/28/2012 4:18:00 PM Notification:
This report informs you of laboratory results associated with an Anatomic Pathology case. Laboratory results should be interpreted in conjunction with pathologic findings. In some instances, laboratory results may be received prior to the pathology report. In all instances, a cumulative report will be issued.