UCDAVIS VETERINARY MEDICINE
California Animal Health and
Food Safety Laboratory
18760 Road 112, Tulare, CA 93274-9042
(559) 688-7543
www.cahfs.ucdavis.edu

CAHFS Accession #: T1900043

FINAL REPORT

Ref.#: [redacted]

Coordinator: John Adaska DVM, MPVM, PhD, Dipl. ACVP

E-Signed and Authorized by: Adaska, John M. on 3/27/2019 9:17:57AM

Email To:
[redacted]

Collection Site:
[redacted]

This report supersedes all previous reports for this case

Specimens Received: 1 Carcass;

Date Collected: 01/05/2019 **Date Received:** 01/05/2019

Case Contacts

Submitter [redacted]
Report To [redacted]

Specimen Details

Animal/Source	ID Type	Taxonomy	Gender	Age
1 [redacted]	Name	African Elephant	Female	52.00 Years

Laboratory Findings/Diagnosis

African elephant with reluctance to walk and ultimately inability to rise

1. Euthanasia.
2. Severe bilateral osteochondrosis, distal humerus.
3. Moderate cystic endometrial hyperplasia.
4. Mild to moderate lipofuscin, neurons of the brain and trigeminal ganglia, old age change.
5. Mild to moderate, centrilobular to midzonal pigment accumulation, probable iron, liver.
6. Moderate submucosal hemosiderin, colon.

Case Summary

The presented elephant had very severe lesions within the cartilage of the distal humerus bilaterally with erosions and ulcerations. Other joints examined in both the front and rear legs had areas with mild to moderate lipping of the cartilage, thining and mild defects in cartilage and mild synovial proliferation when examined grossly. Photographs were taken of articular surfaces in all four legs at the time of examination and are available if they are needed. These smaller, more widespread changes are considered less significant than the lesions in the elbows. There were multiple tissues including liver and colon that had accumulation of pigment that is of uncertain identity. I have requested multiple special stains to try and define what this material more precisely but I suspect that there is bile accumulation in the liver and hemosiderin accumulation in the submucosa of the colon. Further reports will follow.

Additional Information 2/10/19: Iron stains confirmed that th material seen histologically in the subserosa of the colon was hemosiderin. Bile and copper stains of the liver were negative and this suggests that the material in the liver is iron. Mycobacterial culture of tracheobronchial lymph node by NVSL is pending and a final report will be sent when the results become available.

Additional Information 2/15/19: The liver iron in this animal was 820 ppm which is high relative to what we expect in most other species. We do not have a normal range for African Elephants. This supports the earlier thought that the material noted histologically in the liver is iron. A final report will be sent when Mycobacterium testing has been completed.

Final Report 3/27/19: The Mycobacterium testing of the tracheobronchial lymph node was negative. All testing has been completed.

Gross Observations

Examined is the carcass of a 52-year-old female African elephant (Loxodonta cyclotis) in good nutritional and postmortem condition. Based on the clinical history, this animal was euthanized by intravascular barbituates. There is mild loss of muscling over the pelvis. The tusks have been removed at the base. The skin is mild to markedly hyperkeratotic across approximately 80% of its surface area. In severely affected areas, such as the dorsum, the skin is raised in columnar cornifications that are up to 2.0 cm tall. Coating the length of the esophageal mucosa is a thin white friable membrane that is easily removed (suspect mucous and adhered feed material or candidiasis). Lungs are congested, soft and collapsed. The thymus contains an ~4.0 cm diameter cyst containing watery translucent yellow fluid. The tracheobronchial lymph nodes contain indistinct tan foci, up to 0.5 cm in diameter, on cut section (nodular hyperplasia suspected). The left kidney contains two cortical cysts that measure ~0.5 and 1.0 cm in diameter and contain watery, translucent yellow fluid. Along the serosal surface of the stomach are between 25 and 50 polypoid proliferations that are bunched together and extend up to 0.5 cm from the surface. The stomach contains a small amount of mucous admixed with hay. One examined ovary contains a single follicle and corpus luteum. Throughout the uterine mucosa are numerous cysts and polypoid proliferations that range from 0.2 to 1.5 cm in diameter. Similar polypoid proliferations extend from the vulva and are visible externally. There are also proliferations around the ovary/mesovarium. These are up to 0.5 cm, number between 20-30 and they are moderately papillomatous. Along the capsular surface of the spleen are numerous dark purple slightly raised foci that range from 1.0 to 2.0 cm in diameter. (I have seen these before in elephants and can't remember what Linda called them). Small intestines contains hay and the mucosa is somewhat dark. Large intestine contain hay and ingesta with numerous stones present in lumen (up to 2 to 3 cm dia).

All four limbs were disarticulated and the joint surfaces photographed. There were scattered small erosions of articular surfaces with mild bony proliferations along the margins. The most severe lesions were in both elbows where there were severe uclerations of the articular surface of the distal humerus.

Organ weights were as follows:
Thyroid gland: 430 gms (only 1 was weighed)
Liver: 30.7 kg
Kidney: Left: 6.07 kg, right: 7.04 kg
Heart: 22.08 kg
Spleen: 14.81 kg
Adrenal gland: left: 226 gms, right: 280 gms.

Bacteriology

Mycobacterium culture non regulatory- NVSL

Animal/Source	Specimen	Specimen Type	Results
1 [redacted]	(4) [redacted]/Tracheobronchial LN	Lymph Node Tissue	No Mycobacterium isolated scanned to case

SALMONELLA CULTURE - MAMMALIAN

Animal/Source	Specimen	Specimen Type	Results
1 [redacted]	(3) [redacted]	Colon Swab	No growth

Histology

Within the spleen there are large amounts of hemosiderin within the red pulp. The uterus has endometrial polyps which often consist of fibrous connective tissue with pale homogenous eosinophilic hyaline material in variable size aggregates. Other areas with polyps have multifocal and coalescing open structures lined by cuboidal to tall columnar epithelium and with wispy pale eosinophilic luminal material [cystic endometrial hyperplasia]. Individual glandular structures form indistinct aggregates and are often surrounded by variably thick dense band connective tissue. The brain and trigeminal ganglia have frequent neurons with small to moderate amounts of cytoplasmic lipofuscin. Within the brain there also occasional areas in which there is globular

gold-brown pigment. The stomach has frequent small papillary projections on the serosal surface and there are also occasional areas with moderate amounts of probable hemosiderin. In the liver centrilobular to midzonal hepatocytes have moderate amounts of course gold-brown cytoplasmic pigment. The colon sections have large amounts of globular cold-brown pigment similar to that described in the brain within the cytoplasm of large numbers of cells within the submucosa.

Detail of individual slides:
1. Spleen and tracheobronchial lymph node.
2-7. Reproductive.
8. Teat.
9. Tracheobronchial lymph node.
10. Pre-scapular lymph node and two miscellaneous lymph nodes.
11. Miscellaneous lymph node.
12. Right trigeminal ganglion.
13. Left trigeminal ganglion.
14. Trachea.
17. Tendon.
18. Joint wall and synovium.
19-24. Stomach
26. Left ventricle, heart.
27. Pulmonis valve.
28. Papillary muscle, heart.
29. Left AV valve, heart.
30. Intraventricular septum, heart.
31. Aortic valve, heart.
32. Abdominal aorta and apex of the heart.
33. Thoracic aorta and right ventricular free wall, heart.
34. Right AV valve, heart.
35. Left atrium, heart.
36. Right atrium, heart.
37-39. Digestive system.
40-48. Intestine.
49-62. Brain.

Toxicology

Reporting Limit (Rep. Limit): The lowest routinely quantified concentration of an analyte in a sample. The analyte may be detected, but not quantified, at concentrations below the reporting limit. Sample volumes less than requested might result in reporting limits that are higher than those listed.

Note that we don't have established "normal" liver mineral concentration ranges for this species. The detected liver iron concentration is probably moderately elevated. Elevated liver iron concentrations can result from congestion, hemolysis, overexposure to iron, iron storage abnormalities or starvation/fasting. The other values are generally unremarkable - the cadmium is not particularly high in a long-lived species and the copper might be somewhat low, but the clinical significance of a suboptimal concentration is uncertain.

HEAVY METAL SCREEN

Animal/Source	Specimen	Specimen Type
1 [redacted]	(8) [redacted]	Liver Tissue

Analyte	Result	Units	Rep. Limit	Units
Lead	Not Detected	ppm	1	ppm
Manganese	2.4	ppm	0.1	ppm
Iron	820	ppm	1	ppm
Mercury	Not Detected	ppm	1	ppm
Arsenic	Not Detected	ppm	1	ppm
Molybdenum	2.2	ppm	0.4	ppm
Zinc	48	ppm	0.3	ppm
Copper	2.8	ppm	0.3	ppm

Cadmium	7.8	ppm	0.3	ppm

Appendix - Report Related Images

FINAL REPORT

National Veterinary Services Laboratories
PO Box 844
Ames, Iowa 50010
Phone: 515-337-7514 **Fax**: 515-337-7938
FEDERAL RELAY SERVICE (Voice/TTY/ASCII/Spanish) 1-800-877-8339
The USDA is an equal opportunity provider and employer.

Laboratory Test Report

Owner
[redacted]

Animal Location
CA

Submitter - 26952
John Adaska
CA Animal Health & Food Safety (CAHFS)
University of CA
18830 Road 112
Tulare, CA 93274
FAX #: 559-686-4231
Phone #: 559-688-7543

Accession Number: **19-002721**

Date Collected: 01/05/2019
Date Received: 01/30/2019
Date Completed: 03/26/2019
Collected By: Adaska
Purpose: TB-10-4

Referral/Retain Tag Number: T1900043

This is not a billable case.

NOTE: Condition of the sample(s) was adequate unless otherwise noted.

Animal ID: [redacted] **Case #:** TB19-00781 **Sample:** T1900043 **Specimen Type:** Lymph Node, Tracheobronchial **Species:** Elephant, African

Mycobacterial Culture Result — No Isolation Made

Results authorized by: Dr. Tyler C. Thacker, Section Head, Mycobacteria and Brucella Section
NVSL MB General Phone: 515-337-7034

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