



# Arizona Veterinary Diagnostic Laboratory

## Amended Results Report

BARBARA PAGE DVM  
ARIZONA SONORA DESERT MUSEUM  
2021 N KINNEY RD  
TUCSON, AZ 85743

Phone: (520) 883-1380  
Accession Date: 04/21/22

Case: 22-2085      AF3680  
Animal ID: AF6380 MEXICAN WOLF  
Owner: AZ SONORA DESERT MUESUM

Species: Canis Lupus  
Breed: Mexican Wolf  
Age: 14 Years

Case Coordinator: **Gregory A. Bradley, DVM**

## Necropsy

### NECROPSY FINDINGS

Received is the body of a 14 year, 11 month, intact male Mexican gray wolf. The wolf was found deceased in its standby the keeper lying in its normal sleeping pose. He had been under supportive treatment for protein losing enteropathy and CKD. On October 5, 2021 there was intermittent diarrhea. There was a positive diagnosis for cryptococcus and azithromycin was prescribed. On November 22, 2021 there was continued intermittent but increasingly frequent severe diarrhea. There was a positive Clostridium perfringens alpha toxin test. Treatment was amoxicillin and clavulanic acid. On December 23, 2021 increase BUN, BUN ratio, SDMA, and phosphorus along with decreased albumin, globulin and AG ratio were noted. There was leukocytosis and mild anemia. On January 11, 2022 diarrhea continued and metronidazole was prescribed. A diagnostic ultrasound was scheduled. The ultrasound examination on January 24, 2022 showed probable thickening of the intestinal wall compared to domestic canine, wolf values undetermined. The working diagnosis was protein losing enteropathy, mural lymphosarcoma and chronic kidney disease. Supportive/palliative treatment was elected due to age and multiple diagnoses of poor prognosis. On January 24 until death, diet modifications, probiotics and serenity and were administered for intermittent vomiting, Meloxicam for intermittent lameness. Appetite was generally within normal limits and he ate dinner the night prior to death. The wolf was last directly observed by the veterinarian on April 19. Keepers reported observing hindlimb lameness the previous day. The wolf was observed moving smoothly/normally while walking and trotting around the exhibit after being disturbed from sleep/resting. No abnormal behavior or demeanor was noted.

### Gross necropsy findings :

The body is that of an intact male wolf and good flesh with adequate adipose stores. Unless otherwise described, all organs are within normal limits. The eyes are slightly recessed in the orbits. The mucous membranes are slightly pale and the subcutaneous tissues are slightly dry and tacky. There is marked abdominal tympany. There is a 360° volvulus of the stomach. The stomach wall is red to dark red with some



areas of red streaking. The stomach contains abundant gas and several cups of partially digested and fluid digest. The spleen is markedly enlarged, dark red/black and whose is copious dark red fluid from the cut surface. The right and left kidneys are slightly smaller than expected with large, irregular depressed white cortical areas corresponding to roughly wedge-shaped white tan areas extending from the cortical surface to the cortical-medullary junction. Capsules peel easily from the cortical surface. The rights testicle contains a single, 1 cm diameter red nodule. The nasal cavity and sinuses have glistening mucosal surfaces and are free of exudate or masses.

**Microscopic description :**

Brain: Unremarkable

Right and left kidneys: The sections contain roughly wedge-shaped foci of interstitial fibrosis extending from a depressed area on the cortical surface to approximately the cortical medullary junction. There is effacement of tubules within the fibrosis and entrapped glomeruli have increased mesangial substance or are shrunken and sclerotic. Entrapped tubules contain small amounts of proteinic fluid. Small numbers of mononuclear leukocytes consisting of lymphocytes and plasma cells are present in the connective tissue. Areas adjacent to chronic infarcts have glomeruli that are hypertrophic with mildly increased mesangial substance and thickening of Bowman's capsule with mild epithelial proliferation on the visceral surface. There is mildly increased amounts of collagenous stroma in the medullary interstitium.

Liver: There is moderate autolysis but no significant lesions are identified.

Spleen: There is marked, diffuse congestion of the red pulp.

Right and left adrenal glands: Unremarkable

Pancreas: There is multifocal interstitial congestion and hemorrhage

Heart (left and right ventricle): Unremarkable

Lung: There is multifocal atelectasis. Collections of macrophages containing dust particles are present adjacent to small airways.

Lymph node: Unremarkable

Prostate gland:

Left and right testis: The right testis contains a nodular mass. The mass is composed of sheets and packets of polygonal shaped cells with abundant, eosinophilic cytoplasm with variable numbers of small lipid vacuoles and ovoid vesicular nucleus with a small nucleolus. There is mild to moderate variation in nuclear and cell size. Mitotic count is one per 10 high power fields. The epididymis and spermatic cords are unremarkable.

Skeletal muscle: Unremarkable

Salivary gland: Unremarkable

Small intestine: There is diffuse autolysis of mucosa. There is a thin layer of eosinophils and a few lymphocytes and plasma cells up to five cell layers thick between the base of the crypts and the lamina muscularis mucosa. There are no etiologic agents or neoplastic infiltrates. In one of the sections there is a small perivascular infiltrate inflammatory cells in the mesentery immediately adjacent to the serosa. These consist of a mixture of macrophages, lymphocytes and plasma cells. No etiologic agents are identified. In only one of multiple sections (slide 19), there is a diffuse expansion of the mucosal by autolyzed round cells. These extend through the lamina muscularis mucosa into the submucosa and the inner layer of the tunica muscularis. A few intact cells are present and are morphologically consistent with large lymphocytes.

Colon: Unremarkable

Urinary bladder: Unremarkable

Esophagus: Unremarkable

Cervical spinal cord: Unremarkable  
Right and left thyroid/parathyroid: unremarkable  
Nasal mucosa: Unremarkable  
Stomach: There is diffuse autolysis

**Diagnosis:**

Gastric dilation volvulus  
Lymphoma (presumptive), focal, small intestine  
Enteritis, eosinophilic and lymphoplasmacytic, chronic, diffuse, mild, small intestine  
Glomerulonephritis, global, diffuse, mild, kidneys  
Chronic infarcts, multifocal, marked, kidneys  
Interstitial cell adenoma, right testicle  
Congestion, marked, spleen

**Comment:**

The cause of death is gastric dilation volvulus. Other significant lesions included large chronic infarcts in both kidneys and a mild, diffuse, chronic glomerulonephritis. Changes consistent with mild chronic inflammatory bowel disease were noted in the small intestine. One of the sections of small intestine contained a focal area suggestive of early large lymphocyte lymphoma expanding the mucosa and infiltrating the bowel wall to included the inner muscular tunic. Autolysis obscured the cellular detail to a degree that I have left this as a presumptive diagnosis but I think lymphoma is likely based on the few intact cells that had morphologic features of large lymphocytes, the expansion of the lamina propria and infiltration into the tunica muscularis.

Reported on: 05/05/22  
Gregory A. Bradley, DVM  
Diplomate, ACVP  
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**END OF AZVDL REPORT**

This report supersedes all previous reports for this case

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22-2085  
04/21/22

GAB



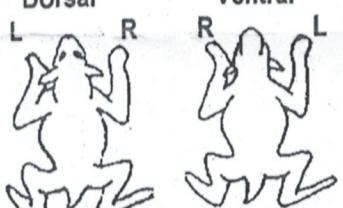
1 Date: 21 April 22 Specimen Relinquished by: Jason Barck  
2 Bill to: (check appropriate box) \* Payment is due at time of submission unless prior arrangements are made  
☐ Veterinarian: Dr. Page ☒ Owner:  
Clinic: Arizona Sonora Desert Museum Address: ASDM  
Address: 2021 N. Kinney Rd. City/State/Zip code:  
City/State/Zip code: Tucson, AZ 85743 Phone:  
Phone: 520-883-1380 Fax:  
Fax: 520-883-2500 E-Mail:  
E-Mail: sriplog-peterson@desertmuseum.org E-Mail:  
Report: Phone Y\_\_N\_\_ Fax YX\_N\_\_ Email YX\_N\_\_ 3 SAVE BODY Y\_\_N\_\_ 4 POSSIBLE LITIGATION? Y\_\_NX  
\*\*contact lab with cremation service choice

5 Animal Name/ID: AF3680 WNV? Y\_\_NX\_\_ Number in herd/flock: 2  
Age: 14.11m Y M W D Species: Mammal \*Rabies Suspect? Y\_\_NX\_\_ Euthanized? Y\_\_NX\_\_  
Sex: Male Female 1 S N Breed: Mexican Wolf (\*Contact lab for Rabies Suspect Form) Date of death(s): 20 April 22

AZVDL USE ONLY: Condition of Specimen: Acceptable Not Acceptable  
FFI FFI SS FO LTT RTI CL SW SR WB UR MIK CSF AN FC FE PL WA XX

6 TEST(S) REQUESTED / SPECIAL REQUESTS: \*\*\*LABEL EACH CONTAINER - Clinic, owner and patient name\*\*  
autopsy

7 Specimen(s) Submitted: 8 Source(s) of specimen:

9 HISTOPATHOLOGY ☐ STAT CYTOLOGY (ADDITIONAL \$30.00 CHARGE APPLY)  
☐ Incisional ☐ Endoscopic ☐ Aspirate Cytology (masses, cystic lesions, internal organs)  
☐ Excisional ☐ Needle ☐ Fluid Analysis (pleural/thoracic fluid, peritoneal/abdominal fluid, joint fluid)—EDTA purple top tube  
☐ CSF Analysis--Serum tube only  
Please indicate lesion location:  
Dorsal Ventral  
L R R L  
 Lesion description (size, margins, etc):

10 Clinical History: Dr. Page will send History ASAP  
Incontinent (GI) episodes over past few months  
Increased lameness in hind end over past couple months  
found Dead in crate on 20 April 22

REPORT: Phone Fax Email on Billed Prepaid



Repro - can send it

Protocal - standard necropsy  
representative sample of everything  
send results -

do standard necropsy protocol

High prevalence - examine nasal cavity

old dog stuff -



22-2085  
04/21/22

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## 1.0 Mexican Grey Wolf AF 3680 Chico

April 21, 2022

Chico found deceased in den by keeper this morning, lying in normal sleeping pose.

Chico has been under supportive treatment for protein-losing enteropathy and CKD.

Oct. 5, 2021 Intermittent diarrhea began, diagnosed positive Cryptococcus, RX: Azithromycin.

Nov. 22 Continued intermittent but increasing frequency of severe diarrhea, positive for C. perfringens alpha toxin, treatment with Amoxi/Clav.

Dec. 23. Increased BUN, BUN/Ratio, SDMA, Phosphorus; Decreased albumin, globulin, and A/G ratio. Leukocytosis (all cell types), mild anemia.

Jan. 11, 2022. Diarrhea continued, RX metronidazole. Scheduled diagnostic ultrasound with Michael Matz, DVM

Jan. 24 Ultrasound: Probable thickening of intestinal wall (compared to domestic canine, wolf values undetermined) Working DX: protein losing enteropathy, mural lymphosarcoma, CKD. Supportive/palliative treatment was elected due to Chico's age and multiple diagnoses of poor prognosis.

Jan. 24-today: Diet modifications, probiotics, Cerenia as needed for intermittent vomiting, Meloxicam for intermittent lameness. His appetite was generally WNL, and he ate his dinner last night.

Chico was last directly observed by Vet BP on April 19: keepers reported observing hindlimb lameness on previous day. Wolf was observed moving smoothly, normally, while walking and trotting around exhibit after being disturbed from sleep/resting (both wolves were initially napping and reluctant to move around possibly due to 95F environmental temperature.) No abnormal behavior or demeanor was noted.

Intact male w/ on good flesh w adequate adipose stores  
Eyes are slightly recessed in the orbits. mucous pale  
subcutis is sl tacky/dry.

marked abdominal tympany

360 view of stomach - stomach is red  
w dark red streaks. contains several  
cups of <sup>partly</sup> fluid digests.

Spleen markedly enlarged, dark red/black & oozes  
copious dark red fluid from the cut surface



R + L kidneys are sl. small w irregular, white depressed cortical areas. Cysts not easily

SI - unremarkable

CT - unremarkable

R + C adrenal - unremarkable

pancreas - "

W. bladder - empty - tan smooth mucosa

prostate - bilateral symmetry, smooth

(H) testis - single 1 cm red nodule

(C) " - unremarkable

lungs - "

heart - "

Nasal / sinus cavities - " no masses seen

no other gross findings



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← adequate

UNICO roop viral

Grade 7  
nervous

Date	AM diet	Vomit?	Grade 2#	Grade 3#	Grade 4#	Grade 5#	Grade 6#	Grade 7#
23-Feb	rabbit, chv	N	1	-	-	-	-	4
24-Feb	rabbit, all day, everyday	N		1				3
25-Feb	rabbit	N	2	1				2
26-Feb	rabbit	N	1	1				-
27-Feb	rabbit	N	3	2 (one chv)			1 (nervous)	-
28-Feb	rabbit	N	4	3				-
1-Mar	rabbit	N	3	1	1			-
2-Mar	"	N	4	1	1			-
3-Mar	rabbit	N	5	1	1	2	1	-
4-Mar	rabbit	N	4	1	1			-
5-Mar	rabbit	N	4	1	1			-
6-Mar	"	N	5	1	2		1 (GS)	-
7-Mar	"	N	2.5	1	1	1	1 nervous	1 (GS) 2 + 1/2 Grade 7 nervous
8-Mar	"	N	5	1	1	1		1
9-Mar	"	N	4	1 (nervous)	1	1		1
10-Mar	rabbit + canine	N	4	1	1	1		1
11-Mar	rabbit + VG	N	4	1	1	1		1
12-Mar	rabbit + VG	N	3	1	1	1		1
13-Mar	"	N	4	1	1	1		1
14-Mar	" + Whipped cream (small amount)	N	4	1	1	1		1
15-Mar	Rabbit + K9	N	3	1	1	1	1 (nervous)	3
16-Mar	Rabbit + K9	N	1	1	1	1	1 (nervous)	1
17-Mar	Rabbit + K9	N	2	1	1	1	1 (nervous)	1
18-Mar	"	N	4	1	1	1	1 (nervous)	1
19-Mar	"	N	3	1	1	1	1 (nervous)	1
20-Mar	Canine	N	3 (H) 1 (H)	1	1	1	1	1
21-Mar	Canine	N	4	1	1	1	1	1





Date	AM diet	Vomit?	Grade 2#	Grade 3#	Grade 4#	Grade 5#	Grade 6#	Grade 7#
22-Mar	Nebraska Canine	NO	4	1 (small)				
23-Mar	NB K9 + rabbit	NO	4	1 small, fresh				
24-Mar	NB K9 + wrapped cream	NO	4					
25-Mar	NB K9 + rabbit	NO	3		1			
26-Mar	NB K9 + rabbit	NO	3		1 w/ bunny hair			
27-Mar	NB K9	N	3					
28-Mar	NB K9	N	4					
29-Mar	NB K9 and rabbit	NO	1		2			
30-Mar	NB K9 and rabbit	NO	1		1			
31-Mar	Nebraska Canine	Yes (dried)	1		2			
1-Apr	Canine	NO	2		1			
2-Apr	Canine	Yes (fear)	2		1			
3-Apr	Canine	N	3		1			
4-Apr	Canine	Y	4		1			
5-Apr	NB K9 + Rabbit	Y	3		1			
6-Apr	"	N	3 w/ 1 small 2 attached					
7-Apr	Nebraska Canine	N	4					
8-Apr	"	N	4					
9-Apr	"	N	2		2			
10-Apr	"	N	1		1			
11-Apr	"	N	3					
12-Apr	"	N	3					
13-Apr	"	N	3					
14-Apr	"	N	2					
15-Apr	Nebraska - Rabbit	N	2					
16-Apr	"	N	2					
17-Apr	"	N	4					
18-Apr	"	N	4					
19-Apr	Nebraska only	N	3					



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16 grade

Date	AM diet	Vomit?	Grade 2#	Grade 3#	Grade 4#	Grade 5#	Grade 6#	Grade 7#
18-Apr	Neb LA	2	4	1				
19-Apr	Neb LA	2	3				1	
20-Apr	Neb LA	2	4	3				
21-Apr								
22-Apr								
23-Apr								
24-Apr								
25-Apr								
26-Apr								
27-Apr								
28-Apr								
29-Apr								
30-Apr								
1-May								
2-May								
3-May								
4-May								
5-May								
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7-May								
8-May								
9-May								
10-May								
11-May								
12-May								
13-May								
14-May								