

Urinalysis results in an apparently healthy dog: Saffron



Patient: Saffron, 7-year-old, spayed female American Staffordshire terrier

Presenting reason: Saffron presented for her annual wellness exam and vaccines.

History: She was adopted one year prior from a local rescue group. Her medical history before adoption is unknown, but at the time of rescue, she had negative vector-borne disease testing (heartworm, *Ehrlichia* spp., *Anaplasma* spp., and *Borrelia burgdorferi* [Lyme]). She was receiving monthly heartworm and intestinal parasite prevention. She was spayed after adoption, with no major abnormalities on preanesthetic laboratory testing.

Her owners reported a normal energy level and appetite. When the owners were asked about drinking and urination, they noted that over the past month, she had been urinating more frequently on walks and seemed to produce a drop or two each time she squatted. Her first morning's urine seemed normal in volume, with possibly some straining at the end.

Physical examination: Saffron appeared bright and alert. She had mild evidence of dental disease, with a small amount of tartar noted on her molars M1–M3 bilaterally. Her body condition score (BCS) was 5/9 with normal muscle mass. Thoracic auscultation revealed normal lung sounds bilaterally and normal cardiac auscultation. She was slightly tense on abdominal palpation but not uncomfortable. Her vulvar anatomy and rectal examination were normal.

Recommendations: Per AAHA-AVMA preventive healthcare guidelines for an adult dog, it was recommended that Saffron have infectious disease screening appropriate for her geographic location. Based on her age and history of change in urinary habits, a complete blood count (CBC), chemistry panel with SDMA and a complete urinalysis were considered appropriate. Her laboratory testing was completed in-house for real-time care decisions. Specifically, for her urine sample, this allowed for the best assessment for cells, bacteria, or crystals.^{1,2} A clean free-catch urine sample was collected in-house. The owners agreed to bring in a fecal sample for intestinal parasite screening.

Results

CBC

IDEXX VetConnect ^{PLUS}			
SAFFRON			
Canine American Staffordshire Terrier Female Spayed 7y Profile			
Hematology 10/29/19 4:35 PM			
Click to view Differentials			
RBC	7.99	5.65 - 8.87 M/μL	
Hematocrit	56.7	37.3 - 61.7 %	
Hemoglobin	20.0	13.1 - 20.5 g/dL	
MCV	71.0	61.6 - 73.5 fL	
MCH	25.0	21.2 - 25.9 pg	
MCHC	35.3	32.0 - 37.9 g/dL	
RDW	17.8	13.6 - 21.7 %	
% Reticulocyte	0.4	%	
Reticulocytes	28.0	10.0 - 110.0 K/μL	
Reticulocyte Hemoglobin	24.3	22.3 - 29.6 pg	
WBC	7.12	5.05 - 16.76 K/μL	
Neutrophils	4.54	2.95 - 11.64 K/μL	
Lymphocytes	1.80	1.05 - 5.10 K/μL	
Monocytes	0.37	0.16 - 1.12 K/μL	
Eosinophils	0.37	0.06 - 1.23 K/μL	
Basophils	0.04	0.00 - 0.10 K/μL	
Platelets	199	148 - 484 K/μL	
PDW	11.8	9.1 - 19.4 fL	
MPV	11.9	8.7 - 13.2 fL	
Plateletcrit	0.24	0.14 - 0.46 %	
RBC Run			
WBC Run			

Chemistry panel

Chemistry		10/29/19 4:40 PM	
Click to view Differentials			
Glucose	108	74 - 143 mg/dL	
IDEXX SDMA	9	0 - 14 μg/dL	
Learn More			
Creatinine	1.5	0.5 - 1.8 mg/dL	
BUN	16	7 - 27 mg/dL	
BUN: Creatinine Ratio	11		
Phosphorus	4.1	2.5 - 6.8 mg/dL	
Calcium	9.6	7.9 - 12.0 mg/dL	
Sodium	157	144 - 160 mmol/L	
Potassium	4.7	3.5 - 5.8 mmol/L	
Na: K Ratio	33		
Chloride	121	109 - 122 mmol/L	
Total Protein	7.0	5.2 - 8.2 g/dL	
Albumin	3.6	2.3 - 4.0 g/dL	
Globulin	3.4	2.5 - 4.5 g/dL	
Albumin: Globulin Ratio	1.1		
ALT	46	10 - 125 U/L	
ALP	18	23 - 212 U/L	
GGT	2	0 - 11 U/L	
Bilirubin - Total	0.6	0.0 - 0.9 mg/dL	
Cholesterol	266	110 - 320 mg/dL	
Amylase	517	500 - 1,500 U/L	
Lipase	1,161	200 - 1,800 U/L	
Osmolality	312	mmol/kg	

Vector-borne disease testing

Serology		10/29/19 4:35 PM	
Click to view Differentials			
Heartworm Antigen	Negative		
Ehrlichia canis / ewingii	Negative		
Lyme (Borrelia burgdorferi)	Negative		
Anaplasma phagocytophilum / platys	Negative		

Urinalysis

Urinalysis		10/29/19 4:45 PM	4:17 PM
Collection	Free Catch		
Color	Straw		
Clarity	Slightly Cloudy		
Specific Gravity	1.032		
pH	5.0		
Urine Protein	neg		
Glucose	neg		
Ketones	neg		
Blood / Hemoglobin	25	Ery/ μ L	
Bilirubin	neg		
Urobilinogen	norm		
Leukocyte Esterase	500	Leu/ μ L	
White Blood Cells	>50 /HPF		
Red Blood Cells	3 /HPF		
Bacteria, Cocci	None detected		
Bacteria, Rods	Present		
Squamous Epithelial Cells	None detected		
Non-Squamous Epithelial Cells	None detected		
Hyaline Casts	None detected		
Non-Hyaline Casts	None detected		
Calcium Oxalate Dihydrate Crystals	None detected		
Struvite Crystals	None detected		
Ammonium Biurate Crystals	None detected		
Bilirubin Crystals	None detected		
Unclassified Crystals	None detected		
Images			

Saffron's results were reviewed as she waited with her owners. Her CBC, including dot plots, revealed no concerns. Her chemistry revealed no indications of systemic disease. Saffron's ALP was noted to be slightly below the reported reference interval; however, this was not considered to be pathologic or representative of a problem unless loss of hepatic mass is suspected. Her urinalysis showed a marked increase in white blood cells (WBCs), with a slight increase in blood and red blood cells (RBCs) reported. Rods were reported as present. In reviewing her images from the SediVue Dx[®] Urine Sediment Analyzer, it was easy to confirm both the presence of WBCs and bacteria (rods). While this was a free-catch sample, the volume of bacteria and WBCs seen were certainly abnormal. The sediment changes, along with her increased frequency of urination on walks, suggest a lower urinary tract infection.^{2,3} Her veterinarian re-examined her vulvar area to confirm there was no evidence of vaginitis that might contaminate her urine sample.

During the consultation, Saffron's veterinarian explained that having a cystocentesis sample for urine culture would be best to confirm the presence of infection.⁴ Saffron's owners chose instead to accept treatment based on her clinical signs and urinalysis findings for financial reasons. Given her history, sporadic, uncomplicated bacterial cystitis was suspected. Without results of urine culture and minimum inhibitory concentration (MIC) susceptibility, the antibiotic should be chosen based on the bacterial pathogen's morphology and regional resistance patterns. Rods in the urine of veterinary patients are most likely to be either *E. coli*, *Klebsiella* spp., *Enterobacter* spp., or *Pseudomonas* spp.² Therefore, amoxicillin at standard dosing was prescribed for 5 days. While specific follow-up for sporadic bacterial cystitis is rarely needed, given the vague nature of Saffron's clinical signs, her veterinarian recommended that she have a follow-up urinalysis about 2 days after completing her course of treatment.⁴

Follow-up

Two days after completion of the antibiotics, Saffron's owners dropped off a midstream free-catch urine sample in a sterile container provided by the practice as well as a fecal sample. They reported that she was urinating less frequently on walks and seemed more comfortable.

Urinalysis		11/7/19 4:25 PM	4:26 PM
Collection	Free Catch		
Color	Dark Yellow		
Clarity	Clear		
Specific Gravity	1.046		
pH	6.5		
Urine Protein	TR		
Glucose	neg		
Ketones	neg		
Blood / Hemoglobin	neg		
Bilirubin	1	mg/dL	
Urobilinogen	4	mg/dL	
Leukocyte Esterase	25	Leu/ μ L	
White Blood Cells	12 /HPF		
Red Blood Cells	<1 / HPF		
Bacteria, Cocci	None detected		
Bacteria, Rods	None detected		
Squamous Epithelial Cells	None detected		
Non-Squamous Epithelial Cells	None detected		
Hyaline Casts	None detected		
Non-Hyaline Casts	None detected		
Calcium Oxalate Dihydrate Crystals	None detected		
Struvite Crystals	None detected		
Ammonium Biurate Crystals	None detected		
Bilirubin Crystals	None detected		
Unclassified Crystals	None detected		
Images			

Results

Saffron's repeated urinalysis on the SediVue Dx® Urine Sediment Analyzer revealed a marked reduction in cellular components, specifically WBCs and bacteria. The small number of white blood cells that remained were likely due to the free-catch nature of her sample but slightly more than expected. Intestinal parasite screening on the fecal sample provided was negative (not shown). Considering her resolved clinical signs and the clearance of bacteria, her veterinarian made several recommendations: continue to monitor for return of clinical signs, consider repeating a urinalysis in 2 weeks to assess the white blood cells and trace proteinuria still present, and continue Saffron's preventive healthcare screening with yearly infectious disease testing, blood work, and urinalysis.

References

1. AAHA-AVMA canine preventive healthcare guidelines. Accessed November 20, 2020. www.avma.org/resources-tools/avma-policies/aaha-avma-canine-preventive-healthcare-guidelines.
2. Callens AJ, Bartges JW. Urinalysis. *Vet Clin North Am Small Anim Pract*. 2015;45(4):621–637. doi:10.1016/j.cvsm.2015.02.001
3. Bartges J, Polzin DJ, eds. *Nephrology and Urology of Small Animals*. Wiley-Blackwell; 2011.
4. Weese JS, Blondeau J, Boothe D, et al. International Society for Companion Animal Infectious Diseases (ISCAID) guidelines for the diagnosis and management of bacterial urinary tract infections in dogs and cats. *Vet J*. May 2019;247:8–25. doi:10.1016/j.tvjl.2019.02.008