

PROTEINURIA IN A CAT

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SIGNALMENT, CASE HISTORY AND CLINICAL PRESENTATION

“Bartolomeo” is a 15-month-old intact male domestic shorthair cat. He is an indoor cat and a previous FIV- FeLV test resulted negative.

He was admitted to the San Francesco Veterinary Hospital for a history of exercise intolerance, stiff gait and polyuria - inappropriate urination. In the previous 6 months, the owner noticed some white nodules appearing and spontaneously regressing on the tongue.

At the clinical presentation, the cat was bright, alert, and no abdominal pain or respiratory distress were noted.

LABORATORY FINDINGS

A complete cell blood count (CBC. ProCyte Dx, Idexx Laboratories), biochemical analysis (BT 1500 vet, Futurlab Italia), urinalysis which included urinary protein to creatinine (UPC) ratio (spectrophotometric measurement with pyrogallol red and Jaffè methods, respectively) and urinary culture were performed.

CBC results were unremarkable except for a mild eosinopenia (confirmed by manual differential count) and a mild increase in hemoglobin (Hgb) concentration. - **Table 1**

Parameter	Result	Reference Intervals
RBC (x10 ⁶ /μL)	11.66	6.54 – 12.20
Hgb (g/dL)	16.3	9.8 – 16.2
HCT (%)	49.4	30.3 – 52.3
MCV (fL)	42.4	35.9 – 53.1
MCH (pg)	14	11.8 – 17.3
MCHC (g/dL)	33	28.1 – 35.8
RDW (%)	27	15 - 27
Reticulocyte count (x10 ³ /μL)	43.1	3 - 50
WBC (x10 ³ /μL)	10.77	2.87 – 17.02
Neutrophils (%)	42	-
Neutrophils (x10 ³ /μL)	4.52	2.30 – 10.29
Lymphocytes (%)	51	-
Lymphocytes (x10 ³ /μL)	2.31	0.92 – 6.88
Monocytes (%)	5	-
Monocytes (x10 ³ /μL)	0.54	0.05 – 0.67
Eosinophils (%)	1	-
Eosinophils (x10 ³ /μL)	0.11	0.17 – 1.57
Basophils (%)	0	-
Basophils (x10 ³ /μL)	0	0.01 – 0.26
PLT (x10 ³ / μL)	419	151 - 600

Table 1: Hematological results of the cat. Mild eosinopenia and mild increase in Hgb concentration are present (Procyte Dx, Idexx Laboratories).

Serum had normal aspect and biochemical results showed a severe increase in CK activity, moderate increase of ALT and AST activities and mild hyperlipasemia – **Table 2**

Parameter	Result	Reference Intervals
ALT (UI/L)	283	25 – 87
AST (UI/L)	427	10 – 35
ALP (UI/L)	32	19 – 70
GGT (UI/L)	2	0 – 8
DGGR Lipase (UI/L)	36	12 – 31
CK (UI/L)	45577	91 – 326
Total Bilirubin (mg/dL)	0.12	0 – 0.26
Cholesterol (mg/dL)	129	95 – 210
Triglycerides (mg/dL)	29	19 – 81
Glucose (mg/dL)	130	72 – 136
Total proteins (g/dL)	7.3	6 – 8.2
Albumin (g/dL)	4.2	3 – 4.2
Globulin (g/dL)	3.1	1.8 – 5.5
A:G ratio	1.35	0.5 – 1.3
Creatinine (mg/dL)	1.0	0.6 – 1.8
Urea (mg/dL)	61	30 – 65
Calcium (mg/dL)	9.3	7.3 – 11.5
Phosphorus (mg/dL)	5.8	2.6 – 6.2
Sodium (mmol/L)	152	146 – 159
Potassium (mmol/L)	4.3	3.8 – 5.3
Chloride (mmol/L)	115	108 - 130
SDMA Idexx (µg/dL)	9	0-14

Table 2: Biochemical results of the cats. Severe increase of CK activity, moderate increase of ALT and AST activities, mild hyperlipasemia are present (BT1500 vet, Futurlab).

The urine sample was collected by cystocentesis. Complete urinalysis (chemical and physical analysis performed by visual inspection, refractometric urine specific gravity (USG) measurement, dipstick test, and microscopic sediment evaluation) showed a marked positive reaction to pads of heme-containing compounds and proteins; sediment was inactive and UPC ratio was increased. The urinary culture was negative. – **Tables 3 and 4.**

Chemical – physical analysis	Result	Reference Intervals
Color and Aspect	Clear yellow	Clear yellow
USG	1.050	1.015 – 1.060
pH	5	6.5 - 7
Proteins	+++	Negative
Glucose	Negative	Negative
Ketones	Negative	Negative
Heme-containing compounds	+++	Negative
Bilirubin	Negative	Negative
UPC ratio	1.1	0.2 – 0.4

Sediment evaluation	Result	Reference Intervals
Leucocytes	Absent	<5/HPF
RBC	Absent	<5/HPF
Clusters	Absent	Absent - rare
Crystals	Absent	Absent
Epithelial cells	Absent	Rare
Bacteria	Not seen	Absent
Others	Lipid drops	-

Tables 3 - 4: Urinalysis of the cat. The urine was acid and marked positive reaction to heme – containing compounds and proteins pads are seen. Sediment is inactive and proteinuria is identified.

Sodium dodecyl sulfate – agarose gel electrophoresis (SDS - AGE. Hydragel 5 Proteinuria, Sebia Italia) was performed to investigate the urinary protein profile. A marked band slightly above 26.6 kDa, homogenous protein traces between 66 kDa and the upper limit of the gel and marked bands between 66 and 150 kDa were seen.

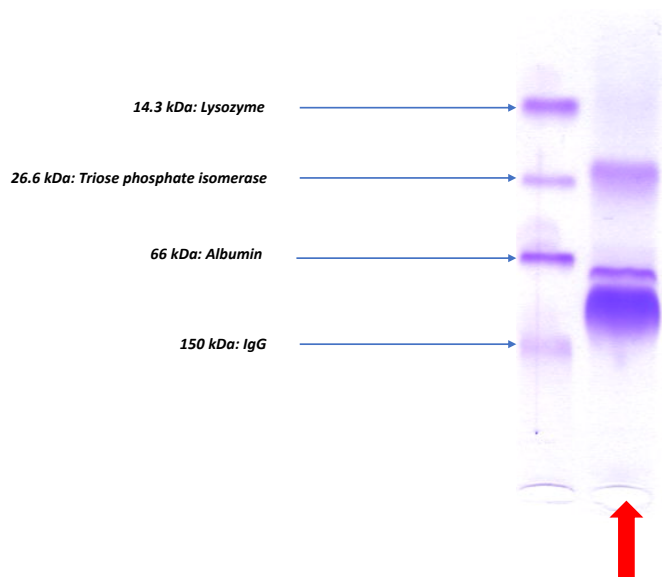


Image 1: SDS- AGE of the cat. The first line (left) shows the control sample with known molecular weights (Molecular Mass Control; Sebia Italia) corresponding to lysozyme (14.3 kDa), triose phosphate isomerase (26.6 kDa), bovine albumin (66 kDa) and human IgG (150 kDa). **The second line (right) is the cat (red arrow)** (Hydragel 5 Proteinuria, Sebia Italia).

QUESTIONS:

1. How could you interpret the SDS - AGE results?
2. What additional tests would you consider?
3. Which differential diagnosis would you consider?