

HYPERCALCEMIC GOLDEN RETRIEVER

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SIGNALMENT

Jako, 4 years old, male neutered Golden Retriever.

HISTORY

Jako was referred from his regular clinic to the small animal teaching hospital (*Hospital Clinic Veterinari*) at *Universitat Autònoma de Barcelona* (UAB), Spain, on March 22nd 2017 with a history of weight loss, polyuria, polydipsia and hypercalcemia. The owners noticed that Jako refused to eat and he was not himself since seven days ago.

One day before being referred, Jako's regular veterinarian performed a complete blood count (CBC) (Table 1), a biochemistry profile (Table 2) and urinalysis (Table 3). The major finding on the CBC was mild neutrophilic leukocytosis with mild left shift. The biochemistry profile showed marked hypercalcemia and severe hyperlipasemia. The other parameters altered were mild increase in creatinine and urea, mild increase in AST activity and very mild hyperbilirubinemia. The urinalysis was unremarkable with the exception of urine specific gravity of 1008.

Jako was diagnosed of aortic stenosis when he was a puppy but he did not show clinical signs of cardiovascular disease during physical examination. Besides, Jako was not receiving any treatment regarding his heart disease at that time.

CLINICAL FINDINGS

On physical examination, Jako showed a heart murmur of 4 over 6. The rest of clinical examination was within normal limits.

DIAGNOSTIC TEST

Jako was hospitalized in the intensive care unit (ICU) for emergency treatment and monitoring of calcium levels, as well as, to complete the diagnostic workup. At the time of admission, Jako's calcium ionized concentration was 2.73 mmol/L (Reference interval: 1.25-1.50 mmol/L,

IDEXX Vet Stat). Initially, the animal received fluidotherapy and furosemide at a dose of 2mg/kg every 12 hours.

A biochemistry profile was performed the day after Jako's admission. The results are listed on table 2.

The abdominal ultrasound revealed mild amount of abdominal fluid that was not sampled and multiple hepatic nodules of heterogeneous ecogenicity with moderate discrete margins and variable sized, ranging from 0.8 to 3.5 cm. The abdominal ultrasound also displayed mild mesenteric lymphadenomegaly. An ultrasound-guided fine needle aspiration biopsy of the hepatic nodules was performed (figure 1).

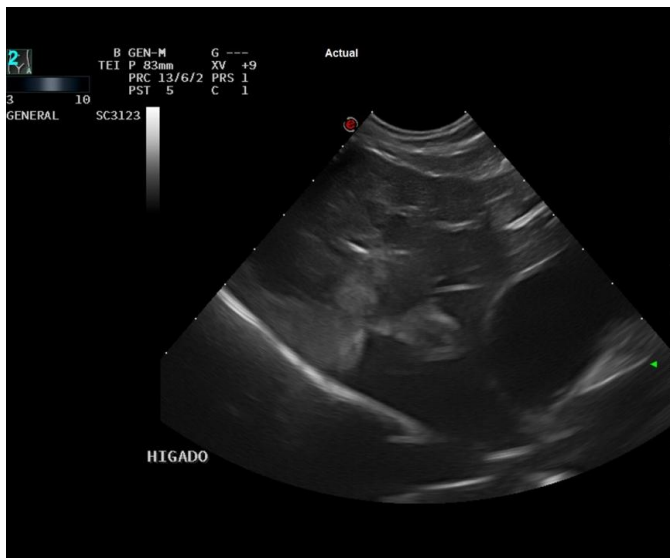


Figure 1. Hepatic nodule of heterogeneous ecogenicity with moderate discrete margins

Table 1. Hematological results of the patient

Parameters (units)	March 21 st (Sysmex XT2000) ¹	
	Result	Reference interval
RBCs (x10 ⁶ /μL)	6.05	5.39 – 8.7
Hematocrit (%)	42	38.3 – 56.5
Hemoglobin (g/dL)	14.5	13.4 – 20.7
MCV (fl)	69.1	59 – 76
RDW (%)	13.0	13.2 – 19.1
Reticulocytes (x10 ³ cells/ μL)	13,310	10,000 – 110,000
WBC (x10 ³ cells/ μL)	18.68	4.9 – 17.6
Neutrophils (cells/ μL)	15,392	2,940 – 12,670
Band cells (cells/ μL)	187	0 – 170
Lymphocytes (cells/ μL)	2,354	1060 – 4950
Monocytes (cells/ μL)	672	130 – 1,150
Eosinophils (cells/ μL)	75	60 – 1,490
Basophils (cells/ μL)	0	0 – 100
Platelets (x10 ³ cells/ μL)	93 ²	143 – 448

¹Results obtained from an external referral laboratory (IDEXX Laboratories) one day before the admission.

²Peripheral blood smear was done and a high number of platelet clumps were observed; therefore, the platelet concentration was considered within reference intervals.

Table 2. Biochemistry results of the patient

Parameters (units)	March 21 st (Beckman Coulter AU640) ¹		March 23 rd (Olympus AU400) ²	
	Result	Reference interval	Result	Reference interval
Proteins (g/dL)	6.4	4.8 – 7.8	Not performed	
Albumin (g/dL)	2.8	2.7 – 4.1		
Globulins (g/dL)	3.6	2.5 – 4.4		
ALT (UI/L)	58	26 – 89		
AST (UI/L)	113	16 – 89		
ALP (UI/L)	40	13-105		
Total bilirubin (mg/dL)	0.34	0.01 – 0.31		
Total calcium (mg/dL)	16.0	8.2 – 11.9		
Phosphorus (mg/dL)	2.7	2.7 – 6.7	3.82	2.6 – 6.2
Creatinine (mg/dL)	1.6	0.5 – 1.5	2.06	0.5 – 1.5
Urea (mg/dL)	70	21 – 59	95.7	21.4 – 59.9
Sodium (mEq/L)	145	142 – 153	138.1	141 – 152
Potassium (mEq/L)	3.9	3.9 – 5.6	4,33	4.37 – 5.35
Chloride (mEq/L)	102	105 – 121	95.9	105 – 115
Glucose (mg/dL)	98	60 – 120	83.5	65 - 118
Cholesterol (mg/dL)	271	112 – 326	Not performed	
Lipase (UI/L)	15,557	75 – 784		
Amylase (UI/L)	563	256 – 1204		

¹Results obtained from an external referral laboratory (IDEXX Laboratories) one day before the admission. ²Results obtained at biochemistry laboratory in the *Hospital Clinic Veterinari* (UAB) one day after admission.

Table 3. Urinalysis

	March 21 st IDEXX Laboratories ¹
Color	Yellow
pH	6.5
Glucose	Negative
Ketones	Negative
Bilirubin	Negative
RBC/Hemoglobin	Negative
Proteins	Negative
Urine specific gravity (USG)	1008

¹Results obtained from an external referral laboratory (IDEXX Laboratories) one day before the admission.

The urinary sediment was inactive.

The protein/creatinine ratio was performed and the result was 0.19.

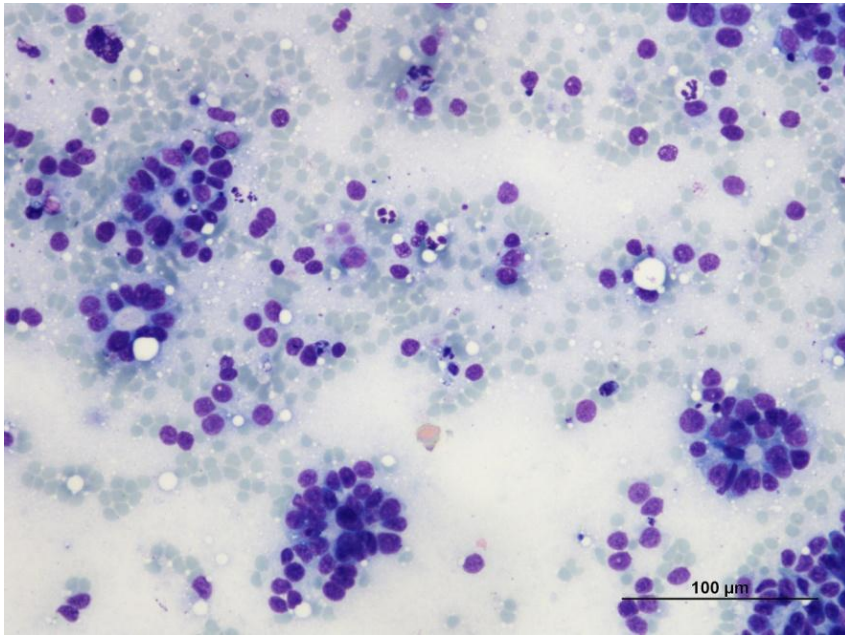


Figure 2. Fine needle aspirate of hepatic nodule, 200x (Quick Panoptic stain).

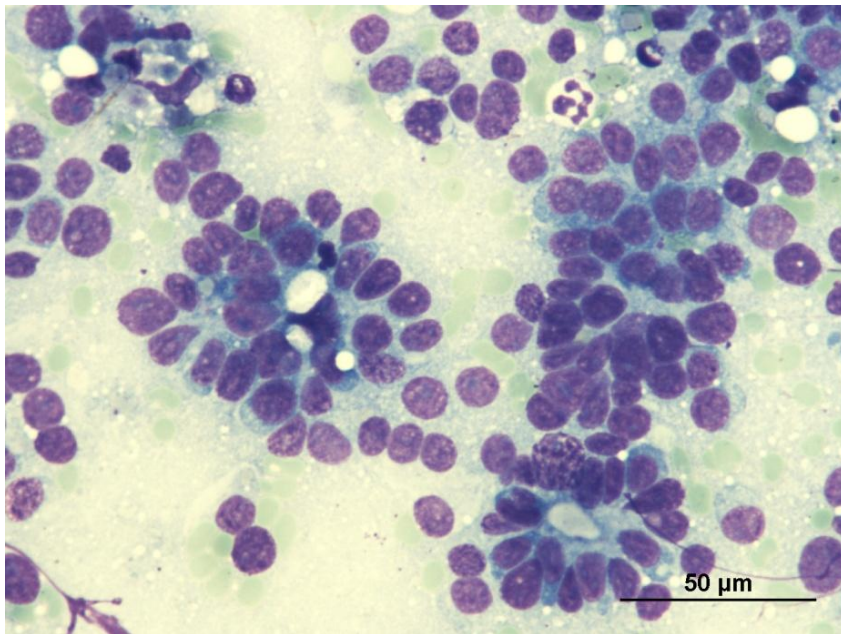


Figure 3. Hepatic nodule aspirate, 400x (Quick Panoptic stain).

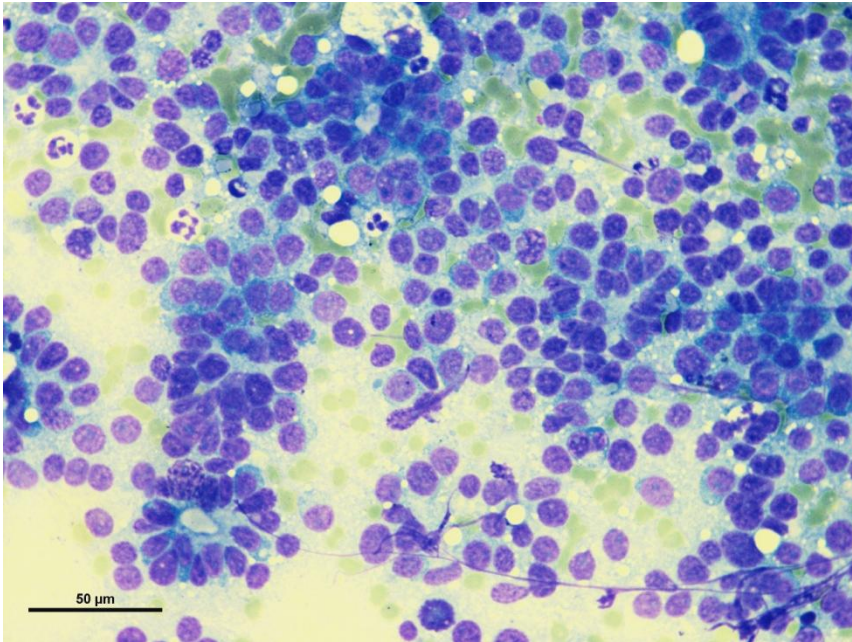


Figure 4. Hepatic mass aspirate, 400x (Diff Quick Panoptic stain).

QUESTIONS

1. How would you interpret the test results performed on Jako?
2. What is your cytological interpretation?
3. What other test would you recommend in this patient?