Hematology data from a dog

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SPECIMEN: Peripheral blood smear

SIGNALMENT: 7 year-old castrated male English sheepdog,

HISTORY AND CLINICAL FINDINGS: This dog presented to the emergency service and subsequently to the internal medicine service at the Centre Hospitalier Universitaire Vétérinaire (CHUV) at the Université de Montréal in February 2016, for evaluation of severe non-regenerative anemia. Two months prior, the owner noted that the dog had pale mucous membranes, but no other clinical signs were observed. A week prior to presentation at the CHUV, the dog was evaluated by the referring veterinarian, and a complete blood count (CBC), biochemistry panel, and thoracic and abdominal radiographs were performed. Laboratory abnormalities at that time included a severe normocytic, hypochromic non-regenerative anemia (Hct: 14%; RI: 38-57%), mild hyperkalemia (5.9 mmol/L; RI: 4-5.4 mmol/L) and mildly increased symmetric dimethylarginine (SDMA: 15 ug/dL; RI: 0-14 ug/dL). Mild splenomegaly and hepatomegaly were noted on abdominal radiographs.

In the previous two years, the dog suffered two episodes of marked thrombocytopenia that resolved with immunosuppressive therapy (prednisone and azathioprine). There was no other relevant medical history.

On presentation to the CHUV (Day 0), physical exam revealed pale mucous membranes and a 2/6 holosystolic heart murmur. No other abnormalities were noted. CBC data (Advia 120, Siemens Healthcare, Tarrytown, New York, USA), including RBC V/HC scattergrams and morphology flagging results from Days 0 and 15, as well as a blood smear from Day 15, are provided.

LABORATORY DATA:
Complete blood count results:

TEST	UNITS	RESULT Day 0	RESULT Day 15	REFERENCE INTERVAL
HCT	L/L	0.17 L	0.23 L	0.40-0.56
RBC	X 10^9/L	2.67 L	3.45 L	5.40-8.6
HGB	g/L	54 L	77 L	139-198
MCV	FL	64	67	62-73
MCHC	g/L	324 L	331	325-373
Reticulocytes	X 10^6/L	10 680	65 550	0- 91 000
RDW	%	26.3 H	24 H	11.0-13.0
Platelets	X 10^9/L	253	426 H	153-400
WBC	X 10^9/L	4.61 L	14.81 H	5.10-14.20
Neutrophils	X 10^9/L	2.81	11.66 H	2.70-9.80
Bands	X 10^9/L	0.09	0	0-0.30
Lymphocytes	X 10^9/L	1.06	2.30	0.70-3.80
Monocytes	X 10^9/L	0.23	0.78	0.10-0.90
Eosinophils	X 10^9/L	0.41	0.07	0-1.40
Basophils	X 10^9/L	0	0	0-0.10

Advia 120 Red Blood Cell V/HC scattergrams and morphology flagging results
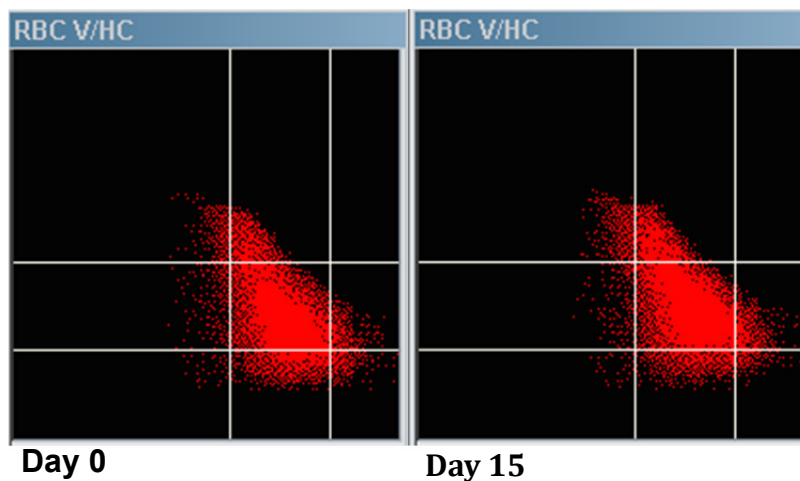
Day 0   Day 15

	Day 0	Day 15
Micro	+++	+
Macro	++	++
Aniso	+++	+++

* Blood smear findings from Day 0 and Day 15 are similar. The slides available for review are from Day 15.
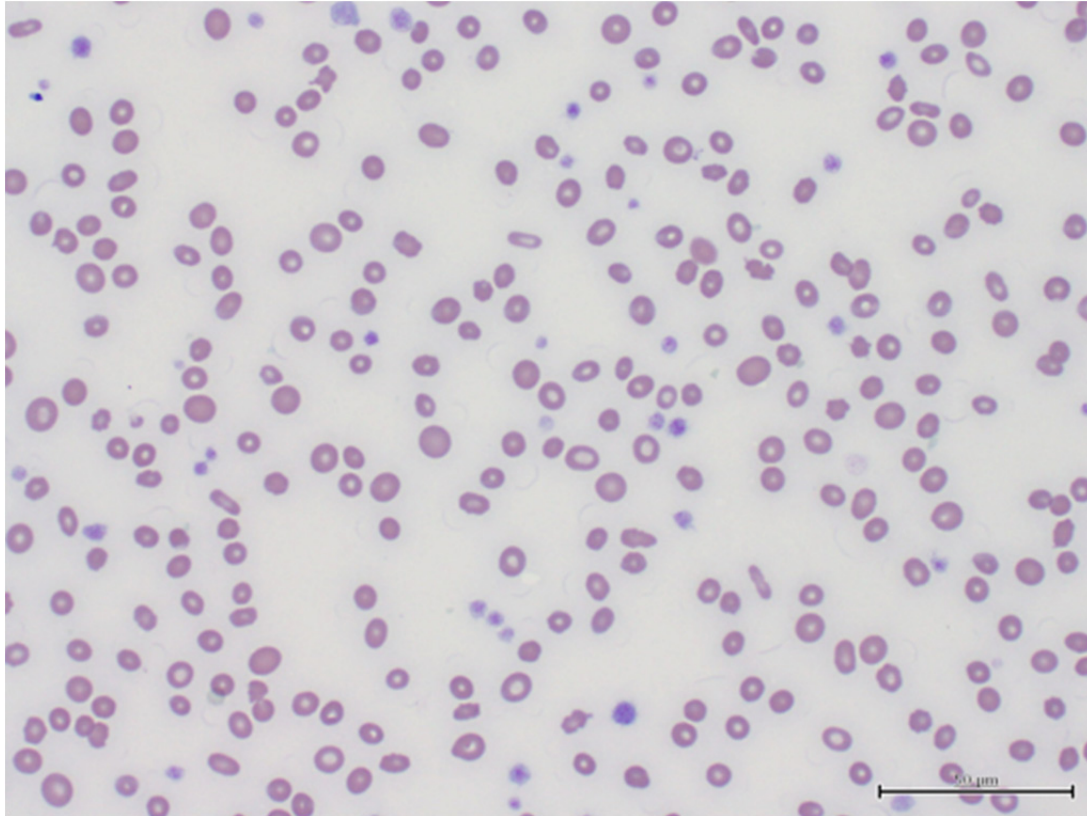
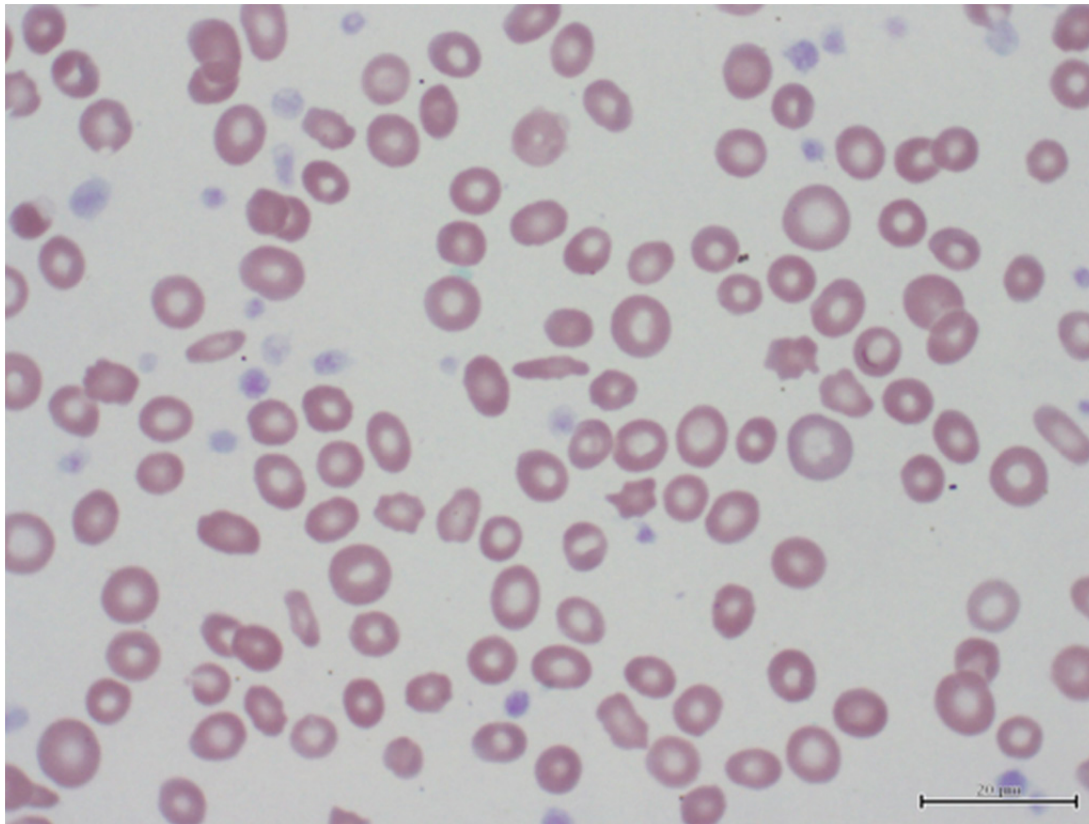**Figure 1.** Blood film. Day 0. Modified Wright-Giemsa. 50x objective

Figure 2. Blood film. Day 15. Modified Wright-Giemsa. 100x objective.
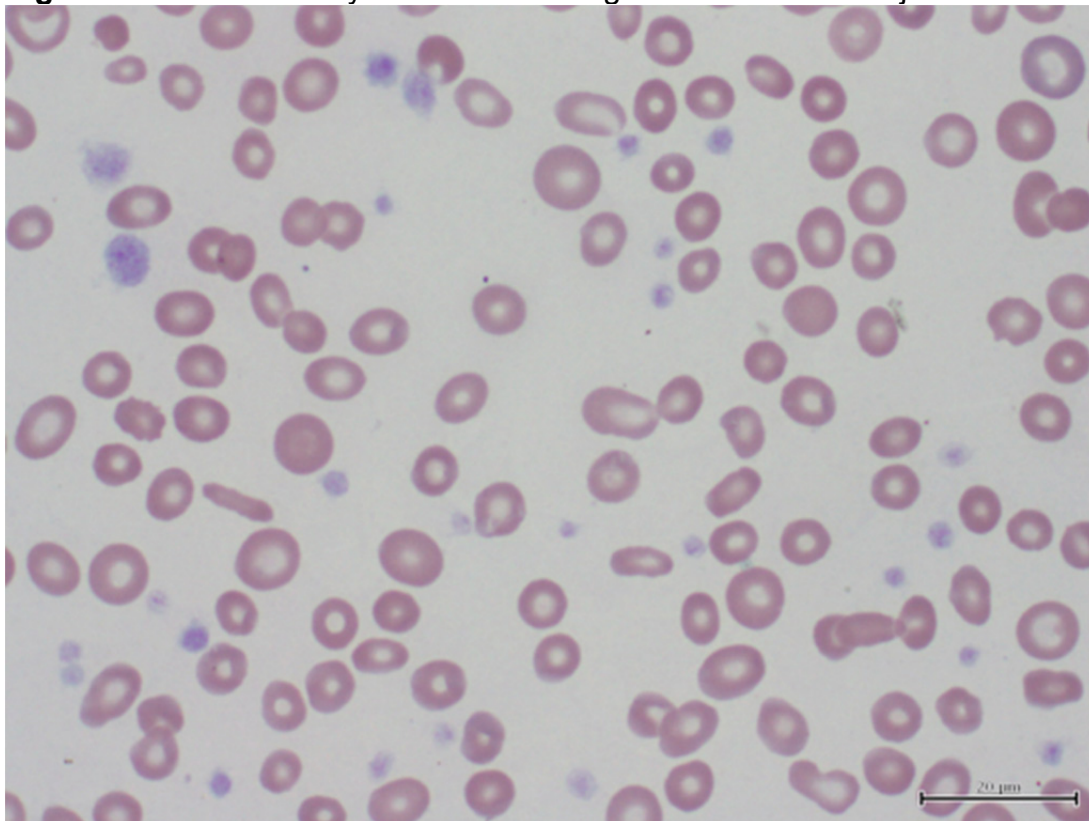

Figure 3. Blood film. Day 15. Modified Wright-Giemsa. 100x objective.

ADDITIONAL DIAGNOSTIC TESTS:

Snap 4DX Plus (IDEXX, Westbrook, Maine, USA): Negative

Thoracic radiographs: Slightly elongated cardiac silhouette without any sign of cardiac failure. No other abnormalities.

Abdominal ultrasound:
- Moderate splenomegaly of benign appearance. Neoplastic infiltration cannot be ruled out but seems unlikely.
- Non-specific discrete hepatomegaly. Vacuolar hepatomegaly is likely. Neoplastic infiltration appears unlikely.

QUESTIONS:

1. What is the most likely explanation for the ensemble of hematologic changes observed in this dog?

2. What supplementary test(s) would you recommend to confirm the diagnosis?