

Pancytopenia in a dog

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Signalment: 12 year old castrated male Miniature Pinscher Dog

History: This patient first presented to the Bailey Small Animal Teaching Hospital at Auburn University (AU-SATH) Emergency and Critical Care (ECC) service on 6/22/15 for evaluation of a two-month history of lethargy, weight-loss, and decreased appetite. Notable laboratory findings at that visit included mild, poorly-regenerative anemia (HCT-31.8%; absolute reticulocytes 94,000/ μ L), increased RDW (17.9%), and moderate to marked thrombocytopenia (38,000/ μ L; only rare platelet clumps noted on smear). Serum biochemistry abnormalities included hyperproteinemia (13.59 g/dL), hypoalbuminemia (1.3 g/dL), hyperglobulinemia (11.5 g/dL), and hypercalcemia (15.9 mg/dL). Radiographs revealed small radiolucent opacities of the dorsal spinous processes of T10 and L2 vertebrae. A bone marrow aspirate was obtained and a representative photomicrograph can be seen in **Figure 1**. The patient was discharged with the standard of care oral medications for the condition diagnosed.

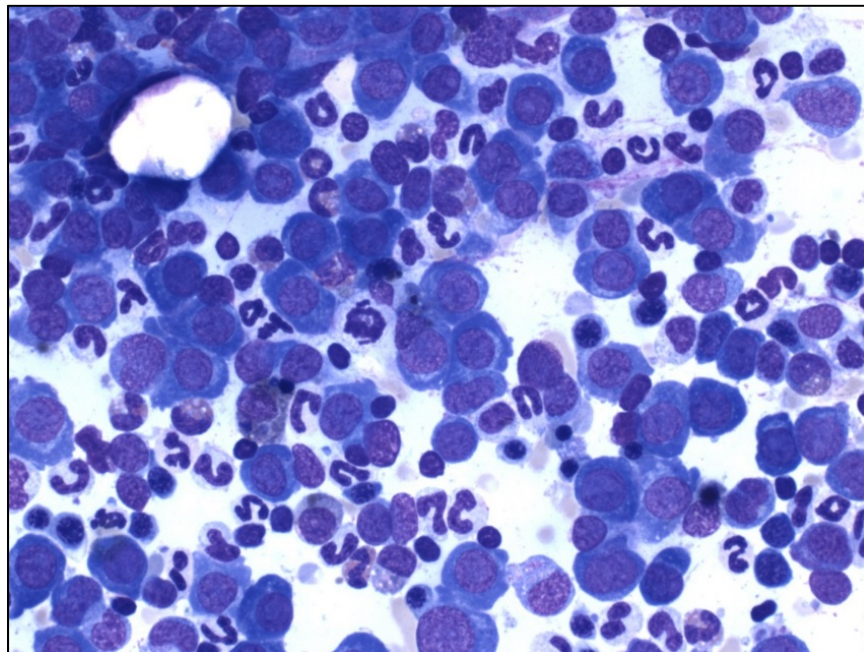


Figure 1. Bone marrow aspirate (direct smear), Modified Wright stain, original magnification 40x.

Clinical Findings: The patient did well at home until about a week later, in the afternoon of 6/29/15, when the owners noticed trembling, hypersalivation, vomiting and diarrhea. The owners re-presented the patient to the AU-SATH ECC service. On physical exam, the patient was depressed, febrile (105°F, ~40.56°C), tachycardic (160 beats/min), and tachypneic (48 breaths/min). This patient was also hypotensive (systolic blood pressure ~60 mmHg). A small amount of free peritoneal fluid was noted on a brief abdominal ultrasound, and the effusion was submitted for analysis (see text below, and **Figure 4** and **Figure 5**).

Laboratory Findings: A CBC was performed on an Advia[®] 120 hematology analyzer on 6/29/15 (**Table 1**). A representative peripheral blood photomicrograph from this feathered edge can be seen in **Figure 2**.

Table 1: CBC (Advia® 120 hematology analyzer) results (6/29/15)

TEST	RESULT	UNITS	REFERENCE INTERVAL
HCT	22.9	%	38.7-59.2
RBC	3.67	$\times 10^9/\text{L}$	6.02 - 8.64
Hgb	8.1	g/dL	13.1 - 20.1
MCV	62.4	fL	60.5-73.8
MCHC	35.6	g/dL	32-37.9
RDW	21.4	%	11.2-14.4
Retic. (abs.)	90,700	cells/ μL	0-60,000
nRBC	33	/100 WBC	0-10
WBC (corrected)	2,660	cells/ μL	5,090-17,410
Seg. Neutrophils	931	cells/ μL	2,600-10,400
Bands	1,197	cells/ μL	0-300
Lymphocytes	186	cells/ μL	390-6,730
Monocytes	346	cells/ μL	160-1,160
Platelets	46,000	cells/ μL	152,000-518,000
MPV	8.9	fL	8-14.6

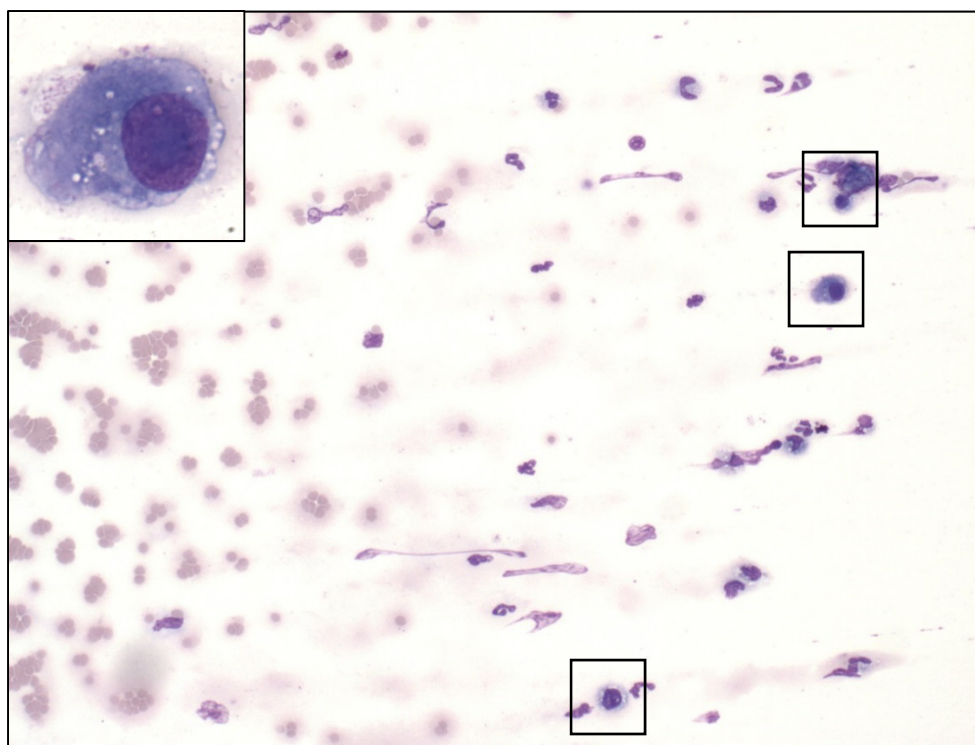


Figure 2. Peripheral blood smear at the feathered edge, Modified Wright stain, original magnification 10x.
Inset: Magnified view (100x) of one of the cells highlighted by the black box outlines.

Peritoneal effusion analysis (6/29/15):

- Appearance: red, turbid
- Total protein: 7.0 g/dL
- Total nucleated cell concentration: 28,530/ μ L
- Total RBC concentration: 100,000/ μ L
- Cytologic findings: representative photomicrographs are provided (**Figure 3** and **Figure 4**).

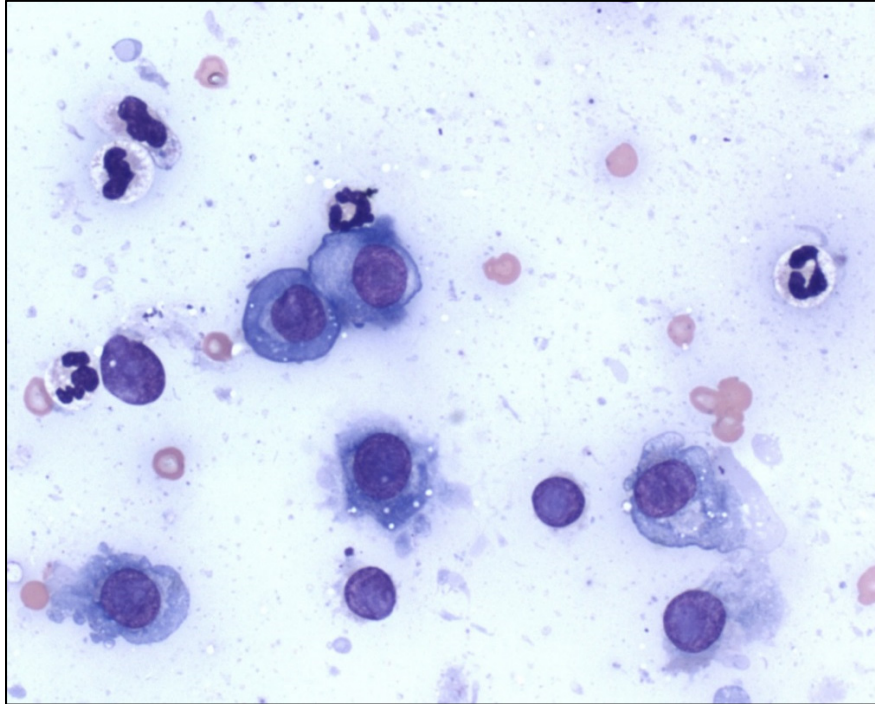


Figure 3. Peritoneal fluid (direct smear), Modified Wright stain, original magnification 40x.

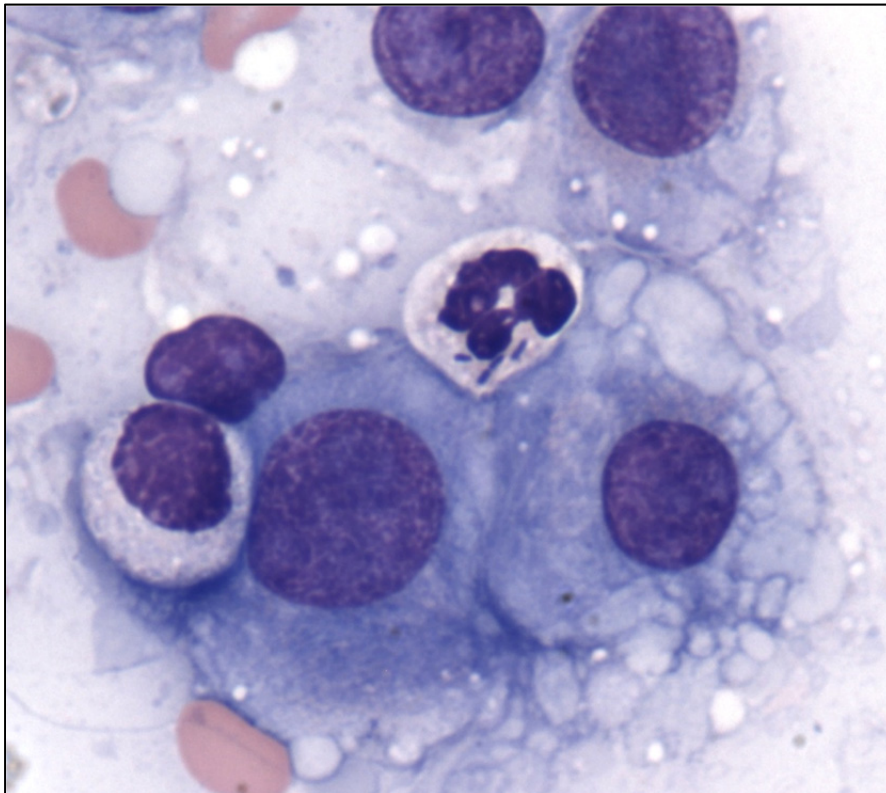


Figure 4. Peritoneal fluid (direct smear), Modified Wright stain, original magnification 100x.

Questions:

1. What is your presumptive diagnosis based on the tests completed on 6/22/15?
2. What medication(s) was this patient likely prescribed based on the initial diagnostics? Does this medication or medications have any potential adverse effects that may contribute to the morbidity noted on 6/29/15?
3. Discuss all possible mechanistic explanations for the cytopenias present in this patient on 6/29/15.
4. What is the significance, if any, of the leukogram and nRBCs on the CBC from 6/29/15?
5. How would you classify and interpret the peritoneal body cavity effusion? What mechanisms may have contributed to this effusion? Are these findings typical for your presumptive diagnosis from Question 1?