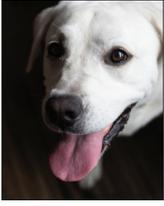


A reticulocytosis case study: Sadie



Patient: Sadie, a 10-year-old, spayed female yellow Labrador retriever

Presenting reason: Sadie was brought in for a routine complete blood count (CBC) evaluation prior to her second chemotherapy treatment.

History: One month prior to the current presentation, Sadie was diagnosed with a splenic hemangiosarcoma based on histopathologic evaluation. No evidence of metastatic disease was noted at the time, and she started a chemotherapy protocol after a splenectomy.

Physical examination: Sadie was bright, alert, and responsive (BAR). No abnormalities were detected.

VetConnect PLUS report

IDEXX VetConnect PLUS			
← SADIE Canine Female Spayed 10 y			
2019 Jun 3 Apr 1 Feb 14 Jan 24 Jan 17 Jan 10 Jan 3 2018			
Graphing <input checked="" type="checkbox"/>		Result Details ▾	
Hematology 11/27/18 11:31 AM			
> RBC	5.22	5.65 - 8.87 M/ μ L	
> Hematocrit	33.7	37.3 - 61.7 %	
> Hemoglobin	12.2	13.1 - 20.5 g/dL	
> MCV	64.6	61.6 - 73.5 fL	
> MCH	23.4	21.2 - 25.9 pg	
> MCHC	36.2	32.0 - 37.9 g/dL	
> RDW	19.5	13.6 - 21.7 %	
> % Reticulocyte	3.8	%	
> Reticulocytes	196.8	10 - 110 K/ μ L	
> Reticulocyte Hemoglobin	23.2	22.3 - 29.6 pg	
> WBC	6.38	5.05 - 16.76 K/ μ L	
> Neutrophils	3.79	2.95 - 11.64 K/ μ L	
> Lymphocytes	1.34	1.05 - 5.1 K/ μ L	
> Monocytes	0.61	0.16 - 1.12 K/ μ L	
> Eosinophils	0.63	0.06 - 1.23 K/ μ L	
> Basophils	0.01	0 - 0.1 K/ μ L	
> Platelets	314	148 - 484 K/ μ L	
> PDW	10.3	9.1 - 19.4 fL	
> MPV	8.7	8.7 - 13.2 fL	
> Plateletcrit	0.27	0.14 - 0.46 %	

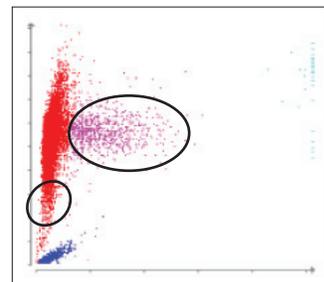
Diagnostic plan

A complete blood count (CBC) with reticulocyte parameters was performed on the ProCyte Dx[®] Hematology Analyzer. Review of red blood cell (RBC) dot plots and ProCyte Dx interpretive aids allowed for a more comprehensive interpretation of Sadie's CBC.

Diagnostic review

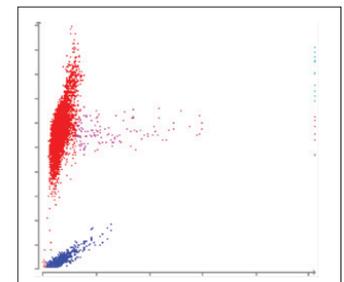
- Mild anemia, with normal red blood cell indices (MCV, MCH, MCHC, and RDW), and increased reticulocyte count
 - **Classified as a mild regenerative anemia.**
- RBC dot plot:
 - Confirmed reticulocytosis; reticulocytes represented by increased magenta digitized events seen on the dot plot.
 - Provided evidence of significant numbers of small red blood cells (RBCs) or RBC fragments; represented by increased red digitized events low on the y-axis.
- Review of blood film noted numerous schistocytes (RBC fragments),** which are a result of mechanical fragmentation of RBCs while in circulation and can be seen in cases of hemangiosarcoma.

Sadie's RBC run



Anemia with reticulocytosis, likely regenerative anemia

Normal RBC run



Next steps

Additional investigation, including thoracic radiographs and abdominal ultrasound, was undertaken to evaluate for the emergence of metastatic hemangiosarcoma.

Discussion

Sadie's case outlines the importance of an absolute reticulocyte count on all CBCs. **An increased reticulocyte count is the most objective measure of bone marrow responsiveness to a need for increased RBC production.**¹⁻³

It also reinforces that more information can help change the course of action:

- A dot plot review enabled the clinician to identify a classic pattern that indicated alteration of red blood cell morphology, which led to a blood film review.
- The schistocytes noted on the blood film raised concern for diseases where mechanical damage to the RBCs may be found. One possible disease is highly vascularized neoplastic disease, such as hemangiosarcoma.
 - Since the primary splenic hemangiosarcoma was removed, the presence of schistocytes led to concern for the emergence of metastatic disease, and further evaluation was initiated prior to continuing her chemotherapy treatment.

References

1. DeNicola DB, Bilbrough GEA, Russell J, Hammond J. Limitations of red blood cell distribution width, mean corpuscular volume and mean corpuscular hemoglobin concentration in predicting canine bone marrow response to anemia compared to absolute reticulocyte count [ESVCP Abstract 25]. Paper presented at: 19th ESVCP-ECVCP Annual Congress 2017; September 8, 2017; London, UK.
2. Hodges J, Christopher MM. Diagnostic accuracy of using erythrocyte indices and polychromasia to identify regenerative anemia in dogs. *JAVMA*. 2011;238(11):1452-1458. doi:10.2460/javma.238.11.1452
3. Barry A, Chase J, Hendrickson P, Hammond J, DeNicola DB. MCV, MCHC and RDW limitations in assessing bone marrow response in anemic cats. Presented at: International Society of Feline Medicine European Feline Congress; June 27-July 1, 2018; Sorrento, Italy.