



ECVP/ESVP Summer School in Veterinary Pathology



Summer School 2009 – Clinical Pathology C527-08

Dog, Crossbred 5yo male. Asthenia and depression. Progressive anemia and leukocytosis was detected on previous exams. Based on the geographical area of the dog a presumptive diagnosis of babesiosis has been formulated (but parasites have not been detected on blood smears). Nevertheless, anemia continues to worsen in spite of anti-babesia therapy.

Biochemistry is WRI and serum protein electrophoresis reveals a moderate increase of alpha-2-globulin. CBC is reported below.

Eritrociti x 100 ³ /μl	1,52	5,5-8,5	Hb (g/dl)	4,3	12-18
Eritrociti nucleati (%)	5,00	rari	Ht (%)	14	37-55
Eritr. nucleati x 100 ³ /μl	4,32	rari	RDW	22,70	12-17
Reticolociti (%)	21,72	<1,5	MCV (fl)	92,11	60-77
Indice di prod. retic. (RPI)	2,758	>1<2	MCHC (%)	30,71	32-36
Morfologia eritrocitaria			MCH (pg)	28,29	19-24
Corpi di Howell-Jolly, anisocitosi, policromasia, sferociti++, codociti++, rari stomatociti			Piastrine x 10 ³ /μl	375,00	200-500
Proteine plasmatiche (g/dl)		4,9-7,9	Stima piastrinica	NA	A = adeguata
Fibrinogeno (g/dl)		<0,2	MPV (fl)		8,5-13
Icterus Index		2-5	PCT (%)		0,2-0,4
		6-19,5	PDW		8-18
Leucociti x 10 ³ /μl	82,07	6-19,5	Altri esami effettuati		
Neutrofili (%)	71,00	60-70	(x 10 ³ /μl)	58,27	3-11,5
Band neutrofili (%)	1,00	<3	(x 10 ³ /μl)	0,82	<0,2
Eosinofili (%)	0,00	2-10	(x 10 ³ /μl)	0,00	0,1-1,2
Basofili (%)	0,00	rari	(x 10 ³ /μl)	0,00	rari
Linfociti (%)	6,00	12-30	(x 10 ³ /μl)	4,92	1-4,8
Monociti (%)	22,00	3-10	(x 10 ³ /μl)	18,06	0,1-1,5
Non class. (%)	0,00	0	(x 10 ³ /μl)	0,00	0
Morfologia leucocitaria					

Smear description:

Cellularity: RBC seems to be decreased, Platelets appear to be normal to increased; WBCs are extremely increased

Erythron: RBCs show anisocytosis and polichromasia, with several polychromatophilic RBCs (likely reticulocytes), schistocytes and spherocytes.

Nucleated RBC are occasionally present

Thrombon: Platelets estimate is adequate. No morphological abnormalities.

Leukon: The main population is composed by neutrophils, which are prevalently mature, although several bands neutrophils are present. Some neutrophils have a vacuolized cytoplasm.



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Monocytes are relatively abundant (approximately 20%) and pleomorphic. Most of them are large, with irregularly shaped nuclei (although round shaped or indented nuclei can also be seen), and abundant slightly basophilic and micro- or macrovacuolated cytoplasm.

Lymphocytes are less represented (approximately 10%) and small-medium sized. Cytoplasm often show signs of activation (basophilia, rarely granules).

Hematological diagnosis:

Severe macrocytic hypochromic regenerative anemia associated with an extreme leukocytosis with left shift neutrophilia and monocytosis

Comment:

The main haematological finding is the severe regenerative anemia, which has haematological signs consistent with a haemolytic origin, likely immune mediated. No parasites are seen but babesiosis is unlikely, based on the lack of responses to therapies. PCR for babesia could be performed but even in the presence of a positive PCRm the clinical course would not support a primary role of the parasite in the development of anemia. Other causes of immune mediated anemia should be investigated. The intense leukocytic response suggest a strong inflammatory component, likely acute (presence of bands) or subacute (bands and activated monocytes), although the bone marrow activation in response to acute blood losses (such as haemolytic anemias) often induce the release of immature precursors of both (myeloid and erythroid) lineages even in the absence of a peripheral inflammation. In this case, however, the release of erythroid precursors from bone marrow is moderate (reticulocytes are present as a compensatory response to anemia but earlier precursors are not released by the bone marrow) and the presence of immature leukocytes is thus much more consistent with inflammation than with a “non-specific” response to anemia.

SCORING:

Cellularity	0,5 pts
RBC description	1 pt
Presence of reticulocytes and only few metarubricytes	0,5 pt
WBCs:	
Neutrophils (mature, bands and vacuolization)	1 pt
Monocyte description	1 pt
Hematological diagnosis	1 pt
Comments	
Primary process : anemia	0,5 pt
Likely immune mediated	1 pt
Comments on the possible cause of anemia	0,5 pts
Comments on leukocyte response (Dd anemia/inflammation)	1 pt
TOTAL	8 pts