

# AXIOM

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## CASE STUDY

### Canine Essential Thrombocythemia with Basophilia

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#### HISTORY

7 year old NF Collie  
Signs of anaemia, pyrexia and lethargy.  
Spayed Feb'05 and blood transfusion performed at same time.  
T=104°F.

#### BACKGROUND

First presented in Feb'05 with moderately regenerative anaemia and toxic neutropenia with a left shift. Increased platelet numbers noted.  
Presented again in Sept'05 with weight gain, exercise intolerance and the continuation of anaemia and thrombocytosis. Bone marrow aspirate recommended with suspicion of a possible bone marrow dyscrasia. ECG performed showing normal sinus rhythm 140/min. Cardiac x-ray showed no signs of abnormality...  
...case referred to Axiom Veterinary Laboratory.

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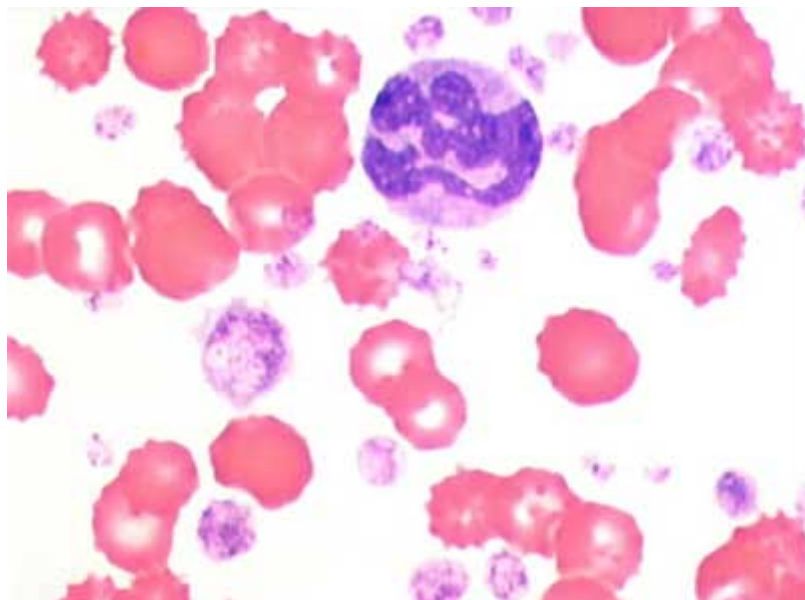
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### LABORATORY REPORT

HAEMATOLOGY		
WBC	L	$5.9 \times 10^9/l$
RBC	L	$3.14 \times 10^{12}/l$
Hb	L	6.8 g/dl
PCV	L	24 %
MCV		76.4 fl
MCH	L	21.7 pg
MCHC	L	28.3 g/dl
Platelets	H	$\times 10^9/l$

**Abs Retics =  $43.96 \times 10^9/l$**   
**Marked neutropenia and basophilia**



**Canine Essential Thrombocythemia with Basophilia**

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## CASE STUDY

### FILM REVIEW

Basophil granules are poorly staining  
Platelets clumped in film  
Platelet count appears raised >1000  
Platelet anisocytosis  
Scanty polychromasia  
Slight anisocytosis

### CLINICAL PATHOLOGIST REPORT

Moderate anaemia which appears to be poorly regenerative and suspected to be secondary to a possible bone marrow disorder.

Neutropenia alert - risk of sepsis. May be transient phenomenon, or may reflect possible bone marrow disorder.

Marked thrombocytosis present with basophilia. Thrombocytosis can be reactive e.g. due to inflammation, chronic haemorrhage etc, or may be pathological including a condition called Essential Thrombocythemia.

Essential Thrombocythemia may be associated with basophilia.

Consider bone marrow aspirate to investigate further and haematological monitoring also advised.

## CASE STUDY

### DISCUSSION

Essential Thrombocythemia (ET) is a myeloproliferative disorder (MPD) characterised by the proliferation of a pluripotent haemopoietic stem cell. This leads to the expansion of the megakaryocyte (MK) compartment in bone marrow and the growth and maturation to large, mature MKs, and the excessive and presumably autonomous production of structurally and functionally abnormal platelets (Feldman et al, 2000).

Although elevated platelet counts occur in all MPDs, ET is distinguished by the singular prominence of platelets. MPDs include ET, polycythemia vera, chronic myelogenous leukaemia and myelofibrosis. As thrombocytosis is a feature of these and other MPDs it is therefore stated that ET is a diagnosis of exclusion, where all other causes of thrombocytosis are excluded to make a diagnosis.

Part of the diagnostic criteria for ET is normal or decreased RBCs and <40% HCT (Feldman et al, 2000). The dog in this case was presented with thrombocytosis ( $>1000 \times 10^9/l$ ), decreased RBC ( $3.14 \times 10^{12/l}$ ) and HCT <40% (PCV=24%).

Few cases of ET have been reported in domestic animals; only six canine cases have been reported in recent literature. The dogs in these cases that were diagnosed with ET were aged between 4 and 11 years old and were presented with lethargy, pale mucus membranes, weight loss, pica, anorexia and exercise intolerance.

In this case it is suggested that basophilia may be associated with ET. This phenomenon was also reported by Hopper et al in 1989. Essential thrombocythemia in an 11-year-old dog was characterized by persistently high platelet counts, abnormal platelet morphology, marked megakaryocytic hyperplasia in the bone marrow, absence of circulating megakaryoblasts, and history of splenomegaly and gastrointestinal bleeding. Another significant finding was the presence of a basophilia in blood (4,836/microliters) and bone marrow. Interestingly, the mature basophils were reported as unusual in that their granules stained poorly with Wright's stain but well with Giemsa and toluidine blue. The film review in this case also states that the basophil granules were poorly staining.

Final diagnosis was made from increased numbers of megakaryocytes and megakaryoblasts (15% to 20%) in the bone marrow of the reported case and was confirmed by a positive acetylcholinesterase reaction. The dog was treated with radiophosphorus and the results were a rapid decline in the numbers of megakaryoblasts and megakaryocytes in the bone marrow, and normal counts of platelets and basophils in the peripheral blood.

A bone marrow aspirate has been recommended for this case and haematological monitoring is also advised to confirm the diagnosis of a possible MPD.

#### References:

Feldman BF, Zinkl JG, Jain NC, et al. (2000) Schalm's Veterinary Haematology - 5th Edition. P504-507. Lippincott Williams & Wilkins Publishing.

Hopper PE, Mandell CP, Turrel JM, Jain NC, Tablin F, Zinkl JG. Probable essential thrombocythemia in a dog. J Vet Intern Med. 1989 Apr-Jun;3(2):79-85