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Thrombocytopenia

Issue Description

Thrombocytopenia refers to an abnormally low blood-concentration of platelets, which are blood cells that promote blood clotting after injury to the lining of the blood vessels. When the concentration of platelets becomes too low, bruising and bleeding may occur. Dogs with blood platelet concentrations of less than 40,000 per microliter of blood are at risk for spontaneous bleeding.

Abnormally low platelet numbers in blood can be caused by a variety of disease processes. These include failure to produce new platelets in the bone marrow, premature destruction of circulating platelets often by the body's own immune system, sequestration or storing of platelets in organs, and consumption of platelets at a rate that exceeds production in the bone marrow. Dogs of either gender, any age and any breed can suffer from thrombocytopenia.

The severity of bleeding associated with thrombocytopenia depends on how low the platelet numbers fall.

Causes

Decreased platelet counts can be due to a number of disease processes:

Decreased Production

- Vitamin B12 or folic acid deficiency.
- Leukemia or myelodysplastic syndrome.
- Decreased production of thrombopoietin by the liver in liver failure.
- Sepsis, systemic viral or bacterial infection.
- Dengue fever can cause thrombocytopenia by direct infection of bone marrow megakaryocytes as well as immunological shortened platelet survival.

Hereditary Syndromes

- Congenital amegakaryocytic thrombocytopenia (CAMT)
- Thrombocytopenia absent radius syndrome.
- Fanconi anemia
- Bernard-Soulier syndrome, associated with large platelets.
- May Hegglin anomaly, the combination of thrombocytopenia, pale-blue leukocyte inclusions, and giant platelets.
- Grey platelet syndrome
- Alport syndrome

Increased Destruction

- Idiopathic thrombocytopenic purpura (ITP)
- Thrombotic thrombocytopenic purpura (TTP)
- Hemolytic-uremic syndrome (HUS)
- Disseminated intravascular coagulation (DIC)
- Paroxysmal nocturnal hemoglobinuria (PNH)
- Antiphospholipid syndrome
- Systemic lupus erythematosus (SLE)
- Post transfusion purpura

- Neonatal alloimmune thrombocytopenia (NAITP)
- Splenic sequestration of platelets due to hypersplenism
- Dengue fever has been shown to cause shortened platelet survival and immunological platelet destruction

Medication-induced

Thrombocytopenia-inducing medications include:

- Direct myelosuppression
 - o Valproic acid
 - o Methotrexate
 - o Carboplatin
 - o Interferon
 - o Other chemotherapy drugs

Immunological Platelet Destruction

- Drug binds Fab portion of an antibody. The classic example of this mechanism is the quinidine group of drugs. The Fc portion of the antibody molecule is not involved in the binding process.
- Drug binds to Fc, and drug-antibody complex binds and activates platelets. Heparin induced thrombocytopenia (HIT) is the classic example of this phenomenon. In HIT, the heparin-antibody-platelet factor 4 (PF4) complex binds to Fc receptors on the surface of the platelet. Since Fc portion of the antibody is bound to the platelets, they are not available to the Fc receptors of the reticulo-endothelial cells, so therefore this system cannot destroy platelets as usual. This may explain why severe thrombocytopenia is not a common feature of HIT.

Symptoms

The usual patient is a middle-aged dog. Poodles appear to be predisposed though Cocker Spaniels and Old English Sheepdogs also seem to have a higher than average incidence of this condition.

Spontaneous bruising is the major clinical sign. The gums and oral surfaces or on the whites of the eyes are a obvious areas to check as is the hairless area of the belly. Small spots of bruising in large conglomerations called "petechiae" are the telltale sign. A large, purple expansive bruise might also be seen called "ecchymosis." Large internal bleeds are not typical of platelet dysfunction, though bleeding small amounts in urine, from the nose, or rectally may also indicate a platelet problem.

Diagnosis

Inspection of gums and mouth, whites of the eyes, and abdomen may reveal petechiae or ecchymosis. Blood platelet counts can determine if numbers of platelets are normal or too low, or appear abnormal. Tests are not yet available to detect anti-platelet antibodies. Veterinarian diagnosis on a case-by-case basis, using tests for other diseases combined with symptom assessment.

Treatment

- Treatment of the cause, if known.
- Prednisone or dexamethasone immunosuppression.
- Azathioprine if no response to above.
- Transfusion when a crisis occurs.
- Splenectomy

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